In The Name of God

35th Iranian Congress of Radiology

17th Iranian Congress of Radiographic Sciences Association
هفدهمین کنگره علوم پرتونگاری ایران

April 23-26, 2019
Tehran/Iran

Table of Contents

J. Jalal Shokouhi, MD

President,
Iranian Society of Radiology

Welcome message-ISR President*

By year 2018-2019, 123 years after x-ray discovery and 53 years of starting ISR, we are going to hold ICR-35 in TEHRAN, IRAN.

By specific or special Geopolitical and economical condition of the middle east and our country it is so challenging and difficult to do the best in this event but visiting friends and colleagues and listening to the speaches in the congress chambers give us determination to do very well.

Parallel to this event 17th congress of our friends in technical science cooperation will be held.

Venue of these events will be at Milad tower complex in the live weather of spring from 23rd to 26th of April 2019, "3rd to 6th of ordibehesht 1398 of Iranian calendar".

Selected butterfly icon for this congress emblem containing MRI- tractography image for the body and digital mammography for the wings extending to follow ICR – 34's rose flower emblem indicate free and smooth flight of the butterfly which stands for radiology, smell the best scent of the fresh flowers.

Butterflies like magpie's love fresh weather unlikely crows that stayed in dirty cities alongside human.

Main themes of the congress are radiation protection for the safety of staff and patients through more emphasis an x-ray as a better protection, woman's imaging because 50% of the population's health consists of that of mothers, sisters, wives and daughters, Oncology radiology for life expectancy and addressing the increased cases of cancers in developed societies due to new unknown products and stress contamination, central nervous imaging in regards to its leadership of the brain and spinal cord through the entire body and finally, future of radiology for hybrid functional, molecular complementary and specific targeted imaging.

Dr Morteza Sanei Taheri is the president of ICR-35 from Shahid Beheshti University Medical Sciences who is an active member and a kind friend of ISR and scientific committees with a lot of good ideas.

The scientific secretary and the executive secretary are Dr Ali Hekmatnia ;ICR-34 president and professor of Isfahan University of Medical Sciences and the kind renowned secretary of ISR Dr Vahid Karimi.

President of 17th congress of our technical friends is Dr Mazyar Mahdavi who is an educated kind and active colleague.

I would like to thank my friend Mr. Morteza Afrah; president of IRSA for his cooperation between two associations and societies.

Parallel to the two congresses there is a large radiological instrumental exhibition leading to important scientific effects and economic benefits.

I would like to thank my friend Mr. Hosein Rezvani president of Iran Medical Engineering Companies, IMEC. Along with all members of the ISR, IRSA and IMEC, people keep our radiology flag flying.

Honorary president of ICR-35 is professor Iraj Honarbakhsh a longtime friend and high grade teacher of Shahid Beheshti medical university, ISR and Iranian radiological cooperative association "CIRAD".

For the last two years ISR had a good cooperation with national brain mapping laboratory and we founded the first biobank in the middle east. There are good active large biobanks in USA, UK, Germany, France and another well developed countries.

In the past 2-3 years multiple educational programs have been made as symposiums and local congresses by ISR and 22 provincial radiological societies.

For us this is the beginning of de-centralization in medical societies.

Finlay we are looking for a real suitable fee for imaging services, because with present fees the future of investment in this field is in question.

I would like to say my warm welcome to our invited quests and speakers, Also all audience and congress visitors.

WELCOME MESSAGE OF PRESIDENT OF ICR 2019

Dear colleges,

On behalf of the Iranian Society of Radiology, I am honored to inform you that the 35th Iranian Congress of Radiology is due to be held in Tehran Milad conference center from 23 to26. April 2019. This event is to offer a unique perspective on topics most pertinent to your practice today including Obstetric. & Gynecology. imaging, Radiation protection, oncology imaging, imaging of the nervous system and hybrid imaging.

This year we have one of the countries' highly respectable and prominent professors, Dr. Iraj Honarbakhsh as the honorary president and Dr.Ali Hekmatnia from the Isfahan university of medical sciences as the scientific Secretary of the congress.

The scientific committee of the congress has organized an assembly of prominent faculty in various developing subspecialty areas to provide a unique opportunity for professional development and exchanging expertise in both practice and theory for the attending colleagues.

In the 35th ICR, renowned professors from Iran and other countries are to address current issues and trends in various areas of radiology to have all colleagues, residents of radiology and faculty from different corners of our country, gain updates to enhance their clinical expertise. the program has been especially customized according to your valuable comments and suggestions during our previous events to cover your educational needs for everyday clinical practice.

Along with Scientific presentations and lectures held at various halls of the venue, this year's congress will also feature several interesting items including workshops, interactive case reviews, meeting with professors, case of the day, resident quiz, etc.

In the interest of the radiology residents' training needs, we have revised this year's board review and allocated a full review to Gynecology Imaging. Moreover, obstetric interventions will be dealt with in specific sessions.

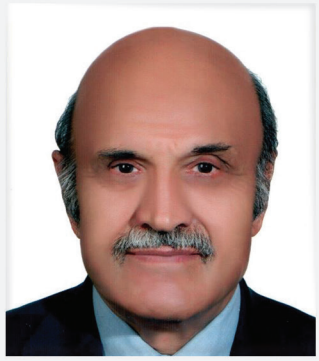
In addition to the scientific content of the congress, it will also host several sponsoring companies active in the area of medical imaging who will present their latest products to would be customers.

several national, regional and international scientific societies especially from neighboring countries, are expected to be represented at the congress. Finally, we cordially look forward to having you at the 35th ICR and hope you enable us improve the quality of our service with your valuable comments and suggestions.

M. Saneie Taheri, MD

President of the 35th Iranian Congress of Radiology (ICR 2019)

This is quite an honor to be invited as honorary president of **35th Iranian Congress of Radiology (ICR2019)**.
Due to economic problems many yearly Iranian Medical Congress has been canceled but with the help of our Iranian radiologists, we are proud to be able to perform our regular yearly congress.
This congress covers various aspects of the diagnosis and management of oncology, The role of imaging in detection, staging and follow ups.
We Will also cover radiation protection, Women and obstetrics, imaging in neuroradiology, hybrid imaging (PET CT) but main focus will be on oncology and radiation protection.
It's quite apparent that never before has the role of radiologist in detection, diagnosis and management of the patient with cancer a prominent role that I believe will continue fat into the future.
In behalf of all participant radiologist in 35th ICR I would like to express my thanks to Dr. Sanei and his team for their contributions to this congress Good Luck.



I. Honarbakhsh, MD

Honorary President of ICR 2019

WELCOME MESSAGE OF ISR GENERAL SECRETARY

Welcome to the annual congress of the Iranian Society of Radiology.

Iran is the country goodwill and peace. We hope that along with fruitful engagement in scientific and technical discussions, you be able to convey our people's message of goodwill and peace to the people of your countries. The Iranian Society of Radiology has endeavored to hold the35th Iranian Congress of Radiology in closest possible accordance with the highest standards of international congresses to fulfil its mission of meeting the scientific needs and requirements of our country.

V. Karimi, MD

General Secretary of
Iranian Society of Radiology

Dear Colleagues

It is my honor to welcome you for participation in the 17th Congress of Radiographic Sciences Association. The Congress mainly deals with radiation protection and X-ray image quality, and a group of experts in the fields of Medical Physics, Radiology Technology, Radiation protection and Radiation Biology present the knowledge and advanced techniques, which could be a guideline for technologists to establish the ALARA safety principle as well as maintain the image quality in the radiology departments simultaneously. The other areas of imaging and related technologies are also included and discussed in the Congress to achieve the educational promotion, which is the main requirement for the Radiology Technologists all over Iran, our beloved country.

M. Mahdavi PhD

President & Scientific Secretary
Assistant Professor in Medical Physics

WELCOME MESSAGE OF HONORARY PRESIDENT OF ICR 2019

Dear colleagues, Friends and distinguished Guests.

On behalf of the congress committees, it gives me great pleasure to welcome you all to 17th Congress of Iranian Radiographer Sciences Association.
This congress is an opportunity to share expert knowledge and learn the principles of radiation protection, imaging sciences and provide the best diagnostic and therapeutic methods.
By pursuing scientific progress and enhancing the educational capabilities of Radiographers in Iran, the Iranian Society of Radiography has tried to provide the best possible results by holding scientific conferences and presenting the latest research papers.
We have tried to turn this Congress into a great success in all fields of imaging sciences so that all participants in Congress can benefit.
Once again, on behalf of IRSA would like to welcome you and wish you a happy and successful Congress.

M. Afrah

President of Radiographic Sciences Association

GENERAL INFORMATION

Venue.
International Conference Center of Tehran Milad Tower, Tehran, Iran
Organizer:
35th Iranian Congress of Radiology (ICR 2019) is organized by the Iranian Society of Radiology.
Date:
April 23- 26, 2019
Language
The language of the congress is English and Persian
Secretariat Registration
Registration fee includes: • Admission to scientific sessions and commercial exhibition • Congress bag, the welcome receptions • Certificate of attendance
Scientific Program Secretarial
Assistance and information regarding the scientific program will be provided by secretariat at conference center lobby.
Speaker Ready Room
The slide preview room is located in the "Main Hall "at Conference Center on the ground floor and will operate from 8:00 to 18:00. Lecturers are requested to submit their presentations 30 minutes before their session. The presentation should be in PowerPoint 2003 format. The files should be in portable media format supplied in flash-disk or CD.
VIP Room
The VIP room (Molavi Hall) is available for all ICR2019 speakers on -1/B1 floor at Conference Center
Electronic Posters
This year we only accept posters in electronic format. All posters should be prepared in PowerPoint 2003 format .Posters will be displayed in the lobby
Badges
Participants are requested to always wear their badges. The badges contain a bar-code which will be used for registering your entrance into the halls and also restaurants.
Workshop Registration
Workshops need separate registration. workshop schedule will be available at www.35.icrad.ir.
Transportation
Transport between Conference Center and Hemmat Highway will be available each 30 minutes starting from 8:00 until 18:00.
Meals
Coffee break will be available daily at 10:30- 11:00, 16:00-16:30 and lunch at 13:00- 14:00. All participants are advised to acquire the voucher for meals in advance at the time of their registration, otherwise they ought to get the voucher from registration desk.
Technical Exhibition
A technical exhibition will take place at the Conference Center, sufficient time during intermissions is reserved for visiting the booths of leading sponsors (Medical Engineering Companies), which present their latest achievements and give you ample expert information. Please refferte the Exhibit guide in your Congress bag.
Society Booth
The Iranian Society of Radiology booth is located on -2/B2. Application forms and general information for membership are available. It provides membership services, information and an opportunity to pay annual dues for the society.
Only the Author is Liable for the Content and Wording of Abstracts. مسئولیت محتوا و نگارش بر عهده نویسنده مسئول مقاله می باشد.

SCIENTIFIIC ORAL ACCEPTED ABSTRACTS
10 BEST PAPER:ICR2019

Artificial Inteligence in Medical Imaging
Houman Sotoudeh

Assessment of Scatter Radiation Dose by TLD Measurement Including Skin Dose Thyroid & Contralateral Breast Dose in Mammography Patients
Masoumeh Gity

Rotterdam CT Score and Predicting Early Outcomes Among Children with Traumatic Brain Injury
Masoumeh Abedzadeh

Comparison of Visual Evaluation of MS Plaques in Successive MRI Images for Evaluation of Disease Status with a Dedicative Software
Banafsheh Zeinali-Rafsanjani

Primary CNS Neoplasm; Post treatment Imaging
Houman Sotoudeh

Diagnostic Value of Venous-arterial Attenuation Ratio and Hounsfield-Hematocrit Ratio in the Evaluation of Acute Cerebral Venous Sinus Thrombosis in Non-contrast Brain Computed Tomography
Bita Abbasi

Cognitive Functions and White Matter Lesions on MR Images in a Sample of Normal Iranian Population with Cardiovascular Risk Factors
Mehran Arab Ahmadi

CAD System Based on B-mode and Color Doppler Sonographic Features may Predict If a Thyroid Nodule Is Hot or Cold
Afshin Mohammadi

1Breast Tumor Classification in Shear Wave Elastography Images Using Convolutional Neural Network
Mostafa Ghelich Oghli

Diagnostic Value of Coronary Transluminal Attenuation Gradient in Coronary CT Angiography for Determining Stenosis Severity
Pooya Akbari

INVITED SPEAKER ABSTRACTS LIST OF ICR 2019

INVITED SPEAKER ABSTRACTS LIST OF ICR 2019

INVITED SPEAKER ABSTRACTS LIST OF ICR 2019

INVITED SPEAKER ABSTRACTS LIST OF ICR 2019

SCIENTIFIC ORAL ACCEPTED ABSTRACTS LIST OF ICR 2018

SCIENTIFIC ORAL ACCEPTED ABSTRACTS LIST OF ICR 2019

POSTER ACCEPTED ABSTRACTS LIST

POSTER ACCEPTED ABSTRACTS LIST OF ICR 2019

POSTER ACCEPTED ABSTRACTS LIST OF ICR 2019

POSTER ACCEPTED ABSTRACTS LIST OF ICR 2019

POSTER ACCEPTED ABSTRACTS LIST OF ICR 2019

POSTER ACCEPTED ABSTRACTS LIST OF ICR 2019

SCIENTIFIIC ORAL ACCEPTED ABSTRACTS
17TH CONGRESS OF IRSA

SCIENTIFIIC POSTER ACCEPTED ABSTRACTS
17TH CONGRESS OF IRSA

INVITED SPEAKER ABSTRACTS

STANDARD METHOD FOR WOMEN PELVIC MRI

Behnaz Moradi, MD
Assistant Professor of Radiology, TUMS, YAS Hospital

Abstract:

Magnetic resonance imaging of the pelvis is a noninvasive technique for the evaluation, assessment of severity, and follow-up of diseases of the female pelvic organs. MRI provides excellent contrast of soft tissues and provides multiplanar and 3D depiction of pathology and anatomy without exposure to ionizing radiation.

Indication Includes:

1-Evaluation of suspicious known mass/tumors for further evaluation of indeterminate or questionable findings; 2-Evaluation of known cancer for further evaluation of indeterminate or questionable findings or staging; 3-For evaluation of suspected infection or inflammatory disease; 4- Pre-operative evaluation; 5-For post-operative/procedural evaluation; 6-Endometriosis; 7- Pelvic floor imaging…
Standard MRI of the female pelvis includes coronal single-shot fast spin-echo (FSE), axial T2-weighted (T2W) FSE, axial in-phase and opposed-phase T1-weighted (T1W) gradient-recalled echo (GRE), and sagittal T2W FSE fat-suppressed sequences utilizing a dedicated pelvic phased-array coil. Fat-suppressed axial 3-dimensional T1W GRE dynamic imaging following intravenous administration of 20 mL of gadolinium contrast is obtained routinely. Delayed fat-suppressed 2-dimensional (2D) GRE imaging is subsequently obtained in another plane. If artifact from the bowel is perceived as problematic on initial sequences, glucagon may be administered by intramuscular (0.8 mg) or intravenous injection (0.2 mg). For pelvic floor imaging, dynamic 2D GRE imaging may be performed with and without the Valsalva maneuver, to detect pelvic prolapse.

Keywords:

Pelvic MRI, Female, Uterus, ovaries

ENDOMETRIAL ABNORMALITIES AND ROLE OF IMAGING, WHICH MODALITY AND WHEN?

Maryam Rahmani, MD
Professor of Radiology, Tehran University of Medical Sciences
Imam Khomeini Complex, ADIR

Women symptoms arising from the endometrial abnormalities are common and depend on age, menstrual cycle, and history of medications such as hormone replacement and tamoxifen.
Although imaging doesn't replace tissue diagnosis but it could predict benign and malignant conditions based on endometrial thickness, shape and several other characteristics.
The first modality of choice is transvaginal ultrasound (TVUS) and transabdominal ultrasound (TAUS) is sometimes useful.
Endometrial biopsy may be used before TVUS in some cases and nowadays it is done more than D&C as first line sampling method.
Magnetic resonance imaging (MRI) plays a complementary role.
Additional imaging methods include Saline Infusion hysterosonography (SIS) and new promising method, Gel Infusion hysterosonography (GIS).

IMAGING FINDINGS OF ENDOMETRIAL AND CERVICAL POLYPS

Ladan Younesi, MD
Shahid Akbarabadi, Clinical Research Development Unit (ShACRDU), Iran University of Medical Sciences(IUMS), Tehran, Iran

Endometrial polyps are sessile masses of variable size that project into the endometrial cavity. They may be asymptomatic or symptomatic, causing abnormal bleeding if they ulcerate or undergo necrosis.
Tamoxifen therapy is a risk factor for the development of endometrial polyps; polyps develop in 8% to 36% of postmenopausal women treated with tamoxifen.

Transvaginal ultrasonography (TVUS) is the primary modality for assessing endometrial abnor-mality.
Sonohysterography (saline infusion sonogram) is more accurate than ultrasound (US) alone in making a diagnosis of endometrial polyps. However, these lesions often cannot be separated from the surrounding endometrium because the whole endometrium may appear diffusely thickened. As endometrial thickening is a nonspecific US finding, it should be correlated with the patient's age, symptoms, and hormonal status.
To make a specific diagnosis in these circumstances, endometrial cytology, biopsy, and curettage have been the mainstays of preoperative diagnosis. As these procedures are commonly performed in a blind manner, it is not always possible to make a definitive diagnosis. Moreover, these procedures are difficult to perform in some cases with vaginal or cervical stenosis.
Because of its excellent soft-tissue -contrast resolution and multiplanar capability, magnetic resonance imaging (MRI) can demonstrate morphologic features and the extent of lesions, both of which are useful in making decisions for surgical or hysteroscopic resection.
The purpose of this study is to describe US, Sonohysterography and MRI characteristics of endometrial and cervical polyps and to evaluate the usefulness of these characteristics for differentiating these polyps from other endometrial lesions, especially endometrial carcinomas.

Keywords:
Polyps, Endometrium, US, MRI.

PELVIC FLOOR US

Arvin Arian, MD, TUMS
Imam Khomeini Hospital, Medical Imaging Center-Cancer Institute

Pelvic organ dysfunction is widespread problem in the middle age and elderly women's that significantly decrease the quality of life especially in the later life. Trans perineal (trans perineal), 2D ultrasonography can be used for the assessment of female pelvic floor components in anterior part (Bladder, urethra), middle compartment (Uterus and cervix) and posterior compartment(rectum ,anal canal) for anatomical defects, tissue biomechanics and prosthetic implants dislodgement. The study performs in rest, squeeze and straining with benefit of real time access to patient.
3D & 4D US may allow dynamic assessment of anatomy in the axial plane with the advantage of tomographic images for quantification of levator defects. Us also benefits from low cost, easy availability and good access to patient.

Keywords:
Pelvic floor dysfunction, US (2D & 3D), trans labial (transperineal)

PELVIC FLOOR IMAGING (2D, 3D US AND MRI)

Arvin Arian, MD, TUMS
Imam Khomeini Hospital, Medical Imaging Center-Cancer Institute

Pelvic floor disorders consist of a wide spectrum of various pathologies and account for a variety of clinical presentations. Clinical complains include urinary and fecal incontinence, chronic pelvic pain, sexual dysfunction, constipation and genital prolapsed. They make a significant impairment in quality of life and involve up to 30% of middle age women. Basically the first method of investigation is manual exam preferably POP-Q. However, it is not enough as there is a high recurrence rate after pelvic floor surgeries. In this way imaging modalities may help in more precise detection of pelvic floor dysfunction and to determine if the defect is global or confined to a specific compartment.
Trans labial US is an easy and available modality with low cost and is recommended as the first line of imaging evaluation. US also lacks the disadvantage of limitation access to patient.
MRI with multiple sequences in static and dynamic series can play a major role in definition of multi compartment nature of most of pelvic floor disorders and potentially can provide a road map for Gynecologist for best surgical planning.
In this presentation we describe the US (2D & 3D) and MRI findings in various defects of muscular support of pelvic floor and endopelvic fascia

responsible for dysfunctions in Anterior, mid and posterior compartments.

Keywords:
Pelvic floor dysfunction, US (2D & 3D) and MRI

BREAST MRI, ROLE IN SCREENING AND PRE-OPERATIVE STAGING

Amin Astani, MD
Assistant Professor of Radiology
Shahid Beheshti University of Medical Sciences

Breast MRI has a proven beneficial role in screening for breast cancer in certain population. If this population is carefully selected, the breast MRI is highly effective, economic, and decreases morbidity and mortality from breast cancer. Currently, based on the available published research, breast MRI is not recommended as a screening tool for general population and masses. Frequently, there is a misconception on the ability and role of breast MRI to the point that the essential and primary role of mammogram is ignored at a great cost and detriment to the patient. Breast MRI and mammography have an additive role and one does not substitute the other. Breast MRI can also have a productive role in pre-operative staging of breast cancer in certain clinical scenarios. Familiarity with the role of breast MRI, its limitations and published guidelines on who can benefit from screening breast MRI is essential for every radiologists and clinicians who can potentially request a breast MRI.

BREAST CANCER IN MEN

Amin Astani, MD
Assistant Professor of Radiology
Shahid Beheshti University of Medical Sciences

Although significantly less prevalent than female, breast cancer also occurs in men. Male breast cancer is typically more aggressive, diagnosed at larger size and more advanced stage, and has a poorer prognosis than age and stage matched female breast cancers. While female breast cancer survival has seen significant improvement over time, there is no change in male breast cancer survival. It has been suggested that molecular profile and natural history of male breast cancer is different than female breast cancer. Understanding of male breast cancer pathophysiology and familiarity with clinical presentation and imaging features of male breast cancer are essential in guiding clinicians to earlier diagnosis and potentially better prognosis of male breast cancer.

"WHAT SHOULD WE KNOW ABOUT LYMPH NODES"

Nahid Sadighi, MD
TUMS, ADIR, Imam Khomaini Hospital

Lymph nodes are involved in a wide variety of diseases, particularly in cancer. In the latter, precise nodal staging is essential to guide therapeutic options and to determine prognosis.
In patients with cancer, the demonstration or exclusion of lymph node metastases is an important component of tumor staging besides evaluation of local tumor extent and has crucial implications for the patient's prognosis and therapeutic strategy, especially when deciding on curative versus palliative treatment.
The lymphatic drainage of the breast is of great importance in the spread of carcinoma and about three quarters of it is to the axillary nodes.
There are three surgical levels of axillary lymph nodes:

- level I: below the lower edge of the pectoralis minor muscle.
- level II: underneath/posterior the pectoralis minor muscle.
- level III: above/medial the pectoralis minor muscle.

In many settings, the ability to detect axillary lymph nodes containing metastases with imaging and image-guided biopsy can allow surgeons to bypass sentinel lymph node dissection and proceed with full axillary lymph node dissection. However, no imaging modality currently has sufficient negative-predictive value to obviate surgical staging of the axilla if no abnormal lymph nodes are detected.
In many settings, the ability to detect axillary lymph

nodes containing metastases with imaging and image-guided biopsy can allow surgeons to bypass sentinel lymph node dissection and proceed with full axillary lymph node dissection.
However, no imaging modality currently has sufficient negative-predictive value to obviate surgical staging of the axilla if no abnormal lymph nodes are detected.
Currently, the most accepted and useful modality for imaging axillary lymph nodes is ultrasonography.
Advantages of MRI over sonographic evaluation of the axilla include the ability to compare directly axillary lymph nodes in question with the contralateral axilla and decreased dependence on operator experience.
Finally, the increased availability of functional imaging, especially through the use of FDG-PET, has greatly contributed to the accuracy improvement of nodal metastases identification. The aim of this review will thus be to briefly review the anatomy and physiology of the lymphatic systems and to overview the basic principles of up-to-date lymph node imaging.

MAMMOGRAPHIC PATHOLOGIC CORRELATION

Arvin Arian, MD
Assistant Professor of Radiology, Cancer Institute, (TUMS)

Nowadays the requests for percutaneous breast biopsy has significantly increased due to improvement of imaging modalities.
The radiologist has to recognize the lesions that need tissue diagnosis then offer the best way to have an efficient biopsy and then proceeding to biopsy. After that he or she should determine the concordance of radiology and pathology according to BI-RADS Lexicons. Whether the lesion needs to have short term follow up or surgical excision. It is a main responsibility of radiologist to make decision in this way.

LOBULAR NEOPLASIA IN BREAST SCREEN SETTING MULTICENTRE STUDY (ST VINCENT AND MONASH) RETROSPECTIVE, DESCRIPTIVE STUDY 23 YEARS (1993-2016)

Parisa Aminzadeh, MD
Stephanie Khoo, MD

Background on Lobular neoplasms
Spectrum of lesions encompassing atypical lobular hyperplasia (ALH) and lobular carcinoma in situ (LCIS).

- LN is often multifocal and bilateral.
- LCIS SUBTYPES
- Classic
- Variant types (pleomorphic and LCIS with comedo necrosis)
- SIGNIFICANCE
- Marker of increased risk for invasive carcinoma.
- LCIS: 8-9-fold risk of developing subsequent carcinoma
- ALH:4-5-fold risk
- Clinical guidance for the management of lobular carcinoma in situ(Cancer Australia)
- MDM Decision
- Concordant Classic LCIS on core needle biopsy. No other higher risk abnormalities that would impact management surveillance remains an appropriate option.
- Discordant LCIS on core needle biopsy: Subsequent biopsy to obtain a larger tissue sample
- Other LCIS subtypes (pleomorphic or with comedo necrosis) or proliferative lesions present that require investigation, excision should be undertaken.
- Problem
- limited consensus recommendation for the management of lobular neoplasia in particular Classic LCIS.
- Research question:
- Incidence
- Radiological appearance
- Management
- Final outcome

- of screen-detected lobular neoplasia (LN)?
- to help guide future management and evidence-based recommendations.
- Method
- Inclusion criteria: Patients with ALH and LCIS as the highest risk lesion on core biopsy were included
- Search parameters using ALH and/or LCIS diagnosis on core biopsy and high-risk status LCIS patients
- Exclusion criteria: Those with additional ADH, DCIS, invasive carcinoma and radial scar on core biopsy
- Analysis of
- Age, family history, Breast Screen round, lesion type
- Imaging
- Architectural distortion, mass, calcification
- Size
- Unilateral, Bilateral
- Imaging concordance? (calcification or asymmetric density in this group)
- Histopathology on excision or follow up period
- Results
- At both centers during 1993 -2016:
- 504 686 women were screened
- 1 913 245 screening mammograms were performed
- 72 patients met inclusion criteria
- 60 LCIS and 12 ALH on core biopsy; 16 with LCIS – variant type
- Median screening round 3.5 (range 1 - 11)
- Incidence of LCIS 11.8 per 100 000 Breast Screen women
- Table A at the end of abstract
- Conclusion

Table A

TYPE OF LN	NUMBER	UPGRADE NUMBER	UPGRADE RATE
LN: VARIANT (PLEOMORPHIC and other non classic0	16	5	31%
LN: LCIS CLASSIC	44	7	15.9%
LN:ALH	12	1	8.3%

APPROACH TO CHILDREN THYROID NODULES

Hashem Sharifian, MD
Radiologist, Tehran University of Medical Sciences, Amira'alam Hospital

Thyroid nodules are among the most common disorders in human being. The difference in prevalence and rate of malignancy between thyroid nodules in children and adults, make it necessary to discuss this entity separately in children.
According to ATA guidelines, I discuss the age group that in them these differences are important, rate of malignancy, points for follow-up or intervention and classic approach to children's thyroid nodule will be reviewed in the lecture.

SKULL BASE LESION

Timothy Beale, MD
Consultant Radiologist, University College London Hospital,UK

The lecture will cover a method of classifying skull base lesions and briefly demonstrate the clinically relevant anatomy.
A series of cases will highlight how to differentiate skull base lesions depending on site (anterior, central and posterior skull base) and subsites (jugular foramen and petrous apex).
The common pitfalls in imaging this complex region and how to avoid them will be discussed.

INTERACTIVE CASES: REVIEW OF SINONASAL DISEASE AND TUMORS.

Timothy Beale, MD
Consultant Radiologist, University College London Hospital,UK

A variety of clinical cases will be presented highlighting a range of sinonasal pathology. Important review areas and the "pearls and pitfalls" for each clinical scenario will be discussed.
The important features to mention in your report and how to come to an appropriate differential diagnosis will be covered.

APPROACH TO CERVICAL LYMPH NODES

Mohammad Ali Kazemi, MD
Assistant Professor of Radiology, Tehran University of Medical Sciences, Amir Alam & Imam Hospitals

Cervical lymph nodes are mentioned by their levels from one to seven. There are also some important lymph nodes out of these levels.
We are going to discuss about warning signs of lymph nodes findings as size, borders, appearance, vascularity and so on.
At the end we want to see what is the next step for each lymph node to be done?

FACIAL NERVE ANATOMY AND PATHOLOGY

Mahmood F. Mafee, MD
(FACR), Professor Emeritus of Neuroradiolgoy
University of California, San Diego, University of Illinois at Chicago

Learning Objectives:

Upon completion of this presentation participants will be able to:

1. Understand the CT and MR imaging anatomy of facial nerve within the temporal bone and its extracranial course within the parotid gland.
2. Identify the role of CT and MR imaging in the clinical management of patients with facial nerve varied pathologies.
3. Choose the most appropriate imaging modality and protocol in the facial nerve palsy clinical scenarios.
4. Review a gallery of neuroimaging cases of patients with peripheral facial nerve palsy.

OPTIC NERVE AND GLOBE PATHOLOGY

Mahmood F. Mafee, MD
(FACR), Professor Emeritus of Neuroradiolgoy
University of California, San Diego, University of Illinois at Chicago

Learning Objectives:

Upon completion of this presentation participants will be able to:

1. Identify the role of CT and MR imagining in the clinical management of patients with optic nerve and intraocular pathology.
2. Review the differential diagnosis of optic nerve and ocular lesions.
3. Demonstrate the utility of diffusion – weighted imaging in the diagnosis of ischemic optic nerve/infarct and ocular pathology including retinoblastoma, medulloepithelioma and uveal melanoma.

INTERACTIVE FASCINATING HEAD & NECK CASES

Mahmood F. Mafee, MD
(FACR), Professor Emeritus of Neuroradiolgoy
University of California, San Diego, University of Illinois at Chicago

Learning Objectives:

Upon completion of this board review/presentation participants will be able to:

1. Understand the concepts underlying CT and MR imaging in a systematic approach in providing an intellectual list of differential diagnosis in imaging interpretation of varied head and neck pathologies.
2. Explain and define the role of head and neck imaging with regard to clinical management of patients with varied head and neck lesions.
3. List an imaging overview with regard to differential diagnosis of head and neck pathology.

CAROTID SHEATH LESIONS

M. Mohammadzadeh, MD
Assistant Professor, Department of Radiology, Division of Neuroradiology, Amiralam Hospital, Tehran University of Medical Sciences

Carotid space extends from carotid canal and jugular foramen at skull space down to aortic arch.
It contains internal carotid artery, internal jugular vein, cranial nerves 9-12 & sympathetic plexus.
Common lesions of carotid space include mainly paraganglioma, nerve sheath tumors, lymph nodes and vascular lesions such as carotid artery aneurysm and dissection as well as jugular vein thrombosis.
Different interactive cases of carotid space lesions as well as clues for differentiating them from parapharyngeal space lesions will be presented with details during the session.

POST OP THYROID ULTRASONOGRAPHY

Leila Aghaghazvini, MD
Associated Professor of Radiology, Shariati Hospital, Tehran University of Medical Sciences, Tehran, Iran

Thyroid cancer most times has good prognosis and surgery is the mainstay treatment and is followed by hormone therapy.
Post op ultrasonography and isotope scan follow up duration depend on the severity and type of malignancy.
Different pattern including post thyroidectomy normal tissue, thyroid remnant, granulation tissue or recurrence can be evaluated by ultrasonography. On the other hand ultrasound can determine the different pattern of malignant or suspicious metastatic lymphadenopathy versus reactive types.
We describe the ultrasound finding in post thyroidectomy period.

IMAGING IN CYSTIC NECK MASSES

Yasmin Davoudi, MD
Associate Professor of Radiology, (MUMS)

Associate Professor of Radiology Head of the Radiology Education Program Mashhad University of Medical Sciences MR Neuro Radiology Fellowship University of Califronia, San Diego Cystic masses of neck are a frequent finding on imaging and include a wide range of congenital and acquired lesions. Although clinical history and examination may suggest the diagnosis, imaging has a critical role in confirmation of the clinical diagnosis and assess the anatomical extent of the lesion before treatment.
High-resolution ultrasound (US) is an ideal initial imaging investigation for neck masses as it shows the cystic nature in most cases and localizes the mass in relationship to the surrounding structures. Development of three-dimensional technology, color, and power Doppler applications has led to great improvement in its diagnostic utility.
This presentation would review the imaging findings of different cystic neck lesions and would Focus on the important imaging characteristics that will help to narrow the differential and in many situations, would give the definite diagnosis.

INFLAMMATORY DISORDERS OF THE NERVOUS SYSTEM

Reza Bakhshandehpour, MD
Neuroradiologist, Paytakht and Parseh Medical imaging Centers, Tehran. <bakhshandehpour@gmail.com>
Alireza Aziz Ahari, MD
Assistant Professor of Radiology, Rasool-e-Akram Hospital, Iran University of Medical Sciences, <azizahari.ar@iums.ac.ir>
Mohammad Molavi, MD
Assistant Professor of Radiology, Ali-e-Asghar Hospital, Iran University of Medical Sciences, <molavi.m@iums.ac.ir>

The inflammatory and infectious diseases of the nervous system are a large group of disorders caused by abnormal autoimmune response of body against specific targets in the CNS or tissue damages triggered by different types of pathogens in the brain and spine. They can present with a wide spectrum of clinical symptoms, locations, and appearance.

The purpose of this presentation is to review their imaging characteristics in a case review manner. Although there might be some typical imaging findings, most of these disorders have nonspecific and even atypical appearances and could be in differential of wide range of neurological diseases, including primary and secondary tumors. So, awareness of radiologist will have a critical role for better patients' medical and surgical management and prevention of unwanted surgical interventions. We discuss these disorders in the adults and pediatric groups separately.

CNS TUMORS

Ali Hekmatnia, MD
Professor of Radiology Isfahan University of Medical Sciences
<ahekmatnia@hotmail.com>
Mahshid Bahrami, MD
Radiologist of Isfahan University of Medical Sciences
<Mahshidbahrami273@yahoo.com>
Hodasadat Sharif, MD
Assistant Professor of Dezful University of Medical Science
<Hodasharif24@yahoo.com>
Helen Nayeri, MD
Neuroradiologist
<Helnaryeri@yahoo.com>

Often, the radiologist is the first physician to diagnose a probable brain tumor, and description and differential diagnosis provided have profound implication for subsequent clinical decision making, so a radiologic accurate diagnosis can be very helpful in patient management.

In 2016, the WHO released an update to its brain tumor classification system (not only based on microscopic information but also including molecular/genetic information) that included numerous significant changes. Several previously recognized brain tumor diagnoses such as oligoastrocytoma, PNET, and gliomatosis cerebri, were redefined or eliminated altogether.

Conversely multiple new entities were recognized, including diffuse leptomeningeal glioneural tumor and multinodular and vacuolating tumor of the cerebrum.

The glioma category has been significantly reorganized, with several infiltrating gliomas in children and adults now defined by genetic features for the first time.

The increased emphasis on genetic factors in brain tumor diagnosis has important implication for radiology.

According to the 2016 WHO classification of CNS tumors, these lesions can broadly divide as following:

- Diffuse astrocytic and oligodendroglial tumors
- Other astrocytic tumors (pilocytic astrocytoma, subependymal giant cell astrocytoma &…)
- Ependymal tumors
- Other gliomas (choroid glioma of 3rd ventricle, angiocentric glioma, astroblastoma)
- Choroid plexus tumors
- Neuronal and mixed neuronal-glial tumors
- Tumors of the pineal region
- Embryonal tumors
- Tumors of cranial and paraspinal nerves

Despite the currently ongoing efforts, the medical treatment options for patients with brain tumors are limited and significant efforts are underway to find more effective and novel therapies for patients with brain tumors. The (RANO) working group is an international collaboration of neuro-oncologists, medical oncologists, radiation oncologists, neurosurgeons, neuroradiologists, and regulatory groups commissioned to develop objective and tumor-specific response criteria for various tumor subtypes.

The development of reliable response assessment criteria is necessary to avoid false conclusions regarding the efficacy of the investigated drugs (responders and non-responders).

In the first part of the session we will have a brief discussion about 2016 updates to the WHO brain tumor classification and The Response Assessment in Neuro-Oncology (RANO). In other parts we will discuss interactive case presentations about different types of CNS tumors according to new WHO classification.

IMAGING FINDINGS IN PRECOCIOUS PUBERTY

Leila Bayani, MD
Consultant Radiologist in Tehran University of Medical Science (TUMS), Arash Hospital, Headmaster of Radiology Department.

Abstract:

Precocious puberty is defined as the development of secondary sexual characteristics before the age of 8 years in girls and less than 9 years in boys.

Precocious puberty is caused by a heterogeneous group of disorders, which ranges from idiopathic to malignant tumors.

It is divided into central (gonadotrophin-dependent) precocious puberty and peripheral (gonadotrophin-independent) precocious puberty.

In order to understand the two types of precocious puberty, basic knowledge of normal puberty pertaining to the hypothalamus-pituitary-gonadal (HPG) axis is necessary.

There are several causes of premature sexual development which can be divided into:

a) premature activation of the hypothalamic pituitary-gonadal (HPG) axis (central PP).
b) abnormal patterns of gonadotrophin secretion (premature thelarche, thelarche variant).
c) excess adrenal androgens (adrenarche, congenital adrenal hyperplasia (CAH), adrenal tumours).
d) gonadotrophin independent PP (secretion of sex steroids is independent of the HPG axis).

MRI of the brain, ultrasound of the pelvis/testes or CT of the abdomen are main modality which performed in these group of patient.

According to literature, brain MRI can show spectrum from normal to brain tumor, hydrocephalus ,inflammatory changes and etc.

Abdominal CT scan can be normal or show adrenal hyperplasia or adrenocortical carcinoma.

Although the most valuable parameter for differentiating girls with CPP is the measurement of luteinizing hormone (either the baseline value or after stimulation with gonadotropin-releasing hormone (GnRH) or GnRH analogs), it has been reported in a recent consensus statement that pelvic ultrasound imaging is considered helpful as an adjunct to GnRH stimulation in differentiating CPP from premature thelarche.

This consensus statement reported cut-off values for uterine length ranging from 3.4 to 4.0 cm, and between 1.0 and 3.0 cm

For ovarian volume which are going to be discussed in more detail in this lecture.

IMAGING FOR RESPONSE ASSESSMENT IN LYMPHOMA PATIENTS

Atoosa Adibi, MD
Professor of Radiology, Department of Radiology, Isfahan University of Medical Sciences

CT-Based Response Assessment is main part of our regional practice for lymphoma

because in most parts of our country PET/CT is unavailable (as in certain parts of the world).

Guidelines are provided for assessing outcome can be categorized as follows: complete response, partial response, stable disease, or progressive disease.

For response evaluation, tumor burden is calculated at baseline by choosing up to six of the largest measurable target lesions (e.g., the largest nodes, nodal mass, or extra nodal deposits in solid organs) representing different body regions and overall disease burden and then performing follow-up evaluations.

Lymph nodes larger than 1.5 cm and extranodal lesions larger than 1.0 cm along their longest diameter are considered to be target lesions, although target nodal lesions are preferable.

The overall objective assessment is performed by measuring the target lesion area

as the product of the perpendicular diameters (i.e., the diameter of the long axis multiplied

by the diameter of the short axis) and then calculating the sum of the product of the

perpendicular diameters of all considered target lesions.

No measurable disease includes lesions too small to be considered measurable, bony skeleton lesions, ascites, pleural and pericardial effusion, spread of lymphangitis, and leptomeningeal disease.

a partial response (PR) was defined as a 50% or greater reduction in the area based on bidimensional measurements.

Likewise, progression in lymphoma is defined as a 50% or greater in the area from nadir.
CR is defined as a complete resolution of all target lesions by CT scans with complete normalization of FDGPET uptake in all areas (Deauville score of 1–3), and bone marrow
biopsy negativity (if it was positive or unknown at baseline).
If pretreatment PET scan was negative, lymph nodes that measured 15mm in the long axis should regress to <10 mm. CR is also defined as achievement of a partial remission by CT scan criteria (reduction in sum of longest diameters by CT imaging by
>30%) with normalization (Deauville score 1–3) of FDG-PET activity in FDG-avid lymphoma.
There are some differences between RECIST, RECIL, and Lugano assessment which should be considered.

INTERVENTIONAL PROCEDURES FOR INVASIVE PLACENTA

Amin Astani, MD
Assistant Professor of Radiology, Shahid Beheshti University of Medical Sciences

There is a growing incidence of invasive placenta as a result of increasing deliveries by cesarean section. Invasive placenta can cause massive life-threatening hemorrhage and is now the most common indication for emergent postpartum hysterectomy. Postpartum hemorrhage can be severe in these patients and medical management may be insufficient. Antepartum diagnosis of invasive placenta enables a planned delivery approach that may lead to significantly less blood loss than that resulting from emergent management. The interventional radiologist plays a major role in prevention of major hemorrhage due to invasive placenta. A number of interventional procedures are available for these placentae including balloon inflation technique, planned uterine artery embolization, hybrid techniques and emergency postpartum UAE.

PELVIC CONGESTION SYNDROME AND UTERINE AVF

Amin Astani, MD
Assistant Professor of Radiology, Shahid Beheshti University of Medical Sciences

Pelvic congestion syndrome is varicosities of the veins inside the female pelvis causing chronic dull and aching pain and is analogous to varicocele in men. This syndrome is not rare and is estimated to account for 15% of outpatient gynecologic visits and 30% of diagnostic laparoscopic exams. Yet, it is consistently underdiagnosed and under treated. Many clinicians are not familiar with this syndrome or are uncomfortable in rendering the diagnosis. Therefore, many women with this treatable condition are left with decades of draining pelvic pain. There are effective treatment options and interventional radiology procedures for pelvic congestion syndrome. Familiarity with this syndrome, comfort in making the diagnosis, and awareness of the treatment options are essential for any clinician for interacts with chronic pelvic pain.

PLACENTA ACCRETA (CHALLENGES AND PITFALLS).

Leila Bayani, MD
Consultant Radiologist in Tehran University of Medical Science (TUMS), Arash Hospital, Headmaster of Radiologic Department.

Abstract:

There are three commonly recognized types abnormal adhered placenta defined by the depth of penetration of the placental villi into the myometrium.
The placenta accreta spectrum disorders include both abnormally adherent (accreta) and invasive placenta (increta and percreta).
Placenta accreta spectrum disorders prevent normal separation of the placenta at delivery, resulting in a high risk of severe post-partum hemorrhage.
Abnormally invasive placenta (increta and percreta) is a life-threatening condition, and a major cause of caesarean-hysterectomy and maternal morbidity and mortality.
The prevalence in the general population of pregnant women is around 1.7 per 10,000 pregnancies.

The incidence of PAS is 4.1% in women with one prior cesarean delivery and 13.3% in women with two or more previous caesarean deliveries.
Prenatal diagnosis of PAS is vital as it facilitates appropriate referral to a team experienced in the complexities such deliveries present and has been shown to reduce maternal morbidity.
In the FIGO consensus guidelines, there is a clinical grading system to categorize placental adherence at delivery,but the main criteria for diagnosis are sonographic signs.
Prenatal ultrasound diagnosis is based on a number of different signs. Standardized descriptions of these signs were proposed by the European Working Group on Abnormally Invasive Placenta (EW-AIP) which is going to explain with detail in the lecture.
There are two sub groups , 2D Grey-scale and Color Doppler imaging.
Magnetic Resonance Imaging is widely used to assist with the prenatal diagnosis of PAS, although the accuracy of MRI isn't much more better than high resolution accurate sonography ;however, MRI is especially useful where evaluation of uteroplacental interface is difficult, for example when there is a posterior placenta.
Management depends both on the type of PAS and the standard practices of the specialist centre. Delivery is generally by planned caesarean section at around 34-36 weeks' gestation, in order to avoid emergency delivery.
The two most common management strategies are caesarean-hysterectomy and leaving the placenta in situ (conservative management)

FUNCTIONAL ASSESSMENT OF FETAL HEART

Behnaz Moradi, MD
Assistant Professor of Radiology, (TUMS), Yas Hospital

Abstract:

Evaluation of fetal cardiac function is one of the most important components of fetal echocardiography. Cardiac function might provide important information on fetal hemodynamic adaptation or deterioration.
A variety of functional tests can be used, but there is no single clinical standard. To maintain normal cardiac function, both systolic and diastolic processes must be preserved and time events must occur in a synchronized manner. Ventricular inflow characteristics; the duration of the left ventricular IR time; and the systemic and pulmonary venous Doppler flow patterns are used for evaluation of diastolic function. An abnormal shortening fraction or decreased cardiac output are usually indicative of myocardial compromise and systolic dysfunction. Myocardial Performance Index (MPI) is a widely used ratio to describe the systolic and diastolic function of the heart in echocardiography.
Fetal cardiac dysfunction may be due to an intrinsic myocardial disease or to a secondary adaptive mechanism. Detailed functional assessment should be performed if cardiac function appears impaired.

Keywords:

Cardiac function. Echocardiography. Fetus.

FIRST TRIMESTER THICK NUCHAL TRANSLUCENCY: CAUSES AND MANAGEMENT

Mohammad Zare Mehrjardi, MD
Division of Clinical Research, Climax Radiology Education Foundation, Tehran, Iran
Division of Clinical Research, Iranian Association of Fetal Ultrasound, Tehran, Iran
<E-mail: zare@sbmu.ac.ir >

Currently, a fetus with thick nuchal translucency (NT) on ultrasound screening is referred for genetic counselling and invasive diagnostic testing, because an increased NT thickness is strongly associated with aneuploidies particularly trisomy 21. However, presence of thick NT with normal karyotyping is not uncommon and causes a major challenge both for the clinician and the parents. There is a wide spectrum of conditions that may lead to a thick NT with normal karyotype such as genetic syndromes and congenital heart defects. Also, it can be associated with an increased risk of intrauterine fetal demise. In this lecture, current knowledge related to this topic and a stepwise approach in case of thick NT detection on sonography would be presented.

FETAL VENOUS SYSTEM EVALUATION

Reza Gerami, MD

The most important Fetal veins are, Umbelical vein, ductus venusus.
The main blood flow of Umbelical vein_relative sixty-five percent _is toward to portal vein and 35% direct to dactus venusus that contains well oxygenated blood.
This DV blood is direct to IVC with liver bypass then enter to RA،fossa ovals and LA and LV and AORTA and shifted to head and neck and upper limbs.
Concept of ductus venusus circulation and its Doppler pattern is very important to understand of fetal heart physiology.
Venus anomalies of fetus have some sign in ante natal sono/echo such as:

- Persistent left svc
- Dilated coronary sinus
- Thoracic Venus collector

FETAL HYPOXIC- ISCHEMIC INJURIES.

Behnaz Moradi, MD
Assistant Professor of Radiology, (TUMS), Yas Hospital

Abstract:

Hypoxicischemic injury (HII), which is also known as hypoxic-ischemic encephalopathy, refers to the subset of neonatal encephalopathy that results from a hypoxic or ischemic event.
Fetal hypoxic stress that may eventually be sufficient to cause fetal brain damage as a result of prolonged partial hypoxic ischemia. In some cases, it is difficult to classify the lesion since we see the end effect: cavitation.
It is not so easy to differentiate between effect of genetic or environment. Following the diagnosis of a clastic/ cavitary congenital lesion, detailed investigation of a possible pregnancy related event like: Prothrombotic factors, genetic mutation in the mother and child is recommended.
Frequently these lesions are not diagnosed in utero due to late occurrence. Ultrasonography is the first modality but MRI is more accurate. Intraventricular hemorrhage (IVH) is the most common of all. Other types of fetal brain damage include: porencephaly, multicystic encephalopathy, periventricular leukomalacia schizencephaly…

Keywords:

hypoxic- ischemic injuries. MRI. Fetus.

MILD FETAL VENTRICULOMEGALY: DIAGNOSIS,EVALUATION, AND MANAGEMENT

Ladan Younesi, MD
Shahid Akbarabadi Clinical Research Development Unit (ShACRDU), Iran University of Medical Sciences (IUMS), Tehran, Iran

Ventriculomegaly is defined as dilation of the fetal cerebral ventricles and is a relatively common finding on prenatal ultrasound. The purpose of this lecture is to review the diagnosis, evaluation, and management of mild fetal ventriculomegaly.
When enlargement of the lateral ventricles (≥10 mm) is identified, a thorough evaluation should be performed, including detailed sonographic evaluation of fetal anatomy, amniocentesis for karyotype and chromosomal microarray analysis, and a workup for fetal infection.
In some cases, fetal magnetic resonance imaging may identify other central nervous system abnormalities and should be considered when this technology as well as expert interpretation is available.
Follow-up ultrasound examination should be performed to assess for progression of the ventricular dilation. In the setting of isolated ventriculomegaly of 10-12 mm, the likelihood of survival with normal neurodevelopment is >90%. With moderate ventriculomegaly (13-15 mm), the likelihood of normal neurodevelopment is 75-93%. The following are Society for Maternal-Fetal Medicine recommendations: We suggest that ventriculomegaly be characterized as mild (10-12 mm), moderate (13-15 mm), or severe (>15 mm) for the purposes of patient counseling, given that the chance of an adverse outcome and potential for other abnormalities are higher when the ventricles

measure 13-15 mm vs 10-12 mm (GRADE 2B); we recommend that diagnostic testing (amniocentesis) with chromosomal microarray analysis should be offered when ventriculomegaly is detected (GRADE 1B); we recommend testing for cytomegalovirus and toxoplasmosis when ventriculomegaly is detected, regardless of known exposure or symptoms (GRADE 1B); we suggest that magnetic resonance imaging be considered in cases of mild or moderate fetal ventriculomegaly when this modality and expert radiologic interpretation are available; magnetic resonance imaging is likely to be of less value if the patient has had a detailed ultrasound performed by an individual with specific experience and expertise in sonographic imaging of the fetal brain (GRADE 2B); we recommend that timing and mode of delivery be based on standard obstetric indications (GRADE 1C); we recommend that with isolated mild ventriculomegaly of 10-12 mm, after a complete evaluation, women be counseled that the outcome is favorable, and the infant is likely to be normal (GRADE 1B); we recommend that with isolated moderate ventriculomegaly of 13-15 mm, after a complete evaluation, women be counseled that the outcome is likely to be favorable but that there is an increased risk of neurodevelopmental disabilities (GRADE 1B).

Keywords:
Dilated cerebral ventricles, Fetal brain, Fetal magnetic resonance imaging, Hydrocephalus, Ventriculomegaly

RETAINED PRODUCTS OF CONCEPTION

Masoumeh Raoufi, MD
Shahid Beheshti University of Medical Sciences

Retained products of conception (RPOC) are a common and treatable complication after delivery or termination of pregnancy.
The pathologic diagnosis of RPOC is made based on the presence of chorionic villi, which indicates persistent placental or trophoblastic tissue. In the setting of postpartum hemorrhage, however, distinguishing RPOC from bleeding related to normal postpartum lochia or uterine atony is important. Ultrasonography is first line study in these patients. A thickened endometrium or a discrete mass in the uterine cavity is a helpful finding that suggests RPOC however detection of vascularity in a thickened endometrium or an endometrial mass at color or power Doppler US increases the positive predictive value for the diagnosis of RPOC. Diagnostic pitfalls may include highly vascular RPOC, which can be mistaken for a uterine arteriovenous malformation; true arteriovenous malformations of the uterus; invasive moles; blood clot; and subinvolution of the placental implantation site. In this lecture we explain role of different imaging modalities especially ultrasound in diagnosis, ruling out differential diagnosis and also diagnostic pitfalls.

PLACENTAL HYPOECHOIC ZONES

Atoosa Adibi, MD
Professor of Radiology, Department of Radiology, Isfahan University of Medical Sciences

Placental function is essential for fetal growth and wellbeing.
Although uncommon, abnormalities of the placenta are important to recognize owing to the potential for maternal and fetal morbidity and mortality.
Sonography is the imaging modality of choice for placental evaluation.
On the other hand, by increasing placental age, this structure becomes nonhomogeneous by itself.
There are some pathological conditions which cause placental heterogeneity and produce some hypoechoic zones in placenta. Placental Lakes, Sub chorionic Fibrin Deposition, and placental Infarcts are examples of hypoechoic zones in placenta becoming obvious with placental maturity.
The role of radiologist is to define pathological conditions from physiologic ones.

AVASCULAR NECROSIS OR OSTEONECROSIS

Leila Aghaghazvini, MD
Associated Professor of Radiology, Shariati hospital, Tehran University of Medical Sciences, Tehran, Iran

- Describes an ischemic death of the some areas of bones and is associated with different factors and can affect any bone.
- Infarction begins when the circulation is interrupted to any part of bone and in any stages can be seen with variety of radiologic presentation.
- MRI and nuclear medicine are the best modalities and MRI can be considered as the first modality for diagnosis.

We describe different staging radiologic pattern of AVN with focus on MRI presentation.

HOW TO REPORT KNEE MRI AND REVIEW OF DIFFERENT CASES

Leila Aghaghazvini, MD
Associated Professor of Radiology, Shariati Hospital, Tehran University of Medical Sciences, Tehran, Iran

Knee has a complex anatomy and different pathologies such as tumors, arthritis, trauma and etc, can involve the knee.
Trauma with different mechanism is the most common problem and can lead to probable ligamentous, menisci or. tendon injuries
In this workshop and lecture we plan to introduce normal anatomy in knee and present some cases of knee MRI indicative different pathologies.

ULTRASOUND GUIDED WIRE LOCALIZATION OF ANAL TRACT IN IMPERFORATE ANUS PATIENTS.

Seyed Ali Alamdaran, MD
Rashed, MD
Masoud Mahdavi, MD
Samira Jafari, MD
Marjan Joodi, MD

Abstract:

Objectives:

The exact anus reconstruction is critical in patients with imperforated anus. It is related to the correct diagnosis of sphincter complex. The aim of this study was accurate investigation of the perineal region for ultrasound detection of the location and pathway of sphincter muscle complex and the efficacy of the ultrasound-guided wire localization of the anal tract and sphincter muscle complex in the patients with imperforate anus.

Methods:

This study was conducted on 34 patients with imperforate anus referring to the Doctor Sheikh and Akbar Pediatric Hospitals, Mashhad, Iran, between2016 and 2018. The trans-perineal ultrasonography was performed under general anesthesia to identify the location and direction of the anal tract, which was checked by a muscle stimulator. Then, the localization needle was inserted in the center of two multi-layer structure in surface and depth of perineal area until it reached the rectal pouch. Eventually, by using the wire as a guide, the rectum was brought to the middle of the sphincter complex through the minimally invasive pull-through procedure.

Results:

The deep concentric hypoechoic structure (probably levator ani muscle) could be seen in all patients with the thickness of 1.8 – 5.8 mm and occasionally asymmetric. The superficial multi-layer view structure (the anal pit probably contains of subcutaneous and superficial external muscle complex and parasagittal fibers) is visualized in all patients. These two had a curved and occasionally parasagittal pathway. The shortest distance between the rectal pouch and skin was 8 to 20 mm, but the distance between the rectal pouch and skin via the muscle sphincter path was longer (11 to 23 mm). Muscle stimulator findings showed that the wire was located in the middle of the sphincter muscle complex in all patients. Mean localization time was 38 min.

Conclusions:

in imperforate anus patients, two anatomic-sonographic structure as multi-layer view in surface

and depth of perineal area were seen that adapted with anal pit (subcutaneous and superficial external muscle sphincter) and the levator ani muscle. These two important sonographic findings can act as an indicator for the location of this procedure. The ultra sound-guided wire localization of the anal tract facilitated the implementation of a less invasive and anatomically corrected rectal pull-through operation in patients with imperforate anus.

MYOCARDITIS

Sanaz Asadian, MD

In a cohort of healthy subjects undergoing smallpox vaccination, new-onset chest pain, dyspnoea, or palpitations occurred in 10.6% of the cases, as compared to 2.6% in subjects undergoing another vaccination. Importantly, an active survey of these subjects, including high-sensitive troponin testing, revealed that myocarditis was 60 times more frequent than clinically suspected.

Aside from clinically mild cases, myocarditis can present with symptoms and findings of acute heart failure or MI. In patients with MI and non-obstructed coronary arteries (MINOCA), myocarditis occurred in 33% of cases and was the single most frequent underlying cause for MINOCA.

Myocarditis can result in myocardial scars, which themselves may introduce a risk for cardiovascular events. In a recent study, myocardial scarring consistent with myocarditis was found in 25% of survivors of sudden cardiac death, and the presence and extent of such scars predicted outcome . However, in the setting of subepicardial LV scar, a differential diagnosis of other conditions, including hereditary forms of cardiomyopathy, needs to be considered.

Neither the clinical presentation nor findings obtained by standard techniques, such as ECG or echocardiography, are specific for non-ischaemic myocardial inflammation, and thus CMR plays an important role in patients with suspected myocarditis. In turn, myocarditis is one of the most frequent indications for CMR scans.

Since the introduction of non-invasive in vivo tissue characterization by CMR, the awareness and understanding of clinicians of the impact of myocardial involvement in systemic diseases have increased significantly. CMR is indicated in patients with symptoms and findings suggestive of myocardial injury of unknown aetiology. In patients with heart failure, it may act as a gatekeeper for the need of endomyocardial biopsy (EMB). Diagnostic targets of CMR in patients with suspected myocardial inflammation are myocardial oedema, inflammation-induced hyperaemia, and myocardial scarring in a non-ischaemic regional distribution pattern, and a standard protocol, known as the Lake Louise criteria, has been proposed.

Imaging in Myocarditis

Given the invasive nature of EMBs, non-invasive methods to assess for myocarditis play an essential role in the diagnosis of suspected myocarditis, although EMB remains the gold standard to achieve the aetiopathogenetic diagnosis. As stated in the recommendations of the ESC, CMR may be considered in clinically stable patients. However, CMR cannot differentiate between virus persistence and autoimmune inflammation and thus cannot replace EMB for certain therapeutic decision-making. In cases with acute heart failure or other life-threatening presentations, EMB should not be delayed by any other diagnostic proce¬dure . Echocardiography remains an essential, and often the first-line, imaging modality to assess suspected cases; however, it suffers from a lack of sensitivity to identify myocarditis in cases without overt LV dysfunction , with a low specificity in distinguishing acute from chronic, as well as non-ischaemic from ischaemic forms of, cardiac disease. In the past, nuclear medicine imaging with 67-gallium and 111-indium has been described as a useful technique to identify acute myocarditis, but it is rarely used in contem¬porary clinical practice. FDG-PET has been compared to CMR with good diagnostic agreement but suffers from radi¬ation exposure, limited availability, and relative poor spatial resolution.

CMR, with its superior capabilities in myocardial tissue characterization, compared to other cardiac imaging modal¬ities, in addition to excellent functional and morphological visualization, plays an eminent role in the non-invasive diagnosis of myocarditis. Suspected myocarditis is a top indication (>30% when including cardiomyopathies) for CMR . Tissue abnormalities related to inflammation, such as oedema, hyperaemia

and capillary leak, and myo¬cyte necrosis, can be detected by CMR using T2-weighted imaging, EGE, and LGE, respectively. In addition, CMR can detect associated pericardial effusions and ventricular dysfunction as supportive information, and follow LV mass regression over time with the resolution of oedema. The Lake Louise Consensus Criteria (2009) recom¬mends using a combination of any two out of the three tissue characterization techniques to increase the confidence in detecting acute myocarditis. Novel techniques, such as T1-mapping, ECV mapping, and T2-mapping, are emerging as promising methods to evaluate myocarditis.

The Lake Louise Criteria

Include T2-weighted, EGE, and LGE imaging. Cine imaging using SSFP sequences should also be performed for functional analysis and identification of any associ¬ated pericardial effusion. Most of the sequences used are well established in MR systems and standardized in recent recommendations, from image acquisition to final reporting.

T2-weighted Imaging

T2-weighted imaging is typically acquired using black blood spin echo techniques with flow and fat suppression. Body coils or surface coils with signal intensity correction algorithms should be used to minimize hardware-derived signal inhomogeneity. Maximizing LV coverage will increase the diagnostic yield, and at least three short-axis slices should be obtained, with careful adjustments for heart rate variability which might hamper correct inter¬pretation of signal intensities. Findings suspicious of focal oedema should be confirmed in at least one orthogo¬nal plane.

Pre- and Post-contrast EGE Imaging

Pre- and post-contrast EGE imaging is obtained using T1-weighted, free-breathing black blood fast spin echo sequences in short-axis or axial views (the latter with more robust image quality). As for dark blood T2-weighted images, body coils are preferable. Spatial saturation bands over the atria and using four averages will improve the SNR. Post-contrast images should be acquired within the first minute after gadolinium injection (0.1 mmol/kg) at the same slice positions and using the same parameter prescriptions as for the pre-contrast images.

Currently, these two components of the Lake Louise Criteria are not employed by all centres for a number of rea¬sons, including the local ability to implement the methods, availability of expertise, and inconsistent image quality of T2-weighted and EGE images.

LGE Imaging

LGE imaging should be obtained using an inversion recovery GRE sequence, about 10 minutes after gadolinium adminis¬tration (0.1 mmol/kg). As for all LGE imaging, optimization of the inversion time for myocardial nulling is essential. To increase the sensitivity for detecting disease, acquisition of a full short-axis stack, as well as long-axis views, should be performed. Findings of focal injury should be confirmed in at least one orthogonal plane.

Reporting of the results for assessment of myocarditis should include the description of the presence or absence of the assessed criteria.

Future Developments

The diagnosis of myocarditis using CMR requires multiple CMR techniques that provide overlapping, as well as complementary, information to increase diagnostic confidence.

The true gold standard of myocarditis for the validation of CMR imaging techniques is whole-heart histopathology for direct comparison to imaging findings, although this type of data is difficult to obtain for in vivo human subjects. EMB is problematic as a gold standard for validation of CMR diagnostic performance due to its sampling error and inability to rule out small areas of focal myocarditis, although it may have a role in selected clinical settings for therapeutic decision-making. The availability of imaging (echo, CMR, electrovoltage mapping)-guided EMB can increase its diagnostic sensitivity. Novel mapping methods are now available to add to the repertoire of tissue characterization techniques that are sensitive to various pathophysiologic changes that occur in myocarditis. In the future, it may be feasible to prescribe simplified and gadolinium-free CMR protocols, which can shorten scan times and obviate the need for contrast agent administration. As further evidence and experience accumulate, revised CMR imaging protocols are expected to increase the confidence and efficiency in the non-invasive diagnosis of myocarditis.

CLINICAL INDICATION IN CORONARY CT ANGIOGRAPHY

Maryam Farghadani, MD
Assistant Professor of Department of Radiology, Isfahan University of Medical Sciences, Isfahan, Iran
Meri Sirous, MD*
Associate Professor of Department of Radiology, Isfahan University of Medical Sciences, Isfahan, Iran

Abstract:

Background:

Imaging of the coronary arteries requires high temporal and spatial resolution. Invasive, catheter-based coronary angiography is the clinical standard tool for assessment of the coronary arteries, but it has several shortcomings: First of all, it is an invasive procedure and, as such, is associated with a certain morbidity and mortality, which in most cases is a consequence of the required arterial access. 1 Secondly, some limitations are due to its projectional nature, finally, cardiac catheterization requires elaborate equipment that is not available at every hospital or outpatient setting, dedicated and well-trained staff is necessary, and associated costs are high. Computed tomographic (CT) technology has progressed rapidly over the past several years. Both spatial and temporal resolution have steadily been improved, and the introduction of 64-slice and higher-slice CT has made coronary CT angiography (CTA) a relatively robust and stable tool for coronary artery visualization

Objectives:

In this presentation, clinical applications, the advantages and disadvantages of CTA will be weighed against those of invasive coronary angiography.

Conclusion:

Coronary CTA has numerous clinical applications. Its most prominent role is in the assessment of patients with possible coronary artery stenosis, but a relatively low likelihood of disease, with the aim to rule out coronary stenosis and avoid the need for an invasive coronary angiogram. This includes patients with various clinical scenarios, such as atypical symptoms, unclear electrocardiographic changes or stress test results, patients with new onset of heart failure, and patients before non coronary cardiac surgery. Assessment of coronary anomalies is another strong indication, but much less frequent. Other applications of CT are to provide peri-interventional information, to detect in-stent restenosis, or to provide risk stratification

Keywords:

Coronary CT angiography ,clinical indication

PANCREATIC ADENOCARCINOMA: PART 1. PREOP STAGING, ASSESSMENT FOR RESPECTABILITY PART 2. TREATMENT RESPONSE

Amir H. Davarpanah, MD
Divisions of Abdominal and Cardiothoracic Imaging
Emory University School of Medicine
1364 Clifton Rd. NE, Atlanta, GA 30329, Phone: (404) 778-3800
<amir.davarpanah@emory.edu>

Pancreatic ductal adenocarcinoma (PDA) is the second most common gastrointestinal malignancy and the fourth leading cause of all cancer-related deaths in the US. It is a highly aggressive tumor that continues to carry a high mortality rate continues to carry a poor prognosis. This can be attributed to the lack of early detection and the aggressive disease biology and early systemic spread of disease. Surgical resection remains the only curative option; however, at the time of diagnosis only minority of the patients are deemed resectable. With limited improvements in the treatment of advanced PDA, the main hope for improved patient survival and potential cure lies in early detection of the disease when complete surgical resection is feasible. Any patients with PDA evaluated by a pancreatic surgeon may require a high-risk surgical procedure that offers the only chance of cure. Accurate staging of PDA (identifying anatomic relationship of the tumor and critical vessels as well as extrapancreatic disease) carries substantial implications for appropriate recommendation of the most suitable treatment option, thus maximizing the survival benefit for patients in whom complete resection can be achieved and minimizing the morbidity from unnecessary laparotomy or major surgery in patients with high risk of residual disease following resection. In this two-part talk, we will discuss pretreatment imaging evaluation of patients with PDA and respectability criteria. We will also discuss role of radiologist for tumor restaging after neoadjuvant therapy.

CYSTIC LESION OF PANCREAS

Niloofar Ayoobi Yazdi, MD
Assistant Professor of Radiology,Tehran University of Medical Science

Cystic pancreatic lesion of pancreas is heterogeneous and range from benign to malignant entities. Pancreatic cysts are found with increasing frequency, especially in asymptomatic patients due to widespread use of high-resolution imaging.
The most common cystic lesion is pseudo cysts. Most of cystic lesions are differentiate by imaging such as CT or MRI. Cystic lesions can be unilocular or multilocular. They are hypo dense in CT and are differentiated according to their characteristic in CT or MRI.

HEPATIC ADENOMA VS. FNH

Valérie Vilgrain, MD
Professor of Radiology, University of Paris Diderot Sorbonne Cité
Chair, Department of Radiology
The University Beaujon Hospital
Clichy, France

Focal nodular hyperplasia (FNH) and Hepatocellular adenomas (HCA) are both benign hepatocellular tumors. They are mostly seen in child-bearing age women however they have major differences. As FNH is a benign and indolent lesion, HCA may complicate with bleeding and malignant transformation. Then, it is crucial to differentiate them. Imaging and contrast-enhanced MRI in particular plays a major role for the diagnosis. In most of the cases, the diagnosis of FNH is based on a combination of 5 imaging findings (homogeneity, signal intensity close to the liver, hyperenhancement on arterial phase, lack of capsule and central scar). Imaging findings of HCA are consistent with the genetic mutations. The two most common subtypes: HNF-1& and inflammatory have characteristic patterns on imaging. This lecture will highlight the role of imaging in the diagnosis and in the patient management

IMAGING OF HCC

Valérie Vilgrain, MD
Professor of Radiology, University of Paris Diderot Sorbonne Cité
Chair, Department of Radiology
The University Beaujon Hospital
Clichy, France

Hepatocellular carcinoma (HCC) is the most common type of liver cancer, accounting for 80–90% of all cases of liver cancer. It is the fifth most common cancer and the third leading cause of cancer-related deaths around the world. As HCC occurs in 90% of the cases in patients with chronic liver disease, screening is indicated in those patients having compensated cirrhosis.
Several guidelines have been implemented to help the practionner to manage the patients during the screening, when a nodule is detected and to decide the optimal treatment in patients with HCC.
Among the HCC guidelines which are the most used: AASLD, EASL, Japanese, Korean, and Asia-Pacific ones, there are common features. All agree: i) on the noninvasive diagnosis of HCC using contrast-enhanced CT or MR imaging with two hallmarks: hypervascularization on arterial-phase and wash-out on portal and/or delayed phase in lesions larger than one centimeter; ii) on the role of liver biopsy when diagnosis cannot be achieved with imaging.
Yet they differ in many other issues: stratification according to lesion size, first-line imaging modality, role of hepatobiliary MR contrast agents, role of contrast-enhanced ultrasound. These differences are explained by the different prevalence of HCC worldwide and the different goals of diagnostic performance (high specificity or high sensitivity). This lecture will focus on the recent European guidelines, which propose a n algorithm in patients with chronic liver diseases.

WHICH IMAGING FINDINGS ARE SEEN IN LIVER METASTASIS ACCORDING TO PRIMARY TUMOR?

Valérie Vilgrain, MD
Professor of Radiology, University of Paris Diderot Sorbonne Cité
Chair, Department of Radiology
The University Beaujon Hospital
Clichy, France

Liver metastases are by far the most common liver malignancies. The most frequent liver metastases originate from colorectal cancer, pancreatic cancer, lung cancer, and breast cancer ; yet many other primary cancer can speard metastases to the liver. The diagnosis can be easy when the primary cancer is diagnosed, but may be more challenging when liver tumors are likely to be liver metastases. Indeed, most liver metastases look like the primary cancer. This lecture will focus on the imaging presentation of liver metastases. The most common liver metastases are fibrous metastases secondary to colorectal, pancreatic, and breast cancer. Hypervascular liver metases are commonly secondary to neuroendocrine cancer, but may be seen in less common cancers. Peculiar imaging features will be discussed: cystic liver metastases, calcifications, lymphangitic metastases, endobiliary metastases. The differentials will be considered for each imaging presentation.

IMAGING OF CHOLANGIOCARCINOMA: HOT TOPICS IN STAGING AND RESECTABILITY

Amir Reza Radmard, MD
Department of Radiology, Shariati Hospital, Tehran University of Medical Sciences.

Cholangiocarcinoma is a challenging disease in terms of diagnosis and treatment. The worldwide incidence of this uncommon disease is on the rise and it remains the second most common primary hepatobiliary malignancy. The radiologic presentations of cholangiocarcinoma are extremely diverse because these tumors vary considerably in terms of location, histologic subtype and growth pattern. Magnetic resonance imaging (MRI) with magnetic resonance cholangiopancreatography (MRCP) is the radiologic modality of choice as the mainstay of diagnosis in cholangiocarcinoma. It provides visualization of the tumor location and displays the longitudinal extent along the biliary tree as well as vertical spread into the adjacent hepatic parenchyma and vessels. Surgery is the main curative option for the patient, so resectability of the tumor should be precisely assessed. The knowledge of radiologist about imaging manifestations and preoperative staging of cholangiocarcinoma play a major role in management of this devastating malignancy. In this presentation, imaging findings in different types of cholangiocarcinoma will be reviewed and hot topics in tumor resectability and resection will be discussed.

RESPONSE EVALUATION CRITERIA IN SOLID TUMORS VERSION 1.1

Nemat Nematollahy, MD
Department of Radiology ,Golestan Univercity of Medical Science, Gorgan, Iran

Objective assessment of tumor response to treatment is an integral and increasingly important role of radiologists and is essential in day to day oncologic imaging. RECIST published in 2000 by an international collaboration and revised as RECIST 1.1 in 2009. The RECIST criteria have been adopted by academic institutions, regulatory authorities, and the pharmaceutical industry, in which the primary end points are objective response or progression. In this talk, RECIST criteria, including its terms, rules and methods will be discussed.
There are also special problems in evaluation of some tumors' response to treatment such as tumor necrosis or cavitation which will be clarified.
Concerns about using RECIST and its shortcomings will also be explained.Because many newer cancer therapies may be more cytostatic than cytocidal, good tumor response may be associated predominantly with a decrease in metabolism, without a major reduction in tumor size. This has led to development of tumor- or therapy- specific guidelines such as modified RECIST, which will be reviewed.
Finally, future trends and modifications of RECIST will be presented.

CROSS SECTIONAL IMAGING IN ACUTE MESENTERIC ISCHEMIA, WHAT A RADIOLOGIST SHOULD KNOW

Maryam Farghadani, MD
Assistant Professor of Department of Radiology, Isfahan University of Medical Sciences, Isfahan, Iran

Abstract:

Background:

Acute mesenteric ischemia is a rare life-threatening condition that accounts for approximately one in 1000 hospital admissions. The mortality rate is 50%–69% owing to the absence of specific symptoms and laboratory data, which makes early detection of this condition difficult. If the use of contrast material is possible, biphasic contrast material–enhanced multidetector computed tomography (CT) is the first-line imaging test for early diagnosis of the disease and for differentiation from other causes of acute abdomen. Multidetector CT can depict mesenteric ischemia, its underlying causes, and its severity.
Objectives: To discuss about the causes of AMI include arterial embolism, arterial thrombosis, venous thrombosis, and non-occlusive mesenteric ischemia, among which arterial causes are far more common than venous causes.

Conclusion:

Early diagnosis and prompt management of AMI are mandatory to improve the patient prognosis. For patients with suspected AMI, contrast-enhanced multidetector CT should be the first-line imaging modality for correct diagnosis and to exclude other causes of acute abdomen. Interpretation of CT images should include accurate assessment of the mesenteric arteries and veins, bowel wall thickness, the presence or absence of bowel wall enhancement, patterns of bowel enhancement, abnormalities in the mesentery and peritoneum, and the presence or absence of ascites and extra bowel gas. The severity of the condition and the viability of the bowel should be carefully appreciated with consideration of the underlying cause, as CT findings vary depending on the pathophysiology and the presence of associated complications.

Keywords:

Mesenteric Ischemia, MDCT angiography

ROLE OF THE RADIOLOGIST IN DIAGNOSIS, STAGING AND SURVEILLANCE OF RENAL CELL CARCINOMA

Amir H. Davarpanah, MD
Divisions of Abdominal and Cardiothoracic Imaging
Emory University School of Medicine
1364 Clifton Rd. NE
Atlanta, GA 30329
<amir.davarpanah@emory.edu>

Renal Cell Carcinoma (RCC) is the most common tumor of the kidney, accounting for 80% to 85% of all malignant renal tumors and 2% to 3% of all malignant diseases in adults. Currently, with the widespread use of cross-sectional imaging, most RCCs are detected incidentally in asymptomatic patients. The role of imaging is central to detection, staging, and treatment of the RCC. Multidetector computed tomography (MDCT) is primarily used for detecting and staging of RCCs, however, improved equipment and pulse sequence techniques has resulted in similar accuracy of MR imaging compared with those of CT scanning. MR imaging offers inherently exquisite tissue contrast, which allows characterization of hemorrhage, fat, and subtle enhancement, making it particularly useful when ultrasonography or CT are inconclusive. In addition, contrast-enhanced MR imaging can be helpful for the determination of the histologic subtype in RCC. Furthermore, determination of the extent of tumor is critical for selection of optimal therapy and surgical approach, particularly in case of nephron-sparing surgery. After surgery, contrast-enhanced CT or MR imaging may be used to evaluate for early postoperative complications, including hemorrhage or urinary leak, in those patients who undergo partial nephrectomy and ablation. In addition, CT or MR imaging is useful in the routine postoperative surveillance for recurrent neoplasm or metachronous lesions.
In this talk, we discuss major role of imaging in detection and staging of RCC or recurrence after treatment.

CHALLENGING GENITOURINARY CASES

Amir H. Davarpanah, MD
Divisions of Abdominal and Cardiothoracic Imaging
Emory University School of Medicine
1364 Clifton Rd. NE
Atlanta, GA 30329
<amir.davarpanah@emory.edu>

In this workshop, we will review real-life examples of unusual genitourinary lesions with focus on differentials, management and final pathologic diagnosis.

RADIATION PROTECTION IN PREGNANCY

Amin Astani, MD
Assistant Professor of Radiology Shahid Beheshti University of Medical Sciences

Often, accurate and timely diagnosis of clinical conditions during pregnancy requires radiologic imaging that involves ionizing radiation to the mother and fetus. A seemingly simple question has proven to be a challenge for many clinicians and radiologists alike: What is the safe radiation dose in a pregnant patient that requires radiologic imaging? Not surprisingly, nonradiologists have limited understanding of radiation dosimetry and commonly struggle to choose the best imaging study that delivers the least amount of radiation. Naturally, they turn to their radiology colleagues for answers. However, published studies demonstrated that radiologists – both resident and practicing radiologists alike – are less than comfortable discussing dosimetry. This presentation discusses radiation dosimetry during pregnancy, ionizing radiation and its effect on pregnant patients and fetus including deterministic and stochastic effects, misconception and tips on safe practice of radiology during pregnancy.

FLUOROSCOPY SAFETY AND DOSE REDUCTION TECHNIQUES

Amin Astani, MD
Assistant Professor of Radiology Shahid Beheshti University of Medical Sciences

Ionizing radiation by the means of fluoroscopic and angiographic guidance are increasingly being utilized for innovating and often more effective treatments and interventions. These procedures expose the patient and operators to ionizing radiation. These radiation exposures can commonly be significantly higher than any diagnostic examination. Ever more, many physicians choose careers that involve exposure to ionizing radiation on a daily basis. May operators can be exposed to cumulative radiations that were uncommon a few decades ago. Therefore, fluoroscopy safety and dose reduction techniques are ever so important. This presentation brings forward the most recent published guidelines, recommendation, published radiation benchmarks, basics of dosimetry and tip on reducing radiation exposure to the patient and the operators.

RISK TO VISION FROM RADIATION EXPOSURE

Amin Astani, MD
Assistant Professor of Radiology Shahid Beheshti University of Medical Sciences

The lens of the eye is one of the most radiation sensitive tissues of the body. Additionally, unlike other organs, the ionizing radiation effect on the lens of the eye is deterministic and cumulative leading to cataract. Radiation induced cataract can be distinguishable from the more common age-related cataract. The cataract maximum occupational dose hazard has recently been decreased. Multiple published studies demonstrated that half of the interventional radiologists and interventional cardiologists have radiation damage to the lens. Yet, only 25% to 36% of interventionalists utilize basic protection techniques. Radiation exposure to the eye can be minimized by taking three simple and effective steps: exercising healthy fluoroscopy habits, using personal protective devices, and employing barrier protection.

IVC FILTER INSERTION AND RETRIEVAL TIPS

Amin Astani, MD
Assistant Professor of Radiology Shahid Beheshti University of Medical Sciences

Inferior vena cava filter is a double edge sword; it is an extremely effective tool in preventing potentially fatal pulmonary embolism when used appropriately. On the other hand, it can be associated with increased risk of developing thrombosis and major morbidity secondary to fracture, perforation and migration of the filter. Therefore, similar to many other interventions, careful and methodical patient selection is essential to maximize the benefits and minimize the risks. Most of the risk and side effects of vena cava filters can be avoided if the filter is removed as soon as it is no longer needed. Therefore, filter retrieval is now highly recommended by most of the major societies and organizations as well as the United States Food and Drug Administration. Most filters can be removed using simple snare or cone retrieval systems. However, a large percentage of the filters require advanced retrieval techniques. Therefore, familiarity with these advanced techniques and situations in which each technique can be useful is essential for every interventionalist who inserts filters.

POSTPARTUM HEMORRHAGE (TREATMENT & MANAGEMENT)

Mohammad Reza Babaei, MD
Assistant Professor of Interventional Radiology, Iran University of Medical Science

Postpartum hemorrhage is the most serious complication encountered by obstetricians during routine patient care and is the leading cause of severe maternal morbidity and death. The incidence of maternal mortality due to postpartum bleeding varies between countries. In developing countries, the incidence of maternal mortality is approximately 1 in 1,000 deliveries, whereas in developed countries, the incidence is only around 1 in 10,0000 deliveries / This large difference in maternal mortality is primarily attributed to country-specific differences in management capacity. Recommended procedures for management of postpartum hemorrhage have been well published, with recent reports focusing on use of conservative management rather than cesarean hysterectomy (CH) to preserve the uterus.

The first step in common management of postpartum hemorrhage is the use of uterine stimulants (uterotonics) such as oxytocin, ergot derivatives, prostaglandins, and misoprostol, and bimanual compression of the uterus. Recommended operative procedures for the management of postpartum hemorrhage include surgical repair of lower genital tract lacerations, uterine hypogastric artery ligation, and hysterectomy.

More recently, the relative benefits of uterine artery embolization (UAE) versus CH have been debated. UAE is generally accepted to be a safe and reliable procedure; however, the success rates and complications for this procedure have been published, and these presented only a small number of cases. Primary postpartum hemorrhage occurs within the first 24 hours following delivery. We estimate critical patient characteristics influencing the success of UAE for the treatment of emergent primary postpartum hemorrhage.

the purpose of intervention is to preserve the mother's life and not to rescue the uterus. In developed countries, UAE has been utilized as an alternative method for management of intractable bleeding following failure of medical management, and uterine artery pseudoaneurysm or arteriovenous malformation.

UTERINE FIBROID EMBOLIZATION

Mohammad Gharib Salehi, MD
Kermanshah University of Medical Sciences, Associate Professor of Radiology. <kumssalehi@yahoo.com>

Uterine fibroid embolization (UFE) has become established as an accepted minimally invasive treatment for uterine fibroids and should be considered a treatment option for patients with symptomatic uterine fibroids. It is important for diagnostic radiologists to understand the procedure, since imaging is a key component in the evaluation and care of these patients. Both the interventional radiologist and the gynecologist must fully evaluate a patient before recommending UFE as a treatment

for symptomatic fibroids. However, relatively few absolute contraindications exist (pregnancy, known or suspected gynecologic malignancy, and current uterine or adnexal infection). A thorough evaluation includes a medical history, menstrual history, physical examination, and discussion of fertility goals. In almost all cases, bilateral uterine artery catheterization and embolization are needed, since most uterine fibroids, whether single or multiple, receive blood supply from both uterine arteries. After UFE, patients can reasonably expect resolution of symptoms such as menorrhagia, pelvic pressure, and pelvic pain. Although infrequent, major adverse events can occur and include ovarian failure or amenorrhea, fibroid expulsion, and rarely venous thromboembolism. Hysterectomy remains the definitive and most common treatment for uterine fibroids, but less-invasive approaches such as UFE are becoming of greater interest to both patients and physicians.

ILIOFEMORAL STENTING FOR VENOUS OCCLUSIVE DISEASE.

MohammadGharib Salehi, MD
Kermanshah University of Medical Sciences, Associate Professor of Radiology. <kumssalehi@yahoo.com>

Venous hypertension is a significant cause of patient morbidity and decreased quality of life. Common etiologies of venous hypertension include deep venous thrombosis (DVT) or congenital abnormalities resulting in chronic outflow obstruction. We have implemented an aggressive endovascular approach for the treatment of iliac venous occlusion with angioplasty and stenting

INTERVENTION IN VARICOSE VEIN

Mohammad Reza Babaei, MD
Assistant Professor of Interventional Radiology
Iran University of Medical Science

Chronic venous insufficiency (CVI) is extraordinarily common, with estimates of up to 25% of women and 10% of men suffering from some form of CVI.1 Most patients with CVI have symptoms that interfere with daily living (e.g., leg aches, fatigue, throbbing, heaviness, night cramps).
Severe cases can lead to skin damage resulting from chronic venous hypertension (e.g., eczema, edema, hyperpigmentation, lipodermatosclerosis).
The majority of patients with leg ulceration have superficial venous insufficiency (SVI) as the primary underlying cause, with SVI being the sole factor in 20%.
Initial treatment includes graduated compression and wound care, but long-term control is dependent on the ability to successfully treat the underlying venous disease.
Many patients with SVI also seek to rid their legs of spider veins, varicose veins, or other sequelae of SVI, and though not life threatening, the unsightly appearance of CVI can and often does adversely affect quality of life.
Patients with symptoms typical of CVI and clinical signs of CVI require further evaluation with duplex ultrasound (DUS). The goal of DUS evaluation is to map out all the
incompetent venous pathways responsible for the patient's condition, including the primary or highest points of reflux and the presence of obstruction.3 Such a map is necessary
to determine the best treatment plan.

Types of Vein Treatment

- Radiofrequency and LASER ablation
- VenaSealTM vein closure
- Sclerotherapy
- Phlebectomy

Technical success of EVLT is defined as a procedure in which successful access is achieved, the segment to be treated is crossed, the vein is emptied adequately, tumescent anesthesia is administered properly, and sufficient laser energy is delivered to the entire incompetent segment.
Clinical success is defined as occlusion of the treated vein segments, with successful elimination of related varicose veins and improvement in the clinical classification of patients.
Adequate understanding of an appropriate history and physical, ultrasound evaluation, anatomy, pathophysiology, knowledge of sclerosing solutions, patient selection, and post-treatment care, as well as the ability to prevent, recognize, and treat complications are required before embarking on treatment.

PEDIATRIC CHEST ULTRASOUND: A PRACTICAL APPROACH

Elham Zarei, MD
Assistant Professor of Radiology, Iran University of Medical Science, Ali Asghar Children Hospital, Tehran, Iran

Lung ultrasound can be performed quickly and easily especially in critically ill patients.it has a higher diagnostic accuracy than physical exam and CXR combined.
It enhances safety by avoiding ionizing radiation and the need for potentially dangerous transfers within the hospital.
In this session, I discuss about how to perform a scan, describe the ultrasound appearances of normal and pathological lung conditions.

SLAP LESIONS, ROLE OF MR ARTHROGRAM

Mahrooz Malek, MD
Associated Professor of Tehran University of Medical Science

SLAP (superior labrum anterior posterior) tears lead to shoulder instability and pain. Diagnosis by physical exam is limited so imaging is critical in diagnosis of SLAP lesions. MRI specially MR atrthrogram is modality of choice for evaluation of labral lesions .in this lecture, practical approach to normal capsulolabral variants, primary and secondary signs of labral tears, SLAP lesion typing on MR arthrogram will be reviewed.

PELVIC ENDOMETRIOSIS, ULTRASOUND AND MRI CASE PRESENTATION

Sara Parviz, MD

Endometriosis is a common gynecological problem, affecting approximately 5% of women.
The disease has different manifestation and could present as an ovarian cysts (endometrioma), superficial endometriosis, and deep infiltrative endometriosis (DIE).
The non-endometrioma type of the disease could be found in different site of the pelvic including the col-de-sac, the uterosacral ligaments, the uterovesical region, and the rectovaginal septum.
The degree of pelvic adhesions and the patient's symptoms differ between these different features. Considering the difference in the symptoms and treatments, correct site-specific mapping of the pelvic involvement is of great importance.
The firs line non-invasive method for endomeriosis mapping is trans-vaginal ultrasound (TVS).
The recent consensus statement, suggests a standard TVS approach to all patients suspected for the pelvic endometriosis. This approach is formed of four basic steps, which evaluate the uterine, and ovaries, presence of any pelvic adhesion, presence of DIE in the anterior or posterior compartments.
MRI is a second step imaging modality, and could be suggested in any case with non specific ultrasound findings, in patients suspected for malignancy, or to determine the extent of the disease in the regions non accessible by ultrasound.

PECTORALIS, LATISSIMUS DORSI, AND TERES MAJOR MUSCLES

Sara Parviz, MD

The pectoralis major is a complex muscle with three sternal, clavicular and abdominal origins.
Recently the prevalence of the traumatic injury of this muscle has been increased in the young athletes. Imaging plays an important role in determining the location and extends of the injury, which is crucial for the treatment planning.
The latissimus dorsi and teres major may also get involved in a traumatic sprain. If the trauma is remote, this type of muscle injury may present as a chest wall mass or shoulder pain and mislead the diagnosis and again the imaging modalities, specially MRI, are important to make an accurate diagnosis. In the current presentation we focus on the imaging anatomy and also different type and classification of the chest wall muscle injury including the pectoralis major, the Lattisimus dorsi and the Teres major.

DIAGNOSIS OF CONGENITAL UTERINE MALFORMATIONS BY IMAGING TECHNIQUES

Firoozeh Ahmadi, MD
Department of Reproductive Imaging, Reproductive Biomedicine Research Center, Royan Institute for Reproductive Biomedicine, ACECR, Tehran, Iran. <Dr.ahmadi1390@gmail.com >
Maryam Javam, B.Sc.

Congenital uterine malformations are a various group of uterine anatomical abnormalities originated from development defects during fetal growth. These anomalies are found in about %1-3 of women, particularly those with infertility.
These malformations are associated with higher incidences of infertility, recurrent abortions, intrauterine fetal death, intrauterine growth retardation, premature delivery, fetal malposition, higher rate of caesarean section, retained placenta and gynecologic complications such as obstructive hematocolpos & hematometra. However, manifestations and severity of the obstetric/gynecologic complications vary depending on each class. Moreover, treatment procedures are associated to the type of anomaly. Therefore, accurate diagnosis of uterine malformations and differentiation between various classes of them play a significant role in management of patients with congenital uterine anomalies.
Imaging is first-line evaluation method for patients suspected of having uterine anomaly. Several imaging modalities are used including 2D/3D ultrasound, 2D/3D hysterosonography, hysterosalpingography and MRI. Each modality has its own pros and cons. Current lecture provides useful knowledge on diagnosis and classification of uterine malformations and related complications by means of various imaging tools.

Keywords:
Congenital uterine malformations, Ultrasound, hysterosonography, Hysterosalpingography, MRI

WORKSHOP: INTERACTIVE PEDIATRIC NEUROIMAGING CASE PRESENTATION

Ali Hekmatnia, MD
Professor of Radiology, Isfahan University of Medical Sciences
Helen Nayeri, MD
Maryam Riahinejad, MD
Assistant Professor of Radiology, Isfahan University of Medical Sciences
Neda Pak, MD
Assistant Professor of Radiology, Tehran University of Medical Sciences
Ghazaleh Jamalipour Soufi, MD
Assistant Professor of Radiology, Isfahan University of Medical Sciences
Elham Zarei, MD
Assistant Professor of Radiology, Iran University of Medical Sciences

Pediatric neuroimaging is challenging due the rapid structural, metabolic and functional changes that occur in the developing brain.
In these session, we present some cases of common diseases of the pediatric central nervous system and discuss about their neuroimaging characteristics.
We have attempted to cover subjects that are encountered in everyday practice such as infections and inflammatory diseases of CNS, metabolic and toxic disorders, congenital malformations and Brain tumors.
Target audience includes radiology Residents, Radiologists and Neurologists.

WORKSHOP: COMMON PEDIATRIC GASTROINTESTINAL IMAGING CASE PRESENTATION

Parisa Hajalioghli, MD
Assistant Professor of Radiology, Tabriz University of Medical Sciences

Ultrasound and Radiography have crucial role in evaluating pediatric gastrointestinal system.
In this session, I discuss about ultrasound techniques for evaluation of common pediatric gastrointestinal diseases such as GER and HPS and their sonographic appearances.
Also, I review imaging characteristics of Hirschprung disease.
Target audience includes Radiology residents, Radiologists and Pediatricians.

UPDATED CLINICAL DATA ON CTACE AND RE-CTACE IN THE TREATMENT OF HCC

Mahyar Mohammadifard, MD
Associate Professor of Radiology Birjand University Medical Science.
Fellowship of of Interventional Radiology

A review of Applying Transarterial Chemoembolization (TACE) Method for Management of Hepatocellular Carcinoma Abstract Liver cancer is one of the most ordinary reasons of death among cancers. Hepatocellular carcinoma (HCC) is the most common type of liver cancers. In spite of the fact that, various remedial methods have been approved, particularly the survival effects of transcatheter arterial chemoembolization (TACE) method has been accomplished widely in HCC treatment. By applying TACE method correctly good survival outcomes could be achieved without any harmfully affecting on hepatic functions. Transarterial chemoembolization (TACE) mixes the effect of avascular necrosis (AVN) with the effect of regional chemotherapy those are under the influence of arterial embolization. By knowing this fact that the metastases of liver cancer and also perfusion indices in hepatocellular carcinoma (HCC) are via hepatic arteries, doctors choose TACE method for treatment of liver cancer. On the other hand, in this method the radiologists are able to easily convey antitumor remedies via the arteries. Anyway, medium level HCC is a sensitive stage of heterogeneous disease that many patients suffer from, so specialists must consider it as a hazardous syndrome. TACE procedure could be applied just in cases that the liver function of patients is appropriate yet, the patient liver portal vein don't have any problems and the patients don't have ascites disorder. This review is aimed to figure out the evidence advantages of TACE specially by a comprehensive view on medium level HCC because of that this treatment method is suggested as first line remedy. At last, the future landscape of initial factors of research in managing HCC disorder have been summarized. Keywords: Hepatocellular carcinoma, Transarterial chemoembolization, Arterial embolization, Treatment.

• Paper ID:2

IMAGING OF CONGENITAL MALFORMATIONS OF SPINAL CORD

Maryam Haghighi Morad, MD*
Shahid Beheshti University of Medical Sciences

Abstract

Spinal dysraphism is a term for congenital malformations of spine and spinal cord.
The imaging modality of choice for diagnosing spinal dysraphism is MRI but it is a complicated process because of heterogeneous nature of congenital malformations of the spinal cord. The purpose of this article is to review the imaging features of spinal dysraphism.
Spinal dysraphism is devided in to open and closed type on the basis of presence or absence of skin coverage of neural tissue.
Open spinal dysraphisms are categorized to subgroups regarding to the position of the neural placode relative to the skin surface. If the neural placode is flush with the skin surface it is called myelocele and the neural placode protrudes above the skin surface is called myelomeningocele.
Closed spinal dysraphisms are devided to two smaller groups which are: 1.With subcutaneus mass and 2.without subcutaneous mass. The second group is categorized as simple and complex states, closed spinal dysraphisms with subcutaneous mass including meningocele (CSF containing dural sac herniation), lipomyelocele (neural placode – lipoma interface within the spinal canal), lipomyelomeningocele (neural placode – lipoma interface outside of the spinal canal), terminal myelocystocele (terminal syrinx herniation to posterior meningocele), Myelocystocele (herniation of dilated central canal from posterior spina bifida).
MRI is the best imaging choice for diagnosis and evaluation of these abnormalities.
The subgroup of simple closed spinal dysraphism without subcutaneous mass including intradural lipoma, philar lipoma, tight philum terminale, persistent terminal ventricle and dermal sinus.
The complex subgroup of closed spinal dysrahism without sub cutaneous mass is devided to 1.midline notochordal integration and 2.disorders of notochordal formation. the first group contains: 1.dorsal enteric fistula 2.neuroenteric cyst and 3.diastematomyeli the second group includes 1. Caudal agenesis and 2. Segmental spinal dysgenesis

• Paper ID:16

IMAGING FINDINGS IN DISSEMINATED BACILLI CALMETTE-GUERIN (BCGOSIS) IN IMMUNODEFICIENT PATIENTS

Dina Jalalvand*
Shahid Beheshti University of Medical Science
Shahram Kahkouee
Radiology Professor Assistant, Department of Radiology, Masih Daneshvari Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran
Seyed Alireza Mahdaviani
Pediatric Respiratory Diseases Research Center, National Research Institute of Tuberculosis and Lung Diseases (NRITLD), Shahid Beheshti University of Medical Sciences, Tehran, Iran

Background:

Recognition of imaging findings in disseminated bacilli Calmette-Guerin disease in immunodeficient patients is important for prompt diagnosis and treatment and reduction of the burden of problem. The purpose in this study was to determine the CT scan findings in BCGosis in primary immunodeficiency patients.

Methods and Materials:

In this observational cross-sectional comparative study, 22 consecutive patients with immunodeficiency in Masih-Daneshvari Hospital, Tehran, Iran with disseminated bacilli Calmette-Guerin disease were enrolled and the CT scan findings were determined in them.

Results:

Mediastinal soft tissue mass, parenchymal soft tissue lesions, soft tissue lesions with fusion, soft tissue lesions with lobulation invasion to mediastinal structures, chest wall, ribs, collapse, and tract were present in 54.5%, 36.4%, 36.4%, 9.1%,

36.4%,27.3%, 18.2%, 31.8%, and 9.1%, respectively. Subcutaneous abscess, phrenic invasion, pleural effusion, thickening, extra pleural fat were seen in 9.1%, 9.1%, 27.3%, 22.7%, and 9.1% respectively. Axillary, hillar, mediastinal, prediaphragmatic, retrocrural, upper abdominal, and cervical LAP were seen in 54.5%, 36.4%, 50%, 22.7%, 18.2%, 59.1%, and 27.3%,respectively. No milliary lesion was seen. Tree-in-budd, nodule, cavity, consolidation, GGO, collapse, bronchiectasis,and scar were seen in 4.5%, 18.2%, 9.1%, 31.8%, 13.6%, 31.8%, 22.7%, and 4.5%, respectively. Splenomegaly,hypoecho lesions of spleen, spleen mass, hepatomegaly, and liver mass were seen in 59.1%, 13.6%, 9.1%, 27.3%, and 4.5%, respectively. Femoral, retropritoneal, and mesenteric LAP were present in 22.7%, 13.6%, and 50%, respectively.
bowel Wall thickening, ascitis, omental cake, dirty mesentry, and abcess were present in 40.9%, 22.7%, 4.5%, 27.3%, and 22.7%, respectively. Conclusion: CT scan findings in disseminated bacilli Calmette-Guerin disease in patients with primary immunodeficiency are multiple and diverse. Use of combination of them in the proper clinical context would be useful to predict the presence of disease, or to raise a suspicion of underlying immunodeficiency in patients without positive history of such condition and the mediastinal mass plus lymphadenopathy and organomegaly are good indicators in highly suspected patients.

• **Paper ID:41**

ARTIFICIAL INTELLIGENCE IN MEDICAL IMAGING

Houman Sotoudeh, MD*
University of Alabama at Birmingham
Ehsan Sotoudeh
Iranian Hospital in Dubai

Abstract

The artificial intelligence (AI) application in medicine and especially Medical Imaging is emerging very rapidly. AI has attracted much attention in recent years not just in the field of medical imaging but in almost all aspects of human life. There is uncertainty and concerns about the AI application in Medical Imaging. The radiologists and imaging technologist should be familiar with AI aspects and its possible opportunities.
I this educational presentation we are trying to discuss history of AI in Imaging, its basic concepts, current researches and possible future applications in practical way for radiologists and radiology technicians

• **Paper ID:42**

THE 2018 STROKE TREATMENT PROTOCOL AND "CODE-STROKE" CT PERFUSION

Houman Sotoudeh, MD*
University of Alabama at Birmingham

Abstract

Regarding the most recent ischemic stroke treatment guideline, American Heart Association 2018 (AHA 2018), the perfusion imaging has been recommended up to 24 hours after initial symptoms of brain infarction and patients with a significant amount of potential salvageable peri-infarct ischemia and without contraindication benefit from delay thrombolysis and intra-arterial thrombectomy. This approach causes more and more CT perfusion to be done in subacute phase of ischemic stroke. CT perfusion findings in this "subacute phase" are slightly different from "hyper acute" ischemic stroke. The interpreting radiologist must be confident to report the CT perfusion in urgent setting since these studies are under the umbrella of "code-stroke" and should be read in minutes. In addition, result of the CT perfusion has a critical effect on the patient's outcome. Misinterpretation of stroke CT perfusion can be fatal. Underestimation of the salvageable ischemia excludes the patient from the potential effective treatment and increases the mortality and morbidity. Underestimation of infarct volume causes unnecessary thrombolysis/thrombectomy and potential fatal intracranial hemorrhage. In this review, I am trying to explain the challenges of sub-acute "code-stroke" CT perfusion.

• **Paper ID:46**

ASSESSMENT OF SCATTER RADIATION DOSE BY TLD MEASUREMENT INCLUDING SKIN DOSE THYROID & CONTRALATERAL BREAST DOSE IN MAMMOGRAPHY PATIENTS

Rana Farshbaf
Tehran University of Medical Sciences
Parvaneh (Masoumeh) Gity*
Tehran University of Medical Sciences
Nahid Sadighi
(TUMS)
Ramesh Omranipour
(TUMS)

Abstract

This study will be the first in the country to measure the scatter dose received in contralatrral breast and thyroid , during mammography by thermoluminescent dosimeters (TLD The measurement of skin dose is very important in breast mammography and radiation protection …organs is necessary
Radiation dosimetry is fundamental in Medical Physics, involving patients and phantom dosimetry. Inboth cases thermoluminescence dosimetry (TLD) is the most appropriate technique for measuring the absorbed dose. In this paper thermoluminescence dosimeter GR-200 was used for thyroid and breast skin dose measurements. Results are presented and discussed.

Materials and Methods:

we used the types of thermoluminescence dosimeter crystal, and each time in completely similar standardized conditions.. TLD crystals were calibrated against SSDL (Secondary Standard Dosimetry Laboratory) Farmer chamber of Iran Institute of Atomic Energ and aniling., an overall check of basic calibration mammography, cristals placed in each area of breast and thyroid lobes, and the amount of the exposed X-ray injected was accurately recorded, and after reading the capsules in the physics laboratory, the scatter dose of each capsule was obtained and by applying physical coefficients, including calibration, the adsorbed dose rate was reported.

Results:

According to the results, the absorbed dose in both thyroid organ and the breast outside the radiation field in oblique view and the fact that under normal conditions of breast screening without any additional radiation, magnifying, etc., which includes 4 craniocaudal and oblique views the absorption dose is significant, therefore, the radiation of these organs and choosing the protection techniques and shielding is essential and very important.

Keywords:

Exposure, Scatter Dosimeter, Mammography, Thermoluminescenc

• **Paper ID:53**

INTENSIVE CARE UNIT NURSES' KNOWLEDGE OF RADIATION PROTECTION AND THEIR BEHAVIORS TOWARDS PORTABLE RADIOLOGICAL STUDIES

Hamidreza Talari
Kashan University of Medical Sciences
Amin Hoseinzadeh*
Kashan University of Medical Sciences
Mansoor Dianati
Department of Medical-Surgical Nursing, Kashan University of Medical Sciences, Kashan, IR Iran
Azita Zaheri
Department of Medical-Surgical Nursing, Kashan University of Medical Sciences, Kashan, IR Iran

Abstract

Radiological examinations for patients who are hospitalized at intensive care units are usually performed using portable radiography devices. However they may require knowledge and safety precautions of nurses.
The aim of the study was to investigate ICU nurses' knowledge of radiation safety and their behaviors towards portable radiological examinations.
In total, 44 intensive care nurses were recruited for this cross-sectional descriptive study using census sampling during April and May 2014. The study setting was at intensive care units of Shahid Beheshti Hospital of Kashan, Iran. An eleven-item questionnaire and a five-item checklist were

used for evaluating nurses' radiation protection knowledge and behaviors, respectively. An expert panel consisting of ten nursing and radiology faculty members confirmed the content validity of the questionnaire and the checklist. Moreover, a Geiger-Müller counter was used for measuring ionizing radiation during portable radiological examinations. Study data were analyzed using the SPSS software version 13.0. Mean, standard deviation, frequency and one-sample t test were used for description of the data. The level of significance was set at below 0.05. The mean of participants' radiation protection knowledge was 4.77 ± 1.38. The most prevalent radiation protection behavior of nurses was leaving the intensive care unit during portable radiological examinations. Only 6.8% of nurses stayed at the nursing station during radiological examinations. The highest dose of radiation was 0.11 micro Sievert per hour (μSv/h), which was much lower than the highest permitted level of radiation exposure i.e. 0.25 μSv/h.

Portable radiological examinations did not expose healthcare providers to high doses of ionizing radiation. Nurses' radiation protection knowledge was limited and hence, they require in-service education programs.

• **Paper ID:60**

ROTTERDAM CT SCORE AND PREDICTING EARLY OUTCOMES AMONG CHILDREN WITH TRAUMATIC BRAIN INJURY

Hamidreza Talari
Kashan University of Medical Sciences
Masoumeh Abedzadeh*
Trauma Research Center, Kashan University of Medical Sciences
Yaser Hamidian
Kashan University of Medical Sciences
Noushin Moussavi
Trauma Research Center, Kashan University of Medical Sciences
Esmaeil Fakharian
Trauma Research Center, Kashan University of Medical Sciences
Hossein Akbari
Trauma Research Center, Kashan University of Medical Sciences
Elaheh Baban Taher
Kashan University of Medical Sciences

Abstract

Background:

Outcome Prediction of traumatic brain injury (TBI) among children is of great importance to accurate clinical decision making.

Objectives:

This study aimed to determine the prognostic value of Rotterdam scoring system in predicting early outcome among children with TBI.

Methods:

This study was conducted in 2017 on 506 children with brain injury in Kashan, Iran. A checklist was used to collect demographic and clinical characteristics of patients such as age, gender, mechanism of trauma, Glasgow Coma Scale (GCS), need for surgery, and brain injury outcome. Moreover, each participant's computed tomography scan was evaluated and scored using Rotterdam system. Sensitivity, specificity, positive and negative predictive values, and the best cutoff score were calculated for Rotterdam system. The relationships of Rotterdam score with participants' characteristics were examined using the Chi-square test, while the predictors of brain injury outcome were identified using the logistic regression analysis.

Results:

Pediatric death rate was 4.3%. Most deaths were among children who were male, aged less than four, had developed brain injury due to traffic accidents, had a GCS score of 3–8, suffered from compressed skull fracture and frontal lobe injury, had cerebral edema, and had a Rotterdam score of 5. The sensitivity and specificity of Rotterdam score 3 were 86.4% and 97.9%, respectively. The logistic regression analysis indicated that only GCS and Rotterdam scores were significant predictors of brain injury outcome.

Conclusion:

At a cutoff score of 3, Rotterdam system can be used to predict TBI outcome among children with acceptable sensitivity and specificity.

Keywords:

Computed tomography, Head injury, Rotterdam scoring system, Children

• **Paper ID:62**

RADIOLOGICAL PATTERNS OF PULMONARY INVOLVEMENT IN HUMORAL AND COMBINED IMMUNODEFICIENCIES IN PEDIATRICS

Hossein Farzi *
Shahid Beheshti Medical University
Mitra Khalili
Department of Radiology, Mofid Children's Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran
Sepideh Darougar
Pediatric Respiratory Diseases Research Center, National Research Institute of Tuberculosis and Lung Diseases (NRITLD), Shahid Beheshti University of Medical Sciences, Tehran, Iran
Mehrnaz Mesdaghi
Department of Immunology, Mofid Children's Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran
Mahboubeh Mansouri
Department of Immunology and Allergy, Mofid Children's Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran
Delara Babaie
Department of Immunology and Allergy, Mofid Children's Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran
Amir Hashemitari
East London NHS Foundation Trust, London, United Kingdom
Narges Eslami
Department of Immunology and Allergy, Mofid Children's Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran
Zahra Chavoshzadeh
Pediatric Infections Research Center, Mofid Children's Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Abstract

Backgrounds:

Primary immunodeficiencies (PID) are a heterogeneous, wide-spectrum group of 354 distinct disorders with a variable spectrum of clinical manifestations. Respiratory disease is a significant cause of morbidity and mortality in these disorders. The most common characteristic radiographic and CT abnormalities recognized are noninfectious airway disorders, infections, chronic lung diseases, chronic inflammatory conditions (granulomatosis, interstitial pneumonias) and neoplasms. The aim of this study is to delineate and categorize the radiologic patterns of thoracic involvement in various subtypes of PID.

Patients and Methods:

A total of 58 patients with diagnosis of humoral, cellular or combined primary immunodeficiencies referred to Mofid Children's Hospital, Shahid Beheshti University of medical sciences, Tehran, Iran, were enrolled in the study from 2011 to 2017. Their imaging findings were interpreted and compared according to their specific immunodeficiencies.

Results:

There was a significant difference for alveolar opacification in combined immunodeficiencies in comparison with humoral immunodeficiencies (58% vs. 30%, p value: 0.04). Bronchopneumonia-like pattern has been detected as a significant finding (p value: 0.01) in patients with severe combined immunodeficiency (42%) and Hyper IgM syndrome (43%); compared with other subtypes of immunodeficiency. Two patients with CVID and associated lipopolysacharide responsive beige-like anchor protein (LRBA) deficiency showed parenchymal changes suggestive of granulomatous lymphocytic interstitial lung disease (GLILD). Atrophy of thymus was significantly associated with severe combined immunodeficiency (67%, p value: 0.001). No significant difference was reported comparing bronchiectasis, bronchitis/bronchiolitis pattern, pleural effusion and thoracic lymphadenopathy in patients with either humoral or cellular immunodeficiencies.

Conclusions:

Primary immunodeficiency syndromes may provoke radiologic patterns of thoracic involvement, which may lead the clinician and radiologist to potential diagnosis of disease, and contribute to differentiation of subtypes of the disorder.

Keywords:

Combined primary immunodeficiency, humoral primary immunodeficiency, Radiological patterns, pulmonary, pediatrics

• **Paper ID:63**

TIPS IN IMAGING OF ACUTE AORTIC SYNDROME, CASE REVIEW

Maryam Moradi, MD

Abstract

Acute aortic syndrome as one of life threatening item in the context of acute chest pain has important imaging tips and tricks. Performing appropriate tailored protocol for each patient is crucial, aside from being familiar with imaging criteria and details. This paper aim to present case based discussion and different presentations of acute aortic syndrome including dissection, intramural hematoma and penetrating aortic ulcer will be reviewed.

• **Paper ID:66**

COMPARISON OF VISUAL EVALUATION OF MS PLAQUES IN SUCCESSIVE MRI IMAGES FOR EVALUATION OF DISEASE STATUS WITH A DEDICATIVE SOFTWARE

Amin Abolhasani Foroughi
Department of Radiology, Shiraz University of Medical Sciences, Shiraz, Iran
Masoume Nazeri
Neuroscience Research Center, Department of Neurosurgery, Shiraz University of Medical Sciences, Shiraz, Iran
Banafsheh Zeinali-Rafsanjani*
Medical Imaging Research Center, Shiraz University of Medical Sciences, Shiraz, Iran
Mahdi Saeedi-Moghadam
Medical Imaging Research Center, Shiraz University of Medical Sciences, Shiraz, Iran
Amir Torkaman
Department of Neurology, Shiraz University of medical Sciences

Abstract

Introduction:

Multiple sclerosis (MS) is a disease which cause multiple symptoms in vision, mobility and sense of balance. There are different drugs that avoid the disease worsening such as TYSABRI (natalizumab). Routinely, the neurologist examines the patient with MRI imaging at regular intervals to check the effect of the medication and the condition of the MS plaques. For quantitative and objective assessment of disease some software have been developed to reduce the human error.

Objective:

The objective of this study was to evaluate the conformity of radiologist and neurologist diagnosis with dedicative software developed for assessment the MS plaques volumes.

Methods:

35 MS patients participated in this study. All the patients had a one-year treatment of TYSABRI. The patients underwent two MRI imaging before and after the treatment. Both imaging performed with the same imaging parameters in the same center. A MATLAB code was written to evaluate the MRI images to determine the MS plaque volumes. The code was verified with comparison of the its result with the result of a commercial software called Jim 7. After the objective assessment of MRI images before and after treatment, a radiologist and two neurologists assessed both images and declared if the MS plaques reduced or increased in the MRI image performed after treatment. The physicians were blind to software results.

Results:

21 females and 14 males with the mean-age of 23 years old participated in this study. According to home-made software 13 patients (37.14%) improved and 22 patients (62.86%) worsen after a year of TYSABRI treatment. The radiologist agreed with the software's results in 48.57% of cases and the neurologists agreed with software results in 54.29 and 45.71% of cases. There were 2 reason that the physicians disagree to software results almost in 50% of cases. Firstly, because the changes in successive imaging were small in some cases so they couldn't detect them and secondly because they expected to see the improvement of patients. This expectation can change the diagnosis.

Conclusion:

The results of this study showed that for evaluation the MS disease status after treatment, it is better to assess the successive MRI images objectively in order to reduce human errors.

Keyword:

Multiple Sclerosis, Natalizumab, Objective Assessment

• **Paper ID:67**

ASSESSMENT THE PEDIATRIC IMAGING AND ITS RADIATION DOSE IN THE PATIENTS HOSPITALIZED IN NEUROSURGERY DEPARTMENT

Mahdi Saeedi-Moghadam
Medical Imaging Research Center, Shiraz University of Medical Sciences, Shiraz, Iran
Banafsheh Zeinali-Rafsanjani*
Medical Imaging Research Center, Shiraz University of Medical Sciences, Shiraz, Iran
Sara Haseli
Medical Imaging Centre, Shiraz University of Medical Sciences, Shiraz, Iran
Fariba Zarei
Department of radiology, Shiraz University of medical Sciences, Shiraz, Iran
Reza Jalli
Shiraz University of Medical Sciences, Shiraz

Abstract

Background:

The children hospitalized in neurosurgery department of hospitals underwent lots of medical imaging especially brain imaging and chest X-ray. This imaging repeatedly continues during their hospitalization.

Objective:

This study intended to assess total medical imaging of these patients to calculate the effective radiation dose that delivers to these children.

Methods:

Total medical imaging of 120 patients were tracked using PACS system. The request of imaging also assessed to check the reason of imaging prescription. The effective dose due to different medical imaging was extracted from previous studies and a total effective dose of each patient was calculated.

Results:

68 and 52 male and female with the mean age of 5.82 y/o ranging from 1month to 15 y/o who was hospitalized in neurosurgery department of one of University of Medical Science entered to the study. Totally the number of CT scans of brain, abdomen, and chest were 666, 6 and 6 respectively. The number of plain radiography of chest, abdomen, pelvis, and skull were 233, 28, 19 and 16 respectively. The effective dose (mSv) due to CT scan of brain, abdomen, and chest were calculated as 1332, 60 and 48 mSv. The effective dose of plain radiographs of chest, abdomen, pelvis, and skull were 4.66, 28, 13.3 and 1.12 mSv. According to the results the number of brain CT scan for each patient were between 1 to 30. On average each patient had 5 brain CT images. The request for imaging didn't have a complete information about the reason for imaging. This number of brain CT scans impose the total dose of 1332 mSv which is a lot. The request for brain CT scans should be optimized in order to reduce the radiation dose of children. Although the number of CXRs were also high, ranging from 1-36 for each patient with the average number of 3 for each patient, but this imaging does not impose a more than 5 mSv effective dose to patients provided the imaging techniques (kV and mAs) and field collimation are standard.

Conclusion:

The necessity of brain CT scans in neurosurgery departments should be optimized. Imaging protocols should be provided in order to reduce the unnecessary imaging and so that radiation dose of the children.

Keywords:

Neurosurgery department, Pediatric Imaging, Radiation dose

• Paper ID:69

COMPARISON OF VISUAL ASSESSMENTS OF MAMMOGRAPHIC BREAST DENSITY FROM MAMMOGRAPHY: ALONG WITH EVALUATION THE CORRELATION OF SOME IMPORTANT RISK FACTORS AND ACR BI-RADS STAGES

Fariba Zarei
Department of Radiology, Shiraz University of Medical Sciences, Shiraz, Iran
Banafsheh Zeinali-Rafsanjani*
Medical Imaging Research Center, Shiraz University of Medical Sciences, Shiraz, Iran
Mahdi Saeedi-Moghadam
Medical Imaging Research Center, Shiraz University of Medical Sciences, Shiraz, Iran
Sepideh Sefidbakht
Shiraz University of Medical Science
Didar Shomali
Department of radiology, Shiraz University of medical Sciences, Shiraz

Abstract

Introduction:

Breast density (BD) is a very important risk factor for breast cancer. In order to increase the accuracy of determining the BD, mammography equipment uses some image processing algorithms. The objective of this study was to compare the consistency of BD determined visually and provided by mammography equipment. Besides, the correlation of some risk factors and BDs were assessed.

Material and Method:

Using the 4 category- method of assessing the breast composition introduced by American College of Radiology (ACR) Breast Imaging Reporting and Data System (BI-RADS), BD of patients referred for mammography was determined visually and with the imaging tools. The results of both methods were compared using the Bland–Altman plot and the correlation between these methods were assessed using Pearson correlation test. The correlation of family history of breast cancer, hypertension, having the experience of radiotherapy and chemotherapy, the age of the first pregnancy, the experience of hysterectomy and smoking with the ACRs of BD were assessed.

Results:

95 women with the mean age of 51.28 years old ranging from 35 to 75 years old participated in this study. In 55.79%of cases, there was total agreement between the two methods. In 41.05% of cases there was just one score difference and in 3.16% of cases, there was two score difference between visual and machine determined BD. 14.23% of patients had a family history of breast cancer, among these patients 50, 42.86 and 7.14% of them had the ACRs of B, C, and D respectively. 77.89% of patients had normal breast examination among which the BD in 10.81, 52.70 and 36.49 % of cases were A, B and C. 12.63% of patients had a prior experience of radiotherapy and chemotherapy. Among these patients 8.33, 75 and 16.67% had the ACRs of A, B and C. 34.74, 37.88 and 12.63% of patients had the experience of first pregnancy at the ages of under 18, between 18-25 and more than 25 years old respectively. The ACRs of B and C in these three groups were 93.94, 83.33 and 91.67%. 5.26% had the history of hysterectomy among who 60% had the ACR of C and 40% had the ACR of B. 10.53% were smokers and 90% of them had the ACRs of B and C.

Discussion:

According to Bland–Altman plot the was a good agreement between the results of visual and device determined BDs and according to PEARSON correlation there was a moderate positive correlation between two methods. The family history of breast cancer, hypertension, prior experience of radiotherapy and chemotherapy or hysteroscopy, first pregnancy under 18 or above 25 years and smoking lead to a higher ACRs. 89.19% of the patients who had normal breast examination had the ACRs of B and C.

Conclusion:

There is a rather good agreement between visually and device determined BD. Also, there is a positive correlation between the risk factors which were studied and having the higher ACRs.

Keywords:

Breast density, ACR, Correlation, Risk factor

• **Paper ID:70**

DWI CHANGES OF EXTRA-AXIAL HEMATOMA IN BRAIN MRI OF PATIENTS WITH HEAD TRAUMA DURING 3 WEEKS, A PRELIMINARY STUDY

Amin Abolhasani Foroughi
Department of Radiology, Shiraz University of Medical Sciences, Shiraz, Iran
Ali Rahmani
Department of Radiology, Shiraz University of Medical Science, Shiraz, Iran
Hoseinali Khalili
Neuroscience Research Center, Department of Neurosurgery, Shiraz University of Medical Sciences, Shiraz, Iran
Masoume Nazeri
Neuroscience Research Center, Department of Neurosurgery, Shiraz University of Medical Sciences, Shiraz, Iran
Banafsheh Zeinali-Rafsanjani*
Medical Imaging Research Center, Shiraz University of Medical Sciences, Shiraz, Iran

Abstract

Introduction:

Trauma is the most common cause of Intracranial hemorrhage and CT scan is the first choice to detect the brain damage. Today magnetic resonance imaging (MRI) is increasingly used in order to assess the traumatic brain injuries in emergency departments since it is more sensitive to the focal bleedings and axonal damages in comparison to CT scan. There is some limited information about the diffusion-weighted (DWI) signals of hematoma in different stages especially in chronic hematomas that there is no agreement between the researchers about it. In this study, we intended to detect the extra-axial hematomas and assess its changes during the time using DWI.

Materials and Methods:

This is a cross-sectional study in which the trauma patients who were hospitalized in one of the university hospitals was participated in. the participants were undergone three MRI imaging in the first day, after 48 hours, and after 3 weeks using different pulse sequences of T1, T2, DWI, and ADC map. The changes of their hematomas were evaluated during three weeks. SPSS v21 was used for statistical analysis and Wilcoxon method was applied to compare the changes.

Results:

16 patients participated in this study. MRI was performed in three steps, the first day, after 48 hours and 3 weeks after trauma. The study revealed that over time extra-axial hematoma shows diffusion restriction in DWI. Most of the MRIs (87.5%) in the first day in DWI and 100% in ADC had a signal void. After 48 hours in 75% of DWI and 100% of ADC the signal was hypo-signal and after three weeks all the DWI cases were hyper-signal and the ADCs were hypo-signal.

Conclusion:

In this study to the best of our knowledge, we describe DWI changes in brain MRI of the patients with head trauma. According to the results, DWI changes are different from those seen in intracranial hematomas which well describes in literature.

Keywords:

Intracranial hemorrhage, Extra-axial hematoma, MRI, DWI

• **Paper ID:71**

ASSESSMENT OF THE RELATIONSHIP BETWEEN DEMYELINATED MS PLAQUES, CONTRAST ENHANCEMENTS AND DIFFUSION LIMITATION

Amin Abolhasani Foroughi
Department of Radiology, Shiraz University of Medical Sciences, Shiraz, Iran
Niloufar Zare
Department of Radiology, Shiraz University of Medical Sciences, Shiraz, Iran
Masoume Nazeri
Neuroscience Research Center, Department of Neurosurgery, Shiraz University of Medical Sciences, Shiraz, Iran
Banafsheh Zeinali-Rafsanjani*
Medical Imaging Research Center, Shiraz University of Medical Sciences, Shiraz, Iran

Abstract

Introduction:

Multiple sclerosis (MS) is the most common demyelinating disease in adults, leading to wide disability in the community. The activity of MS disease is significantly associated with the development of new lesions. The purpose of this study is to introduce

a method which can detect the new MS plaques without performing contrast-enhanced MRI and so that without use of contrast-agents and to assess the relationship between the demyelinated plaque's signals and contrast-enhancement and restriction of DWI signal.

Material and Method:

34 patients with acute attack of MS participated in this study. FLAIR, DWI, and T1 (post-contrast) pulse sequences were performed for the patients. LNR and LWR were calculated using signal intensity of brain lesions in FLAIR images. Sensitivity, specificity, accuracy, ppv and npv of LNR and LWR determined. Contrast-enhancement and diffusion restriction of lesions has been also evaluated. Finally, a cutoff value determined for LNR and LWR.

Results:

There was a significant difference between the LWR and LNR of the MS plaques, in FLAIR images, which were enhanced or were not enhanced in T1 contrast imaging. Also a significant difference was seen between the LWR and LNR of the MS plaques which were not restricted in DWI comparing with the LWR and LNR of the plaques which showed DWI restriction. The cutoff value for LWR and LNR were between 0.9 to 1 and 24 to 28 respectively.

Conclusion:

The Flair images can also be used to detect new MS plaques by calculating LWR and LNR. LWR is a better index in diagnosis of new plaques due to its higher sensitivity and specificity. DWI images can also have a role in the detection of new plaques, however, its sensitivity is less than the application of LWR and LNR in FLAIR images.

Keywords:

Multiple sclerosis, signal intensity, contrast enhancement, diffusion restriction.

• Paper ID:72

CONTRAVERSIES IN VARICOCELE DIAGNOSIS, WHAT RADIOLOGISTS SHOULD KNOW

Abolhassan Shakeri Bavil*
Tabriz University of Medical Sciences
Javad Jalili
Tabriz University of Medical Sciences

Abstract

Varicocele is the most frequently observed surgically correctable cause of male infertility. Varicocele has been found in approximately 15% to 20% of the general population however, it has been diagnosed in one third of infertile man. Researhces suggested severel pathophysiological mechanisms underlying the adverse effects of varicocele. The diagnosis of varicocele is based on medical history and physical examination. But in some cases clinical diagnosis is not reflect severity and it is necessary to use other accurate techniques. The introduction of radiographic diagnostic studies has allowed for improved detection and further characterization of varicoceles. The characteristic ultrasound appearance of a varicocele is that of "multiple, anechoic, serpiginous, tubular structures", near the superior and lateral aspects of the testis. Color, power or spectral Doppler ultrasound with settings optimized for low flow velocities is commonly used to aid in the diagnosis of varicoceles. Typical Doppler findings include venous flow at rest with intermittent or continuous flow reversal with Valsalva. While the general ultrasound appearance of varicoceles is agreed-upon, there are no standardized criteria regarding the extent of venous dilation or reflux that must be present to meet the definition of a varicocele. In general, clinicians agree that clinically relevant varicoceles are more than 2.5-3mm in diameter. Different authors use different criteria for defining a varicocele detected ultrasonographically. However other studies suggest that there is no threshold value for the diagnosis of varicocele because vascular structures with retrograde flow on CDU may be smaller than 2mm in diameter. Some says that in order to make a correct diagnosis of varicocele it is necessary to detect a prolonged relux that must be longer than 2s.
The aim of this review article is to answer some questions.

What are the gray scale sonography criteria for diagnosis of varicocele?
What is the rule of color Doppler in diagnosis of varicocele?
Which sonographic findings are more correlate with patient infertility or testicular atrophy?
Which sonographic criteria correlate with surgical improvement?
What are the sonographic criteria of subclinical varicocele?
What is the importance of reflux time in color Doppler sonography?
What are the sonographic criteria of varicocele recurrence after surgery?
And finally how a radiologist sould report of gray scale or Doppler sonography of varicocele.

• **Paper ID:73**

SHEAR-WAVE ELASTOGRAPHY OF PARTLY CYSTIC BREAST LESIONS, DOES IT ALWAYS HELP?

Sepideh Sefidbakht*
Shiraz University of Medical Science
Fariba Zarei
Department of Radiology, Shiraz University of Medical Sciences, Shiraz, Iran
Sara Haseli
Medical Imaging Centre, Shiraz University of Medical Sciences, Shiraz, Iran
Maral Mokhtari
Pathology Department, Shiraz University of Medical Sciences, Shiraz, Iran
Vahid Bazojoo
Medical Imaging Centre, Shiraz University of Medical Sciences, Shiraz, Iran
Vahid Zangoori
Breast Surgery Department, Shiraz University of Medical Sciences, Shiraz, Iran
Pedram Keshavarz
(SUMS)

Abstract

Purpose:

To investigate range of pathological findings in partly cystic breast lesions in ultrasound and to evaluate role of SWE in differential diagnosis

Methods and Materials:

Out of 567 cases,72 breast lesions with partly cystic appearance in B-mode, SWE images were also obtained and correlated with pathological results which was available in 65 patients. Qualitative and quantitative tissue elasticity were displayed with color-coded map and color scale ranging from 0kPa (dark blue; soft) to180kPa (red; stiff). Quantitative elasticity values were measured by drawing a Q box over the stiffest portion and another box on adjacent normal breast tissue. Maximum color and presence of a stiff rim was recorded. Maximum and mean stiffness, also ratio of lesion stiffness to surrounding tissue were compared using Mann Whitney U test.

Results:

lesions with cystic components including 29complicated cysts, 29 complex solid cystic masses, 3intracystic masses, and 11clusters of micro cysts. Pathologic results included 5 invasive carcinomas (two IDC with medullary features, one medullary carcinoma, one papillary carcinoma) 57 nonhigh risk and4high-risk (fibrocystic changes with atypical ductal hyperplasia, or atypical ductal papillomatosis and papillary lesion) benign pathologies. All clusters of micro cysts were low-risk benign lesions except one case with high risk pathology, atypical ductal papillomatosis. Mean and maximum stiffness and stiffness ratio were not significantly different between the benign and malignant groups. (P=0.606, 0.391 and, 0.213 respectively)

Conclusion:

In complex solid cystic masses, SWE is less helpful in differentiating benign and malignant masses. This can be explained by the fact that many partly cystic cancers are medullary, mucinous or papillary which are usually softer in consistency. Other mass features need to be considered before downgrading a partly cystic mass based on stiffness values.

• Paper ID:76

SWE OF LOW RISK BENIGN BREAST LESIONS, WHICH PATHOLOGIC DIAGNOSES MAKES THEM STIFF?

Sepideh Sefidbakht*
Shiraz University of Medical Science
Fariba Zarei
Department of Radiology, Shiraz University of Medical Sciences, Shiraz, Iran
Vahid Bazojoo
Medical Imaging Centre, Shiraz University of Medical Sciences, Shiraz, Iran
Sara Haseli
Medical Imaging Centre, Shiraz University of Medical Sciences, Shiraz, Iran
Amin Dehdashtian
Medical Imaging Centre, Shiraz University of Medical Sciences, Shiraz, Iram
Majid Akrami
Breast Surgery Department, Shiraz University of Medical Sciences, Shiraz, Iran

Abstract

Purpose:

To compare stiffness of high-risk(HR) and low-risk benign breast lesions (LR) and to evaluate range of pathologic basis of LR that appear stiff in SWE.

Methods and Materials:

Retrospective analysis of SWE of 381pathologically confirmed benign lesion(18 HR/363LR) was done. SWE images were correlated with pathological results. Qualitatively elasticity was displayed with colour-coded map ranging from 0kPa(dark blue; soft) to 180kPa(red; stiff). Quantitative elasticity values were measured over the stiffest portion. Maximum &mean stiffness, &ratio to surrounding tissue were compared between HR and LR using Mann-Whitney Utest.

Results:

Mean stiff and maximum stiffness and ratio to normal tissue were 42.08 ,52.06, 3.11 and 23.64, 33.26, 2.09 in the HR& LR categories (significant at p=0.02). HR included papillary lesions, atypical ductal hyperplasia, atypical adenosis, sclerosing adenosis, atypical ductal papillomatosis, LR included FCC, fibroadenoma, benign fibroepithelial lesion, usual hyperplasia without atypia, mastitis, granulomatous mastitis, stromal fibrosis, sclerosing adenosis, adipose tissue, cystic change, apocrine metaplasia, intraductal papilomatosis , fat necrosis, abscess formation, benign phylloides tumor, lymphocystic mastitis. There were 23 lesions in the LRgroup with mean stiffness above two SD above mean of 23.64(above 50 kpa). Pathologies in this group included benign fibroepithelial lesion or fibroadenoma (14),fibrocystic change(3), chronic mastitis(4), acute mastitis(1), sclerosing adenosis(2), Intraductal papilomatosis(1), stromal fibrosis(3),usual hyperplasia(1), fat necrosis(2).

Conclusion:

Many benign low-risk lesions can appear stiff in SWE. In these lesions SWE appearance can be misleading and lead to inadverent upgrading of the lesions in ultrasound.

• Paper ID:82

NEURO-DEGENERATIVE DISORDERS; ANATOMIC IMAGING

Houman Sotoudeh*
University of Alabama at Birmingham

Abstract

The number of people in their 80s and beyond is expected to grow dramatically. As the number of old people grows rapidly, neurodegenerative diseases (NDDs) and brain diseases associated with aging are also expected to rise significantly.
It is obvious that there will be a significant increase in imaging of the aging brain and dementia.
In this presentation I am going to review the aging brain imaging and dementia using the anatomic imaging with standard approach, grading criteria and structural report.

• **Paper ID:83**

PRIMARY CNS NEOPLASM; POST TREATMENT IMAGING

Houman Sotoudeh
University of Alabama at Birmingham

Abstract

Post treatment imaging of primary CNS tumors are challenging and most of the time necessitate advanced imaging techniques. Many treatment options are available to treat CNS neoplasms with different post treatment imaging presentation.It is critical to diagnosis and report the post treatment changes versus tumor recurrence/ progression correctly. In this presentation I am going to review the main post treatment changes and the way that the radiologists can differentiate them versus tumor progression. In addition to the anatomic imaging, the hybrid techniques will be discussed. The standard treatment response criteria will be discussed as well.

• **Paper ID:90**

A FETAL CONSEQUENCES OF PREGNANCIES WITH INCREASED NUCHAL TRANSLUCENCY AND NORMAL CGH ARRAY

Amirhossein Hashemi Attar*
Department of Radiology, Islamic Azad University, Mashhad Branch
Ehsan Ghayoor Karimiani
Genetics Department, Islamic Azad University, Mashhad Branch
Fatemeh Hamidi
Islamic Azad University, Mashhad Branch

Abstract

Background:

NT measurement is an ultrasonographic non-invasive screening method at 11-14 weeks of gestation. Fetuses with increased NT are at higher risk of genetic disorders and structural defects. CGH array is one of the most recent methods for detecting chromosomal abnormalities, which is even more accurate than karyotype.

Purpose:

We managed this study to evaluate fetal consequences in pregnancies with increased nuchal translucency and normal CGH array.

Methods:

In a descriptive-analytical study, CVS was done for fetuses with higher than normal NT measurments. CVS samples were evaluated with CGH array. Fetuses with normal CGH array results were followed for fetal outcomes with advanced anomaly scan at the 18th weeks of pregnancy and also neonatal checkup after birth.

Results:

78 pregnant women were included in our study.Ten fetuses (12.8%) showed abnormal chromosomal patterns. In the remaining fetuses (68 cases), we found 2 cases (2.9%) with congenital heart disorders and 8 cases (11.8%) with non-cardiac structural disorders. There were also 2 cases (2.9%) with intrauterine fetal death. There was no significant relationship between the age of pregnant mothers and the incidence of fetal complications (P value> 0.05).

Conclusions:

This study showed although chromosomal studies in fetuses with increased NT is of a great importance, ultrasonographic followup is mandatory.

Keywords:

Nuchal Translucency, Comparative Genomic Hybridization, Chorionic Villus Sampling, Ultrasonography, Chromosomal abnormalities

• **Paper ID:93**

DIAGNOSTIC VALUE OF VENOUS -ARTERIAL ATTENUATION RATIO AND HOUNSFIELD-HEMATOCRIT RATIO IN THE EVALUATION OF ACUTE CEREBRAL VENOUS SINUS THROMBOSIS IN NON-CONTRAST BRAIN COMPUTED TOMOGRAPHY

Bita Abbasi*
Mashhad University of Medical Sciiences
Majid Shams
Mashhad University of Medical Sciences
Donya Farrokh
Mashhad University of Medical Science
Behrooz Zandi
Mashhad University of Medical Sciences
Masoud Pezeshki-Rad
Mashhad University of Medical Sciences
Jahanbakhsh Hashemi
Mashhad University of Medical Sciences
Ali Feyzi Laein
(MUMS)
Shamim Tayebi
(MUMS)

Abstract

Background:

Elevated density of the venous sinuses is a typical sign of cerebral venous sinus thrombosis (CVST) on non-contrast brain computed tomography (NCBCT). The purpose of this study was to assess the diagnostic value of V:A and H:H ratios for diagnosis of acute CVST in NBCT.

Materials and Methods:

This retrospective case-control study included 50 confirmed cases of patients with CVST by using contrast-enhanced MR venography and 73 cases age- and sex-matched without CVST. Two blinded experienced observers independently interpreted the images for the presence of acute CVST and obtained attenuation values and V:A and H:H ratios for thrombosed and non-thrombosed sinuses on brain NCCT.

Results:

A significant difference in the average sinus attenuation was found between patients with acute cerebral venous sinus thrombosis (65.8±6.4 HU) and the control group (44.9±6.2 HU; $P < .0001$). A similar difference was found for the H:H ratio (1.69±0.32 vs 1.25 ± 0.25) and V:A ratio (2.07±0.55 vs 1.1±0.2) in patients with and without CVST, respectively; ($P < .0001$). Optimal thresholds of 55 HU lead to sensitivities of 92% and specificities of 96% for average sinus attenuation and 1.37 lead to sensitivities of 88% and specificities of 77% for the H:H ratio and 1.43 lead to sensitivities of 100% and specificities of 93.8% for the V:A ratio.

Conclusions:

Increased attenuation and the H:H ratio and V:A ratio in the dural sinuses on non-contrast brain computed tomography have a high sensitivity and specificity in diagnosis of acute cerebral venous sinus thrombosis.

Keywords:

Cerebral venous sinus thrombosis (CVST), Non-contrast brain computed tomography (NCBCT), Venous arterial attenuation ratio (V:A ratio), Honsfield-hematocrit ratio (H:H ratio).

• **Paper ID:98**

APPLICATION OF ABDOMINAL CT SCANS WITHOUT CONTRAST FOR SCREENING THE VERTEBRAL COMPRESSION FRACTURES: ACCORDING TO L1 TRABECULAR ATTENUATION

Fariba Zarei
Department of Radiology, Shiraz University of Medical Sciences, Shiraz, Iran
Banafsheh Zeinali-Rafsanjani*
Medical Imaging Research Center, Shiraz University of Medical Sciences, Shiraz, Iran
Elham Rastgoo
Department of Radiology, Shiraz University of Medical Sciences, Shiraz, Iran
Mahdi Saeedi-Moghadam
Medical Imaging Research Center, Shiraz University of Medical Sciences, Shiraz, Iran

Abstract

Background:

Osteoporosis is a common disease which lead to bone mass loss and increased bone fragility. One of

the methods to reduce the risk of bone fracture is to diagnose the disease at an early stage and prevent its progression. Bone densitometry is the common method of screening the Osteoporosis, however, recent studies have shown that CT scans which were performed for other clinical purposes can also be used for screening, by evaluating the Hounsfield unit (HU) of the first lumbar spine.

Objective:

The objective of this study was evaluation the feasibility of application the abdominal (Abd) CT scans without contrast as a screening tool for anticipation the occurrence of vertebral compression fractures, according to L1 trabecular radiation attenuation.

Methods:

All the abdominal CT scans without contrast that had been performed during a year from 2016 to 2017 for the patients above 55 years old were assessed using images which were saved in PACS system. The HU of the trabecular region of first lumbar spine were evaluated using an ellipsoid region of interest with the same area in all the patients. Evaluation the fracture (fx) status was done using Genant semiquantitative assessment method. This method categorizes the fx into 4 groups from normal to severe fx. T-test was used for evaluation the significance of the difference between the patient who had and had not fx.

Results:

The CT scan of 1016 patients (447 females and 569 males with the mean age of 69.88 years old) were assessed. There were no fx in 949 patients, the average HU of the 1st lumbar spine in these group was 131.86 with SD of 41.93. 67 patients had fx with the average HU of 100.92 and SD of 47.03. According to T-test there were a significant difference ($p<0.0001$) between the HU of the 1st lumbar spine of the patients with and without fx in Abd CT scan.

Conclusion:

The Abd CT scan of the patients which were performed for other clinical purposes can be used for screening the vertebral compression fx. This method decreases the cost of diagnosis and decrease the application of unnecessary ionizing radiation and so that decrease the secondary malignancies induced by radiation. Determination of cut-off point to diagnose osteoporotic patients can be helpful for screening the median to old age patients who had more risks for this disease.

Keywords:

Osteoporosis, Screening, Abdominal CT scan, Trabecular attenuation

• Paper ID:99

FETAL PULMONARY ARTERY DOPPLER EXAMINATION AS A NON-INVASIVE TEST FOR ASSESSING PRENATAL LUNG MATURITY

Mohammad Zare Mehrjardi*
Division of Clinical Research, Climax Radiology Education Foundation, Tehran, Iran; Division of Clinical Research, Iranian Association of Fetal Ultrasound, Tehran, Iran

Abstract

Background:

Fetal lung immaturity is considered as an important factor for adverse neonatal complications such as respiratory distress syndrome. Therefore, multiple attempts have been made to determine prenatal lung maturity. Currently, the gold standard for this purpose is amniocentesis in order to examining lecithin to sphingomyelin ratio of the amniotic fluid. However, amniocentesis is an invasive testing that can cause maternal and/or fetal complications. Fetal pulmonary artery Doppler study is a non-invasive method that may be helpful in predicting fetal lung maturity and preventing postnatal complications.

Objectives:

To investigate the efficacy of fetal pulmonary artery Doppler examination as a predictor of fetal lung maturity.

Patients and Methods:

86 singleton pregnancies with indication of emergent cesarean section before 37 weeks of gestation were included in a prospective study. Pulmonary artery Doppler exam was performed and interpreted by an expert radiologist, 1-12 hour(s) prior to delivery.

Fetal main pulmonary artery resistive index (RI), pulsatility index (PI), and acceleration time to ejection time (AT/ET) were determined using manual tracing of three contiguous waves (for RI and PI) and manual determination of times on one wave (for AT/ET). None of included mothers had comorbidities and/or received corticosteroids after Doppler examination. NICU admission and/or neonatal death due to respiratory distress were considered as adverse postnatal outcome.

Results:

Gestational age at delivery was between 31 and 37 weeks. 16 neonates (19%) required NICU admission because of respiratory distress. No neonatal death occurred during 1-month follow-up. Gestational age was lower in NICU-admitted newborns compared to non-NICU-admitted ones (mean, 33.8±1.3 weeks versus 35.4±1.9 weeks, P =0.002). Pulmonary artery RI (mean, 0.86±0.15 versus 0.81±0.24, P =0.52) as well as PI (mean, 2.18±0.27 versus 2.25±0.41, P =0.43) was not statistically different between NICU-admitted and non-NICU-admitted neonates. However, pulmonary artery AT/ET was found to be significantly lower in newborns with respiratory distress in comparison to those without respiratory distress (mean, 0.24±0.05 versus 0.33±0.09, P <0.001). Receiver operating characteristic curve demonstrated that the optimal cut-off point for predicting fetal lung maturity based on pulmonary artery AT/ET is 0.31 with the ratios ≥0.31 indicating fetal lung maturity (sensitivity =75%, Specificity =93%, negative predictive value =85%, positive predictive value =82%).

Conclusions:

In conclusion, fetal pulmonary artery acceleration time to ejection time is a useful Doppler parameter for predicting fetal lung maturity non-invasively.

Keywords:

fetal Doppler; fetal lung maturity; respiratory distress syndrome

•PaperID:101

COMPARISON OF QUALITATIVE (TIME INTENSITY CURVE ANALYSIS), SEMI-QUANTITATIVE AND QUANTITATIVE MULTIPHASE 3T DCE-MRI PARAMETERS AS PREDICTORS OF MALIGNANCY IN ADNEXAL MASSES

Seyedeh Nooshin Miratashi Yazdi*
Emam Khomeini Hospital

Abstract

Objective:

The present study aimed to compare the qualitative (time intensity curve analysis), semi-quantitative and quantitative multiphase 3T dynamic contrast-enhanced (DCE) MRI parameters as predictors of malignancy in adnexal masses.

Materials and Methods:

In this prospective study, women with an adnexal mass who were scheduled for surgical resection or were followed for more than one year to confirm benignity of their lesions, underwent multiphase 3T DCE-MRI. Qualitative (time intensity curve), semi-quantitative (SImax, SIrel, WIR) and quantitative (Ktrans, Kep, Vb) analyses were performed on DCE-MRI sequences and their predictive values were compared.

Results:

A total of 17 benign and 14 malignant lesions were included. According to qualitative analysis, none of the lesions with type I time intensity curves (TIC) were malignant and none of the masses with type III TICs were benign. The accuracy of quantitative parameters in detection of malignancy was found to be higher than that of semi-quantitative variables, particularly when calculated for a small ROI within a high signal area of the mass (sROI) rather than the largest ROI including the whole mass (lROI), and when inter-MRI variations were omitted using ratios. The Kep(tumor)/Kep(myometrium) ratio measured from an sROI was the best parameter for differentiating a malignant lesion with a sensitivity of 100% and a specificity of 92.3%.

Conclusion:

We concluded that a type I TIC confirms a benign lesion, and a type III TIC confirms malignancy and further evaluation is not recommended for these lesions. So complementary quantitative analysis is only recommended for adnexal masses with type II TICs.

Keywords:

adnexal mass; DCE-MRI; qualitative; semi-quantitative; quantitative; Time Intensity Curve

•PaperID:112

COGNITIVE FUNCTIONS AND WHITE MATTER LESIONS ON MR IMAGES IN A SAMPLE OF NORMAL IRANIAN POPULATION WITH CARDIOVASCULAR RISK FACTORS

Morteza Sanei Taheri
Shahid Beheshti University of Medical Sciences
Mehran Arab Ahmadi*
Tehran University of Medical Sciences
Hamid Reza Haghighatkhah
Shahid Beheshti University of Medical Sciences
Mohammad Amiri
Tehran University of Medical Scienes
Mostafa Ranjbar
Shahid Beheshti University of Medical Sciences

Abstract

Objectives:

Due to a suggestive three-way relationship between brain structural disorders, microvascular lesions, and cognitive impairments, we aimed to examine the association of the volume and number of white matter hyperintensity (WMH) lesions and lacunar infarcts with the cognitive impairment among the patients with cardiovascular risk factors in a sample of Iranian population.

Methods:

This cross-sectional study was conducted on a total number of 156 normal subjectsaged 30 to 74 years with cardiovascular risk factors. We used the Framingham general cardiovascular risk factors prediction model to calculate the likelihood of each risk factor. All patients underwent Brain MRI. The total number of lacunar infarcts and the volume of WMH lesion were calculated. The cognition status was assessed using the Montreal cognitive assessment (MoCA) questionnaire.

Results:

Adverse association was revealed between MoCA cognition score and different cardiovascular risk profiles including Framingham BMI score ($p < 0.001$), Framingham lipid score ($p < 0.001$), Vascular Age Lipid Score ($p < 0.001$), and Vascular Age BMI Score ($p = 0.001$).The total volume of WMH was negatively associated with total MoCA cognition score ($p < 0.001$) as well as with some components of cognitive function including memory ($p = 0.007$), attention ($p = 0.011$), language ($p = 0.027$) and orientation ($p = 0.003$). Our study also showed an adverse association between total number of lacunar infarcts and total MoCA cognition score ($p = 0.038$) and consequently with some cognition components including memory ($p = 0.013$), attention ($p = 0.037$), abstraction ($p = 0.046$) and orientation ($p = 0.002$).

Conclusion:

The total volume of WMH and number of lacunar infarcts correlate with a lowering in cognitive function in normal subjects with cardiovascular risk factors, but without cardiovascular or cerebrovascular disorders. The periventricular lesions are associated with impaired memory, language and visuo-constructional function while the subcortical lesion are associated with impairment in naming, attention, language and abstraction functions in such subjects.

•PaperID:136

THE COMMON STEM OF CALCARINE SULCUS AND PARIETOOCCIPITAL FISSURE IN THE AXIAL PLANE; A POTENTIAL EARLY MARKER OF CORTICAL DEVELOPMENT IN FETAL MRI

Sepideh Sefidbakht
Shiraz University of Medical Science
Zahra Hemmati*
Shiraz University of Medical Science
Bijan Bijan
Department of Radiology, University of California Davis Medical Center
Pooya Iranpour
Shiraz University of Medical Science
Saeed Esmaeilian
Shiraz University of Medical Science
Pegah Katibeh
Shiraz University of Medical Science

Abstract

Purpose:

To investigate the development of the common stem of calcarine sulcus and parietooccipital fissure in the axial plane as a potential early marker of cortical development in fetal MRI

Methods and Materials:

From September 2013 to 2016 out of the 658 fetal MRI's performed in our tertiary care referral hospital 321 fetuses were performed before 20 weeks GA. Sixty-seven fetuses with normal fetal brain MRI and normal outcomes as measured by normal Ages and Stages Questionnaires obtained at least one-year post-delivery were included in the study. Three fetuses with GA of 16, 4 with GA of 17, 18 fetuses with GA of 18, and 42 fetuses with GA of 19 weeks were included in the study. Early midline sulci including the calcarine (cal) and parietooccipital (POF) fissures as well as their common stem were assessed in all fetuses by two radiologists in consensus. The visible sulci based on the method presented by Van der Knaap et al. (0-6).

Results:

The mean scores for the common POF-Cal sulcus stem in axial images were 1 and 0.5 and 0.44 and 1.36. The mean scores for Cal in the standard coronal plane was 0 and 0 and 0.16 and 0.10 in fetuses with GA's of 16, 17, 18 and 19 weeks respectively, while the mean scores for the proximal Cal in axial images was 0.66 and 0.25 and 0.44 and 1.33.

Conclusion:

The common POF-calcarine sulcus stem seems to become visible in MRI earlier than the age mentioned in previous fetal MRI studies. This sulcus is among the first sulci to develop in fetal pathology studies and can be potentially used as an early indicator of early fetal development.

Keywords:

Fetal MRI, calcarine sulcus, parietooccipital fissure

• Paper ID:146

SPECTRUM OF CNS AND EXTRA CNS FINDINGS IN COMMISURAL AGENESIS, A FETAL MRI STUDY

Sepideh Sefidbakht
Shiraz University of Medical Science
Nazanin Sadraee*
Medical Imaging Center, Shiraz University of Medical Sciences,Shiraz, IR
Bijan Bijan
Department of Radiology, University of California Davis Medical Center
Sara Haseli
Medical Imaging Centre, Shiraz University of Medical Sciences, Shiraz, Iran
Pedram Keshavarz
(SUMS)
Pooya Iranpour
Shiraz University of Medical Science
Seyed Hamed Jafari
Shiraz University of Medical Science
Neda Rahimirad
(SUMS)
Nasrin Asadi
(SUMS)

Abstract

Purpose:

To categorize structural CNS and extra-CNS anomalies associated with abnormalities of the corpus callosum,.

Material and Methods:

The university ethics committee approved this retrospective study. 821fetal MRI's were done during

2017-2018 in our institution, including 34corpus callosum and commissural anomalies. MRI's were done on a Seimens Avanto 1.5T Scanner and interpreted with prior knowledge of the mid trimester anatomical survey. Post-delivery follow-ups and images were obtained when available using patients phone numbers and national registry results.

Result:

The MR imaging studies of 167 fetal suspected with ventriculomegaly with ultrasound were reviewed to evaluate types of abnormalities of the corpus callosum. MRI confirmed presence of ventriculomegaly in 94 cases. In 45 (47.8%) out of 94 cases with ventriculomegaly the anomaly of corpus callosum was the suspected in ultrasound. Complete corpus callosum agenesis in 19 Cases and partial agenesis of the corpus callosum in 11 cases were identified, and the remaining 15 Cases had normal corpus callosum. Additional abnormalities were also implemented in the reviewed cases, categorized in two groups as "extra CNS" and "additional CNS" abnormalities. Anterior commissure was seen in 15 cases of complete agenesis while hippocampal commissure was seen in only one.

In complete CCA extra CNS abnormalities documented in 4cases consisted of Renal hypoplasia (1), pulmonary agenesis (1) lower extremimty palsy (1) and bilateral cleft lip (1). The additional CNS anomalies documented in 9 cases include; polymicrogyria (3), shallow insula (2), heterotopia (2), cerebellar hypoplasia (2).

In partial CCA, 1 case of extra CNS anomaly include bilateral cleft lip and palate (1) and 7 cases with additional CNS abnormalities documented constituted of; hydrocephaly(1), closed lip schizencephaly (1), polymicrogyria (2), septo optic dysplasia (2) , dandy walker malformation (1).

In both groups all the extra-CNS findings had also been detected in ultrasound, while out of the extraCNS findings only the cerebellar hypoplasia was seen in ultrasound.

Conclusion:

MRI can detect additional CNS anomalies in patients with ACC and can help rule out callosal agenesis with confidence. Given the heterogeneous clinical outcome of ACC, this can have prognostic and counseling value.

• **Paper ID:159**

RADIATION DOSE OPTIMIZATION IN CT FOR CRANIOSYNOSTOSIS EVALUATION

Fariba Zarei
Department of Radiology, Shiraz University of Medical Sciences, Shiraz, Iran
Zeynab Mashayekhi
Department of Radiology, Shiraz University of Medical Sciences, Shiraz
Rezvan Ravanfar Haghighi*
Medical Imaging Research Center, Shiraz University of Medical Sciences

Abstract

Background:

Computed Tomography (CT) is one of the most important diagnostic methods for craniosynostosis evaluation to assess the skull sutures of pediatric patients. Since the risk of radiation dose is especially very serious in pediatric, the aim of this study is to evaluate the possibility of radiation dose reduction in CT scanning of skull for craniosynostosis, with respect to image quality.

Methods:

A cadaver skull bone was scanned, by 8-MDCT GE Health care, with standard dose (100 kVp, 9mAs) and with 20% reduced dose (80 kVp, 9mAs). Reconstructed 3D images (with 1.25mm slice thickness) were evaluated by two experienced radiologists, subjectively blinded to the exposure parameters. Image quality were reported to be acceptable in both standard and reduced dose cases. Therefore, dose reduction protocol was used to scan 57 pediatric patients, 1 to 36 months old, suspicious of craniosynostosis. Radiation dose indices including volume CT dose index (CTDIvol in mGy) and Dose Length Product (DLP in mGy.cm) for standard (41 patients) and dose reduction protocol were recorded from PACS system. Conversion factor k (in mSv/mGy.cm) was used to calculate effective dose (ED) in mSv.

Results:

Statistical analysis shows that the mean and standard deviation of CTDIvol, DLP and ED are 12.86±2.2 mGy, 199±48 mGy.cm, 1.94 mSv for standard dose and 5.35±0.2 mGy, 84.26±7.4, 0.77±0.17 mSv for dose reduction protocol respectively with $p<0.001$ for all pair parameters.

Conclusion:

Dose reduction protocol for scanning skull of pediatric patients, to evaluate craniosynostosis is able to reduce CTDIvol, DLP and ED values by 58%, 57.5% and 70% respectively relative to standard one, while the diagnostic image quality is acceptable. Therefore, standard dose protocol can be replaced by dose reduction one, as is established in this study.

Keywords:

CT dose reduction, Craniosynostosis, Image quality

• Paper ID:169

CAD SYSTEM BASED ON B-MODE AND COLOR DOPPLER SONOGRAPHIC FEATURES MAY PREDICT IF A THYROID NODULE IS HOT OR COLD

Afshin Mohammadi*
(UMSU)
Mohammad Bagher Shiran
Department of Medical Physics, School of Medicine, Iran University of Medical Sciences
Ali Abbasian Ardakani
Department of Medical Physics, School of Medicine, Iran University of Medical Sciences
Ali Mohammadzadeh
Department of Radiology, Rajaie Cardiovascular, Medical and Research Center

Abstract

Objectives:

The aim of this study was to evaluate if the analysis of sonographic parameters could predict if a thyroid nodule was hot or cold.

Methods:

Overall, 102 thyroid nodules, including 51 hyperfunctioning (hot) and 51 hypofunctioning (cold) nodules, were evaluated in this study. Twelve sonographic features (i.e., seven B-mode and five Doppler features) were extracted for each nodule type. The isthmus thickness, nodule volume, echogenicity, margin, internal component, microcalcification, and halo sign features were obtained in the B-mode, while the vascularity pattern, resistive index (RI), peak systolic velocity, end diastolic velocity, and peak systolic/end diastolic velocity ratio (SDR) were determined, based on Doppler ultrasounds. All significant features were incorporated in the computer-aided diagnosis (CAD) system to classify hot and cold nodules.

Results:

Among all sonographic features, only isthmus thickness, nodule volume, echogenicity, RI, and SDR were significantly different between hot and cold nodules. Based on these features in the training dataset, the CAD system could classify hot and cold nodules with an area under the curve (AUC) of 0.898. Also, in the test dataset, hot and cold nodules were classified with an AUC of 0.833.

Conclusions:

2D sonographic features could differentiate hot and cold thyroid nodules. The CAD system showed a great potential to achieve it automatically.

Key Points

- Cold nodules represent higher volume ($p = 0.005$), isthmus thickness ($p = 0.035$), RI ($p = 0.020$), and SDR ($p = 0.044$) and appear hypoechogenic ($p = 0.010$) in US.
- Nodule volume with an AUC of 0.6

• Paper ID:174

BREAST TUMOR CLASSIFICATION IN SHEAR WAVE ELASTOGRAPHY IMAGES USING CONVOLUTIONAL NEURAL NETWORK

Nasrin Ahmadinejad
Tehran University of Medical Sciences
Mostafa Ghelich Oghli*
Rajaie Cardiovascular Medical and Research Center
Shakiba Moradi
Sharif University of Technology, Tehran, Iran
Arvin Aryan
Tehran University of Medical Sciences
Isaac Shiri
Tehran University of Medical Sciences

Abstract

Background:

Breast cancer is the most common type of cancer among women. About one in eight women are diagnosed with breast cancer during their lifetime. A malignant tissue is stiffer than normal and benign tissues. This stiffness could be evaluated by elastography.

Patients and Methods:

A comprehensive dataset of shear wave elastography (SWE) images of breast tissue using an Esaote MyLab™ 9 system was provided. 100 images were related to breasts with benign tumors and 100 images contain malignant tumors. The gold standard for evaluation of proposed algorithm was biopsy, which was performed on all of examining lesions.
A convolutional neural network was applied to the dataset, to extract the visual features of the images. The architecture was based on Densenet architecture, which is modified for our purpose. We have used the network in both pre-trained and end-to-end training strategies and the results were compared. The network was pre-trained on the Imagenet dataset, due to the lack of sufficient dataset. On the other hand, with data augmentation the network underwent a full training strategy. Finally, the classification layer, which decides about the benignity or malignancy of the lump, is a softmax layer.

Results:

The results of the proposed methods are satisfying in both pre-trained and end-to-end training approaches. We have used various evaluation metrics contain precision, recall, F1-score, ROC curve, and training time for both strategies. The precision, recall, and F1-score were 0.87, 0.91, and 0.89 for the Densenet architecture trained from scratch and 0.93, 0.95, and 0.94 for the transfer learning approach. The ROC curves were plotted for both approaches and the area under the curves (AUCs) were calculated. The transfer learning approach yielded a 0.97 of AUC, whereas this number was 0.91 for the fully-trained approach. At last, the training time of transfer learning approach was less than training from scratch, as it was anticipated.

Conclusion:

The results show the superiority of the transfer learning approach in tumor classification. Higher statistical metrics with lower training time makes this approach more compatible with SWE images.

• Paper ID:181

FETAL GI TRACT OBSTRUCTION, IS MRI INDICATED?

Reza Jahankhah*
(SUMS)
Sepideh Sefidbakht
Shiraz University Of Medical Science
Pedram Keshavarz
(SUMS)
Bijan Bijan
Department of Radiology, University of California Davis Medical Center
Ali Bahador
(SUMS)
Maryam Kasraeean
(SUMS)

Abstract

Background:

Fetal gastrointestinal tract obstructions, while not very common are among the potentially treatable fetal anomalies. The purpose of this study was to retrospectively review fetal MRI's performed for evaluation of a suspected GIT obstruction in our center, correlate them with post-delivery follow-up and evaluate accuracy and value of MRI in diagnosis of these lesions.

Material and Methods:

The university ethics committee approved this retrospective study. 497 fetal MRI's were done during2013-2016 in our institution. 21 studies were performed specifically for further evaluation of suspected GIT obstruction. Only fetuses in whom at least one-year post-delivery follow-up and/or pathology and operative results were available entered the study. 21fetal MRI's were done for evaluation of suspected GI obstruction reported on anomaly US scan and followed to post-delivery /abortion to final diagnosis during2013-2016 in our institution, MRI's were done on a Seimens Avanto 1.5T Scanner and interpreted with prior knowledge of the midtrimester anatomical survey. When operative diagnosis and pathology was not available, the fetuses were evaluated retrospectively in a multidisciplinary team including a radiologist, perinatologist, and pediatric surgeon.

Results:

The final group included 12 GI tract obstruction with varying causes including small bowel atresia (4), esophageal atresia (3),midgut malrotaion (2), MMIHS ,anorectal malformation , external mass compression (each 1) . In 10 cases with distended stomach and suspected gastric outlet obstruction or duodenal atresia MRI was considered normal. In all of these cases third trimester ultrasound was normal. There was one case of anorectal malformation which was missed both by MRI and ultrasound.
US was sensitive for detecting GI obstruction (91%) but it was not specific(57%). This result is acceptable given the fact that ultrasound is a screening tool. Adding MRI to the ultrasound results increased the specificity significantly to 95% while the sensitivity remained unchanged at 91%.

Conclusion:

When performed with prior knowledge of ultrasound results fetal MRI might be able to increase specificity of the diagnosis of fetal bowel obstructions in terms of level and cause of fetal bowel obstruction.

• Paper ID:183

DIAGNOSTIC VALUE OF CORONARY TRANSLUMINAL ATTENUATION GRADIENT IN CORONARY CT ANGIOGRAPHY FOR DETERMINING STENOSIS SEVERITY

Pooya Akbari*
Medical University of Isfahan
Mehdi Karami
Medical University of Isfahan
Maryam Moradi
Medical University of Isfahan
Maryam Farghadani
University of Esfahan
Fariba Alikhani
Uninersity of Isfahan Medical Sciences

Abstract

Background:

The purpose of the present study was to determine the diagnostic accuracy of Transluminal attenuation gradient (TAG) in 64-slice multislice computed tomography in the detection of significant coronary artery disease, using diameter stenosis as the comparison.

Methods:

In 82 patients scheduled for coronary CT angiography, 64-slice MSCT was performed and evaluated for the presence of significant (>50% luminal narrowing) stenosis. Then TAG determined from the change in HU per 5-mm length of coronary artery and defined as the linear regression coefficient between intra-HU and length from the ostium (millimeters).

Result:

Total mean (S.E) of TAG is -2.87(0.28), the TAG is significantly different (PV<0.0001) in patients with significant stenosis -4.71(0.36) in compare with nonsignificant stenosis -1.30(0.23). Also we definition the cutoff point for TAG for better evaluation of severity.

Conclusion:

The present study confirms that TAG is the accurate and noninvasive functional method to determine the significant coronary artery stenosis.

• Paper ID:191

AN ASSESSMENT OF RADIATION EXPOSURE DOSES IN PATIENTS UNDERGOING PRIMARY PERCUTANEOUS CORONARY INTERVENTION BASED ON ANGIOGRAPHIC RECORDS

Mehdi Maghbool*
AboAliSina Hospital

Abstract

The stochastic and non-stochastic (deterministic) effects of radiation dose in patients undergoing primary percutaneous coronary intervention (PPCI) have been investigated using data recorded by an angiographic monitoring system. A total of 132 patients with acute myocardial infarction referred to the angiography department of Vali-Asr hospital, Fasa, Iran, during the second half of 2016 were recruited. Quantities like dose–area product (DAP), total air kerma (Ka,r) and fluoroscopy time (FT) were calculated and converted into effective dose (ED) and peak skin dose (PSD). The values for Ka,r,

DAP and FT equaled 80 399.20 ± 63 312 mGy cm2, 1392.80 ± 1155.373 mGy and 524.11 ± 423.057 s, respectively, which were within the ranges reported in previous studies. After considering standard dose thresholds for Ka,r and PSD, it was revealed that only a small portion of patients had reached these thresholds and exceeded them (<3%). Moreover, ED < 20 mSv for the majority of patients was fairly consistent with results from a recent research in eight Belgian hospitals. It was shown that angiographic records are reliable for assessing radiation dose in patients.

• **Paper ID:210**

APPLICATION OF OPTICAL IMAGING IN MEASURING BREAST CANCER TUMOR RESPONSE TO NEOADJUVANT CHEMOTHERAPY

Samaneh Hassanpour*
Tabriz Med University
Ali Ghafari
B.Sc. Student of Radiology Technology, Member of the Paramedical faculty Student Research Committee, Tabriz university of Medical Sciences, Tabriz, Iran
Davood Khezerloo
Radiology Department, Paramedical Faculty, Tabriz University of Medical Sciences

Abstract

Background:

Breast cancer is the second cause of death and the most prevalent cancer among women. common imaging methods used to diagnose breast cancer are mammography, MRI and ultrasound. main part of breast cancer treatment is the surgical removal of the cancerous tissue. treatment of large tumors usually starts with neoadjuvant chemotherapy (NAC) to shrink the size of the tumor before surgery and also to control distance metastases. Neoadjuvant chemotherapy (NAC) has been established as the standard-of-care treatment for locally advanced inoperable breast cancer. Early knowledge of response to NAC is necessary for providing the optimal treatment strategy. optical imaging has received new interest as a technique to assess tumor response to NAC. Diffuse optical spectroscopy (DOS) uses near-infrared light to provide quantitative spectral information about tissue absorption and scattering properties. We aim to have a review of optical imaging in assessing of breast cancer tumor response to neadjuvant chemotherapy in order to have better understanding of it and it's application.

Methods:

Literature search was conducted in PUBMED, SCOPOUS and Google Scholar using terms "breast cancer", "optical imaging", "spectroscopy" and "neoadjuvant chemotherapy". Half of the articles reviewed were identified appropriate considering the title of this article.

Result:

in one of studies, Diffuse optical spectroscopy (DOS) scans were acquired after the first, third, and last cycle of chemotherapy. As early as after the first chemotherapy cycle, a significant difference between responders and nonresponders was found using DOS, the differences continued during treatment. Using dynamic contrast enhanced MRI (DCE-MRI) a difference between responders and nonresponders was found halfway treatment using tumor volume measurement calculations. DOS was equally effective in predicting tumor response halfway treatment compared with DCE-MRI.

Conclusion:

DOs is a nonionized, noninvasive, cost-effective technique that does not require breast compression or low breast compression. DOS can detect changes in tumor absorption within the first days after the treatment and so could characterize breast tumor response to NAC at an earlier time than other modalities, and is able to differentiate between responders and nonresponders in early stages of therapy and also it could be combine with other imaging modalities to have better and accurate results.

keywords:

Breast cancer, Neoadjuvant chemotherapy, Spectroscopy and Optical imaging

• **Paper ID:214**

MRI-BASED OXYGENATION IMAGING IN DIFFERENTIATING HIGH VS LOW-GRADE GLIOMA

Pejman Maralani*
University of Toronto
Sunit Das
University of Toronto
Aimee Chan
University of Toronto

Abstract

Background:

Glioblastoma is the most common primary malignant neoplasm in adults, with a median survival of 15-18 months after diagnosis. Our group has previously demonstrated that quantitative blood oxygen level dependent (qBOLD) magnetic resonance imaging (MRI)-derived levels of oxygen saturation (SO2) can be used as a surrogate to map oxygen tension in patients with glioblastoma. We investigated whether qBOLD MRI was also able to differentiate different grades of gliomas.

Patients and Methods:

10 patients were enrolled into this prospective study. All patients underwent a preoperative MRI with Ferumoxytol as a contrast agent. Two volumes of interest from the tumor were chosen for biopsy, from sites with different levels of hypoxia. These samples were stained with histological markers and graded by neuropathologists through consensus on a 0-3 scale. Patients with glioblastoma were compared with lower-grade gliomas. Scores were assessed for significant differences using Wilcoxon Two-Sample Test.

Results:

In total, 6 patients had pathological GBM; 1 patient had diffuse astrocytoma; and 3 patients had anaplastic astrocytoma. 1 patient a low-grade glioma had an inconclusive biopsy and was therefore excluded from the study. Although VOIs with different levels of SO2 were chosen, SO2 of VOIs did not differ, and histological markers were not significantly different within high-SO2 VOIs. However, within low-SO2 areas GBM showed significantly higher levels of CAIX (p=0.02), and nearly for VEGF (P=0.08). HIF1a staining did not differ (P=0.13).

Conclusions:

Advanced qBOLD MRI can potentially differentiate high-grade from low-grade glioma.

Keywords:

glioblastoma, qBOLD, MRI, oxygen saturation

• **Paper ID:215**

ASSOCIATION OF HORMONAL AND HER2 STATUS OF INVASIVE DUCTAL CARCINOMA WITH ULTRASOUND DESCRIPTORS IN VARIOUS AGE GROUPS

Maryam Jafari*
ACECR
Parvaneh (Masoumeh) Gity
Tehran University of Medical Sciences
Fateme Sari
(ACECR)
Asiie Olfatbakhsh
(ACECR)

Abstract

Background /Objective:

To evaluate the ultrasound features of solid malignant masses detected in the US with different hormonal (ER/PR) status and HER 2 sub-types in various age groups (under 35, 36 to 50 and over 51).

Patients and Methods:

High-resolution US images of 160 consecutive cases of solid masses with final pathology of invasive ductal carcinoma (IDC) analyzed and correlated with pathology and biomarkers.

Results:

Comparing different age groups there was a significant difference between cancerous masses in terms of margin (p=0.0001), shape (p=0.018), and orientation (p=0.037).
The irregularly shaped cancers were significantly higher in the over 35 and the round shaped ones were more prevalent in age over 51 (p=036).
In the case of margin, there was no malignant with speculated/angular margin at age under 35 years. On the other hand, in over 51 years, the speculated margin was more common (23.1%).

Malignant masses with circumscribed margin were significantly higher in patients' age under 35. Parallel malignant masses were significantly more prevalent in younger than 35. In elder cases, nonparallel malignant masses were more frequent.
There was a significant difference between the margin and shape of the masses with the ER/PR status (P=0.045); ER-positive malignant masses showed commonly indistinct border (57/116,49.1%) while the most of ER-negative tumors showed micro lobulated edge(15/35,39.5%).
In overall, in both groups, the masses were more irregular, but in the ER-negative group, this was significantly higher (66.4% vs. 47.4%).
The number of round masses was also significantly higher in the hormone negative group (7/38, 18.4% vs. 7/116, 6%).
HER 2 positive masses were further heterogeneous (53.7%, 58/108) with the p-value of 0.076.
The HER 2 positive cancers had grade III (39/99(39.4%) vs. 27/44(61.4%)) with a significant analytical difference. Few of the HER 2 positive group had Grade 1, while this level was significantly higher in HER 2 negative group (P=0.004).
In term of mass size, ER-positive cancers were discovered in smaller sizes than negative types (P=0.035).
Most of the patients under age 35 were ER/PR negative (57.8%).In age over 36, most of them were ER/PR positive in 82.7% and 75.8% respectively. This difference was significant (p<0.0001).
Tumors were mostly graded of 3 in age over 50 (48.6%). At the age of under 35, there were more grade 3 also (16/23, 69.5%).

Conclusion:

ER-negative breast tumors were mostly with the microlobulated margin with a higher interest in displaying round or oval/lobulated shapes.
ER-positive cancers are mostly demonstrated masses with indistinct margin and irregularly shaped. Larger Pseudo-benign appearing features are more common in ER-negative cancers which may be due to its higher vascularity and less fibrosis component.

Keywords:

Invasive ductal carcinoma; Ultrasound; Breast cancer; Hormonal status; HER 2 status

Paper ID:231

AMID PROTON TRANSFER IMAGING: BASIC CONCEPT AND CLINICAL APPLICATION

Vahid Shahmaei*
(SBMU)

Abstract

Molecular imaging using endogenous molecules has generated a lot of interest because the methodology does not have the adverse effects of gadolinium (Gd) contrast agents and has clinical benefits in pediatric patients or patients with a contraindication for the use of an exogenous contrast agent.
Amide proton transfer (APT) imaging has recently emerged as an important contrast mechanism for magnetic resonance Imaging (MRI) in the field of molecular and cellular imaging which has higher sensitivity and spatial resolution than magnetic resonance spectroscopy technique.
Amide proton transfer (APT) imaging is a novel molecular MRI technique that detects low-concentration endogenous mobile proteins and peptides in tissue noninvasively. It can indirectly reflect intra cellular metabolic change and physiological and pathological information in vivo. APT imaging is able to detect tissue pH changes in stroke (where pH decreases) and identify the spatial extent and pathological grade of some tumors due to increased mobile protein and peptide.
APT imaging has added a new dimension to in vivo molecular imaging by its ability to demonstrate mobile proteins and physicochemical properties of tissue. High sensitivity in reflecting protein contents enables various applications in brain tumor imaging and stroke imaging in terms of diagnosis and treatment monitoring.
In this review, we describe the basic concepts of APT imaging, particularly with regard to the benefit in clinics from the current literature .Clinical applications of APT imaging are described from two perspectives: in the diagnosis and monitoring of the treatment response in brain tumor by reflecting endogenous mobile proteins and peptides, and in the potential for stroke imaging with respect to tissue acidity.

• **Paper ID:249**

SURROGATE ASSESSMENT OF TUMOR CELLULAR DENSITY AND PROLIFERATION: MAGNETIC RESONANCE SPECTROSCOPY

Mohammad Hossein Jamshidi*
Department of Radiologic Technology, Faculty of Paramedicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran

Abstract

Proton magnetic resonance spectroscopy (1H-MRS) exploits the unique resonant frequencies of protons within differing molecules in tissue to produce a graphical representation of the distribution of metabolites in a region of interest, expressed as a series of peaks on the horizontal axis and by the parts per million and signal amplitude on the vertical axis. Careful attention must be paid to voxel placement, minimising magnetic field inhomogeneity by shimming and adequate fat and water suppression methods to address spectral contamination and optimise results. Higher magnet strengths allow for better discrimination between metabolite peaks. The most widely accepted marker of malignancy in MRS is elevation of the metabolite choline (spectral peak 3.2 ppm), an indirect index of cell turnover and proliferation. This is often referenced to the concentrations of citrate (spectral peak 2.6 ppm) and creatine (spectral peak 3.04 ppm) as a ratio. Spectroscopy has been used in the setting of cerebral glioma to inform tumor typing and grading as well as to facilitate targeted biopsy especially when combined with 18F-FDG PET to identify representative areas of higher metabolic activity. Metabolites such as N-acetylaspartate (NAA), choline, myoinositol, choline, lipids and lactate have proven of use in the evaluation of benign and malignant neuropathology. In general, astrocytomas tend to show elevated choline with reduced NAA and creatine, whilst glioblastoma multiforme classically demonstrates a high lipid (0.9 and 1.3 ppm) and lactate peak. MRS has also been used in the assessment of prostatic malignancy. The normal peripheral zone usually demonstrates high concentrations of citrate; this decreases in the central gland due to the lower proportion of glandular tissue. A reversal of the normal choline to creatine ratio is seen in malignancy. Elevated choline/creatine ratios are also seen in breast, cervical, prostate, colorectal, lymphoma and head and neck squamous cell cancers. There may be a role for MRS in the evaluation of treatment response in several tumour types. Two studies evaluating the choline/lipid ratios by 1H-MRS in a total of 94 tumours before and after transcatheter arterial chemoembolisation of hepatocellular carcinoma found a significant decrease in the ratio post-treatment. In a study of 22 patients with uterine cervical carcinoma undergoing neoadjuvant chemotherapy prior to hysterectomy, a significant drop in the triglyceride peak post treatment correlated with a reduction in tumour volume though no advantage was found in terms of survival. In a study of 80 patients with cerebral glioma, MRS, in particular the choline/NAA ratio, was found to be equal in terms of sensitivity (81.8%) but superior to diffusion-weighted imaging in specificity (84 versus 69%), positive (81 versus 69%) and negative predictive values (81 versus 84%) in predicting disease response to treatment.

Keywords:

Tumor, Imaging, MRI.

• **Paper ID:261**

PREOPERATIVE EVALUATION OF TUMOR ADHESION TO THE ADJACENT BRAIN TISSUE IN PATIENT WITH MENINGIOMA WITH BSMI METHOD

Sonia Rezaei*
Department of Radiology, School of Allied Medical Science, Shahid Beheshti University of Medical Sciences, Tehran, Iran
Fariborz Faeghi
Radiology Technology Department, School of Allied Medical Sciences, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Abstract

Purpose:

To investigate the ability of BSMI, to preoperative evaluation of tumor adhesion to the adjacent brain tissue in the patient with meningioma and comparing this method to the Width of edema around the tumor, using finding at surgery as the reference standard.

Methods:

Thirty Patients with meningioma brain tumor who underwent surgery from Loghman hospital were entered the study between November 2016 and January 2018. The level of edema according to the classification of Ide et al. (1995) compared to the surgical finding Blinded to the results, neurosurgeons

made a qualitative assessment of tumor adhesion at the time of resection. The ability of BSMI and level of edema to predict the surgical assessment of adhesion was tested using The Fisher exact test.

Results:

BSMI method was performed on patients with meningioma brain tumor, it judged 22 (73.3%) patients as adhesion (+) and 8 (26.66%) patients as adhesion (-). In this case, there was a significance relationship between BSMI judge and surgical findings (p-value<0.0001). The sensitivity, specificity, precision and accuracy was high, at 91.30%, 85.71%, 94.45% and 90%, respectively. Using T2 sequence, of the 30 patients, 13 (43.3%) were judged as adhesion (+) and 17 (56.7%) as adhesion (-) from edema, whereas surgical findings evaluated 23 (76.7%) as adhesion (+) and 7 (23.3%) as adhesion (-). The sensitivity was moderate but the specificity was high, at 52.17% and 85.71%, respectively. Other criteria such as precision and accuracy were 92.31% and 60%, respectively.

Conclusions:

BSMI evaluated adhesion of the tumor to the adjacent brain tissue with high-accuracy presurgicaly. This method was more effective than Edema method in evaluating adhesion between meningioma and the brain.

• Paper ID:279

DIAGNOSTIC VALUE OF CERVICAL CONSISTENCY INDEX FOR PREDICTION OF SPONTANEOUS PRETERM BIRTH

Mandana Barfei*
(SBMU)
Elham Keshavarz
University of Shahid Beheshti
Hamid Reza Haghighatkhah
Shahid Beheshti University of Medical Sciences
Mojgan Kalantari
Uninersity of Shahid Beheshti Medical Sciences
Ensi Khalili Pouya
Uninersity of Shahid Beheshti Medical Sciences

Abstract

Background:

Pre-term birth (PTB) has been a major problem leading to CNS damage and requires expensive and intensive care.To date, the gold screening tool is cervical length (CL) measurement which has not been shown to be adequate as a single predictor of PTB. The aim of this investigation was to determine the predictive value of cervical consistency index (CCI) in low risk pregnancies.

Methods:

This was a prospective cross-sectional study performed on pregnant women at 14-28 weeks of gestation. The cervical length (CL) and anteroposterior cervical diameter were measured at rest (AP) and after at least 5 minutes gradual maximum compression (AP') using the trans-vaginal probe and the CCI was calculated using this formula: CCI = (AP′ /AP)×100. The primary outcome was sPTB before 34+0w & 37+0w. Logistic regression and analysis of ROC curves were performed to evaluate the diagnostic power of CCI compared to CL.The inter-observer & intra-observer agreements were validated by ICC.

Results:

Among 110 participants with follow-up,11.7% leaded to PTB. Mean CCI for all subjects were 79.13%+/-10.3% that was lower in PTBs(58.2%). Pearson correlation coefficient was found to show a positive correlation between the weeks of pregnancy leading to delivery and the cervical length of women under study (P = 0.0001), and also show a positive correlation between GA in weeks and CCI in women (P = 0.013). According to ROC curve the best cutoff was CCI= 68.82%, which had sensitivity of 68.8% and specificity =70.9% for prediction of PTB comparing with current cutoff CL<25mm which had sensitivity= 34.8% & specificity =67.3%. The AUC for CCI for prediction of sPTB<37w was 0.863 while AUC for CL was 0.324.Inter-observer ICC for CCI and CL was 0.928 and 0.970 respectively while Intraobserver ICC was >0.90 for both.

Conclusion:

Among low risk women for PTB,CCI shows better diagnostic value than CL. This new variable appears to provide better prediction of sPTB than does CL.

Keywords:

Pre term birth, Cervical consistency index, Cervical length, Trans-vaginl Sonography

• **Paper ID: 280**

USING DEEP LEARNING FOR ABNORMALITY DETECTION IN MUSCULOSKELETAL RADIOGRAPHS

Zahra Rezaei*
Department of Computer and Electrical Engineering University of Kashan, Kashan, Iran <z.rezaei2010@gmail.com>
Hossein Ebrahimpour-Komleh*
Department of Computer and Electrical Engineering University of Kashan, Kashan, Iran <ebrahimpour@kashanu.ac.ir>
Kaveh Daneshmand Jahromi*
Post-MBA student in Business Intelligence (BI), Industrial Management Institute (IMI), Tehran, Iran <d1978k@gmail.com>

Abstract

One of the most remarkable applications of deep learning is in medical diagnoses and new improvements in this field have shown that with large enough datasets and right methods, one can achieve results as reliable as experienced doctors. One of such developments is MURA which is a dataset about musculoskeletal radiographs consisting of 14,863 studies from 12,173 patients, resulting in a number of 40,561 multi-view radiographic images. Each one of these studies is about one of seven standard upper extremity radiographic study types, namely, finger, forearm, elbow, hand, shoulder, humerus, and wrist. Each study was categorized as normal or abnormal by board-certified radiologists in the diagnostic radiology environment between 2001 and 2012. Abnormality detection in muscular radiography is of great clinical applications. This gains more importance in cases which abnormality detection is difficult for physicians. If the proposed model can help us in detection, the process of treatment will precipitate. This model is termed inception-v3. The AUROC of our model is 0.94, and the operating point is 0.83 for sensitivity and specificity of 0.90. Although the average opinion of radiologists still shows better results, in images in which fracture detection is delicate, like finger fracture, the proposed model works more accurately, and it can as a decision support assistant for physicians in final detection of fracture. If the image is separated from normal images using Platinum, and a new class is made, and pre-processing is done, the precision of the proposed model enhances.

So, a model which can automatically detect abnormality, can identify the part of image which is detected to be abnormal by the model. If this model is efficient, it can interpret the images more efficiently, it can reduce errors, and it can enhance quality. In order to evaluate the integration of this model with other models of deep learning in clinical setting, more studies are needed to be carried out.

Keywords:

Musculoskeletal Radiographs, Deep learning, medical image processing, Abnormal detection

Paper ID: 4

HYPERSENSITIVITY PNEUMONITIS HRCT FINDINGS, AND THEIR CORRELATION WITH THE ETIOLOGY AND DISEASE DURATION

Farzaneh Shobeirian*
Shahid Beheshti University of Medical Science
Payam Mehrian
Shahid Beheshti University of Medical Science
Abtin Doroudinia
Shahib Beheshti University of Medical Science

Background:

Hypersensitivity pneumonitis (HP) is an immune-mediated diffuse parenchymal lung disease induced by inhaled antigens. High-resolution computed tomography (HRCT) is widely used in the diagnosis and follow-up of patients and determining the progression and prognosis of the disease.

Methods:

In this retrospective study, 45 consecutive patients with the final diagnosis of HP seen at a large tertiary care center during a period of 4 years, were included in the study and their HRCT findings were evaluated.

Results:

The most common findings were ground glass opacity and reticulation. Some HRCT patterns were detected in bird fanciers more severely in comparison with other etiologies. Conclusion: There is no "gold standard" for the diagnosis of HP. HRCT findings are an important part of hypersensitivity pneumonitis diagnosis and CT can also help to define the severity of hypersensitivity pneumonitis injuries. In our study, reticulation and ground glass opacity were the most common findings in HRCT of patients with HP. We also find that patients with avian contacts had a significantly higher rate of fibrosis.

Paper ID: 5

BASILIC VEIN ANEURYSM AND HEMANGIOMA WITH PERI AND INTER TENDINOUS GROWTH: A CASE REPORT

Farzaneh Shobeirian*
Shahid Beheshti University of Medical Science
Mohammad Zare Mehrjardi
Division of Clinical Research, Climax Radiology Education Foundation, Tehran, Iran; Division of Clinical Research, Iranian Association of Fetal Ultrasound, Tehran, Iran
Seyed Morteza Bagheri
Iran University of Medical Science

Most upper extremity venous aneurysms occur following arteriovenous fistulas. In this case report we described a 35-year-old woman with primary multiple basilic vein aneurysm and palmar hemangioma with Peri- and inter-tendinous growth around the fourth and fifth flexor digitorum superficialis and profundus tendon. Physicians and radiologists should be aware of clinical and imaging findings in vascular malformations of the extremities to make a correct diagnosis since they may be mistaken for other pathologies especially without the help of imaging modalities.

Paper ID:6

HUGE UPPER LIP ARTERIOVENOUS MALFORMATION: A CASE REPORT

Farzaneh Shobeirian*
Shahid Beheshti University of Medical Science
Morteza Sanei Taheri
Shahid Beheshti University of Medical Sciences

AVMs are uncommon vascular lesions that can arise in any part of the body. Here, we present a huge upper lip AVM (arteriovenous malformation) in a 70-year-old man. Computed tomography angiography (CTA) revealed a large AVM with feeders from the right facial artery and its branch superior labial artery. Right facial artery showed increased diameter and tortuous changes. Selective catheterization of right carotid followed by super selective catheterization of the right facial artery was done. Then, embolization of the tumor blush was performed. Ten days after the embolization, the surgical removal of the tumor was done.

Paper ID:7

PET/MRI: CURRENT STATUS AND FUTURE PERSPECTIVES

Soheila Refahi*
Ardabil University of Medical Sciences
Hakimeh Saadati
Ardabil University of Medical Sciences

Hybrid imaging is specified as the combination of two or more imaging technologies into a single, new form of imaging. Typically, this new form is synergistic that is, more powerful than the sum of its parts. Although some hybrid imaging modalities may be used purely to depict anatomy, the most exciting characteristic of hybrid imaging is its potential to show molecular processes in vivo within their larger anatomic context. PET/MRI is a first-of-its-kind imaging technology approved by the FDA in 2014. This combined technology is used for the diagnosis, staging and treatment of a variety of conditions, including cancer, neurological, oncological and musculoskeletal diseases. PET/MRI provides high-quality images while reducing patient exposure to radiation. PET/MRI may increase diagnostic accuracy over the single modalities. In this approach we focus on clinical applications of PET/MRI: current status and future perspectives.

Paper ID:8

FUNCTIONAL MAGNETIC RESONANCE IMAGING AND SYNAPTIC PLASTICITY

Hakimeh Saadati
Ardabil University of Medical Sciences
Soheila Refahi*
Ardabil University of Medical Sciences

Functional magnetic resonance imaging (fMRI) is a type of particular MRI scan. It determines the hemodynamic response (change in blood flow) relayed to neural activity in the brain or spinal cord of humans or animals. This effect has been extensively exploited in a several research settings sequentially to study regional activation related with several of cognitive processes, language, reward processing, decision making and fear as well as motor and sensory processing. Functional MRI can offer important insights into brain plasticity and reorganization after injury such as trauma or stroke. Changes in neural performance with experience happen with development and learning. For instance, developmental experiment with nonhuman animals has indicated that sensory experience causes changes at the molecular and cellular levels and the cortical map level. Because fMRI can indirect determine the synaptic activity, only those changes in synaptic activity will be measurable via this technique. In this review study we assess the brain plasticity using fMRI methods because neuroimaging of learning and development is one of the most important issues of cognitive neuroscience.

Paper ID:9

COMPARATIVE STUDY OF LIVER FIBROSIS STAGING AND GRADING BY MRI(DWI) AND BIOPSY

Saeed Naghibi*
Azad University

Background:

Liver fibrosis is known as a life threatening disease due to its side effects such as portal hypertension and liver dysfunction. The disease is curable at early stages which makes the diagnostics of Fibrosis a crucial matter. The golden standard for Liver Fibrosis evaluation is the liver biopsy. However, this method is considered to be invasive and is followed by side effects. Thus, there is a growing demand for non-invasive methods to diagnose Liver Fibrosis and the stage of the disease. One of the non-aggressive approaches is Diffusion-Weighted Imaging (DWI).

Purpose:

Comparison of Biopsy and DW MRI as diagnostic approaches for staging liver fibrosis. Methods: This study covers a group of patients suffering from chronic liver disease who are referred to an Imaging Centre located in Mashhad city in 1395-96. The experienced radiologists in the field of intervention performed the biopsy procedure and the tissue samples were tested in the pathology laboratory to

determine the stage and severity of the Fibrosis. Furthermore, the patients were scanned by MRI (MRI 1.5 Tesla Siemens symphony) with all the required sequences (T1,T2, ADC,…) and b values 500 ,1000 s/mm2. The results were collected by the radiologist and analyzed by SPSS software.

Results:

It is found that a negative correlation exists between Apparent Diffusion Coefficient (ADC) value and the Liver Fibrosis severity level. At lower ADC values the Fibrosis is more severe. Additionally, the ADC value was evaluated versus the Fibrosis stage. The results show a statistical difference between Stage 1,4, Stage 2,3, Stage 2,4 and no obvious statistical difference between F1,F2 and F3,F4.

Conclusion:

Based on the experimental results in the current study, DWI is a useful method to observe and diagnose at the middle and final stages of Fibrosis. However, DWI cannot use as a valid approach to differentiate between early stages of the disease.

Paper ID:10

ASSOCIATION OF MEASUREMENT OF THE FETAL TRANSVERSE CEREBELLAR DIAMETER WITH GESTATIONAL AGE

Saeed Naghibi*
Azad University

Background:

Ultrasound techniques during pregnancy play a very important role in evaluating fetal growth, diagnosis of retardation, intrauterine growth, determining the termination of pregnancy, determining the time of invasive diagnostic tests, amniocentesis. The cerebellum can be seen at 12 weeks of gestation and is the largest posterior part of the brain. The cerebellum cross section can be a predictive factor in determining the age of the embryo's ultrasound pregnancy.

Purpose:

The aim of this study is to investigate association of measurement of the fetal transverse cerebellar diameter with gestational age.

Methods:

This cross-sectional study was performed on pregnant women with gestational age of 40-40 weeks. Individuals were evaluated based on gestational age in three periods (14-20, 11-21, 30-40 weeks). Patients underwent ultrasound and then the cross section of the cerebellum in the posterior cavity was measured with butterfly properties in millimeters. The gestational age was obtained by ultrasound with a calculated value of LMP or ultrasonography before 20 weeks, and the pregnancy gestational neomagram chart was based on TCD. Data were analyzed using IBM SPSS 22.0 software. A significant level of 5% was considered significant.

Results:

The mean age of the mothers was 26.15 ± 0.64 years and the mean gestational age was 24.81 ± 0.60 weeks and the mean cross-sectional dimension of the cerebellum was 23.86 ± 0.54 mm. As the Pregnancy age increased, in mothers with different gestational age, body mass indexes, size of cross section of the cerebellum have increased significantly. There is also a significant relationship between the size of fetal femur length, fetal abdominal circumference, the approximate weight of the fetus and the diameter of the embryo with the gestational age. ($P < 0.05$).

Conclusion:

Measuring cross section of the embryo's cerebellum in the estimation of gestational age in the second and third trimester has a diagnostic accuracy that is approximately equivalent to measuring the fetal length of the embryo and the circumference of the abdomen and the diameter of the embryo

Paper ID: 11

NOVEL CT FINDINGS FOR PULMONARY ANTHRACOFIBROSIS; A RETROSPECTIVE STUDY

Shaghayegh Sadat Khabbaz*
Residen of Radiology, Department of Radiology, Shohada-e-Tajrish Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran
shahram kahkouee
Radiology Professor Assistant, Department of Radiology, Masih Daneshvari Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran
Elham Keshavarz
University of Shahid Beheshti
Mohammad Zare Mehrjardi
Division of Clinical Research, Climax Radiology Education Foundation, Tehran, Iran; Division of Clinical Research, Iranian Association of Fetal Ultrasound, Tehran, Iran
Ghazal Hajinasrollah
Resident of Community Medicine, Department of community Medicine, Shahid Beheshti University of Medical Sciences
Arda Kiani
4Pulmonologist Professor Assistant Tracheal Diseases Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Introduction:

Anthracosis and bronchial anthracofibrosis, a form of pneumoconiosis commonly caused by air pollution and other environmental factors, are the new entity in respiratory disorders. Bronchoscopy and transbronchial lung biopsy (TBLB) are the gold standard of anthracosis diagnosis. Herein, we evaluated the results of bronchoscopy and chest CT scans of 187 anthracotic patients.

Method:

Between April 2016 to April 2017, 187 cases (male =99, mean age of 65 ± 10.2 years) that underwent flexible bronchoscopy and TBLB for various indications were considered for this study. CT examinations of these patients were reported as a "blind to bronchoscopy results" interpretation of chest CT by a board certified radiologist with more than ten years of experience.

Result:

According to the results of bronchoscopy and TBLB, 100 patients were diagnosed as anthracosis. CT scans confirmed 71 cases of them as anthracosis. Sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV) and accuracy of chest CT scans for diagnosis of anthracosis compared to bronchoscopy as the gold standard were 71%, 80%, 79%, 70% and 75% respectively (CI:95%). Sensitivity, specificity, PPV, NPV and accuracy of Hyper-dense non-calcified mediastinal and hilar lymph nodes, which named as Brilliant lymphnodes, for the diagnosis of anthracosis compared to bronchoscopy as the gold standard were 55%, 92%, 89%, 64% and 72%, respectively (CI:95%). Also, there was a positive correlation between anthracosis and brilliant lymph nodes (P-value= 0). The mean of the maximal lymph node density in the anthracotic patients (54 patients) was 160 ± 28, with mean density of 95 ± 21 and standard deviation of 27 ± 10 Honsfield units.Analysis of ground glass appearance of lung attenuation with bronchoscopy estimated sensitivity, specificity, PPV, NPV and accuracy as 41%, 94%, 89%, 58% and 65% respectively (CI:95%). Based on cross-tab, specificity of Brilliant lymph nodes, ground glass appearance of lung attenuation and multisegmental atelectasis as a diagnostic triad of anthracosis was 100%, yielding compatibility with anthracosis when all three CT criteria exist simultaneously.

Conclusion:

Based on our analyses, the triad of Brilliant lymph nodes, ground glass appearance of lung attenuation and multisegmental atelectasis were identified as a reliable set of imaging findings for the diagnosis of anthracosis.

Keyword:

Anthracosis, Chest Computed tomography, hyperdense lymph nodes, ground glass appearance of lung attenuation, Multisegmental atelectasis

Paper ID:12

COMPUTED TOMOGRAPHY PULMONARY ANGIOGRAPHY FOR ACUTE PULMONARY EMBOLISM: PREDICTION OF ADVERSE OUTCOME AND 90-DAY MORTALITY IN A SINGLE TEST

Neda Akhoundi*
Shahid Beheshti University of Medicine
Taraneh Faghihi
University of Shahid Beheshti

Aims:

Pulmonary embolism (PE) is a potentially fetal cardiopulmonary disease, therefore rapid risk stratification is necessary to make decisions of appropriate management strategies. The aim of this study was to assess various CT findings in order to find new prognostic factors of adverse outcome and mortality.

Method and Results:

The study retrospectively enrolled 104 patients with acute PE. Patients were categorized to 4 groups, group 1: patients who experienced adverse outcome, group 2: patients who died within 30 days, group 3: patients who died between 30-90 days, group4: patients who survived without experiencing adverse outcome. comorbidities such as ischemic heart disease (IHD) were obtained from their medical records. Patients CT angiography were reviewed for recording variables such as, main pulmonary artery diameter (MPA), RV/LV ratio. Patients death till three month of diagnosis of PE had been registered. logistic regression analysis was done to find predictors. sixteen patients experienced adverse outcome, ten death occurred within 30 days and 5 deaths were between 30-90 days. based on multiple logistic regression, RV/LV ratio (OR 11.54;95% CI 1.16 to 114.35; P=0.037), LV diameter (OR 0.813; 95% CI 0.681 to 0.969; P=0.021), right sided pulmonary infarction (OR 0.111; 95% CI 0.017 to 0.730; P=0.022) are predictors of mortality in 30 days. RV/LV ratio of 1.19 could successfully discriminate patients who died within 30 days and who did not. Conclusion: RV/LV ratio, LV diameter, right sided pulmonary infarction, assessed with helical CT, can help predict mortality in 30 days.

Keywords:

Mortality; Prognostic factors; Embolism

Paper ID:13

USING FRACTIONAL LIMB VOLUME IN PREDICTION OF BIRTH WEIGHT IN DIABETIC MOTHERS

Zahra Afravi*
(Private)

Background:

To compare estimated birth weight using Hadlock or fractional limb volume methods in prediction of observed birth weight at delivery and prediction of macrosomia. Patients and methods: 120 diabetic pregnant women at their 37th-38th week of pregnancy underwent US examination to estimate fetal weight using Hadlock and fractional limb volume methods.The results compared with birth weight of the same fetuses.

Results:

Sensitivity, specificity and accuracy of each method in prediction of birth weight were calculated.

Conclusion:

Fractional limb volume is more accurate than routine Hadlock method in estimation of birth weight of infants of diabetic mothers and prediction of macrosomia.

Keywords:

Estimated Fetal Weight, Fractional Limb Volume, Hadlock, Gestational diabetes, Macrosomia

Paper ID:15

MOTION STUDY OF TMJ BY MAGNETIC RESONANCE IMAGING

Ali Kiani Nazarloua*
MRI Department, Emam Reza Hospital, Tabriz University of Medical Sciences, Tabriz

Objective:

The aim of this study was to evaluate the motion study of TMJ by MRI.

Material and Method:

About 30 patients who were examined by MRI 1.5 T machine Siemens Avanto, images were studied by two radiologists and images T2, T1 and dynamic

series T1-flash, were studied, that refer to Tabesh Medical Imaging center Tabriz, Iran from 2015-2018.

Conclusions:

The use of dynamic study and cine images, in assessment of TMJ, is very useful in dysfunctional of TMJ.

Paper ID:17

MULTIDETECTOR CT ANGIOGRAPHY FOR EVALUATION OF CORONARY STENTS

Marzie Motevalli*
Rajaie Cardiovascular Center
Mohammadzade Ali Rezai Kalantari Kiara
Asadian Sanaz Rajaie Cardiovascular Medical and Research Center, Iran University of Medical Sciences, Tehran, Iran

Percutaneous coronary intervention (PCI) is the most common invasive cardiovascular procedure performed worldwide1. The drug-eluting stents are used in most PCI because of their positive outcomes for decrease the risk of in-stent restenosis, abrupt occlusion, prevent vessel recoil and complex lesions. According to Society of Cardiovascular Computed Tomography (SCCT) guidelines as determined by an experienced physician, there may be a carefully defined circumstance that supports the use of coronary CTA for post revascularization patients. 2 Although the accuracy of coronary CTA evaluation of stenosis severity may be reduced due to calcification, metallic stents, or surgical clips, evaluation of proximal stents with a diameter ≥3.0 mm has been reported to have a higher accuracy rate .3,4 Computed coronary tomography angiography (CCTA) has limitation resulting from the metallic stent struts and fast coronary artery motion, high and irregular heart rates and small stent diameter for small vessels <2.50 mm makes it even more difficult to reliably detecting coronary in stent visibility by CCTA. In addition, patients treated with stenting often have increased CAD prevalence and high atherosclerotic burden of non-stented segments that further affect CCTA interpretability and accuracy.5

Paper ID:19

ACUTE SCROTAL PAIN, GRAY SACLE, DOPPLER SONOGRAPHY AND ELASTOGRAPHY

Ahmad Soltanishirazi*
Ahvaz Jundishapour Medical Science University

Sonography plays critical role in evaluation of numerous cause of acute scrotal pain because clinical sign and symptom have overlapping and are insufficient for correct decision and type of treatment. combination of high resolution sonography with doppler application as well elastography allow us for evaluation of scrotal soft tissues, internal contents ,covering layers and pattern of vascularity and degree of vascular perfusion and non invasive tissue assessment of mechanical and visualized difference of biomechanics properties of normal tissue and pathology. we can evaluated and differentiated the torsion, epidydimities, orchities, post trumatic lacertion and hematoma of scrotum by complimentary detailed sonography and clinical sign

Paper ID:29

LEAD POISONING DUE TO INGESTION OF LEAD-CONTAMINATED OPIUM; A DIAGNOSTIC STUDY ON PATIENTS' IMAGING FINDINGS

Sara Ahmadi, MD*
Hossein Hassanian
Shahid Beheshti University of Medical Sciences Tehrān
Hooman Bahrami Motlagh
Assistant Professor

Objectives:

Lead, a radiopaque metal may be ingested via different substances and cause severe toxicity. The aim of current study was to describe plain abdominal X-ray and abdominopelvic CT findings of lead poisoned patients following ingestion of lead-contaminated opium.

Materials and Methods:

All patients of >21 years with confirmed diagnosis of lead toxicity, who had undergone abdominal X-ray or

non-contrast abdominopelvic CT, were prospectively included as cases. Patients with other toxicities who had undergone similar imaging profiles but had low BLLs were enrolled as controls.

Results:

A total of 79 cases and 79 controls with median [IQR] BLLs of 126 [97.4, 160] µg/dL and 8.7 [5.5, 15] µg/dL, were evaluated. Anemia (94.9%) and abdominal pain (92.4%) were the most common clinical manifestations in cases. All cases and eleven controls (13.9%) were addicted to oral opium. X-ray and noncontract CTs were reviewed by two radiologists. Fifty (63.3%) and 53 (67.1%) cases and controls underwent CT scanning with 34 (68%) vs. 6 (11.3%) positive CTs (P<0.001) while 43 (54.4%) and 39 (43.3%) underwent X-rays with 21 (48.8%) vs. 4 (11.8%) positive X-rays, respectively (P<0.001). Positive CT can predict BLL higher than 10 and 45 µg/dL with a specificity of 96.9%, 88.7% and positive predictive value of 97.5% and 85% respectively.

Conclusions:

In suspected cases of lead toxicity due to ingested opium, a positive imaging result may guide radiologists and physicians to think about lead toxicity, if BLL is not readily available. Other opioids that are extracted from opium may be polluted and need further investigation.

Keywords:

Computed Tomography; X-Ray; Lead poisoning; Opioid; Abdominal pain; Anemia

PaperID:31

NON-TUMORAL SCROTAL DISORDERS IN CHILDREN

Amirreza Jahanshahi*
Assistant Professor Of Radiology, Tabriz University Of Medical Science

Pediatric scrotal ultrasonography is performed with the patient in the supine position and scrotum supported by a towel placed between the thighs. Study of the spermatic cord is an important part of the examination, particularly in patients with varicocele and suspected testicular torsion. Testicular volume is approximately 1–2 cm3 before the age of 12 years and reaches 4 cm3 in pubertal males,it should be obtained in patients with varicocele, testicular atrophy, or acute scrotum to assess changes in testicular size. testicular appendages are five types and are are the remnants of the mesonephric and paramesonephric ducts Failure of the testis to descend into the scrotum and patency or anomalous closure of the processus vaginalis result in the following conditions: Cryptorchidism, inguinoscrotal hernia and hydrocele. The cryptorchid testis is usually smaller and isoechoic or hypoechoic relative to the normally located testis. Hydrocele is the most common cause of painless scrotal swelling in children.In the normal scrotum, 1–2 ml of serous fluid may be observed in the potential tunica vaginalis cavity and should not be mistaken for hydrocele Acute Scrotum is clinical picture of sudden-onset scrotal pain, redness, and swelling, most frequently caused by acute epididymo-orchitis, torsion of the testicular appendages, or testicular torsion Epididymo-orchitis usually originates in the bladder or prostate gland, spreads through the vas deferens and the lymphatics of the spermatic cord to the epididymis, and finally reaches the testis, causing epididymo-orchitis. Isolated orchitis is very rare! Testicular torsion, or twisting of the spermatic cord, implies first venous and later arterial flow obstruction.

Keywords:

Pediatrics, Scrotum, Inguinal Canal, Non-tumoral

PaperID:36

A CASE REPORT OF PARTIAL ANOMALOUS PULMONARY VENOUS RETURN FROM LEFT SUPERIOR LOBE

Manizhe Ataee Kachuee*
Iran University of Medical Science

We reported a case of partial anomalous pulmonary venous return from the left upper lobe in a 48-year-old woman who is known case of lupus erythematosis, hospitalized to receive cyclophosphamide pulse. Partial anomalous pulmonary venous return is an uncommon condition because of failure of connection

between the draining vein of the some portion of lungs and the common pulmonary vein. Right sided anomalous return is the most common form, while left sided anomalous return is rare. Presented patient is a case of left upper lobe partial anomalous pulmonary venous connection that was diagnosed incidentally on contrast enhanced chest computed tomography (CT) performed because of low grade fever before starting cyclophosphamide pulse. The left upper lobe pulmonary vein drains into a vertical vein, which is drained into the left brachiocephalic vein. This represents a partial anomalous left upper lobe pulmonary venous connection. The remaining pulmonary veins and cardiovascular structures were normal in appearance and connection. No sign of cardiac dysfunction was noted.

Keywords:

Partial anomalous pulmonary venous return

PaperID:37

CAROTID INTIMA-MEDIA THICKNESS MEASUREMENT IN PSORIASIS PATIENTS

Farnood Rajabzadeh*
Islamic Azad Unversity
Mahshid Emamy
Islamic Azad Unversity

Background:

Psoriasis, a chronic inflammatory immune disorder. has been linked to increased cardiovascular mortality and morbidity. Psoriasis is associated with an increased risk of atherosclerosis. Carotid intima-media thickness (IMT) measurement is a promising tool for detecting atherosclerosis in its pre-occlusive/ subclinical phase. This study compared subclinical atherosclerosis of the carotid arteries in psoriasis patients and healthy controls using high-resolution ultrasonography.

Method:

We studied 30 psoriasis patients and 30 healthy controls matched for age and sex. Intima-media thickness (IMT) of the common carotid arteries (CCA) were measured ultrasonographically.

Results:

Psoriatic patients showed significantly higher IMT than controls. The mean of the intima-media thickness of the two vessels examined showed a positive correlation with patients' mean ages, and no correlation with BMI and sex and age.

Conclusion:

Psoriasis is an independent risk factor for subclinical atherosclerosis.

Keywords:

Psoriasis- Intima-media thickness (IMT) Carotid artery- Atherosclerosis- ultrasonography.

PaperID:43

NEURO-DEGENERATIVE DISORDERS; MOLECULAR IMAGING.

Houman Sotoudeh*
University of Alabama at Birmingham

The number of people in their 80s and beyond is expected to grow dramatically. As the number of old people grows rapidly, neurodegenerative diseases (NDDs) and brain diseases associated with aging are also expected to rise significantly. It is obvious that there will be a significant increase in imaging of the aging brain and dementia. Recently many molecular imaging modalities have been developed to address increasing prevalence of dementia. In this presentation I am going to review the aging brain imaging and dementia using the molecular imaging.

PaperID:44

CYSTIC MENINGIOMA: A CASE REPORT OF AN UNCOMMON FORM OF MENINGIOMA

Iman Mohseni*
Iran University of Medical Science

Cystic meningioma is an uncommon form of meningioma and the radiological appearance of the mass may cause a diagnostic challenge. We

report the case of a 65 year old woman presenting with severe headache in the emergency department of Firoozgar hospital. A large left-sided parieto-occipital hypodense solid cystic mass was detected on noncontrast enhanced CT of the brain. The appearance suggested a malignant tumor, then brain MRI with gadolinium delineated the the extra axial solid- cystic mass with peripheral and solid component enhancement. A preoperative diagnosis of cystic meningioma was made, and hemangiopericytoma was considered as differential diagnosis. The histological report verified the diagnosis after tumor resection. It was a benign WHO Grade I meningioma. The preoperative diagnosis of cystic meningioma is challenging. Necrotic glioma and metastasis can mimic this lesion. Brain MRI with gadolinium is very helpful for better characterization and diagnosis. Histopathological examination of the tumor cells should always be performed to confirm the diagnosis and determine subtype of the tumor.

PaperID:49

A REVIEW ON ULTRASOUND AND MR IMAGING SENSITIVITY AND ACCURACY FOR ENDOMETRIOSIS DIAGNOSIS

Sanaz Alibabaei*
MSc Student of Medical Physics, Department of Medical Physics, Faculty of Medicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran
Marziyeh Tahmasbi
Assistant Professor of Medical Physics, Department of Radiologic Technology, Faculty of Paramedicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran

Objective and Background:

Endometriosis is a chronic gynecological condition affecting women of reproductive age which may cause pelvic pain and infertility and estimated to occur in 10% of the female population. Endometriosis is an estrogen-dependent and characterized by the growth of functional ectopic endometrial glands and stroma outside the uterus. The etiology of endometriosis is unknown.

Clinical symptoms include dysmenorrhea, dyspareunia, infertility, painful defecation or cyclic urinary. Physicians recommend that Pregnancy can avoid the spreading of endometriosis. Common diagnostic methods are: clinical history and symptoms, Gynecological examination, 2D and 3D transvaginal ultrasound, MR imaging, Hysteroscopy and Laparoscopy. Common treatment for endometriosis are Analgesics, Hormone therapy, surgery, assisted reproductive and hysterectomy. The purpose of this review is to compare the ultrasound and MRI methods to diagnose endometriosis.

Method:

we performed a systematic literature search of Pub Med, Google scholar, Science Direct for all research articles using the different combinations of terms" diagnosis endometriosis", " ultrasound " and "MRI". At first 639 articles were found, then 14 articles were completely reviewed by removing duplicates based on the title and reading abstracts.

Results:

Ultrasound can confirm the presence of a small size lesion and is capable of differentiating the cystic from solid masses. MRI is the most useful technique for determining the extent of endometriosis, especially for ureters, bladder and rectosigmoid. The sensitivity of transabdominal ultrasound, transvaginal ultrasound and MRI in endometriosis diagnosis are 81%, 88% and 85% respectively. The overall accuracy rate of the mentioned methods is 73%, 76% and 85% respectively.

Conclusion:

A reliable diagnose of endometriosis can be made by the combination of clinical history, gynecological examination, and transvaginal 2Dand 3D ultrasound. In addition, Doppler sonography and MR imaging might help to determine endometriosis, especially in cases with combined uterine fibroids. Although MRI can diagnose the endometriosis in all sites of body, ultrasound remains the initial imaging modality due to its availability.

Keywords:

Endometriosis, Magnetic resonance imaging, ultrasound.

Paper ID:50

A RARE PRESENTATION OF INFERIOR VENA CAVA ANEURYSM DUE TO MURAL VASCULAR MALFORMATION

Mohammad Momeni*
Ahvaz Jundishapur University of Medical Sciences
Fatemeh Momeni
Ahvaz Jundishapur University of Medical Sciences

Introduction:

Aneurysm of the inferior vena cava is a rare anomaly with a few reports worldwide. To the best of our knowledge, this is the first presentation of an IVC aneurysm due to mural vascular malformation.

Case Presentations:

Our case presentation was a 26 years-old man with acute severe abdominal pain and hypovolemic shock with an episode of syncopal attack. Ultrasound showed a fusiform aneurysmal dilation of subhepatic IVC with a large saccular portion at the posterolateral wall and mural thrombosis, and Abdominal CT scan revealed extension of malformation to the right renal vein which was adhered to the right kidney. The involved portions of the saccular aneurysm and right kidney were resected, and the postoperative anatomopathological examination of removal tissue revealed that it was a congenital vascular malformation. After the operation, all symptoms were disappeared.

Conclusion:

This is the first described case of a symptomatic congenital saccular aneurysm of the IVC due to moral vascular malformation with the involvement of the right kidney which led to nephrectomy.Noninvasive imaging techniques such as ultrasonography and CT scan are well suited for initial characterization of such lesions.

Keywords:

Inferior vena cava, Aneurysm, Ultrasonography, Computed tomography scan

Paper ID:54

RADIOLOGIC EVALUATION OF CHRONIC FOOT PAIN

Hamid Mirbagheri*
UK

During last ten years I have been one the guest speakers who presented the principles of foot and ankle radiology in details since 2006 - 2015 in Iranian Congress Radiology. In this presentation I am focusing on one the specific problems of the foot which is very common practice in the field of radiology and orthopaedic surgery. Chronic foot pain has a broad spectrum of potential causes and imaging studies play a key role in diagnosis and management. Chronic foot pain is a common and often disabling clinical complaint that can interfere with a patient's routine activities. Despite careful and detailed clinical history and physical examination, providing an accurate diagnosis is often difficult. Imaging studies play a critical role in diagnosis and management. Initial assessment is typically done by plain radiography; but magnetic resonance imaging has superior soft-tissue contrast resolution and multiplanar capability, which makes it important in the early diagnosis of difficult cases when initial radiographic findings are unclear. Computed tomography displays bony detail in stress fractures, as well as in tarsal coalition. Bone scanning and ultra-sonography also are useful procedures for diagnosing specific conditions that produce chronic foot pain. Plain X-ray is an important diagnostic technique in the initial evaluation of patients with chronic foot pain. It is the most commonly used modality because of its wide availability and low cost. Radiography using the oblique view shows articulation of the Calcaneus, Talus, Navicular, and Cuboid bones, and it can be helpful in patients with foot pain who have no obvious diagnosis. Magnetic resonance imaging (MRI) can play a significant role in making a precise diagnosis, guiding treatment decisions, and determining response to therapy. Bone scanning, ultrasonography, and computed tomography (CT) also are useful procedures in the diagnosis of specific conditions.

Paper ID:55

LONG-TERM VITAMIN D AND HIGH-DOSE OMEGA-3 FATTY ACID SUPPLEMENTATION IMPROVES MARKERS OF CARDIO-METABOLIC RISK IN TYPE 2 DIABETIC PATIENTS WITH CORONARY HEART DISEASE

Hamidreza Talari*
Kashan University of Medical Sciences
Vahid Najafi
Department of Radiology, Kashan University of Medical Sciences, Kashan, I.R. Iran
Zatollah Asemi
Research Center for Biochemistry and Nutrition in Metabolic Diseases, Kashan University of Medical Sciences, Kashan, I.R. Iran

Objective:

This study was performed to evaluate the effects of long-term vitamin D and omega-3 fatty acid co-supplementation on markers of cardio-metabolic risk in diabetic patients with coronary heart disease (CHD).

Methods:

This randomized, double-blind, placebo-controlled trial was done among 61 diabetic patients with CHD aged 40-85 years old. Subjects were randomly assigned into two groups to intake either 50,000 IU vitamin D supplements every 2 weeks plus 2 X 1,000 mg/day omega-3 fatty acid from flaxseed oil (n=30) or placebo (n=31) for 6 months.

Results:

Vitamin D and omega-3 fatty acid co-supplementation resulted in a significant reduction in mean (β -0.03 mm; 95% CI, -0.06, -0.009; P=0.01) and maximum levels of left carotid intima-media thickness (CIMT) (β -0.06 mm; 95% CI, -0.10, -0.02; P=0.004), and mean (β -0.04 mm; 95% CI, -0.08, -0.006; P=0.02) and maximum levels of right CIMT (β -0.08 mm; 95% CI, -0.13, -0.02; P=0.003) compared with the placebo. Additionally, high-sensitivity C-reactive protein (hs-CRP) (β -1.56 mg/L; 95% CI, -2.65, -0.48; P=0.005) was significantly reduced in the supplemented group compared with the placebo group.

Conclusion:

Overall, long-term vitamin D and omega-3 fatty acid co-supplementation for 6 months had beneficial effects on CIMT, and hs-CRP levels.

Keywords:

Vitamin D supplementation, omega-3 fatty acid, cardio-metabolic risk, type 2 diabetes mellitus, coronary heart disease

Paper ID:56

THE EFFECTS OF MAGNESIUM SUPPLEMENTATION ON CAROTID INTIMA-MEDIA THICKNESS AND METABOLIC PROFILES IN DIABETIC HEMODIALYSIS PATIENTS: A RANDOMIZED, DOUBLE-BLIND, PLACEBO-CONTROLLED TRIAL

Hamidreza Talari
Kashan University of Medical Sciences
Mehrafrouz Zakizade*
Kashan University Radiology Department
Zatollah Asemi
Research Center for Biochemistry and Nutrition in Metabolic Diseases, Kashan University of Medical Sciences, Kashan, I.R. Iran

Objective:

This study evaluated the effects of magnesium administration on carotid intima-media thickness (CIMT) and markers of cardio-metabolic risk in diabetic hemodialysis (HD) patients.

Methods:

This was randomized, double-blind, placebo-controlled clinical trial conducted in 54 diabetic HD patients. Participants were randomly divided into two groups to take either 250 magnesium as magnesium oxide (n=27) or placebo (n=27) for 24 weeks.

Results:

Magnesium supplementation resulted in a significant reduction in mean (β -0.04 mm; 95% CI, -0.06, -0.02; P<0.001) and maximum levels of left carotid intima-media thickness (CIMT) (β -0.06 mm; 95% CI, -0.11, -0.009; P=0.02), and mean levels of right CIMT (β -0.05 mm; 95% CI, -0.08, -0.01; P=0.004) compared with the placebo. Additionally, magnesium administration led to a significant reduction in serum total- (β -11.84 mg/dL; 95% CI, -21.74, -1.93; P=0.02), LDL-cholesterol (β -11.26 mg/dL; 95% CI, -20.27, -2.25; P=0.01), high sensitivity C-reactive protein (hs-CRP) (β -1.57 mg/L; 95% CI, -2.06, -1.08;

P<0.001) and plasma malondialdehyde (MDA) (β -0.26 µmol/L; 95% CI, -0.53, -0.001; P=0.04); also, a significant rise in plasma total antioxidant capacity (TAC) (β 168.91 mmol/L; 95% CI, 113.92, 223.89; P<0.001) was observed compared with the placebo.

Conclusion:

Overall, we found that taking magnesium for 24 weeks by diabetic HD patients significantly improved mean and maximum levels of left and mean levels of right CIMT, hs-CRP, TAC and MDA levels.

Keywords:

Magnesium supplementation, hemodialysis, carotid intima-media thickness, metabolic status

PaperID:58

COMPARISON OF RESULTS OF BIOPSY OF BREAST MASSES IN BIRADS 3,4,5 WITH ULTRASOUND RESULTS IN THE PAST 5 YEARS.

Saeede Basir*
(ISR)
Khadije Bakhtavar
Assistant Professor of Radiology (TUMS)

Introduction:

In attention to the high incidence of breast cancer in the country and alternative methods of diagnosis, the purpose of this study was to compare the results of a biopsy of breast masses in BI-RADS 3,4,5 with ultrasound results in the past 5 years.

Tools and Methods:

The people who in the past 5 years based on sonography (BI-RADS 3,4,5) went to the clinic to perform breast biopsies were studied, their lesion samples were sent to valid laboratories. Collected biopsy results. After the match biopsy results with ultrasound report were analyzed and were published reports.

Results:

Some of 100 patients were entranced in this study, with an average age of 48.18 ± 11.59 years .The most commonly affected by BI-RADS grading of BIRADS 4 with 68% of cases. Based on histopathological findings, 64% of cases was benign and 36% was malignant. In our study, 38% of the grade specified in the ultrasound pathology was matched with the answer"s pathology. In 34% of cases specified in the ultrasound grade was not suitable matched with the answer"s pathology. In 28% of cases was reported benign lesion or pathology report was normal that grade ultrasound 3 that had been set for these patients was determind. This interpretation of the sensitivity of ultrasound in the pathological grading BIRADS 92.3%, specificity 67.3%, positive predictive value 66.6%, negative predictive value was 90%. also the accuracy of the test was 72%. The likelihood of malignancy for BIRADS 3, 0 and for BIRADS 4a, 2.8% and for BIRADS 4b, 40.1% and for BIRADS 4c, 95%, and for BIRADS 5,> 95% was calculated.

Conclusion:

Finally, according to the results of this study and other studies of BI-RADS classification seems inadequate ability in the diagnosis of breast masses had and can greatly reduce the need for invasive procedures such as biopsies. However, for a closer look because of the importance of this issue is suggested more studies with larger sample size and taking over a questioner done.

Keywords:

BIRADS, Mammography

PaperID:59

APPLICATION OF LIVER BIOPSY AS A TREATMENT STRATEGY DETERMINANT IN BUDD-CHIARI SYNDROME

Faranak Rafiee*
Shiraz University of Medical Sciences
Alireza Rasekhi
Shiraz University of Medical Sciences
Bita Geramizade
Shiraz University of Medical Sciences

Background:

udd-Chiari syndrome (BCS) is hepatic venous outflow obstruction, which may occur at the level of sinusoids, hepatic veins, inferior vena cava or hepatic vein outlets. The primary goal of treatment is the resolution of hepatic congestion in order to improve liver

perfusion and preserve hepatocytes function. Medical management, recanalization of stenotic or occluded hepatic veins, portosystemic shunting and eventually liver transplantation are the treatment options. The aim of this study is to determine if angioplastic intervention can substitute the portosystemic shunting, by means of a new histopathological grading system for zone 3 congestion in BCS.

Patients and Methods:

In a retrograde study we reviewed 34 cases of BCS, diagnosed on radiology/pathology basis, who underwent percutaneous biopsy of the explanted liver prior to transplantation. Alongside the extent and amount of irreversible fibrosis, we emphasized on other pathologic changes including sinusoidal and central venular dilatation. The pathologic slides were rechecked and according to a new congestion scoring system, patients were categorized considering extent of central venular and sinusoidal dilatation. Total scores of 3-8 were applied for each patient.

Results:

According to radiologic findings, total of 11 patients were in proximal type subgroup, all representing histopathologic score of 4 or less (score 3 in six patients, while others had score 4). The remaining 23 patients were in distal type category, including 7 patients with score 5, and the rest demonstrating score 6 or more. After pathological/radiological correlation, the study revealed that the more proximal location of the venous obstruction, the less sinusoidal and central venular dilatation. Thus in cases gaining lower score in this system, there is more chance of restoring hepatic function by percutaneous angioplasty.

Conclusion:

Selection of treatment in BCS is based on the degree of hepatic injury (clinical settings), liver biopsy results, potential for parenchymal recovery, and pressure measurements. The use of histopathology is beyond determining the presence of fibrosis. Liver biopsy results are useful in predicting the site of venous obstruction in BCS, thus considered as valuable pretreatment findings.

Keywords:

Budd-Chiari syndrome, percutaneous angioplasty, liver biopsy, central venules, sinusoids

PaperID:64

CONGENITAL AORTIC ARCH ABNORMALITIES, CASE BASED DISCUSSION

Maryam Moradi, MD*

Congenital aortic arch anomalies are important in pediatric cardiovascular imaging not only because of association with other structural heart abnormalities ,but also they may cause digestive and/or respiratory problems due to pressure effect on the lumen of esophagus and /or trachea. This paper aim to review and describe different types of arch and major vascular anomalies as well as vascular ring. Aside from embryonic based explanation and description of important and more common anomalies, related cases of our institute will be present and discussed.

PaperID:68

EVALUATION OF PORTABLE CHEST X-RAY IMAGING IN NEWBORNS HOSPITALIZED IN NICU: FOCUSED ON ASSESSING THE IMPACT OF ADJUSTING THE STANDARD FIELD SIZE IN REDUCING THE RADIATION DOSE AND RISK OF CANCER

Banafsheh Zeinali-Rafsanjani
Medical Imaging Research Center, Shiraz University of Medical Sciences, Shiraz, Iran
Mahdi Saeedi-Moghadam*
Medical Imaging Research Center, Shiraz University of Medical Sciences, Shiraz, Iran
Sara Haseli
Medical Imaging Centre, Shiraz University of Medical Sciences, Shiraz, Iran
Reza Jalli
Shiraz University of Medical Sciences, Shiraz
Fariba Zarei
Department of Radiology, Shiraz University of Medical Sciences, Shiraz, Iran

Introduction:

Lots of neonates are hospitalized in NICU as a result of prematurity, respiratory, digestive or other diseases. During the period of hospitalization, they should be undergone to some medical imaging such as portable chest X-ray.

Objective:

The objective of this study was an evaluation of the number of portable CXR during the hospitalization of children and assessing the radiation field size (FS), radiation dose, and the risk of childhood cancer.

Methods:

The number of CXR imaging of 120 neonates hospitalized were assessed using the information of PACS. All the images were assessed to check the imaging FSs. The reason for imaging also extracted from the imaging requests. The radiation effective dose that was delivered to the children due to each CXR imaging were calculated. The standard radiation dose due to CXR was also available from other studies. The risk of childhood cancer was estimated using the risk factors suggested by ICRP 60.

Results:

The imaging information of 120 neonates with the mean age of 12.81±13.21 days and the mean weight of 2636.66±93 gr were assessed. Totally 670 CXR were performed for these children ranging from 1 to 60. 25% of this children had 5 to 10, 9.17% had 11 to 20 and 2.5% had more than 20 CXR during the hospitalization. The FS of 30.75% of CXRs was larger than standard and covered the whole abdomen and 51.04% of FSs were even larger and covered the whole abdomen and pelvis. The mean effective radiation dose of each neonate was 82.43 µSv ranging from 8.3 to 798.74 µSv. Among the patients with more than 10 CXR, 37.5% had a digestive disease, 25% had respiratory disease, 18.75% had heart disease and 18.5% were premature. According to the results, on average each neonate had near to 6 CXR during the hospitalization which is a lot. There should be more supervision on imaging requests and their necessity. The FS of about 83% of imaging were larger than standard which leads to imposing much higher radiation doses to neonates.

Conclusion:

Because the neonates have a long life ahead and they may perform more imaging during their life it is important to supervise the necessity of imaging requests and also the necessary protections such as limiting the radiation FS should perform to reduce the risk of cancer during their future life.

Keywords:

Portable Chest X-ray, Neonates, Necessity of imaging, Effective radiation dose, Risk of cancer

Paper ID:74

RANGE OF PATHOLOGICAL FINDINGS IN LESIONS SUSPECTED OF HAVING AN INTRADUCTAL COMPONENT IN ULTRASOUND AND ROLE OF SHEAR WAVE ELASTOGRAPHY IN DIFFERENTIAL DIAGNOSIS

Fariba Zarei*
Department of Radiology, Shiraz University of Medical Sciences, Shiraz, Iran
Sepideh Sefidbakht
Shiraz University of Medical Science
Sara Haseli
Medical Imaging Centre, Shiraz University of Medical Sciences, Shiraz, Iran
Nazanin Sadraee
Medical Imaging Center, Shiraz University of Medical Sciences, Shiraz, IR
Nasrin Ahmadnejad
Radiology Department, Tehran University of Medical Sciences, Tehran, Iran
Vahid Bazojoo
Medical Imaging Centre, Shiraz University of Medical Sciences, Shiraz, Iran
Sedigheh Tahmasebi
Breast Surgery Department, Shiraz University of Medical Sciences, Shiraz, Iran

Purpose:

To investigate pathological findings in lesions suspected to have intraductal component in ultrasound and to assess role of SWE in differential diagnosis.

Methods and Materials:

Out of 567cases, 36 lesions with initial suspicion of being intraductal, B-mode and SWE images were correlated with pathological results. Qualitative and quantitative tissue elasticity were displayed with color-coded map and color scale ranging from 0kPa (dark blue; soft) to 180 kPa (red; stiff).Quantitative elasticity values were measured by drawing a Q box over the stiffest portion and another box on adjacent normal breast tissue. Maximum color and presence of a stiff rim was recorded. Maximum and mean stiffness, also ratio of lesion stiffness to surrounding tissue were compared between benign and malignant pathologies using Mann Whitney U test.

Results:

Morphologically the ductal lesions were categorized as single discrete intraductal lesions 14, multiple discrete intraductal lesions 3 and diffuse intraductal thickening 6. Out of these 36 lesions, only 12 showed various pathologies related to the ducts including papillary carcinoma1, IDC2, DCIS 2, typical 3or atypical ductal hyperplasia 5 and benign papillomatous lesions 3. The other 19 lesions with nonductal pathologies included fibrocystic changes10, fat necrosis 3, benign fibroepithelial lesions4, and chronic inflammation 2. The most common morphological appearances among lesions with ductal pathologies was single intraductal mass. The most common morphological appearances among non-ductal pathologies was non-mass lesion with ductal pattern. The mean lesion stiffness and ratio were not significantly different between malignant and benign lesions (P=0.172 and 0.35) however the maximum lesion stiffness was significantly higher in the malignant lesions (P=0.32)

Conclusion:

Various benign pathologies such as fibrocystic changes, fat necrosis and benign fibroepithelial changes can mimic intraductal lesions in ultrasound. SWE helps differentiate between benign and malignant intraductal lesions

PaperID:75

SHEAR-WAVE ELASTOGRAPHY IN EVALUATION OF NON-MASS BREAST LESIONS, DOES IT PERFORM EQUALLY WELL IN PALPABLE AND NON-PALPABLE NON-MASS LESIONS?

Fariba Zarei*
Department of Radiology, Shiraz University of Medical Sciences, Shiraz, Iran
Sepideh Sefidbakht
Shiraz University of Medical Science
Sara Haseli
Medical Imaging Centre, Shiraz University of Medical Sciences, Shiraz, Iran
Sedigheh Tahmasebi
Breast Surgery Department, Shiraz University of Medical Sciences, Shiraz, Iran
Vahid Bazojoo
Medical Imaging Centre, Shiraz University of Medical Sciences, Shiraz, Iran

Purpose:

We correlated B-mode and SWE images of non-mass lesions (NML) to assess the role of SWE in evaluation of NML detected in ultrasound.

Methods and Materials:

B-mode and SWE images were correlated with pathological results. Qualitative and quantitative tissue elasticity were displayed with color-coded map and color scale ranging from 0kPa (dark blue; soft) to180kPa (red; stiff). Quantitative elasticity values were measured by drawing a Q box over the stiffest portion and another Q box on adjacent normal breast tissue. The maximum stiffness color scale was measured. Pathologically the NML were categorized into4groups of low risk benign, high risk benign, DCIS and invasive carcinoma. Morphologically NML were categorized into four categories of NM ductal, NM non-ductal, tissue distortion and shadowing. Descriptive statistics were given for each category. Maximum and mean stiffness, were compared between the benign and malignant pathologies. Results: Out of 567US guided CNB's, 84 patients had NML including 58 non-high risk benign lesions, 7 high risk benign lesions, 7DCIS and 12invasive carcinomas. There were 47 non-palpable lesions included 38benign lesions including4high risk and 34 non-high risk lesions, 5DCIS and 4 invasive carcinomas. Palpable lesions included 27 benign lesions including 3 high risk and 24 non-high risk, 2DCIS and 8 invasive lesions. Within the non-palpable NML, there were 24 lesions with ductal pattern, 20 with non-ductal pattern, 4lesions with tissue distortion and 4 lesions only had shadowing. Among the palpable NML, there were11lesions with ductal pattern, 24 lesions with non-ductal pattern, and3with some calcification, 6lesions with tissue distortion and3lesions with shadowing. The mean, max and ratio were different between the four groups in palpable as well as non-palpable NML. (P=0.002, 0.005and0.038) (P=0.008, 0.006and0.35). Conclusion: SWE might help to categorize lesions not only in benign or malignant but also high versus low risk. The value is maintained whether the NML is palpable or not.

Paper ID:77

INVESTIGATING FACTORS AFFECTING RADIATION PROTECTION IN NICU REVIEW ARTICLE

Reyhane Rafiee Vardanjani*
Isfahan University of Medical Sciences

Background:

It should be noted that 30% and 50% of medical diagnoses rely on the request of radiography The small size of the premature infants causes many of their organs to be placed in the field of radiography, and that is why the radiation exposure of children is 10 times higher than that of adults, as well as because of the proliferation and tissue differentiation at the beginning of the birth, cells are more susceptible to cancer and even causes the possibility of a genetic disorder in the next generation of children, which makes it increasingly important to pay attention to the radiation protection of children.

Method:

It is a review study that examines the effects of all factors that reduce the acceptable dose of newborns. In this study, accessible articles in valid scientific databases like Pub Med and Scopus have been reviewed.

Results:

Performed studies in this field show that factors like high KV but not so high that reduce picture quality, high FFD, aids for remaining children in secure place, appropriate imaging, periodic evaluation of devices and high sensitivity films, with proper matching between Foley and film, if using a screen film system for imaging can reduce the absorption dose of the patient. In addition, using carbon-based cassettes instead of aluminum cassettes that reduce the patient's absorption dose by as much as 40%. Giving to the data reported in the studies, thyroid protection reduces by using 90% of the absorbed dose in this area, and lead glasses can reduce the lens dose by 98% if used.

Recommendation:

The use of high FFD reduces patient's absorption dose and does not need to be equipped with modern instruments; therefore, it can be effective in radiation protection; the use of lead protections, especially the special protection of the guinea, not only protects the baby's radiation but also the next generations by protecting the germ cells. as well as the use of educational posters and encouraging strategies for utilizing the methods of radiation protection can be extremely effective when taking a graph.

Keywords:

Portable Radiology; Radiation Protection; NICU

Paper ID:80

SURVEY OF PHYSICAL SPACE STANDARDS IN THE RADIOLOGY DEPARTMENTS OF PRIVATE AND PUBLIC CENTERS OF HAMADAN

Siamak Sabzevari*
Farshchiyan Sina Hospital
Karim Ghazikhanloosani
Hamadan University Of Medical Sciences

Objective:

Radiology departments are one of the basic parts of any health center, that the observance of standards in these sections has special importance due to the harmful effects of ionizing radiation. Of these sections being standard can, in addition to reducing the effects of radiation, play an important role in the comfort and calmness of the patients, companions and personnel, Therefore, this study was done in order to study the compliance of standards of physical spaces in radiology departments, located in the city of Hamadan.

Material and Methods:

In this cross-sectional study a checklist was prepared in accordance with the international standards and regulations of designing hospital departments. The administrators of the current study visited the hospitals at different times and then filled out the checklist with the help of the supervisor of the

department and next the results were analyzed by statistical tests of one-way analysis of variance (ANOVA) and Kolmogorov-Smirnov test (KS test).

Results:

The Results of data analysis revealed that the average correlation between the current situation and the international standards in public hospitals was 81.5% and in private centers it was 62.01%.The condition of observance of standards in oral radiology centers was also highly undesirable. In contrast, MRI centers with 85%, angiographic centers with 84%, CT-scan centers with 70% and lithotripsy centers with 88% compliance had a favorable status.

Conclusion:

The amount of the standards being followed in physical spaces of radiology units in hospitals is undesirable, however, this amount in private medical imaging centers is much lower.

Keywords:

Radiology, Standards, Survey, Physical spaces

PaperID:81

QUANTITATIVE DIAGNOSIS OF OSTEOPOROSIS USING LUMBAR SPINE SIGNAL INTENSITY IN MAGNETIC RESONANCE IMAGING

Azin Shayganfar*
Isfahan University
Maede Khodayi
Isfahan University

Abstract:

Objective:

Osteoporosis is the most common metabolic bone disease that is not recognized in many elderly people. To determine the cause of low back pain, lumbosacral magnetic resonance imaging (MRI) is done for a large population who may not have undergone dual energy X-ray absorptiometry (DXA). The aim of this study is to predict bone density using lumbar spine signals in lumbosacral MRI in high risk patients for osteoporosis including post-menopausal women and calculate a threshold for a new quantitative MRI-based score to be used in estimation of lumbar spine bone mass density (BMD).

Materials and Methods:

Eighty-two menopausal females, who had undergone DXA before, were selected and MRI was done within 6 months after DXA. Sixty-nine healthy females aged 20 to 29 years who had undergone lumbar MRI were selected as reference group. Results were analyzed, then threshold and diagnostic performance of MRI-based score (M-score) on the method of T-score was calculated.

Results:

Negative correlation between M-score and T-score was detected. Cutoff point of 2.05 was found for M-score for differentiating osteoporotic patients from non-osteoporotic individuals.

Conclusions:

M-score is a MRI-based method which can be used to identify patients at risk of osteoporosis. Early diagnosis of osteoporosis can reduce morbidity and mortality caused by it.

PaperID:84

VISIBLE ADIPOSE TISSUE ON CT SCAN IN URINARY BLADDER WALL

Mohammad Reza Sasani*
Shiraz University of Medical Sciences
Fereshte Malekpoor
Shiraz University of Medical Sciences

Background:

The topic of visible fat on CT scan within the urinary bladder wall is relatively new. This finding is attracting interest due to unclear clinical significance; there are only a few studies focusing on this issue. There is some controversy surrounding concept of intramural vesicular fat. Previous research demonstrated that it is more common in men and in subjects with renal stone. This cross sectional study presents an investigation into significance of the CT-visible fat within bladder wall.

Patients and Methods:

Eligible subjects consisted of 203 patients were recruited for this study. These patients were referred for performing KUB CT scan without contrast administration. A urine analysis is performed to detect urinary tract infection in all patients. One radiologist assessed CT images of the participants for the presence and location of the adipose tissue in urinary bladder wall and for renal stone.

Results:

A total of 203 participants were enrolled in this study. One hundred fifteen (56.7%) were men and 88 (43.3%) were women. One hundred forty-nine (73.4%) patients had urinary tract stone and 90 (44.8%) patients had urinary tract infection. Fifteen (7.4%) cases had visible fat within wall of urinary bladder; interestingly, in most of the patients who had intramural fat, this finding could be seen next to site of urachus. Visible fat in wall of urinary bladder on CT scan is seen more in male subjects; but, their association was not significant statistically (p=0.058). The analysis did not reveal any significant difference considering urinary tract stone or urinary tract infection in cases with fat in the urinary bladder wall.

Conclusions:

CT-visible intramural fat in urinary bladder seems to be common finding with frequency of 7.4%. This finding may be a developmental phenomenon during involution of the urachus; it is an issue to resolve for future studies. There was no association between presence of the fat in urinary bladder wall with gender, urinary tract stone, and infection. The radiologists should aware of this finding resulting in image misinterpretation. Keywords: Fatty tissue; Bladder; Urinary tract infect; Urinary calculi.

Paper ID:86

INCREASING THE SNR OF MRS SIGNALS PROVIDED BY STEAM PULSE SEQUENCE USING FAST PADÉ TRANSFORM

Mahdi Saeedi Moghadam
Department of Medical Radiation Engineering, Science and Research Branch, Islamic Azad University, Tehran, Iran
Majid Pouladian*
Department of Biomedical Engineering, Science and Research Branch, Islamic Azad University, Tehran, Iran
Reza Faghihi
Department of Nuclear Engineering, School of Mechanical Engineering, Shiraz University, Shiraz, Iran
Mehrzad Lotfi
Medical Imaging Research Center, Shiraz University of Medical Sciences, Shiraz, Iran

Background:

There are two routine pulse-sequences for single-voxel-spectroscopy (SVS), point-resolved-spectroscopy (PRESS) and stimulated-echo-acquisition-mode (STEAM). Although, STEAM has several advantages in comparison to PRESS, signal/noise ratio (SNR) superiority of PRESS makes it the first choice for SVS. Application of Fast-Padé-transform (FPT) instead of Fast-Furrier-transform (FFT) might increase the SNR of the signal produced by STEAM pulse-sequence and therefore allow take the benefits of its advantages.

Objective:

The objective of this study was evaluating and comparing the noise root-mean-square (RMS) and SNR provided by STEAM pulse-sequence using both FPT and FFT.

Methods:

A gelatin-based phantom was constructed in a 19-cm Acrylic-cylinder. The phantom had two normal/tumoral parts. The SVS was performed using a 3T MRI scanner. STEAM pulse-sequence were used with the following parameters, TR=2000ms, TM=10ms, and three TEs of 20, 135 and 270ms with two data-points of 1024 and 512 and voxel-size of 1cm3. The raw data were extracted and processed using both FFT and FPT estimators to produce the spectrum. The noise RMS and SNR of Cho and Cr metabolites were assessed.

Results:

According to the results, noise RMS of spectra provided by FPT were decreased between 3619.01-14252.94% in comparison to FFT ($p<0.00001$). The SNR of Cr1 and Cho peaks of the spectra provided by FPT were increased more than 96.80 and 97.18 respectively ($0.00006<p<0.02$). The difference of noise RMS's provided by FPT are thousands percent less than FFT. These enormous decrease in noise provides a good increase of SNR. While the range of Cr1 and Cho SNR by FFT are between 41.55-120.32 the range of SNRs of these peaks provided by FPT are between 1719.99-9744.79 which implies a significant difference between the efficiency of FPT and FFT.

Conclusion:

This study showed that application of FPT in comparison to FFT can increase the spectra SNR and so that its usage can be helpful during the application of STEAM pulse-sequence which results in lower SNR in comparison to PRESS pulse-sequence. Thus we can take the advantages of STEAM pulse-sequence.

Keywords:

Magnetic Resonance Spectroscopy, Fast Padé Transform, Signal to Noise Ratio, STEAM pulse sequence

PaperID:87

INCREASING THE SNR OF MRS SIGNALS PROVIDED SMALL VOXEL SIZES USING FAST PADÉ TRANSFORM

Mahdi Saeedi Moghadam*
Department of Medical Radiation Engineering, Science and Research Branch, Islamic Azad University, Tehran, Iran
Banafsheh Zeinali-Rafsanjani
Medical Imaging Research Center, Shiraz University of Medical Sciences, Shiraz, Iran
Majid Pouladian
Department of Biomedical Engineering, Science and Research Branch, Islamic Azad University, Tehran, Iran
Reza Faghihi
Department of Nuclear Engineering, School of Mechanical Engineering, Shiraz University, Shiraz, Iran
Mehrzad Lotfi
Medical Imaging Research Center, Shiraz University of Medical Sciences, Shiraz, Iran

Background:

Magnetic resonance spectroscopy (MRS) is a powerful technique that can detect the metabolic changes happen due to diseases. Routinely, the spectroscopic voxel-size should be large to produce sufficient signal, to detect the metabolites. Being able to use small voxel-size is important when the purpose of MRS is imaging of a small organ or the surrounding tissues might ruin the spectrum. In this study, the efficiency of Fast Padé Transform(FPT) in providing a reasonable spectrum during the usage of small voxel-size was assessed.

Objective:

In this study, the efficiency of Fast Padé Transform (FPT) in providing a reasonable spectrum during the usage of small voxel-size was assessed.

Methods:

The FPT calculations were performed using MATLAB - R2016b. The validity of FPT calculation was assessed by simulating the signals in JMRUI and comparing the obtained spectra provided by FPT and Fast Fourier Transform (FFT). A metabolite gelatin-based phantom was built containing the metabolites of Choline (Cho) and Creatin(Cr). A 3T-MRI scanner was used for single voxel spectroscopy (SVS) of both parts of phantom using PRESS pulse sequence, and voxel-size of 0.125 cm3. The raw data of each measurement was exported and processed using FFT and FPT. The obtained spectra were assessed in terms of noise root mean square (RMS) and signal to noise ratio (SNR).

Results:

The FPT code was validated since there was a good agreement between the spectra provided by FPT and FFT transformation of simulated FIDs. In the experimental measurement, the noise RMS was in the range of 0.17-0.3 and 127.14-146.16 in the spectra provided by FPT and FFT respectively. The SNR of Cho and Cr peaks were between 5136.99-11777.31 and 7.39-15.59 provided by FPT and FFT respectively.

Conclusion:

The results showed that the noise of spectra produced by FPT is several thousand times less than FFT which means it can produce high SNR spectra. This study revealed that reducing the voxel-size in conjunction with application of FPT instead of FFT is possible.

Keywords:

Magnetic Resonance Spectroscopy, Fast Padé Transform, Small Voxel Size, Signal to Noise Ratio

Paper ID:92

BRAIN SINGLE PHOTON EMISSION COMPUTED TOMOGRAPHY SCAN (SPECT) AND FUNCTIONAL MRI IN SYSTEMIC LUPUS ERYTHEMATOSUS PATIENTS WITH COGNITIVE DYSFUNCTION: A SYSTEMATIC REVIEW

Bita Abbasi*
Mashhad University of Medical Sciences
Maryam Sahebari
(MUMS)
Zahra Rezaei Yazdi
(MUMS)
Mandana Khodashahi
(MUMS)
Fazlollah Ayatollahi
(MUMS)
Donya Farrokh
Mashhad University of Medical Science

Objective(s):

Systemic lupus erythematosus (SLE) is an autoimmune disease with a wide range of clinical manifestations. Cognitive dysfunction is one of the manifestations that could present prior to the emergence of any other neuropsychiatric involvements in SLE. Cognitive dysfunction is a subtle condition occurring with a high frequency. However, there is no data on the correlation of cognitive dysfunction with central nervous system (CNS) imaging findings, in particular single-photon emission computed tomography scan (SPECT) and functional MRI. We decided to perform a systematic review of brain SPECT and fMRI in SLE patients with cognitive dysfunction.

Methods:

PubMed, Scopus, and Google Scholar databases were searched until April 2017 with the following keywords: "SLE OR systemic lupus erythematous OR lupus" AND "functional MRI OR functional magnetic resonance imaging OR fMRI OR SPECT or SCAN". A total of 1,767 articles were found. Two rheumatologists reviewed the articles and finally 14 articles were selected for the final systematic review.

Results:

The fMRI and SPECT imaging techniques could provide valuable information regarding the SLE patients with cognitive dysfunction at the early stages of the disease.

Conclusion:

Brain SPECT scan and fMRI are used as functional imaging tools in SLE. Both of these diagnostic modalities are sensitive in reflecting the subtle brain damages in SLE patients with cognitive dysfunction. Brain fMRI and SPECT scan could be significantly beneficial in the diagnosis and initial management of cognitive dysfunction in SLE. Nevertheless, prospective studies could be useful in confirming the application of these diagnostic modalities in the clinical setting.

Paper ID:94

IATROGENIC RECTAL PERFORATION FOLLOWING SELF-ADMINISTERED WATER ENEMA

Bita Abbasi*
Mashhad University of Medical Sciences
Reza Akhavan
Mashhad University of Medical Sciences
Masoud Pezeshki-Rad
Mashhad University of Medical Sciences
Jahanbakhsh Hashemi
Mashhad University of Medical Sciences
Behrooz zandi
Mashhad University of Medical Sciences
Donya Farrokh
Mashhad University of Medical Sciences
Ali Feyzi Laein
(MUMS)

An 85-year-old male presented to the emergency department with rectorrhagia. He reported a long-lasting history of constipation and abdominal pain, for which he had self-administrated retrograde water enema using a garden hose at the same morning, until he felt a sudden sharp abdominal pain and noticed rectorrhagia. The patient was diaphoretic and lethargic at the time of presentation. Physical examination revealed tachycardia, low grade fever, generalized abdominal tenderness and decreased bowel sounds. Contrast enhanced computed tomography of abdomen and pelvis showed perforated rectum (arrow in panel a) free fluid in the pelvis (asterisk in panel a) and pneumoperitoneum (arrow in panel b). He underwent primary resection and anastomosis of the rectum. and experienced a favorable outcome.

Paper ID:95

LOCAL RECURRENCE OF RENAL CELL CARCINOMA PRESENTED WITH MASSIVE GASTROINTESTINAL BLEEDING: MANAGEMENT WITH RENAL ARTERY EMBOLIZATION

Donya Farrokh*
Mashhad University of Medical Sciences
Bita Abbasi
Mashhad University of Medical Sciences
Behrooz zandi
Mashhad University of Medical Sciences
Masoud Pezeshki-Rad
Mashhad University of Medical Sciences

Introduction:

GI bleeding from RCC metastasis is an uncommon manifestation of tumor recurrence and is usually difficult to control. Palliative trans-catheter embolization for GI bleeding control has been used and described in the literature. The present report describes a male with local recurrence of RCC who presented with upper GI bleeding. A pseudoaneurysm of renal artery with erosion into the duodenal lumen was responsible for the massive bleeding and was controlled with coil embolization. Case presentation A 55-year-old male presented to the emergency department following an episode of massive GI bleeding. Esophagogastroduodenoscopy was performed and revealed a highly vascular, ulcerative mass lesion in the second segment of the duodenum. Diagnosis was a hemorrhagic ulcerative neoplasm invading the duodenum and needle biopsy was performed. Contrast enhanced (CT) scan of the abdomen and pelvic revealed a heterogeneous soft tissue mass in the nephrectomy bed extending to the second and third segments of the duodenum. There was also a pseudoaneurysm from right renal artery that was located near the soft tissue mass. According to this finding, the patient was planned for and emergency angioembolization of right renal artery. Angiographic examination of the renal artery revealed a lobulated pseudoaneurysm with intermittent episodes of hemorrhage into the duodenum. The lesion was successfully excluded using coils.

Discussion:

Direct invasion of recurrent RCC in the right renal bed was the cause of duodenal involvement in the present case. The present case presented with massive upper GI bleeding as the primary manifestation of RCC metastasis. This is an example of pseudoaneurysm formation and fistulous communication with duodenal lumen causing intractable upper GI bleeding which was controlled by angiography and embolization. It is unique in the way that a pseudoaneurysm from the remaining accessory renal artery (not the tumor-supplying artery) formed a communication with duodenal lumen and caused bleeding.

Paper ID:96

INGUINAL BLADDER HERNIATION: REPORT OF THREE CASES

Donya Farrokh*
Mashhad University of Medical Sciences
Bita Abbasi
Mashhad University of Medical Sciences
Ali Alamdaran
Mashhad University of Medical Sciences
Masoud Pezeshki-Rad
Mashhad University of Medical Sciences
Behrooz Zandi
Mashhad University of Medical Science

Background:

Inguinal bladder herniation is an uncommon clinical entity that constitutes about 1-4% of inguinal hernias. It is usually diagnosed during the herniorrhaphy and is so associated with the risk of unforeseen complications involving bladder or ureter. Most cases are diagnosed intra-operatively. Provided that bladder is recognized and not injured during the surgery, the condition is not a problem. But if this is not recognized by surgeon, it may result in catastrophic bladder and ureteral injuries. Case report Herein, we report three cases of IBH that were diagnosed with abdominopelvic CT scan. We also introduce a novel method of CT reconstruction that makes virtual CT cystography images. These images help the surgeons make a more accurate surgical plan. Discussion Awareness of this condition is important for general surgeons and also urologists to perform preoperative evaluation and optimal treatment. Thus, familiarity of radiologists with imaging features of IBH is essential for proper diagnosis and prevents catastrophic intra-operative complications.

Paper ID:97

HYDATID PULMONARY EMBOLISM

Bita Abbasi*
Mashhad University of Medical Sciences
Donya Farrokh
Mashhad University of Medical Sciences
Masoud Pezeshki-Rad
Mashhad University of Medical Sciences
Yasmin Davoudi
(MUMS)

Case report A 49-year-old female presented to the emergency department with non-massive hemoptysis. She reported a previous history of liver hydatid disease that was being treated with Albendazole. The physical examination showed tachycardia and bloody-stained sputum. The patient was stable and a low-grade fever was detected. Bedside ultrasound examination revealed a filling defect in the suprahepatic Inferior vena cava (IVC); so, a pulmonary CT angiography was ordered with the clinical suspicion of pulmonary embolism. On the pulmonary CT angiography, there were filling defects in the left-upper and left-lower pulmonary arteries (Fig. 1). The involved vessels were distended and filled with cystic material. There was a hydatid cyst in the liver dome with extension into the IVC. Cystic filling defects were seen in the IVC and right atrium (Fig. 2). Multiple other cystic lesions were seen in both lungs, representing pulmonary hydatidosis (Fig. 1a). The patient was diagnosed with acute hydatid pulmonary embolism secondary to intravascular rupture of hepatic hydatid disease and was referred to cardiac surgeon. Discussion Hydatid disease is a zoonosis caused by Echinococcus species that mostly involves liver and lung (1). Cardiac hydatid disease is a rare condition reported in 0.5-2% of patients. Left ventricle is the most common location followed by interventricular septum, right ventricle, pericardium and finally left and right atria (2). Pulmonary embolism of hydatid disease is an extremely rare complication reported in only a few case reports (3). The clinical findings are non-specific and hemoptysis is the most commonly reported symptom (3). In this patient, Hydatid pulmonary embolism was diagnosed by observing direct rupture of intrahepatic hydatid cyst into the IVC and presence of cystic filling defects in the IVC, right atrium and pulmonary arteries. This case emphasizes the importance of familiarity with rare presentations of hydatid disease for physicians working in endemic areas.

Paper ID:104

MARSHALL AND ROTTERDAM COMPUTED TOMOGRAPHY SCORES IN PREDICTING EARLY DEATHS AFTER BRAIN TRAUMA

Mahyar Mohammadifard*
Birjand University of Medical Science

Trauma is one of the most important issues of most healthcare systems accompanying with head trauma in the most cases. We sought to determine the scoring system and initial Computed Tomography (CT) findings predicting the death at hospital discharge (early death) in patients with traumatic brain injury based on Marshall and Rotterdam CT scores. This is a cross sectional study on traumatic neurosurgical patients with mild-to-severe traumatic brain injury admitted to the emergency department of Emam Reza Hospital, Birjand University of Medical Sciences. Patients≥18 years old with TBI during last 24 hours with GCS≤13 were included and exclusion criteria were multiple trauma, penetrating injuries, previous history of anticoagulant therapy, pregnancy, not willingness for participation. Their initial CT and status at hospital discharge, one and three months (dead or alive) were reviewed, and both CT scores were calculated. We examined whether each score is related to death using SPSS11 by The Mann–Whitney U at the level of $p \leq 0.05$. Overall, 98 patients were included. Mean age was 43.52±21.29. Most patients were male (63.3%). Mean Marshall and Rotterdam CT scores were 3.2±1.3 and 2.5±1. The mortality at two weeks, one moth and three months were 19.4%, 20.4%, and 20.4%. Rotterdam CT score was significantly different based on type of hematoma. Median GCS score in alive and dead patients on 2 weeks were 10 and 4 (p=0.0001), at one month were 10 and 4 (p=0.0001), and at three months were 10 and 4 (p=0.0001). The median Marshall CT score on 2 weeks were 2 and 4 (p=0.0001), at one month were 2 and 4 (p=0.0001), and at three months were 2 and 4 (p=0.0001). The median Rotterdam CT score on 2 weeks were 2 and 4 (p=0.0001), at one month were 2 and 3 (p=0.001), and at three months were 2 and 3 (p=0.001). The Rotterdam CT score was significantly correlated with mortality at two weeks, one month and three months (p=0.004, p=0.001, and p=0.001, respectively). The Marshall CT score was

not significantly correlated with mortality at any time. The Rotterdam CT score was more accurate for prediction of mortality on 2 weeks (ROC80.9), at one month (ROC80.7), and at three months were (ROC80.7) than The Rotterdam CT score (ROC 76, 74.1, and 74.1, respectively). This study concluded that The Marshall CT score was more accurate for prediction of mortality on 2 weeks, at one month, and at three months were than The Marshall CT score with higher ROC. The correlation of the Rotterdam CT score with mortality was significant.

Paper ID:115

A SIMPLE RISK SCORE USING ULTRASONOGRAPHY IN DETECTING MALIGNANT THYROID NODULES; A LOGISTIC REGRESSION ANALYSIS

Amirpejman Hashemitaheri*
Tehran University

Solitary thyroid nodules (STN) arise in around 40% of general population. Nevertheless, the prevalence of thyroid malignancies is far less than this. Detecting malignant thyroid nodules by FNA was associated with sensitivity of 54-90% and specificity of 60-100% US is proposed to increase the diagnostic accuracy of FNA in detecting malignant STNs. US can indicate non-palpable thyroid nodules as well. Most of the malignant STN are hypoechoic and may have irregular shapes and margins. Hypoechogenicity, microcalcification, adjacent lymphadenopathy, incomplete halo and elongated shape of nodules are features of a malignant STN Methods In a cross sectional study, all patients consecutively referred to Endocrine Surgery Clinic of TUMS during 2011 and 2012 were included. All patients were referred from a General Endocrinology Clinic for thyroidectomy after being diagnosed with a thyroid nodule. Results In all, 114 consecutive patients with mean age of 43.13±13 years old, consisting of 90(78.9%) females and 51 (44.7%) subjects with a positive family history of thyroid neoplasm, were studied. All were referred for having a coldthyroid nodule and underwent laboratory assessment of TSH, thyroid US, FNA and excisional biopsy using thyroidectomy. Total of 45 (39.5%) patients had malignant pathologies. The most common pathology was MNG (42%) and the most common malignancy was PTC (31.3%). There was no statistical difference in age, gender, family history or the location of lesion between groups with or without malignant pathologies. We compared the US features in groups with and without malignancy. Discussion Hypoechogenicity has the largest effect on malignancy of nodule. To pass the cut-off (achieving 4.7 points out of 8.4) one must fulfill at least 4 criteria and it's not likely for a patient having 3 features to come up with a malignant nodule. In the other hand, everyone who fulfills 5 of the criteria, should be considered to have a malignant thyroid nodule. This simple scoring system has an easy and intuitive implication for rapid triage of patients according to their US features.

Paper ID:121

EVALUATION THE VALIDITY OF SWE IN DIAGNOSING LIVER'S CIRRHOSIS AND FIBROSIS

Ghazaleh firoozy*
Medical Sceiences of Tabriz
morteza najafi vand
Tabriz Medical Sciences University

Background:

Hepatic cirrhosis is a liver disease mostly caused by alcohol, viruses and bacteria, metabolic and cardiac diseases and hepatic fibrosis. Hepatic fibrosis is caused by hepatic injuries and can cause portal vein hyper-tension, hepatic failure and cancer. Hepatic fibrosis is diagnosed by fibro-test, but the introduction of non-invasive Shear-Wave Elastography (SWE) has suggested a new way. SWE has the advantage of measuring liver's stiffness in real time while guided by a B-mode sonography. In this review authors tried to calculate accuracy and specificity of SWE in diagnosis of hepatic fibrosis.

Method:

in order to collect evidence of this review, a systemic review of diagnostic accuracy studies from 2015 to 2017 was conducted and 600 related articles was found in databases of Google Scholar, SID, Springer and PubMed. Finally, only 8 articles were selected which had studied specificity and sensitivity of SWE. Result: Yan Xue and cohorts had calculated the mean

sensitivity and specificity of SWE for different stages as 82.3% and 88%, respectively. The authors calculated the mean specificity and sensitivity of SWE using the data in articles of Manish Dhyani, Hee Mng Yoon, Thierry Poynarel, Jeong Ryekim, Tushkifumi Tada, two other authors and their cohorts as 84.34% and 76.4% respectively using Microsoft Office Excel 2016. The deviation range of the sensitivity in articles was (45.4%-90%), while the specificity was (55%-99%).

Conclusion:

According to the acquired data in this paper, SWE is a reliable and valid modality for detecting and diagnosing liver disease such as fibrosis, cirrhosis, tumors and so on. The coefficient of variation in most studies was calculated ≥0.2 which confirms the validity of SWE.

Keywords:

SWE, sensitivity, specificity, liver fibrosis

Paper ID:124

EVALUATION OF DIAGNOSTIC VALUE AND T2-WEIGHTED THREE-DIMENSIONAL ISOTROPIC TURBO SPIN-ECHO (3D-SPACE) IMAGE QUALITY IN COMPARISON WITH T2-WEIGHTED TWO-DIMENSIONAL TURBO SPIN-ECHO (2D-TSE) SEQUENCES IN LUMBAR SPINE MR IMAGING

Hossein Jomleh*
M.sc Student of Medical Imaging (MRI), Allied Medicine, Shahid Beheshti University of Medical Sciences
Fariborz Faeghi
Radiology Technology Department, School of Allied Medical Sciences, Shahid Beheshti University of Medical Sciences, Tehran, Iran
Mehrnaz Rasteh
Madani Hospital
Babak Rafiei
Bahar Medical Imaging Center

Purpose:

to evaluate diagnostic value and image quality of T2-weighted Three-dimensional isotropic turbo spin-echo (SPACE) in comparison with T2-weighted two-dimensional turbo spin-echo sequences for comprehensive evaluation of lumbar spine pathologies.

Materials and Methods:

Thirty-five subjects with lumbar discopathy were examined on a 1.5-T MRI system with both 2D TSE and 3D SPACE sequences. Obtained images were analyzed with synedra view personal (V 17.0.0.2) software in terms of calculating image quality factors such as signal to noise ratio (SNR) and contrast to noise ratio (CNR) for selected regions of interest. In addition, images were referred to radiologists to report their pathologic indexes. The visibility of anatomical structures in the 3D and 2D sequences was qualitatively assessed by two radiologists independently. Cohen's kappa (k) and Wilcoxon signed rank test was used for the statistical analysis.

Results:

In this study, the 3D SPACE T2-weighted sequence showed significant higher SNR and CNR as well as visibility in all of the regions of interest except vertebrae and intervertebral discs (p-value<0.05). Inter-observer agreement for visibility of regions of interest was substantial and perfect (k>0.6). Also, inter-observer and inter-method agreements for pathologic indexes were substantial and perfect for all of the pathologic indexes (k>0.6). Inter-observer agreement for 3D SPACE sequence was higher (k=0.793) in comparison with 2D-TSE sequence (k=0.603). 3D SPACE sequence and its multi-planar reconstructions (MPR) scan time were less (192 s) than 2D TSE in the sagittal, axial and coronal planes (209 s).

Conclusion:

3D SPACE sequence for lumbar spine MRI proved to have higher SNR, CNR, and visibility for all regions of lumbar spine except vertebrae and disc. Inter-observer and inter-method agreements for pathologic indexes between 3D SPACE and 2D TSE sequences were substantial and 3D SPACE had a higher inter-observer agreement and less scan time. Therefore T2 weighted 3D SPACE sequence and its MPR might be an excellent alternative for 2D TSE in sagittal, axial and coronal planes, especially for patients with abnormal curvature of the lumbar spine.

Paper ID:127

COMPARISON OF DIAGNOSTIC VALUE OF MRI AND TRUS FOR DETECTION OF SEMINAL VESICLE INVOLVEMENT IN PROSTATE CANCER

Mahyar Ghafoori
Uninersity of Iran Medical Sciences
Seyed Kamaledin Hadei*
University of Hamedan Medical Sciences

Abstract Background:

In this study, MRI and TRUS were compared for detection of seminal vesicles in patients with prostate cancer attending to Rasul-Akram Hospital in 2011 and 2012.

Methods and Materials:

In this cross-sectional study, 135 patients with prostate cancer attending to Rasul-Akram Hospital in 2011 and 2012 were evaluated for seminal vesicles involvement by TRUS and MRI methods an also were compared with pathology results.

Results:

The obtained results demonstrated that TRUS had sensitivity, specificity, diagnostic efficiency, Positive and negative predictive value of 67% (95% CI:57-77%), 96% (95% CI:93-99%), 87.4% (95% CI:82 91%), 91% (95% CI:81-96%) and 86% (95%CI:81-91%) respectively (P<0/001). Also sensitivity, specificity, diagnostic efficiency, Positive and negative predictive value of MRI were 94% (95% CI:87-98%), 99% (95% CI:97-99%), 97.7% (95% CI:95-99%), 99% (95% CI:93-99%) and 97% (95% CI:94-99%) respectively (P<0/001).

Conclusion:

Totally, according to the obtained results, it may be concluded that TRUS is accurate in nearly 87 percent of cases for detection of seminal vesicles involvement compared with 97.8 percent for MRI in patients with prostate cancer and so the use of MRI is more recommended compared with TRUS due to better sensitivity, negative predictive value and efficiensy.

Keywords:

Prostate Cancer, TRUS, MRI, Diagnostic value

Paper ID:128

THE ROLE OF DIFFUSION-WEIGHTED AND DYNAMIC CONTRAST-ENHANCED MRI TECHNIQUES IN THE DIAGNOSIS OF PROSTATE CANCER, IMAGING AND HISTOPATHOLOGICAL STUDY

Morteza Sanei Taheri
Shahid Beheshti University of Medical Sciences
Hamid Reza Haghighatkhah
Shahid Beheshti University of Medical Sciences
Mostafa Ranjbar*
Shahid Beheshti University of Medical Sciences
Mehran Arab Ahmadi
Tehran University of Medical Sciences

Abstract Purpose:

Prostate cancer (PC), the commonest noncutaneous cancer, is the second cause of death in males. The current study aimed at comparing apparent diffusion coefficients and Ktrans values between prostate cancer suspected tumors and normal tissue samples in order to distinguish the best functional parameter or a combination of MR findings in the differentiation of cancerous and noncancerous tissue.

Materials and Methods:

fifty subjects (30 biopsy tumor proven and 20 non tumor) underwent endorectal MRI at 1.5 T required Transverse T2-weighted, diffusion-weighted and dynamic contrast-enhanced images. Apparent diffusion coefficient (ADC) and Ktrans of the suspected tumor were quantitatively measured using Syngo MR and Tissue 4D software. Sensitivity and specificity of parameters used to detect cancer was assessed based on ROC.

Results:

There was a significant difference between cancerous and noncancerous tissue based on the mean Ktrans value. The sensitivity and specificity were 73/33% and 70% for the ADC, and 50% and 70% for the DCE, respectively. The sensitivity and specificity increased to 96/67% and 85% respectively following the combination of ADC and DCE results.

Conclusions:

The detection of prostate cancer was significantly improved following the combination of two functional parameters of DWI and DCE.

Paper ID:129

RADIOFREQUENCY ABLATION IN TREATMENT OF PAPILLARY THYROID CARCINOMA

Hojat Ebrahiminik, MD*

Background:

Papillary thyroid carcinoma (PTC) is the most common subtype of thyroid cancer which surgery is the first treatment option. However, several conditions such as previous repeated surgery, poor lung function, severe cardiovascular disease, or old age might contraindicate the surgery. RFA has been recently provided a new promising treatment line for thyroid masses. In our previous papers, we reported successful treatment of benign thyroid nodules. Since last year we began to manage patients with PTC or recurrent thyroid cancers with RFA.

Patients and Methods:

In patients whom we could judge radiologically that complete removal is possible, RFA was performed safely. Otherwise, RFA was performed for palliative purposes in patients which protruding mass caused various symptoms such as dysphagia, hoarseness, dyspnea, or cosmetic problems. In these cases, RFA successfully improved the quality of life of patients. The procedure was performed under local anesthesia with no need for hospitalization. While applying RFA, vital signs and vocal function of patients were continuously monitored. Also, cold serum was constantly injecting to protect non-targeted tissues similar to washing system in vascular intervention.

Results:

At one and three months' post-ablation follow ups 40 to 60 % reduction in nodule volume was observed. Post-procedure tests like Tg and anti-Tg antibody showed rapid decrease and almost in all patients were in normal range. Also nuclear scans of nodule region showed negative results. No hormone imbalance or voice changes were seen in none of the patients. In conclusion, to our knowledge, RFA is a minimally invasive alternative when surgery is not feasible. However, further long-term observation is needed to confirm the value of RFA in the treatment of thyroid cancer.

Keywords:

Papillary thyroid carcinoma, Radiofrequency Ablation

Paper ID:131

A CASE OF GIANT GASTRIC BEZOAR IN A CHILD AFFECTED BY RARE WHITE- SUTTON SYNDROME: A RARE REPORT AND REVIEW OF LITERATURE

Rahele Mehraeen*
Babol University of Medical Science

A bezoar (from Persian padzahr, "antidote") is a mass found trapped in any part of the gastrointestinal system. The accumulated foreign material in the stomach in form of masses or concretions may result in a gastric bezoar. The overall incidence of gastric bezoars is low at approximately 0.4%. The common predisposing factors are altered gastric motility, altered gastric anatomy, psychiatric illness and mental retardation. Bezoars are classified according to their composition: phytobezoars (vegetable matter), trichobezoars (hair), pharmacobezoars (mostly undigested tablets or semi-liquid masses of drugs) and lactobezoar (milk curds). The persimmon fruit (diospyrobezoar) accounting for the majority of cases of phytobezoars. Gastric bezoar is also a rare condition in children. The diagnosis of a bezoar involves obtaining a thorough patient history, including screening patient's risk factors and their diet and medications. A physical examination may reveal a palpable abdominal mass. Plain abdominal radiographs are often the initial imaging modality for diagnosing bezoars and can raise suspicion for a bezoar in 56% of cases. Barium studies are also useful for identifying bezoars and estimating their size. However, barium studies can interfere with diagnostic and therapeutic endoscopic procedures and should be carefully considered before the administration of oral contrast. Both ultrasound and computed tomography (CT) scans have been found to be reliable methods for diagnosing GI bezoars, although CT scans are more accurate and can identify the presence of any additional GI bezoars that may be present (Rapulzen's syndrome) and reveal possible

complications. The therapy of bezoars includes removal of the material and prevention of recurrence. Generally surgical removal of the bezoar is used, but more recent literatures has demonstrated the efficacy of less invasive approaches including endoscopic fragmentation and removal, and chemical dissolution in the cases of smaller gastric and intestinal bezoars. Of chemical dissolutions, Coca-Cola has been reported as a particularly safe, inexpensive and well tolerated option in adult patients, but there is only one published report in pediatric patients. Here, we report a rare case of giant gastric phytobezoar in a 2.5 years-old hypotone girl who affected by rare White Sutton syndrome, due to persimmon fruit ingestion during one month. Patient presented with severe gastroesophageal reflux and a palpable epigastric mass by her mother. The diagnosis was confirmed with ultrasound, CT scan and final endoscopic visualization and tissue sampling of the bezoar. It's imaging features and the unique CT images are explained and shown at this article. Patient treated with multiple endoscopic Cola injection and successful fragmentation and removal of mentioned large bezoar, fortunately.

Paper ID:132

REVIEW OF THE DIFFERENT IMAGING METHODS FOR OVARIAN CANCER DIAGNOSIS

Raziye Jafari*
Ahvaz Jundishapur University of Medical Sciences
Marziyeh Tahmasbi
Assistant Professor of Medical Physics, Department of Radiologic Technology, Faculty of Paramedicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.

Abstract Background and Objectives:

The malignant and abnormal growth of ovarian cells is called ovarian cancer. Ovarian cancer is considered to be the third most common cancer in women. It is the fifth cause of mortality among women's diseases and cancers. This cancer can be treated more efficiently if it is early detected. Factors such as: age, family history, pregnancy and etc. affect the incidence of ovarian cancer. Different imaging methods such as: CT, MRI, Ultrasound and PET/CT are used to diagnose ovarian cancer. Therefore, the purpose of this study was to review the different methods of ovarian cancer imaging.

Methods:

The databases of PubMed, and Google Scholar were explored by different combinations of terms: ovarian cancer or tumor, MRI, CT, PET/CT and ultrasound, diagnosis, detection. The obtained results were screened for the title and abstract. Finally, 6 relevant papers were reviewed full text.

Findings:

Ultrasound is the most commonly used imaging method to evaluate the ovaries. It is primarily implemented for confirming the presence of an ovarian lesion. Also, ultrasound is used to investigate the internal structure for identifying the relevant anomalies, such as ascites or metastases. Symptomatic ovarian cancer which has expanded out of the ovary often can be detected by CT scan. The ovarian metastases should be distinguished by a radiologist from a metastatic colon or the gastric or pancreatic cancer. These lesions are often differentiated in CT images. CT scan is also a preferred method for evaluating the tumor extent in the cancer pre operating. PET/Ct is the best way to detect lesions and follow-up treatment in ovarian cancer. MRI is useful for staging of the disease. Cases that are not specified in ultrasound can often be detected with specific characteristics through enhanced MR imaging.

Conclusion:

CT and MR imaging are useful for ovarian lesions detecting, treatment planning and follow up. CT can be considered as an imaging method which can detect ovarian tumors more effective than ultrasound.

Keywords:

Ovarian Cancer, MRI, CT, PET/CT, Ultrasound.

Paper ID:133

THE DIFFUSION WEIGHTED IMAGING (DWI) FOR THE EPILEPSY DIAGNOSIS: A REVIEW

Mahmood Mohammadi Sadr*
Ahvaz Jundishapur University of Medical Sciences
Ghazal Esmaili Vanda
Ahvaz Jundishapur University of Medical Sciences
Marziyeh Tahmasbi
Assistant Professor of Medical Physics, Department of Radiologic Technology, Faculty of Paramedicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran

Abstract Background and Objectives:

Epilepsy is one of the most common serious brain disorders affecting about 50 million people worldwide. Early diagnosis of epilepsy can prevent disease progression. There are several ways to diagnose epilepsy, including MRI, CT scan and electroencephalography. Recently the new advanced methods such as diffusion weighted imaging (DWI) are introduced to evaluate the epilepsy. Therefore, the aim of this review was to investigate the diffusion weighted imaging for epilepsy detection.

Methods:

The databases of PubMed and Google Scholar were explored by different combinations of terms: epilepsy diagnosis and diffusion weighted MRI. The obtained results were selected for the title and abstracts. Finally, 7 relevant papers were selected and review full text.

Findings:

Diffusion weighted magnetic resonance imaging (DWI) is used to detect changes in the distribution of water molecules in regions affected by various pathologies. Epileptic disorders can cause regional vasogenic/cytotoxic edema that reflects hemodynamic and metabolic changes. DWI images revealed significant signal alterations in different brain regions depending on the location of epileptic activity. Diffusion abnormalities on MRI are common in patients with cluster of seizures and status epilepticus and were highly concordant with clinical semiology and EEG activity. Also, existence of high-intensity areas on DWI at the onset of epilepsy may be a predictive factor for the occurrence of Todd's palsy. Also combined use of DWI and arterial spin labeling (ASL) can provide information on hemodynamic state associated with epileptic ictal hyper perfusion in the various phases of posterior reversible encephalopathy syndrome (PRES).

Conclusion:

Abnormality in diffusion weighted magnetic resonance imaging can represent the early changes associated of the epilepsy. High-energy brain MRI sequences using DWI can be safely performed in epilepsy patients. Additionally, bilateral abnormalities in the thalamus and midbrain in addition to the region of seizure origin can be observed in the DW images.

Keywords:

epilepsy, diffusion weighted imaging, diagnosis

Paper ID:137

INVESTIGATING THE SENSITIVITY AND SPECIFICITY OF THE DIFFERENT IMAGING MODALITIES (MRI, CT, US) FOR DIAGNOSING RENAL TUMORS

Marziyeh Tahmasbi*
Assistant Professor of Medical Physics, Department of Radiologic Technology, Faculty of Paramedicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.
Morvarid Jazaei
Technology Radiology Student, Department of Radiologic Technology, Faculty of Paramedicine, Student Research Committee, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.
Narjes Mousavi Fakhr
Technology Radiology Student, Department of Radiologic Technology, Faculty of Paramedicine, Student Research Committee, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran
Mahtab Parto
Technology Radiology Student, Department of Radiologic Technology, Faculty of Paramedicine, Student Research Committee, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran

Abstract Background and Objectives:

Kidney tumors diagnosis and staging is important for therapy. Oncologists mainly require radiological information in the preoperative phase of therapy. Progress in imaging techniques such as ultrasonography, CT, and MRI has increased diagnosis of renal tumors with a smaller average size and a lower stage. Therefore, the aim of this review was to investigate the sensitivity and specificity of the different imaging methods in renal tumors diagnosis.

Methods:

The databases of PubMed, science direct, Scopus and web of science were explored by different combinations of terms: kidney lesion or tumor, MRI, CT, and ultrasound, diagnosis, detection, screening, sensitivity, specificity. The obtained results were screened for the title and abstract. Finally, 25 relevant papers were reviewed full text.

Findings:

The sensitivity and specificity of CT in preoperative evaluation of renal cell carcinoma were 96% and 93% respectively. While these values were 46% and 98% for staging the tumors with CT. The sensitivity and specificity of CT in differentiation between benign and malignant tumors were 60% and 73% respectively. Contrast-enhanced ultrasonography had sensitivity about 99% and specificity about 80% in the evaluation of renal masses. MRI sensitivity and specificity in differentiation of papillary renal cell carcinoma from other renal masses were approximately 80% and 88% respectively. Also, the values of sensitivity and specificity of the MRI in differentiation of fat-poor angiomyolipoma from renal cell carcinoma were 96% and 93% respectively.

Conclusion:

Magnetic resonance imaging and multi detector-row CT achieve similar accuracy in tumor staging of renal cell carcinoma. Contrast-enhanced sonography is an effective alternative to CT and MRI in the follow-up of renal tumors. MR imaging may be applicable for renal mass evaluation in special situations, such as allergy to iodine contrast, renal failure, and indeterminate or calcified renal masses. Although for lesions detection, there was no statistical difference between the sensitivity and specificity of CT and MRI, but MRI has an important role in the diagnosis and staging of renal neoplasms. Also, detection of a pseudo capsule may be an additional role of MR imaging. Sonography and angiography may also reveal the presence of the pseudo capsule.

Keywords:

Sensitivity, Specificity, CT, MRI, Ultrasound, Renal cell carcinoma

Paper ID:138

VARIOUS IMAGING MODALITIES FOR DETECTING THE EPILEPSY

Nooshin Johar*
Department of Radiologic Technology, Faculty of Paramedicine, Ahvaz Jundishapur University of Medical Sciences
Farshad Babaei Bazaz
Ahvaz Jundishapur University of Medical Sciences
Marziyeh Tahmasbi
Assistant Professor of Medical Physics, Department of Radiologic Technology, Faculty of Paramedicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.

Abstract Background:

Epilepsy is one of neurological disorders with an estimated prevalence of 0.4-1.4%. About 30% of epilepsies are drug resistant. Therefore, the only treatment is removing the lesion by surgery. Accordingly, for the exact diagnosis of epilepsy cores in the brain, imaging techniques such as MRI, PET, SPECT, MRS and etc. are applied. Since, the precision, sensitivity and the application of these diagnosis methods are different, the aim of this study was to investigate various imaging techniques for the epilepsy diagnosis.

Methods:

The presented review article was performed by searching PubMed and Google scholar by different combinations of terms “EEG, MEG, MRI, MRS, PET, SPECT, epilepsy diagnosis and detection”. 29 articles were obtained. After removing the repetitive and reviewing the abstracts 6 articles were selected and reviewed full text.

Findings:

Implementing MRI, can determine the exact location of the lesions before surgery. The FDG_PET is used to identify the abnormal regions in the cases which MRI may not show any abnormalities. PET can help to identify the epileptic area by implementing the suitable radiotracer. This method has a high sensitivity in the detection of external lesions of the temporal lobe. But, the moderate signal-to-noise ratio of PET, beside using the expensive, unstable and short half-life radiotracers, are its limitations. SPECT is very valuable in the study of locating epilepsy-related points (LREs) especially for patients

with abnormal MRI. The MRS method can measure the amount of NAA (N. Acetyl aspartate acid) in the brain tissue and can identify the network distribution patterns in LRE patients. The results of this test can indicate the area for surgery.

Conclusion:

The high-field MRI is useful in identifying nonlesional epilepsy cases. However, in some cases, the use of MRI with a high magnetic field in epileptogenic area detection may have errors. Therefore, other methods such as PET, SPECT and Functional MRI may be useful.

Keywords:

Epilepsy, MRI, EEG, PET, SPECT, MRS, MEG.

Paper ID:139

MAGNETIC RESONANCE IMAGING EVALUATION OF INTERNAL CAROTID ARTERY DIAMETER IN THE LEVEL OF THE SIPHON IN ADULT BRAIN ISCHEMIC STROKE PATIENTS

Fateme Hosseinabadi
Zahedan University of Medical Sciences
Zahra Aires
Zahedan University of Medical Sciences
Aidin Lotfiazar*
Zahedan University of Medical Sciences
Fateme Naseri
Zahedan University of Medical Sciences

Background:

Brain stroke is the second cause of death in the world divided into two types of ischemic and hemorrhagic. MRI, detects cerebral ischemic strokes at a time that is much less than CT scan, and allows faster onset of effective treatment. The aim of this study was to determine the relationship between the diameter of the internal carotid artery at the level of siphon in the axial T2 weighted MRI region with a type of ischemic strokes and compare these changes with normal situation.

Patients and Methods:

A total of 240 patients were evaluated in this retrospective descriptive-analytical study. Of these, 200 persons including 100 cases and 100 control subjects were included in the study. Patients in the case group were selected from patients with cerebrovascular symptoms referred to the emergency department and ischemic stroke was reported to them in MRI. Patients in the control group were selected from patients with normal MRI reporter. Both of the case and control groups were matched for age and sex with control group. Patients with non-ischemic strokes, underlying illness, previous history of stroke and under the age of 20 years' patients were excluded from the study. Also, the location of the stroke, the type of stroke, small and large vessel involvement according to the TOAST criteria and diameter of the intracranial internal carotid artery at the level of the siphon in the axial T2 weighted MRI sequences were determined for each patient. The results were analyzed using SPSS version 24 software.

Results:

In all of the examined samples, the prevalence of stroke was 52% in males and 48% in females. The highest incidence of ischemic stroke was observed in the frontal lobe (27%), parietal (20%), occipital (12%), cerebellum (12%), periventricular (12%) and brain stem (7%). Siphon diameter was significantly higher than control group in frontal, parietal, periventricular and temporal lobe ischemic strokes (P-value <0.01), while in the ischemic strokes of occipital lobe, cerebellum and brain stem, no significant relationship was reported with siphon diameter. The mean diameter of the internal carotid artery in the siphon site was reported in the normal individuals 3.26 ± 0.61 on the right side and 3.22 ± 0.56 on the left side. In the large vessel disease patients these diameters were 2.92 ± 0.83 (P value = 0.17) and 3.26 ± 0.66 (P value = 0.84) for the right and left artery respectively. The diameters in small vessel strokes were 4.63 ± 1 (P value <0.01) and 4.66 ± 1.01 (P value <0.01) for right and left siphon respectively.

Conclusions:

The internal carotid diameters at the level of siphon have a significant relationship with the occurrence of recent ischemic stroke as well as the type of vascular involvement (small vessel disease) in patients with ischemic stroke.

Keywords:

Ischemic stroke, Internal carotid artery, Siphon diameter, Magnetic resonance imaging

Paper ID:140

THE INFLUENCE OF TIBIAL TUBEROSITY TROCHLEAR GROOVE DISTANCE ON THE DEVELOPMENT OF PATELLOFEMORAL PAIN

Leila Aghaghazvini
University of Tehran
Mohammad Naghi Tahmasebi
Department of Orthopedi
Shahin Mirkarimi
Department of Ortohopedi
Hosein Sheidaee*
Department of Radiology
Madjid Shakiba
Department of Obstetrics & Gynecology,Imam Khomeini Hospital, Tehran University of Medical Sciences (TUMS)

Background and Objectives:

Tibial tuberosity- trochlear groove distance (TT_TG distance) measurements play a decisive role in evaluating patellofemoral joint disorders. However, the prevalence of pathological TT-TG distance among patients with patellofemoral pain remains unclear. The purpose of this study was to compare the size of TT-TG distance among patients with PFPS and those with no history of patellofemoral pain.

Patients and Methods:

A total of 100 cases participated in this case-control study, of which 53 individuals were in the case group and 47 individuals were in the control group. TT-TG distance was measured by magnetic resonance imaging.

Results:

Mean TT-TG distance was 12.3±3.3 in patients and 9.3±2.4 in controls (P<0.001). Among patients, we had totally 34 patients with TT-TG equal or lower than 13 (64.2%) and in 18 patients, it was higher than 13 (34%).

Conclusion:

The TT-TG distance mean in patients with PFPS was greater than that in the control group. An increase in TT-TG distance can be considered one of the factors behind the development of PFPS.

Keywords:

knee, MRI, patellofemoral pain syndrome, Tibial Tuberosity, Trochlear groove

Paper ID:141

PLANTAR FASCIITIS DIAGNOSIS: COMPARISON OF ULTRASONOGRAPHIC FINDINGS WITH RADIOGRAPHY AND MRI

Hadi Majidi
Assistant Professor of Radiology, Orthopedic Research Center, Faculty of Medicine, Department of Radiology, Mazandaran University of Medical Science, Sari, Iran.
Hamed Jafarpour
Medical Student, Student Research Committee, Faculty of Medicine, Mazandaran University of Medical Sciences, Sari, Iran.
Fatemeh Niksolat*
Assistant Professor of Rheumatology, Orthopedic Research Center, Faculty of Medicine, Department of Internal Medicine, Mazandaran University of Medical Science, Sari, Iran. <fniksolat@yahoo.com>
Omran Anvari
Resident of Radiology, Faculty of Medicine, Department of Radiology, Mazandaran University of Medical Science, Sari, Iran.

Abstract Aim:

The common method for detecting enthesitis is MRI. Considering the ability to examine the different features of plantar fasciitis with different modalities and ultrasound and its availability to MRI, the aim of this present study was to compare the ultrasound findings with radiographic and MRI findings at the plantar fascia site. Therefore, if ultrasound has a high diagnostic value, it could be used to diagnose enthesitis, hence it can replace radiography and MRI.

Methods:

This descriptive-analytic study was performed on 30 plantar fasciitis diagnosed by rheumatologist that referred to imaging ward of Imam Khomeini Hospital in Sari in 2017. The ultrasound, radiography, and MRI were performed for the plantar fascia. All the cases diagnosed with enthesitis in these three Para clinical studies were evaluated and the findings were compared. Data analyzed by SPSS version 16.

Results:

In this study, 6.7% of the subjects were women

and 56.7% of patients diagnosed with plantar spur on radiography. The MRI findings included: 33.3% thickening of the plantar fascia; 20% fascial signal changes; 63.3% adjacent soft tissue signal changes; 13.3% Enthesopathy and 3.3% Bony spur. The ultrasonography findings Included: 43.3% narrow tract of fluid between plantar fascia and bone; 23.3% loss of ligamentous architecture; 3.3% Plantar spur and 43.3% thickening of the plantar fascia.

Conclusion:

We concluded that ultrasound is a useful imaging modality in diagnosing patients with plantar fasciitis with high diagnostic accuracy compared to MRI. But, in comparison with radiography, due to its low sensitivity in detecting bone lesions, calcification and new bone formation, is not considered appropriate.

Keywords:

plantar fasciitis, enthesopathy, ultrasonography, radiography

Paper ID:142

EVALUATION OF RELATIONSHIP BETWEEN CLINICAL PRESENTATIONS WITH RADIOLOGIC INDICATORS OF LUMBAR SPINAL CANAL STENOSIS ON MRI, IN PATIENTS REFERRED TO DEPARTMENT OF IMAGING, OF SARI CITY

Hadi Majidi*
Motahare Porali
Misagh Shafizad
Fatemeh Niksolat
Zahra Mardanshahi
Mohammad Khademlou
Mani Mahmudi

BackGround:

The correct diagnosis of lumbar spinal canal stenosis is a challenge for clinicians and radiologists. There are many imaging criteria for the study of stenosis that their importance and relevance to clinical symptoms are not well defined. The relationship between clinical manifestations and radiologic criteria of spinal canal stenosis was investigated in MRI to be used in screening and diagnosis of patients.

Material and Methods:

This study is a case-control study. Two groups of 100 (symptomatic and symptomatic) individuals aged 20 to 84 years with low back pain were referred to specialized clinics and underwent MRI.

Results:

There were significant differences between the two groups in clinical signs of canal stenosis (except for back pain). Among the quantitative imaging findings, only the ant- post. diameter of the canal at the level of the intervertebral disc, the central spinal canal cross-section and lateral recesses cross-sectional area were valuable. “Coefficient of stenosis” was calculated for the case and control groups which had statistically significant difference (p-value<0.001).. The difference between qualitative findings such as protrusion, disk sequestration and ... was significant between the two groups.

Conclusion:

As the association of qualitative imaging criteria with clinical manifestations was confirmed, quantitative criteria including the cross-sectional area of the central spinal canal (less than 77.5 mm2 for central stenosis) and lateral recesses (less than 22.5 mm2 for lateral stenosis) were most sensitive and Specific. This study showed that the “Coefficient of stenosis” can be used with high accuracy to investigate the severity of spinal canal stenosis.

Keywords:

Spinal canal stenosis, MRI, low back pain

Paper ID:143

BISMUTH SHIELDING VERSUS TUBE CURRENT MODULATION FOR BREAST RADIATION DOSE REDUCTION IN COMPUTED TOMOGRAPHY

Forough Raeisi Makiani*
Isfahan University of Medical Sciences
Jamshid Shoushtarian
Isfahan University of Medical Science
Maede Mahmoodi
Isfahan University
Mohamad Reza Choopani
Isfahan University of Medical Science

Background:

Computed Tomography (CT) is an effective method for tracking neoplasia's and efficiently diagnosing a vast number of thoracic complications. The use of chest CT has increased in the past decade due to evolution of the scanners. Introducing helical scanners resulted in collecting far accurate data alongside with more radiation dose to patients. Women are more vulnerable to ionized radiation to the breast tissue which may receive substantial radiation doses during CT examinations rather than other thoracic examinations. CT pulmonary angiography may be 10-25 times higher than 2-view screening mammogram (2.4-5.0 mGy). These numbers assure us that reducing radiation dose to the breast tissue cannot be denied. Currently there are a number of options available in favor of reducing breast radiation dose. In this study we compare two of these methods including, bismuth shielding and automatic tube current modulation (ATCM).

Patients and Methods:

A number of published studies with the same objectives were chosen to extract information over this subject and compare the results.

Results:

Bismuth shielding effectively reduces breast exposure meanwhile it increases noise and artifacts. They also tend to attenuate x-rays in all directions, both entering and exiting photons, which results in wasted radiation. Also, mishandling bismuth shields may confuse the automatic and smart exposure control programs. Meanwhile similar breast dose reduction can be achieved without shielding and by reducing tube current (ATCM). Automatic tube current modulation reduces substantial radiation doses Provided that ATCM is performed based on the instructions given by the manufacturer, this technique reduces breast dose without influencing image quality. According to multiple radiation protection researches utilizing ATCM programs is a superior method rather than bismuth shielding.

Keywords:

Bismuth shielding, CT, Radiation dose, Tube current Modulation, ATCM

Paper ID:152

A RARE CASE OF GENERALIZED LYMPHANGIOMATOSIS IN A YOUNG WOMAN

Zahra Rezaei*
Arak University of Medical Sciences
Mersad Mehrnahad
Shahid Beheshti University of Medical Sciences
Fatemeh Safi
Arak University of Medical Sciences
Farnaz Kimia
Shahid Beheshti University of Medical Sciences
Amir Azimi
Arak University of Medical Sciences

Generalized lymphangiomatosis (GLA) is a rare developmental disorder in lymphatic channels .It occurs in any ages specifically in young individuals ,without any gender predilection. All organs except the brain , which is devoid of lymphatic system, can be affected.The lungs are involved in most of the patients ,after the lung , most involvement were reported in the following organs:bone, mediastinum, spleen, liver and retroperitoneum. Radiological findings can confirm the manifestations of the disease. we report a case of 26-year-old woman presented to emergency department with respiratory failure and hypoxia. Diagnostic imaging was performed, Computed tomography (CT scan) revealed: low density pleural effusion, peribronchovascular and interstitial septal thickening along with ground glass opacities in lung

parenchyma and water-density mediastinal mass. Magnetic resonance imaging (MRI) demonstrated multiple lytic bone lesions and bone marrow signal changes as well. Due to nonspecific and various manifestations of the disease, it could be simply disregarded and misdiagnosed. Definitive diagnosis is based upon clinical presentations, radiographic scans and pathological findings. In this case we aim to systematically discuss differentials and diagnostic evaluations, also new assessment methods help to diagnose GLA is described in detail.

Keywords:

lymphangiomatosis, pulmonary lymphangiectasia, cystic mediastinal mass, lytic bone lesion, chylothorax, lymphangioma

Paper ID:153

COMPARISON OF HYSTEROSALPINGOGRAPHY & HYSTEROSONOGRAPHY IN THE INVESTIGATION OF FEMALE INFERTILITY

Firoozeh Ahmadi*
Department of Reproductive Imaging, Reproductive Biomedicine Research Center, Royan Institute for Reproductive Biomedicine, ACECR, Tehran, Iran
Maryam Javam
Department of Reproductive Imaging, Reproductive Biomedicine Research Center, Royan Institute for Reproductive Biomedicine, ACECR, Tehran, Iran

Abstract Evaluation of the endometrial cavity and tubal patency is indicated for many clinical conditions in gynecology, particularly for infertility work up. Several imaging methods are used to help experts to investigate uterine cavity and tubes. Hysterosalpingography (HSG) and hysterosonography (SHG) are the most common and major imaging methods for this situation. Hysterosalpingography is the radiographic evaluation of the uterine cavity, and fallopian tube after injection of a radio-opaque medium through the cervical canal. It plays a significant role to assess infertile couple and provides detailed information about the uterine cavity, tubal patency, lesions, congenital anomalies and different types of intrauterine defects [1-3]. The technique of HSG is quite simple, less invasive, more convenient, and provide reliable information at less cost. Laparoscopy and hysteroscopy also evaluate tubal involvement but these new techniques are more expensive, require general anesthesia, and are not without risk. Despite of advanced diagnostic imaging techniques such as MRI, HSG is still the best method for tubal evaluation. Sonohysterography is a noninvasive imaging technique for assessment of uterine anomalies that involves the infusion of sterile saline solution into the uterine cavity during transvaginal sonography(TVS). Separation endometrial layers of endometrum on SHG produces optimal visualization of the uterine cavity. Uterine abnormalities that can be detected at SHG were grouped into congenital uterine anomalies (arcuate, septate, subseptate, unicornuate, bicornuate and didelphys uteri) and acquired endometrial abnormalities (polyps, hyperplasia, leiomyomas, and intrauterine adhesions). SHG is known as a reliable, simple, cost-effective and non-invasive method which can reduce indications for diagnostic hysteroscopy

Paper ID:156

CORRELATION BETWEEN FACET JOINT ASYMMETRY AND LUMBAR DISC DEGENERATION DISEASE AND FACET JOINT DEGENERATION

Parvaneh Layegh*
Imam Reza Hospital

Objective:

Facet joints tropism (FJT) is defined as asymmetry between left and right facet joints and is postulated as a possible cause of disc herniation, because it has the potential to markedly alter the biomechanics of lumbar spinal movements and precipitate early degenerative changes either in the joint or adjacent intervertebral discs.There are numerous arguments for and against this hypothesis. A correlation between facet asymmetry and the side of disc herniation is also debated. In the present study we use two methods of measurement FJT in former studies and a new method at the same time.

Methods & Materials:

This cross sectional study consisted of lumbosacral MRI of 230 persons (aged 18-70 years) in two group (case-control) for evaluate FJT and degenerative changes in L1-S1. The data were analysed using SPSS statistical Software SPSS version 16.0. For all computations, statistical significance corresponded to $p < 0.05$.

Results:

From 230 persons of this study there are 97 males (42/2%) and 133 females (57/8%) with an average age of 44/6 years (range 18-70 years). Average abdominal obesity index (AOI) was 5/7 (range 3/5-7/5 years). There is a relative relationship between FJT in the level of L3-L4 with AOI>6 in patient group (P=0/050).There is a relationship between age and degenerative changes in lumbar vertebrae. There is a relationship between FJT in the level of L1-L2 and L2-L3 with FTL2 (distance between the reference coronal line and the crossing point between the two facet lines). No significant correlation was observed between lumbar FjT and degenerative changes in other lumbar vertebrae. There is controversy between Facet tropism and its correlation with degenerative disc disease in published literature and different method and imaging modalities have been used to assessed this relation ship. In our study, in which we used FTL and FTL2 for assessment of facet tropism, has shown a relationship between FJT in the level of L1-L2 and L2-L3 with FTL2 (distance between the reference coronal line and the crossing point between the two facet lines). No significant correlation was observed between lumbar FjT and degenerative changes in other lumbar vertebrae. This association may represent an element in the biomechanical evaluation of the aetiology of premature lumbar spine disc degeneration.

Keywords:

Disc degeneration, Facet joints tropism, Lumbar spine

Paper ID:157

EVALUATION OF THE OCCUPATIONAL SKILLS OF RADIOLOGY TECHNOLOGISTS WORKING IN EDUCATIONAL HOSPITALS OF AHVAZ JUNDISHAPUR UNIVERSITY OF MEDICAL SCIENCES

Marziyeh Tahmasbi
Assistant Professor of Medical Physics, Department of Radiologic Technology, Faculty of Paramedicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.
Zahra Farzanegan*
MSc student of Medical Physics, Department of Medical Physics, Faculty of Medicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.
Mohsen Cheki
Assistant Professor of Medical Physics, Department of Radiologic Technology, Faculty of Paramedicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.
Mohamad Sadegh Ghasemi
Technology Radiology student, Department of Radiologic Technology, Faculty of Paramedicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.

Abstract Background and Objectives:

Professional skills and competencies of technologists are critical in patient care system. The increasing demand for high quality diagnostic radiology services has been effective in the professional development of technologists. As a result, technologists' freedom activities have become more involved and need more knowledge and awareness as well as greater accountability for patients and technical equipment. Therefore, the present study was conducted to investigate the occupational skills of radiology technologists working in Ahvaz hospitals.

Methods:

This descriptive cross-sectional study was performed on 94 radiology technologists working in Ahvaz hospitals. Using a questioner designed by researchers, including questions related to technologist's ability in setting the radiation conditions, work with various imaging systems and new equipment. Data analysis implemented using SPSS24 software.

Results:

The mean occupational skill level of the workers was 7.57±2.43. The highest level of occupational

skill obtained in setting the radiation conditions with respect to the target member with an average of (9.19 ± 1.05). The ability to work with the PACS system with an average (5.34 ± 3.85) was least. There was no statistically significant relationship between demographic characteristics of the personnel and their occupational skills (p> 0.05).

Conclusion:

The results of this study indicate that the radiology technologists are not completely familiar with imaging techniques, radiation condition setting, various imaging systems and equipment. Therefore, training courses to improve the technologist's skill and acquaintance of them with the new techniques and methods of image displaying and transmitting seems to be necessary.

Keywords:

Occupational skills, Radiology technologists, Radiation conditions.

Paper ID:162

THE ROLE OF MAGNETIC RESONANCE IMAGING (MRS) IN DETECTION OF PROSTATE LESIONS IN COMPARISON WITH PATHOLOGIC AND CLINICAL METHODS

Zahra Farzanegan*
Ahvaz Jundishapur University of Medical Sciences
Mansour Zabihzadeh
Department of Medical Physics, School of Medicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran
Jafar Fatahi Asl
Ahvaz Jundishapur University of Medical Sciences

Background:

Magnetic resonance spectroscopy is a non-invasive method with high sensitivity and specificity compared to other imaging, pathologic, and clinical methods. With regards to providing anatomical and physiological information, this method is able to detect prostate lesions in the early stages, staging and treatment planning. Therefore, the purpose of this study is to systematically review the ability of MRS to distinguish between benign and malignant prostate lesions.

Methods:

The search of articles in PubMed, Science direct, Embase, Cochran and Scopus databases was performed using the keywords of MRS & prostate, prostate cancer, prostatitis, Benign prostate hyperplasia (BPH), and also Magnetic Resonance Spectroscopy & Prostate lesions. The abstract and the full text of the articles were reviewed by the authors and the relevant studies were selected for systematic review.

Results:

Sensitivity, specificity and accuracy of MRS in the differentiation of benign and malignant prostate lesions were 74.3%, 74.27%, 77.26%, respectively. The increase of choline and myoinozythyl, decreased citrate and polyamine, and the ratio of the higher sum of choline and creatinine to citrate in malignant lesions compared with benign prostatic lesions are as the main markers for the differentiation of lesions. While rectal examination and prostate specific antigen (PSA) level test have very low sensitivity and accuracy, also ultrasound-guided biopsy (TRUS) cannot be performed for all patients due to aggressiveness and the risk of infection and bleeding. Conclusion: The introduction and standardization of MRS has allowed increasing the accuracy of prostate lesions diagnosis in comparison with other pathologic and clinical methods by a combined analysis of magnetic resonance imaging and metabolic data from MRS. it also reduces the negative predictive value by suitable selection of techniques and scan parameters.

Keywords:

MRS, Prostate Cancer, Prostatitis, Benign Prostate hyperplasia.

Paper ID:164

EVALUATION OF IMAGE QUALITY OF ELECTRONIC AND GEOMETRIC MAGNIFICATION VIEW IN MAMMOGRAPHY

Samira Moshiri
Department of Nuclear and Reactor Engineering, Islamic Azad University, Arsanjan 73761168, Fars
Fariba Zarei
Department of Radiology, Shiraz University of Medical Sciences, Shiraz, Iran
Mohammad Esmail Fazilat Moaddeli
Medical Imaging Research Center, Shiraz University of Medical Sciences
Rezvan Ravanfar Haghighi*
Medical Imaging Research Center, Shiraz University of Medical Sciences
Sepideh Sefidbakht
Shiraz University of Medical Science
Zeinab Gholami Bardeji
Shiraz Radiology Department
Sabyasachi Chatterjee
Ongil, 79 D3, Sivaya Nagar, Reddiyur Alagapuram, Salem 636004
Vani Vardhan Chatterjee
Department of Instrumentation and Applied Physics, Indian Institute of Science, Bangalore 560012

Background:

Introducing digital mammography systems have improved the contrast resolution of mammogram while the spatial resolution is limited by the pixel size of the detector element. Therefore, the controversy of using geometric or digital magnification to detect micro-calcifications, evidence of breast cancer in early and curable stage, does arise. The aim of this study is to evaluate image quality of geometric and electronic magnification views in mammography.

Methods:

ACR and DIGmamm phantoms were used to evaluate the ability of the two mammography systems to detect the number of specks group and line pairs per millimeters or lp/mm (high contrast) in geometric and digital magnification views. The phantoms were placed on top of the detector (in contact) and on top of the magnification plate (for 1.5X and 1.8X) in digital zoom and geometric modes respectively. Automatic Exposure Control (AEC) was used to expose phantoms in two image modes. Multi-function meter (Black piranha) was used to measure average glandular dose at the surface of the detector and magnification plate (in two magnified positions 1.5X and 1.8X). Phantom images were visually assed by two expert radiologists.

Results:

Images of the ACR phantom with digital and geometric magnifications show that in all cases 3 groups of specks (mimic micro-calcification) are discernible. Images of high contrast part of DIG-mam phantom revealed that 5 to 7 lp/mm for digital and geometric (1.5X and 1.8X) views are distinguishable. Dose measurement showed that average glandular dose in contact mode used for electronic zoom views is 2 and 3 times less than 1.5X and 1.8X magnification modes respectively.

Conclusion:

Results of this study showed that the image quality of the digital and geometric magnification views are comparable, to detect equal number of specks, mimicking micro-calcification and lp/mm. Therefore, contact mode with spot compression and digital zoom, with at least 50% dose reduction, can be used to evaluate micro-calcification.

Keywords:

micro-calcification, digital zoom, geometric magnification, mammography

Paper ID:166

THE FEASIBILITY OF HISTOGRAM ANALYSIS TO DIFFERENTIATE SIMILAR BRAIN LESIONS IN UNENHANCED BRAIN CT

Fariba Zarei
Department of Radiology, Shiraz University of Medical Sciences, Shiraz, Iran
Asyeh Khoushandish
Department of Radiology, Shiraz University of Medical Imaging, Shiraz
Sabyasachi Chatterjee
Ongil, 79 D3, Sivaya Nagar, Reddiyur Alagapuram, Salem 636004
Rezvan Ravanfar Haghighi*
Medical Imaging Research Center, Shiraz University of Medical Sciences
Seyed Hamed Jafari
Shiraz University of Medical Science
Vani Vardhan Chatterjee
Department of Instrumentation and Applied Physics, Indian Institute of Science, Bangalore 560012

Background:

Average attenuation coefficient of the subject normalized to that of water, Hounsfield Unit (HU), in Computed Tomography (CT), is a function of chemical composition of the scanned material in

addition to the energy of the x-ray beam. The aim of this study is to evaluate the feasibility of histogram analysis of HU value to characterize lesions, due to ischemia and tumor in unenhanced brain CT.

Methods:

Unenhanced brain CT of 50 patients with brain tumor and ischemia, 25 patients for each, were selected. Mean, maximum and minimum of the HU values of the three slices inside of each brain lesions were measured by proper size of ROI. These values were used to make histogram, cumulative and probability percentage distribution for 150 axial slices. Ten unknown cases were used to evaluate the accuracy of our method.

Results:

Histogram bar chart shows that the minimum, maximum and mean of HU values are less in tumor cases. The median of the cumulative distributions of minimum, maximum and mean HU values for tumor are less compare to ischemia cases. The incidence of tumor cases decline as the minimum, maximum and mean of the HU values increases while the trend is completely reverse for ischemia cases. The same data analysis was done for 10 unknown cases. Comparison of the result of histogram analysis and radiologists (blinded to histogram analysis) interpretation agreed in 80% of the cases.

Conclusion:

Histogram analysis may be useful method to differentiate tumor and ischemia lesions in unenhanced brain CT.

Keywords:

Histogram analysis, Computed tomography, Tissue characterization, Brain

Paper ID:167

RADIOPROTECTION TO THE SUPERFICIAL ORGANS DURING COMPUTED TOMOGRAPHY

Maede Mahmoodi*
Isfahan University
Jamshid Shushtarian
Isfahan University
Mohamad Reza Choopani
Isfahan University of Medical Science
Foroogh Raeisi Makiani
Ziaye Hopital

Radioprotection to the superficial organs during computed tomography

Background:

CT examination delivers to the patient more radiation than all other imaging techniques, this radiation dose specially receive by superficial organs such as eye-lens, thyroid and breast. Sinuses and head CT scan as a current scan deliver radiation dose as much as 50 mGy to eye-lens. In abdominal, spinal, head CT and in chest CT, breast exposes to external scatter radiation and primary radiation respectively. so these organs should be protected against scatter and primary radiation with different methods. It's important in pediatrics or patients undergoing repeated CT scan. Our purpose is describing dose reduction techniques and evaluation of percentage dose reduction and their influence on the image quality.

Method:

different articles from pumped, bjr result: for eye-lens we can use of three methods: gantry tilt that reduce radiation dose until 75% but it sometimes cause to beam hardening, ATCM (automatic tube current modulation) reduces doses to 30%, but this method increases image noise until 30% in central and posterior portion of brain. Bismuth shields is a good choice because bismuth related artefacts occurring in head CT are superficial and diagnostically insignificant when brain pathology assessed. For reducing radiation dose to breast due to head or abdominal scan use of lead shields that is effective only against the radiation that reaches the breast from its convexity from the sources that lie above the coronal plane the supine patient. In chest scan more advanced method of reducing exposure, ATCM is superior if available. Bismuth shields effectively reduce breast exposure at the expense of increased noise and artifacts because this shield reduces transmission in all directions.

Conclusion:

Most efficient method for reducing lens dose is gantry tilt when it is not possible in practice because of limitation in gantry rotation and tilting the patient head we can use of atcm if this method is not available on your scanner bismuth shields is a good choice. For protection of breast when it is in our field ATCM is superior and after that bismuth shields.

keywords:

superficial organs, dose, shield

Paper ID:168

QUALITY CONTROL OF CONVENTIONAL RADIOLOGY DEVICES IN SELECTED HOSPITALS OF KHUZESTAN PROVINCE, IRAN

Mostafa Lotfi
Behbahan University
Vahid Hosseini*
Behbahan University

Introduction:

Quality control techniques used to test the components of the radiological system and verify that the equipment is operating satisfactorily. In this study, quality control (QC) assessment of conventional radiology devices was performed in frequently visited radiology centers of Khuzestan province, Iran.

Materials and Methods:

Fifteen conventional radiology devices were examined, based on the protocol proposed in Report No. 77 by the Institute of Physics and Engineering in Medicine (IPEM). Ten standard QC tests, including voltage accuracy and reproducibility, exposure time accuracy and reproducibility, tube output linearity (time and milliampere), filtration (half-value layer), tube output (70 kV at FSD =100 cm), tube output reproducibility and beam alignment were performed and assessed. All measurements were performed, using Barracuda multi-purpose detector.

Results:

The reproducibility of voltage, exposure time and dose output, as well as output linearity, met the standard criteria in all devices. However, in 60% of the units, the results of the beam alignment test were poor. We also found that 66.7% of the studied units offer services to more than 18,000 patients annually or 50 patients per day.

Conclusion:

Despite the fact that radiological devices in Khuzestan province are relatively old with high workload, the obtained results showed that these devices met the standard criteria. This may be mainly related to proper after-sale services, provided by the companies. Although these services may be expensive for radiology centers, the costs may be significantly reduced if QC is defined as a routine procedure performed by qualified medical physicists or radiation safety officers.

Keywords:

Radiation Protection, Quality Control, Diagnostic X-Ray, Radiography, Radiology Device

Paper ID:171

IPSILATERAL INTERSTITIAL ECTOPIC PREGNANCY IN A PATIENT WITH PREVIOUS TOTAL SALPINGO-OOPHERECTOMY: A CASE REPORT

Mohammad Reza Sasani*
Shiraz University of Medical Sciences
Mansoureh Chegeni
Shiraz University of Medical Sciences

Introduction:

Ectopic pregnancy (EP) is a life-threatening condition in pregnancy. Most of the ectopic pregnancies occur in ampullary region of the fallopian tubes (92%) and in interstitial region (2.5%). Ectopic pregnancy after partial or total salpingectomy in same side is rare with mortality significantly more than other types of ectopics. We present a case of interstitial EP in a woman who underwent ipsilateral total salpingo-oopherectomy for endometriosis 3 years ago. Case presentation: A 30-year-old woman with a history of one pregnancy termination (at 8weeks) presented to our hospital. She had pelvic pain, vaginal bleeding associated with vomiting for 4 days. Patient's history was revealed that she had a left salpingo-oopherectomy 3 years ago due to endometriosis. Her serum βHCG level was 62018 IU/l. Therefore, transvaginal ultrasound was done that it shows an echogenic lesion with cystic area in left side just at the region of resected fallopian tube associated with surrounding color flow. Then possibility of left interstitial EP in the site of previous salpingectomy (Fig1) was suggested. Open laparotomy was performed and left interstitial EP confirmed.

Conclusion:

This case highlights that total salpingectomy does

not exclude same sided interstitial EP, which has mortality more than other types of ectopics; and clinicians should be aware this diagnosis.

Keywords:
Interstitial Pregnancy, Tubal Pregnancy, Tubal Excision, Tubectomy.

Paper ID:172

LEFT VENTRICLE SEGMENTATION FROM ULTRASOUND DATA USING A NOVEL DEEP LEARNING BASED ARCHITECTURE

Mostafa Ghelich Oghli*
Rajaie Cardiovascular Medical and Research Center
Shakiba Moradi
Sharif University of Technology, Tehran, Iran.
Azin Aliazdehasl
Rajaie Cardiovascular Medical & Research Center
Isaac Shiri
Tehran University of Medical Sciences
Mehrdad Oveisi
University of British Columbia
Majid Maleki
Rajaie Cardiovascular Medical & Research Center

Background:

Echocardiography is the most popular approach for evaluation of cardiac ventricles due to its low cost, temporal resolution and portability. Left ventricle segmentation is a challenging task in echocardiographic images. It's also necessary for volume, area, diameter, and ejection fraction (EF) measurement in 2D images. Although several approaches have been proposed, the problem is still open due to the main challenges.

Patients and Methods:

In this paper, a deep learning based approach is proposed to overcome these challenges. U-net, which is a well-known image segmentation network, is modified in a way that all feature maps of the decoder are incorporated in the segmentation procedure. The idea is taken from feature pyramid network that utilizes feature maps in all scales to produce predictions. Feature maps in all levels of decoder path of U-net are concatenated, their depths are equalized, and up-sampled to a fixed dimension. The final classifier, which is responsible for the semantic segmentation, is performed by this stack of feature maps (as its input). We prepared a collection of 132 2D echocardiographic transthoracic four-chamber sequences from 200 adult patients (normal cases and acute pulmonary thromboembolism). The images are gathered in Rajaie Cardiovascular Medical and Research Center using Philips EPIQ 7 echocardiographic system with an X5-1 xMatrix transducer.

Results:

Experimental results show a promising agreement between automatic and manual segmentation. The proposed network yielded state-of-the-art results in comparison with U-net, dilated U-net, and deeplabv3, using the same dataset. Dice metric (DM), Hausdorff distance (HD), Jaccard coefficient (JC), and mean absolute distance (MAD) between manually drawn and predicted contours were computed and the values of 0.945, 1.62, 0.96, and 1.32 were achieved respectively. The left ventricle volume, area, and diameter calculated and the correlation graph, bland-altman analysis, and box plot showed a great agreement.

Conclusion:

According to the results, the use of features' pyramid and the dilated convolutional kernels showed robustness to large and rich training sets. Also, taking into account all features in all levels of decoder path provides more accuracy, particularly for challenging slices with low resolution and unclear endocardial border.

Paper ID:173

MFP-UNET: A NOVEL ARCHITECTURE FOR RIGHT VENTRICLE DETECTION AND SEGMENTATION IN ECHOCARDIOGRAPHIC IMAGES

Mostafa Ghelich Oghli*
Rajaie Cardiovascular Medical and Research Center
Shakiba Moradi
Sharif University of Technology, Tehran, Iran.
Azin Aliazdehasl
Rajaie Cardiovascular Medical & Research Center
Isaac Shiri
Tehran University of Medical Sciences
Mehrdad Oveisi
University of British Columbia
Majid Maleki
Rajaie Cardiovascular Medical & Research Center

Background:

Echocardiography has undoubtedly became the preferred approach for visualization and evaluation of cardiac ventricles because of the portability, low cost, and temporal resolution. There are several challenges in visualization of right ventricle like low signal to noise ratio, weak echoes, presence of speckle, etc.

Patients and Methods:

A novel convolutional neural network architecture is proposed in this paper, for right ventricle detection and segmentation in echocardiographic images. U-net, which is a well-known image segmentation network, is modified in a way that all feature maps of the decoder are incorporated in the segmentation procedure. The idea is taken from feature pyramid network that utilizes feature maps in all scales to produce predictions. Feature maps in all levels of decoder path of U-net are concatenated, their depths are equalized, and up-sampled to a fixed dimension. The final classifier, which is responsible for the semantic segmentation, is performed by this stack of feature maps (as its input). An object detection head is also attached at the end of network for detection of right ventricle in the images. It contains a regression box which gives a four element vector that represents xmin, xmax, width, and height of the bounding box. We prepared a collection of 980 2D echocardiographic transthoracic four-chamber sequences from 520 adult patients (patients referred from ecology department). The images are gathered in Rajaie Cardiovascular Medical and Research Center using Philips EPIQ 7 echocardiographic system with an X5-1 xMatrix transducer.

Results:

We have evaluated the proposed network in terms of segmentation and detection. For segmentation, the proposed network compared with three state-of-the-art approaches containing U-net, dilated U-net, and deeplabv3, using the same dataset. Dice metric (DM), Hausdorff distance (HD), Jaccard coefficient (JC), and mean absolute distance (MAD) between manually drawn and predicted contours were computed and the values of 0.87, 5.24, 0.86, and 4.88 were achieved respectively. For the RV detection, FROC analysis performed and the proposed network yielded the best result.

Conclusion:

The proposed network can robustly detect and segment the right ventricle in echocardiographic images. Future works can rely on the application of the proposed network on atriums.

Paper ID:180

QUANTIFICATION OF FETAL ORGAN BY UTILIZING A DEEP LEARNING APPROACH IN ULTRASOUND IMAGES

Nasrin Ahmadinejad
Tehran University of Medical Sciences
Mostafa Ghelich Oghli*
Rajaie Cardiovascular Medical and Research Center
Shakiba Moradi
Sharif University of Technology, Tehran, Iran.
Arvin Aryan
Tehran University of Medical Sciences
Isaac Shiri
Tehran University of Medical Sciences

Background:

Ultrasound imaging is the modality that is used for fetal screening. Nowadays, an ultrasound examination is routinely performed between 18 and 22 weeks of pregnancy to evaluate the growth of the fetus by measuring its head, abdomen and

femur. In this paper, we proposed a deep learning based approach to perform such measurements and compare the results with manual measurements.

Patients and Methods:

We have proposed a convolutional neural network for localization of fetus organs containing skull and femur. The network is trained each organ separately to extract the features. We have used mask RCNN architecture that is a robust and powerful deep network for object detection and segmentation in natural images and videos. The objects are segmented by the segmentation head of mask RCNN to be prepared for the mentioned measurements. After the segmentation process, all of the required measures are achieved by image analysis algorithms. The fetal biparietal diameter (BPD) is measured by a circle detection algorithm and the femur length is also achieved by a skeletonization algorithm. A comprehensive dataset of 2D fetal ultrasound images was provided. The gold standard for evaluation of proposed algorithm was also provided by expert physicians.

Results:

We have divided the evaluation procedure into the object detection and organ measurement phases. For object localization, the FROC curve and the area under the curve is utilized, which yielded 0.94 for fetal head and 0.91 for the femur. The measurements' errors were evaluated by mean absolute difference (MAD), root mean square error (RMSE), and correlation graph. The values of errors were 0.23 mm, 0.11 mm for BPD and 0.18 mm, 0.12 mm for the femur length. The R-values were 0.921 for BPD and 0.966 for femur length.

Conclusion:

According to the results, we have proposed a robust and useful algorithm for fetal organ measurement that can be extended to nuchal translucency (NT) measurement based on providing dataset.

Paper ID:182

ROLE OF MRI IN DETECTION AND CHARACTERIZATION OF FETAL ABDOMINOPELVIC CYSTIC MASSES

Reza Jahankhah*
(SUMS)
Sepideh Sefidbakht
Shiraz University Of Medical Science
Bijan Bijan
Department Of Radiology, University Of California Davis Medical Center
Hamidreza Forotan
(SUMS)
Homeyra Vafaei
(SUMS)
Reza Jalli
Shiraz University Of Medical Sciences, Shiraz
Maryam Rezaei
(SUMS)

Background:

Fetal intra-abdominal cystic masses are quite rare entities and their differential diagnosis is particularly perplexing. The purpose of this study is to review the range of pathologic causes of fetal abdominal cysts in patients referred to our center and to correlate them with post-delivery follow up and pathology results.

Material and Methods:

The university ethics committee approved this retrospective study. 497 fetal MRI's were done during2013-2016 in our institution. 21 studies were performed specifically for further evaluation of fetal abdominopelvic cystic lesions. Only fetuses in whom at least one year post-delivery follow-up and/or pathology and operative results were available entered the study. MRI's were done on a Seimens Avanto 1.5T Scanner and interpreted with prior knowledge of the midtrimester anatomical survey. Each fetuses were evaluated retrospectively in a multidisciplinary team including a radiologists, perinatologists, and pediatric surgeons. MRI's were interpreted with prior knowledge of ultrasound results by two radiologists in consensus.

Results:

The final group included 15 abdominopelvic extrarenal cysts and cystic masses including ovarian cysts(7), resolving cystic lesion of unknown origin and significance(2), kidney cyst (2), liver cyst, mesenchymal

hepatic cystic mass, suprarenal cystic mass (each 1). MRI and ultrasound were both 100% sensitive in detecting intraabdominal cyst. In 5 cases MRI was more accurate in determining the organ of origin of the cysts and/or provide data regarding internal structure and nature based on signal characteristics.

Conclusion:

MRI might have a significant added value in determining organ of origin and nature of fetal abdominal cysts.

Paper ID:184

COMPUTER AIDED DIAGNOSIS OF LIVER FIBROSIS STAGES BASED ON DEEP LEARNING USING 2D SHEAR WAVE ELASTOGRAPHY

Shakiba Moradi
Sharif University of Technology, Tehran, Iran.
Mostafa Ghelich Oghli*
Rajaie Cardiovascular Medical and Research Center
Isaac Shiri
Tehran University of Medical Sciences

Background:

The clinical significance of fibrosis staging in chronic diffused liver diseases (CDLD) and limitations imposed on biopsy, caused the development of noninvasive methods of assessment of liver fibrosis. The real-time shear wave elastography (SWE) represents a new noninvasive method for assessment of liver fibrosis based on the liver stiffness measurements (LSM) quantitative measurement.

Patients and Methods:

A new computer-aided diagnostic (CADx) system is introduced to assess liver fibrosis stages. The proposed network is based on a convolutional neural network (CNN) that extracts the features of an SWE image in a color space and predicts the class of the liver fibrosis stage using the convolution, max pooling, fully-connected, and softmax layers. The proposed network is an improved version of ResNet that is compatible with SWE images. We have used an extensive dataset of 2D SWE images (786 images in different classes) of liver tissue using a SoneusP7 device (Ultrasign). Liver biopsy was performed in the right lobe of a liver by using a 16 or 18 G needle. For using our proposed deep learning approach, the entered patients were randomly divided into the training set and validation set.

Results:

The results of the proposed methods were satisfying. We have used various evaluation metrics contain precision, recall, F1-score, ROC curve, and training time. The precision, recall, and F1-score were 0.92, 0.83, and 0.87. The ROC curve was also plotted and the area under the curve (AUC) was calculated and the result was 0.9. At last, the training time was reasonable (45 minutes for our presented dataset) and the test time was significantly less than the manual approach, as it was anticipated.

Conclusion:

The results show the superiority of the deep learning detection of in liver fibrosis stage. High statistical metrics with low training time makes this approach more compatible with SWE images.

Paper ID:185

EVALUATION OF CT IMAGING FINDINGS OF END STAGE-PRIMARY SCLEROSING CHOLANGITIS VERSUS CRYPTOGENIC CIRRHOSIS IN PATIENTS ADMITTED TO SHIRAZ NAMAZI HOSPITAL BETWEEN 2011 AND 2017

Nazanin Sadraee*
Medical Imaging Center, Shiraz University of Medical Sciences, Shiraz, IR
Seyed Hamed Jafari
Shiraz University of Medical Science
Sepideh Sefidbakht
Shiraz University of Medical Science
Pooya Iranpour
Shiraz University of Medical Science
Sara Haseli
(SUMS)

Purpose:

Determining Primary Sclerosing Cholangitis characteristics in Triphasic CTscans and investigating the presence of any difference between cirrhosis caused by PSC versus cryprogenic cirrhosis.

Material and Methods:

The university ethics committee approved this retrospective study. CT scans of 185 study populations including 100 patients with cryptogenic cirrhosis and 85 patients with end stage PSC were retrospectively reviewed. Ten morphologic criteria were compared between two groups including evaluation of segmental atrophy and hypertrophy by Modified-caudate/Right lobe ratio (m-C/RL), hepatic contour, portal hypertension (utilizing the size of portal vein, splenic size, ascites and presence of portocaval collaterals), presence and size of perihilar lymphadenopathy, biliary tree dilatation, bile duct thickening and gallbladder appearance. Frequency of IBD and Cholangiocarcinoma, presence of and size of perihilar lymph nodes in PSC patients with Cholangiocarcinoma are also measured.

Result:

Six findings are more frequent in PSC patients than those with cryptogenic cirrhosis. These findings include m-CRL>0.73, moderate and severe lobulated liver contour left lobe hypertrophy including segment 4, evidence of cholecystectomy, normal appearing GB ,overdistended GB, biliary tree dilatation and wall thickening were significantly frequent in patients with PSC. LN sizes and frequencies size of portal vein and splenomegaly more frequent in PSC patients. However ascites and collateral formations with P-value<0.005 were significant in cryptogenic cirrhosis as opposed to PSC patients. 12 cases (14.7%) of Cholangiocarcinoma and 49 cases (57.6%) IBD was present in of PSC patients.22.4% of patients were diagnosed with IBD and PSC simultaneously. LN numbers and sizes have depicted no definite significance in PSC patients with cholangiocarcinoma.

Conclusion:

There is enormous difference in hepatic morphology in cirrhosis caused by PSC versus cryptogenic cirrhosis.With use of Triphasic CT scans and knowing characteristics of PSC no further pathology proof is needed.

Paper ID:187

EVALUATION OF DOSE REDUCTION EFFECTS ON IMAGE QUALITY OF COMPUTED TOMOGRAPHY OF TEMPORAL BONE

Fariba Zarei
Department of Radiology, Shiraz University of Medical Sciences, Shiraz, Iran
Raziye Jamali
Medical Imaging Research Center, Shiraz University of Medical Sciences, Shiraz
Rezvan Ravanfar Haghighi*
Medical Imaging Research Center, Shiraz University of Medical Sciences

Background:

Computed Tomography (CT) is a useful diagnostic modality for patient's prognosis with temporal bone abnormalities. Stochastic effects of x-ray forces us to reduce radiation dose, but keeping within sufficient diagnostic image quality in CT scanning of temporal bone. The aim of this study is to evaluate the radiation dose reduction effects on the image quality of CT scanning of temporal bone.

Methods:

A skull bone of human cadaver containing temporal bone was scanned at the regular (140 kVp, 230 mAs) and reduced (120 kVp, 200 mAs) dose protocols. 15 patients, suspected of temporal bone problem were scanned with dose reduction protocol and 15 patients, scanned with regular dose, were selected retrospectively from PACS system. Region of Interest (ROI) were inserted inside the brain stem of the axial and coronal slices and inside the air of the sphenoid (for axial slice) and internal auditory canal to measure the HU values. Contrast to Noise Ratio (CNR) was calculated. CTDIvol of the patients with regular and dose reduced protocols were recorded. An expert radiologist evaluated the image quality of temporal bone CT images.

Results:

Radiologist's report showed that the quality of CT images of temporal bone of skull bone were acceptable for regular and reduced dose protocols. The CNR values of the coronal and axial slices of regular and reduced dose protocols were found to be comparable. The mean values of CTDIvol were 51 and 29 mGy in regular and reduced dose protocols respectively. On

the basis of the radiologist's report important details of the temporal bone could be seen clearly in both regular and dose reduced CT protocols.

Conclusion:

The finding of this study shows that the quality of regular and reduced dose of temporal bone CT scanning is acceptable. Radiation dose to the patient in dose reduced protocol is considerably less than the regular dose of temporal bone CT scanning protocol. Therefore, temporal bone CT scanning with regular dose protocol can be replaced by dose reduced protocol while maintaining acceptable diagnostic image quality.

Keywords:

Dose reduction, CT scanning, Internal Auditory Canal

Paper ID:188

PREGNANCY ASSOCIATED BREAST CANCER: ULTRASOUND APPEARANCE IN 28 PATIENTS AND REVIEW THE IMAGING MODALITIES

Donya Farrokh*
Mashhad University of Medical Science
Ali Alamdaran
Mashhad University of Medical Sciences
Ali Feyzi Laein
(MUMS)
Bita Abbasi
Mashhad University of Medical Sciences

Background:

Pregnancy associated breast cancer (PABC) referees to all cases of breast cancer which diagnosed during pregnancy or 12 months after pregnancy or at the time when a woman is breast feeding. Obgective:to evaluate the ultrasound findings of pregnancy associated breast cancer(PABC)in 28 PATIENTS and review the imaging modalities in PABC.

Methods:

In a retrospective study a total of 28 patients with PABC were diagnosed during pregnancy (n=8) and lactation (20) were evaluated. The diagnosis of PABC was confirmed in all cases after performing core needle biopsy.

Results:

The mean age of patients was 32 years (range between 25 and 42 years) The most common clinical presentation was palpable breast mass 12 patients were diagnosed as locally advanced breast cancer. Sonography was positive in all patients(100%). The presence of a hypoechoic mass with irregular shape. Irregular margins,non-parallel orientation, and complex posterior features was the most common ultrasound appearance that was seen in 18 cases Unusual findings were seen including:.complex cystic pattern with prominent cystic areas (n=10), parallel orientation (n=10), and posterior enhancement (n=6) Associated findings was detected in 12 patients including tissue edema (n=120.skin thickening(n=8), and calcifications (n=6).Axillary lymphadenopathy was seen in 10 cases.

Conclusion:

The ultrasound appearance of PABC may be different from that of breast cancer in non-pregnant women and unusual findings such as prominent cystic component, posterior enhancement, and parallel orientation are not uncommon findings in PABC. so the ultrasound findings may mimic benign breast lesions during pregnancy and lactation

Paper ID:190

DIFFERENTIATING ROTUNDUM FORAMEN FROM VIDIAN CANAL IN AXIAL CT SCAN CUTS: A NOVEL APPROACH

Amineh Davoudian*
Amiralam
Reza Erfanian
Amiralam
Saeed Sohrabpour
Amialam
Maryam Mohamadzadeh
Amiralam
Armin Akbari
Amiralam

Background:

two important elements in the skull base area are foramen rotundum and vidian canal. The vidian canal passes through the pterygoid plate root, but the rotundum foramen is located in the grater wing of

sphenoid bone area. Both elements move from posterior to anterior, and it is difficult to be differentiated in axial CT scan cuts. the different origins and contents of these elements in presurgical evaluation for choosing the approach and during surgery under guidance of navigation system is important.

Methods:

Skull base CT scan images of 250 patients who underwent radiography at the Amiralam Hospital in Tehran were randomly selected and analyzed. The age and sex of these patients were recorded. The incidence of the complete protrusion of the vidian canal and the foramen rotundum into the sphenoid sinuses in each side was evaluated. In axial cuts where the distal end of each of these two channels without the proximal ending was evident, the alignment of these elements with the inferior orbital fissure was evaluated.

Results:

The mean age was 38 and the minimum age was one year and the maximum age was 90 years. The standard deviation was 19 years. Thirty-nine percent of cases were female and 61 percent were male. In 9.2% of the right rotundum foreman and 8.4% of the left rotundum foramen there was bony border separating those from parasellar region in at least one cut of the axial CT scan.. In 19.6% of the cases on the right side and 20.8% of the left side of the rotundum foramen was bifid. In 78.8% of cases, rotundum foramina were single branched. 1.2% of the right rotundum foramina and 2.4% of the left rotundum foramina were completely protruded in the sphenoid sinus in some part of the tract. In 97.2% of the cases, none of the rotundum foramina in either part of their paths were entirely protruded in the sphenoid sinus. The distal part of the foramen rotundum in 96.4% of has connection with the inferior orbital fissure in all cuts including cuts without evidence of proximal origin of the foramina. 13.6% of the right vidian canals and 14% of the left vidian canals, the proximal origins of the canals were started from petroclival suture. In 84.4% of the cases, the vidian canal was started in proximal part from the foramen lacerum. In 18.4% right vidian canal and 20.8% of the left vidian canal were completely protruded in the sphenoid sinus in at least some part of their tracts. In 75.6% of none of the vidian canals were completely protruded in the sphenoid sinus in any part of the tract. In 94.8% of the cases, there were no direct connection of the vidian to inferior orbital fissure.

Conclusion:

In order to differentiate the vidian canal from the foramen rotundum in the axial CT scan cuts, if the proximal origin of the channel is visible with great certainty they would be differentiated. Otherwise, the relationship between the distal part of the channel and inferior orbital fissure should be evaluated.

PaperID:194

THE EFFECT OF VARIOUS CONTRAST AGENTS ON PATIENT ABSORPTION DOSE AND IMAGE QUALITY IN MAMMOGRAPHY

Seyde Simin Mosavi Avendy*
MSc Student of Medical Physics, Department of Medical Physics, Faculty of Medicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.
Marziyeh Tahmasbi
Assistant Professor of Medical Physics, Department of Radiologic Technology, Faculty of Paramedicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.

The effect of various contrast agents on patient absorption dose and image quality in mammography

Abstract

Background and Aim:

Due to the increasing use of ionizing radiation in diagnostic imaging and the proven adverse effects of these radiation, there is always a risk of cancer depending on the radiation dose. Therefore, their implementation is in accordance with the protective provisions to reduce these harmful effects. Techniques such as mammography, although providing important information, increase the patient's absorption dose. Different contrast agents have been developed to enhance image quality and reduce patient dose in imaging techniques such as mammography. Therefore, the purpose of this article is to review the various contrast agents in mammography and their effects on image quality and patient dose.

Method:

The databases of PubMed, and Google Scholar were explored by different combinations of terms: mammography, contrast agent, absorbed dose, and image quality. The obtained results were screened and 16 relevant papers were reviewed full text.

Results:

Iodine, gold nanoparticles, small droplets of perfluorooctyl bromide, bismuth, and a combination of silver sulfide nanoparticles and nickel iron oxide in PEGylated micelles are used as contrast agents in mammography. Iodine is used due to its non-ionic structure and viscosity, for differentiating of malignant and benign lesions. Gold nanoparticles are used at very low concentrations and greatly reduce the x-ray dose. These particles bind to an antibody in the body, creating a significant density in each cell, and increase the resolution of the image. The x-ray absorption coefficient of the small droplets of perfluorooctyl bromide is high and reduces the absorption dose about 30.5 kV while increasing the image resolution. Bismuth, due to its K-edge close to mammography energy, can be a specific contrast agent in detecting breast lesions. The combination of silver sulfide and iron oxide nickel oxide nanoparticles in PEGylated micelles is also an excellent contrast agent with negligible toxicity in mammography.

Conclusion:

The use of contrast agents in mammography is a useful tool for diagnosing and differentiating the benign and malignant breast lesions. In mammography with suitable contrast agent the image quality increases and malignant and benign lesions of the breast tissue are more differentiated by the absorption of contrast media.

Keywords:

Mammography, Contrast agent, Absorbed dose, Image quality.

Paper ID:195

COMPARING THE ACCURACY OF CHEST X-RAY AND SONOGRAPHY IN DIAGNOSIS OF TRANSIENT TACHYPNEA OF THE NEWBORN

Fatemeh Yarmahmoodi*
Radiology Department, Medical School, Shiraz University of Medical Siences, Shiraz, Iran
Seyyed Mostajab Razavinejad
Assistant Professor, Neonatal Research Center, Shiraz University of Medical Siences, Shiraz, Iran

Background:

Transient tachypnea of the newborn (TTN) is a benign condition in term neonate, which is essential to differentiate from other serious diseases cause respiratory distress in term neonates.

Aim:

We aimed to compare the accuracy of chest x-ray and sonography in diagnosis of transient tachypnea of the newborn.

Methods and Materials:

This cross sectional study was done on term neonate who admitted in neonatal wards affiliated to Shiraz University of medical sciences with a diagnosis of TTN (both clinically and radiologically) during one year, from October 2017 to October 2018. Premature neonates, those with congenital heart disease, and complicated TTN were excluded from the study. Chest x-ray finding including lung volume, pleural effusion laminar effusion and fluid in the minor fissure were evaluated. Sonographic findings containing the comet tail artifact were evaluated as a sign of TTN. McNemar's test was used to assess the significance and accuracy of the difference between two diagnosis test. P value with less than 0.05 was considered statistically significant.

Results:

Forty-six neonates were enrolled the study. The mean gestational age was 39wk±4 days. Thirty-six (78.2%) neonates had positive findings of TTN in both chest x-ray and sonography. 80% of the subjects display the characteristic defined by chest x-ray and 97% display the characteristic defined by sonography.

The sonography findings were more accurate than chest x-ray in detecting TTN with odds ratio 9, 95% confidence interval (1.14-71.04), and p=0.021.

keywords:

Transient tachypnea of the newborn (TTN), Chest x-ray, Ultrasound

PaperID:197

RADIATION PROTECTION OF BREAST IN CORONARY CT ANGIOGRAPHY

Reza Malekzadeh*
Department of Medical Physics, School of Medicine, Tabriz University of Medical Sciences, Tabriz, Iran
Parinaz Mehnati
University of Medical Sciences, Tabriz, Iran
Mohammad Yousefi Sooteh
Tabriz University of Medical Sciences, Tabriz, Iran

Background:

CT Angiography is used to imaging arterial and venous arteries using a combination of a multi slice CT scan and angiography. This method is done by injecting a contrast agent (iodine) to detect vascular arrest or to treat small bowel obstruction. Due to the use of contrast agents and long duration of imaging steps in comparison with other medical imaging methods, this is likely due to the high probability of radiation for patients. In order to evaluate breast radiation protection in coronary CT angiography, the use of bismuth composite protectors is a selective method for radiation protection of the patient.

Objectives:

The aim of this study was to evaluate the effectiveness of new bismuth composite to reduce the amount of received dose in the breast during a coronary CT angiography exam.

Methods:

The standard female phantom was scanned using a 128 multi – slice CT scan. The routine chest scanning parameters for adults considered by the machine automatically were used for phantom imaging. The bismuth-silicon composite shield was placed on foam with thickness of 1 cm, and then, it was made to cover the anterior surface of the breasts. To avoid increasing the scan parameters after placing shields were placed after acquiring the CT scout. Dose measurements were conducted by using thermo luminescence dosimetry (TLDs) on the breasts location.

Results:

The breast recorded dose was 9 mSv without using shield. After applying the bismuth composite shield, the average dose rate changed to 7.13 mSv. Therefore, the use of this shield causes 21% dose decline of sensitive breast tissue.

Conclusion:

The results showed that the use of bismuth-silicone shields in the coronary CT angiography, while preserving the diagnostic value of the image, leads to an acceptable decrease in breast received dose.

Keywords:

Breast Cancer Risk, Dose Reduction, Coronary CT Angiography, Composite Shield.

PaperID:199

COMPARATIVE STUDY OF CORPUS LUTEUM ULTRASONOGRAPHIC FINDINGS IN NORMAL AND ABNORMAL PREGNANCIES OF THE FIRST TRIMESTER

Somayeh Hajiahmadi
University of Esfahan
Fariba Alikhani*
University of Isfahan Medical Sciences
Atousa Adibi
University of Esfahan
Pooya Akbari
Medical University of Isfahan

Background:

According to the limited number of studies in this field as well as the contradiction in the results of these studies, we performed this study to investigate corpus luteum RI in normal and abnormal pregnancies of the first trimester and comparison between the two groups.

Methods:

In a cross sectional study, 50 abnormal pregnant and 50 normal pregnant women were selected and were underwent ultrasonography. Blood flow impedance was measured by using the PSV, EDV and RI and the average of three times measuring was considered as the final RI in each patient. Corpus luteum diameter and PSV were also measured in each patient and compared between the two groups.

Results:

The mean of Resistance index, peak systolic velocity and Diameter in the normal and abnormal groups were 0.509±0.068 (P=0.308), 28.71±13.83 and 25.16±13.36(P=0.207), 19.85±5 and 18.86±5.17 (P=0.343) respectively.

Conclusion:

Abnormal pregnancies, which mainly include threatened abortion, blighted ovum, missed abortion are of the most important problems in pregnancy and are a serious challenge among gynecologists. The results of our study showed that the profile of corpus luteum in normal and abnormal pregnancies was not differing significantly.

Paper ID:200

PATIENT DOSE MEASUREMENT IN COMMON MEDICAL X-RAY EXAMINATIONS IN IRAN

Mostafa Lotfi*
Behbahan University
Behrouz Rasouli
Behbahan University
Vahid Hosseini
Behbahan University

Background:

The main purpose of this study was to investigate patient dose in the chest (PA/AP/LAT) and skull (PA/AP/LAT) X-ray examinations, as frequent procedures.

Pations and Methods:

The study was performed in eight public hospitals of Khuzestan province, Iran. Patient dosimetry was conducted on 567 standard patient X-ray examinations (males: 61.2%, female: 38.2%). Dosimetry protocol in this study was indirect method, according to the International Atomic Energy Agency (IAEA) Technical Reports series No.457. Patients weighing 70 ± 10 kg were considered as standard. In the indirect dosimetry approach, exposure parameters such as kVp, mAs, focal film distance (FFD), and tube outputs recorded during data acquisition were used for calculating incident air kerma on the patient's skin, entrance surface air kerma (ESAK) that is recommended by the IAEA as the most appropriate patient dosimetry quantity in simple radiographic examinations. This survey reveals significant variations in the radiological practice.

Results:

Results showed that the parameters set by radiologic technologists change in a wide range: mAs varied from 2 to 80 for skull PA, 2 to 202 for chest LAT, and FFD varied from 50 to 180 for skull LAT projection. The study showed that patient doses in three chest projections exceed the IAEA and European Commission dose reference levels (EC DRLs) — 1.0, 1.12, and 2.20 mGy for chest PA, chest AP, and chest LAT, respectively. Results also showed that mean ESAKs of patients in skull projections were generally lower than the IAEA and EC DRLs, 1.5, 1.72, and 2.25 for skull LAT, skull AP, and skull PA, respectively. This study provides evidence that dose reduction in the simple X-ray examinations is feasible by updating clinical audits and implementation of systematic quality assurance (QA) and quality control (QC) programs.

Conclusion:

The authors recommend that DRLs obtained in this study can be used as local DRLs in Khuzestan area and dose surveys must be performed in all provinces to establish national dose reference levels (NDRLs) in Iran.

Keywords:

Patient dose, Dose reference level, ESAK, X-ray examination, Conventional radiology)

PaperID:204

ENHANCING THE ACCURACY OF DIAGNOSIS USING HYBRID IMAGING SYSTEM

Edris Farhadi *

Background:

In-line combined systems, single-photon emission computed tomography (SPECT) / computed tomography (CT) and positron emission tomography (PET)/CT, allow an instant generation of fused images of scintigraphy and CT data. A primary cause for poor scintigraphic image quality is attenuation. Also prevention of erroneous interpreting for large patients due to artefacts caused by breathing, patient moving or large tissues upon the organ of interest should be considered. Multiple adjacent sentinel nodes should be clearly separated on SPECT images and deeply located nodes, which show only faint activity on planar images, should be clearly seen on SPECT/CT.

Materials and Methods:

The presented article is a systemic review which has done by search in different data bases such as: google scholar and PubMed and Elsevier. In the first stage 31 articles obtained after reviewing abstract 22 articles were selected and reviewed full text.

Results:

Hybrid imaging have shown that attenuation correction almost always facilitates tumor detection. The main reported advantages of SPECT/CT, were spatial localization, separating soft-tissue infection from bone. 18F-fluorodeoxyglucose (FDG) is the most commonly used tracer in routine clinical practice of PET imaging, with high performance in both oncologic and non-oncologic indications. Moreover, comparing side-by-side reading of PET and CT, which were performed separately, to data generated from integrated PET/CT acquisitions in oncologic patients, the latter was found more accurate in the localization of small lesions, lesions adjacent to chest or abdominal wall, and lesions adjacent to mobile organs, such as the diaphragm, mesentery, or loops of bowel. In some patients tumor volume was reduced and directed biopsy sites to regions of highest histological grade by the fused data compared to CT alone

Conclusions:

PET/CT was found to be more accurate in assessing response to treatment in patients compared to PET and CT alone and to side-by-side interpretation. Hybrid imaging improves accuracy of localizing scintigraphic lesions, differentiating benign from malignant sites, delineation of tumor boundaries. Finally it also leads to optimized diagnosis, biopsy, radiotherapy and surgery

Keywords:

SPECT/CT, PET/CT, attenuation artifacts, localizing organ using hybrid imaging, erroneous interpretation

PaperID:205

USE OR NOT USE SHIELD IN CT SCAN?

Mohamad Reza Choopani*
Isfahan University of Medical Science
Jamshid Shoushtarian
Isfahan University of Medical Science
Elham Farjood
Isfahan University of Medical Sciences
Reyhane Rafiee Vardanjani
Isfahan University of Medical Sciences

Background:

Lead shields are intended to reduce radiation for areas in patients not being examined and Bismuth shields intended to limit radiation to areas under investigation. The use of shields has a number of disadvantages that lead to a question: Use or Not Use Shield? The purpose of this study is to answer this question.

Method:

This is a review article that reviews the studies done in this field at various scientific databases. My search strategy at searched the scientific databases were using the MESH terms “Bismuth shield”, “Lead shield”.

Results:

A review of the studies conducted in this field, Shield attenuates photons both entering (from the front), but also exiting (through the front), wasting radiation, Creates beam-hardening, streak artifacts and HU changes, By absorbing low-energy photons

increase the mean photons energy from 69.1keV to 70.5 keV -71.6 keV And when using an AEC, it is necessary to place the shield after the scout image because otherwise the thickness of the examined area is high and the system takes more mA in the imaging. In addition, some studies have been investigated, showed 120 mA, with shield, reduces dose to 44% of original and 80 mA, no shield also reduces dose to 44% of original, better noise, better sectional dose profile, no artifacts, etc.

Conclusion:

The use of shields is limited because of high prices and recent studies also show alternative ways for shields. However recommended that if shield is present in the imaging section and the patient's request to use it, observing Rules for using shield, use it.

Keywords:

Lead shield, Bismuth shield, CT scan

PaperID:209

GENDER DIFFERENCES OF ADULTS' TEMPORAL BONE ON COMPUTERIZED TOMOGRAPHY SCANS

Mohammad Ali Mohammadi Vajari*
Department of Radiology, Iran University of Medical Sciences
Hashem Sharifian
Department of Radiology, Amir Aalam Hospital, Tehran University of Medical Sciences, Tehran, Iran
Maryam Mohammadzadeh
Department of Radiology, Amir Aalam Hospital, Tehran University of Medical Sciences, Tehran, Iran
Mohammad Qorbanisani
Department of Radiology, Zanjan University of Medical Sciences, Zanjan, Iran.
Ghazaleh Tefagh
Student of Medicine, Student's Scientific research Center, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran.

Background:

The skull is one of the most important parts of the body used to determine gender in forensic medicine. Previous studies have focused on cadavers' skulls in races other than Arian race. However we focus only on temporal bone of live Iranian people and evaluate the metric differences between the two sexes in this study.

Materials and Methods:

This is a cross-sectional descriptive analytical study on CT images in Amir Aalam hospital from 2015 until 2017. The sampling method was quota-convenience and temporal bone metric indices were calculated and compared in two groups of men and women. In this study we focused on temporal bone to evaluate its metric sexual dimorphism via measuring 7 indexes on skull CT scans including: lateral angle of internal acoustic canal, length, width and length to width ratio of mastoid process, bone thickness and Hounsfield units of squamous part of temporal bone and the angle between squamous part and zygomatic process of temporal bone. A P-value less than 5 percent has been considered statistically significant.

Results:

In this study lateral angle of internal acoustic canal, length and length to width ratio of mastoid process showed significant differences between women and men while width of mastoid process, bone thickness and Hounsfield units of squamous part of temporal bone and the angle between squamous part and zygomatic process of temporal bone had no significant differences between the sex groups.

Conclusion:

This study showed that certain characteristics of temporal bone alongside other clues can be useful in sex determination, furthermore it has emphasized the importance of sexual dimorphism in human anatomy.

PaperID:229

CLINICAL APPLICATION OF QUANTITATIVE FAT IMAGING IN CHRONIC LIVER DISEASES

Vahid Shahmaei*
(SBMU)

Nonalcoholic fatty liver disease (NAFLD) is a frequent cause of chronic liver diseases. Steatosis, the accumulation of fat-containing vacuoles within hepatocytes, is a key histologic feature of fatty liver disease. Liver biopsy, the current standard of reference for the assessment of steatosis, is invasive, has sampling errors, and is not appropriate in some

settings. Moreover, it can cause morbidity and complications and cannot be repeated often enough to monitor treatment response. Noninvasive methods that accurately and objectively quantify liver fat are needed. Quantitative non-invasive biomarkers of liver fat would be beneficial. MRI methods for detection of liver fat are: Dixon or 'In-phase' and 'out of phase' (IOP) imaging with an echo time at which the fat and water signals are in phase, the signals add constructively and when they are out of phase, the signals cancel. Fat detection is possible by comparing the signal intensity on the in-phase and out-of-phase images. Frequency-selective Imaging Fat quantification may also be performed by acquiring two images, one with and one without a fat-saturation pulse, applied around the CH2 peak to null the dominant component of the fat signal. Complex Chemical Shift Based Water-Fat Separation Methods that can Measure 0-100% Fat and Methods Measure Proton Density Fat Fraction (PDFF). IDEAL IQ provides volumetric whole-liver coverage in a single breath-hold and generates estimated t2* and triglyceride fat fraction maps in a non-invasive manner. The technique is designed for water-triglyceride fat separation with auto t2* correction and estimation based on the IDEAL technique. These techniques permit the breakdown of the net MR signal into fat and water signal components, allowing the quantification of fat in liver tissue, the use of these techniques as a quantitative biomarker of intracellular liver fat hold great promise to provide cost-effective, accessible and accurate evaluation of diffuse liver disease. Potential Clinical Applications for Liver Fat Quantification are Detection and Monitoring of Nonalcoholic Fatty Liver Disease, Monitoring Liver Fat Content to Assess Obesity and Insulin Resistance, Pre transplantation Evaluation of Living Liver Donors, Detection and Monitoring of HIV-associated Lipodystrophy, Monitoring of Hepatic Steatosis Related to Hepatic Neoplasms

Keywords:

Steatosis, liver, Quantitative, MRI, Dixon, fat

PaperID: 230

ADVANCED ULTRAFAST DYNAMIC CONTRAST ENHANCED BREAST MRI

Vahid Shahmaei*
(SBMU)

Dynamic contrast-enhanced magnetic resonance imaging (DCE-MRI) is an important tool for screening high-risk women, evaluating extent of disease in patients with newly diagnosed breast cancer, and monitoring breast tumors during treatment. DCE-MRI provides sensitive and moderately specific characterization of breast lesions when used in conjunction with the American College of Radiology (ACR) MRI Breast Imaging-Reporting and Data System (BI-RADS) lexicon to assess lesion morphology and initial and delayed enhancement patterns. In addition to established diagnostic morphologic features such as margin and distribution DCE-MRI enhancement kinetics have been reported to improve delineation between benign and malignant lesions in multiple studies. One of the applications of DCE-MRI is to quantitatively evaluate tissue perfusion and vessel permeability, where high temporal resolution is needed to estimate the parameters in pharmacokinetic model. In breast MRI, for example, this means that the frame rate should be one dataset every 16 seconds or less, according to a study by Henderson et all. However, in clinical breast applications the acquisition time of each dataset is typically limited to the range of 60–120 seconds due to high spatial resolution requirements. In order to achieve both high temporal and spatial resolution, an efficient data acquisition method is highly desirable. With greater intrinsic signal-to-noise ratio (SNR), acceleration techniques such as parallel imaging and various partial k-space acquisition techniques can be applied in DCE-MRI while maintaining image quality. A novel pulse sequence, TWIST Dixon, which integrates two-point Dixon fat suppression with TWIST to allow DCE-MRI with higher spatial and temporal resolution as well as more accurate fat suppression. TWIST-VIBE sequence improves the temporal resolution of breast MRI while preserving spatial resolution. High-temporal resolution TWIST-VIBE was performed during the initial enhancement phase and high-spatial resolution routine DCE

MRI in a single session, and whether the additional information of initial enhancement analysis using TWIST-VIBE improved the diagnostic accuracy of breast MRI was evaluated. The combination of BI-RADS and new parameters of initial enhancement (MS and TTE) calculated from TWIST-VIBE has the potential to increase the specificity of breast MRI and may be useful as additional information to determine the need for biopsy.

PaperID:232

DIFFUSION TENSOR IMAGING APPLICATIONS IN DIAGNOSIS ALZHEIMER'S DISEASE

Mohammad Farhadirad*
Department of Radiologic Technology, Faculty of Paramedicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.
Mohammad Hossein Jamshidi
Department of Radiologic Technology, Faculty of Paramedicine, Ahvaz Jundishapur University of Medical Sciences,Ahvaz,Iran.

As a neurodegenerative disease, Alzheimer disease entails several pathophysiological changes affecting neurons and axons. Alzheimer disease may be suggested by the combination of hippocampal atrophy and disruption of the neighboring parahippocampal white matter tracts. Inevitably, axonal loss and injury are the result of these degenerative changes that ultimately culminate with cognitive dysfunction and severe dementia. The ability of imaging indices to detect Alzheimer disease at earlier stages may, in the future, allow for interventions that could alter the trajectory of functional impairment. Even though targeted imaging methods such as florbetapir (18F) are now available to image amyloid effectively, the presence of amyloid alone does not definitively diagnose Alzheimer disease, and the addition of Diffusion Tensor Imaging (DTI) could improve sensitivity of amyloid imaging methods. Moreover, neurodegenerative changes and clinical symptoms of dementia may proceed independent of amyloid accumulation. DTI studies in Alzheimer's disease have consistently found white matter (WM) microstructural damage in temporal and frontal lobes, posterior cingulum, corpus callosum, superior longitudinal fasciculus, and uncinate fasciculus, with a posterior-to-anterior gradient of severity. DTI provides detailed anatomical information about the status and directionality of white matter. Determining whether worsening reaction time or memory is related to mild cognitive impairment or "old age" versus a more debilitating dementia, such as Alzheimer disease, provides important information for patients and their families and can guide appropriate treatment strategies. DTI can discern differences in white matter integrity in normal aging compared to mild cognitive impairment and Alzheimer disease. The theory of Wallerian degeneration assumes the loss of gray matter prior to white matter changes, a finding that is subject to much debate but is supported by a large meta-analysis of DTI studies in Alzheimer disease and Mild cognitive impairment. Even despite the presence of multiple studies confirming significant changes in diffusion properties in Alzheimer disease, the clinical application of these findings to individual patients remains difficult. Changes in Alzheimer disease in a singlesubject study were greatest within the posterior cingulate and posterior parietotemporal region, but were relatively minor, pointing to the challenges of detecting subtle changes using DTI on an individual basis. Although no such effective interventions have come to fruition as of yet, imaging with DTI will inevitably also serve a role in assessing treatment response and even perhaps provide information vital to the development of targeted therapeutics for Alzheimer disease.

PaperID:233

DIFFUSION TENSOR IMAGING FINDINGS IN SCHIZOPHRENIA PSYCHIATRIC DISORDERS

Mohammad Farhadirad*
Department of Radiologic Technology, Faculty of Paramedicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.
Mohammad Hossein Jamshidi
Department of Radiologic Technology, Faculty of Paramedicine, Ahvaz Jundishapur University of Medical Sciences,Ahvaz,Iran

Schizophrenia is a disorder of thought, perception, emotion, and behavior affecting an estimated 1% of the population. Patients may experience both "positive" symptoms, such as hallucinations, delusions, altered thoughts and feelings of being controlled, and "negative" symptoms characterized

by withdrawal, flattened affect, and anhedonia. It is the most widely studied psychiatric disorder using Diffusion Tensor Imaging (DTI), with over 300 studies listed on PubMed at the time of writing (early 2015). There are few negative studies, with the majority reporting FA reductions in more than one brain region. Although fractional anisotropy (FA) reduction in frontal and temporal white matter (WM) appears most frequently reported, there are also reports of such decreases in parietal, occipital, and even cerebellar white matter, suggesting widespread diffuse whole brain pathology, consistent with findings of widespread grey matter reductions and functional impairments detected using other imaging modalities. A recent meta-analysis of DTI studies in schizophrenia described two distinct regions where FA was reduced consistently: one in the left perigenual WM of the frontal lobe and a second region, in the medial temporal lobe. The authors postulate that these regions represent two distinct networks that are compromised in schizophrenia, leading to a disconnection of important fronto-temporal grey matter functional areas.

Paper ID:237

ELECTROENCEPHALOGRAPHY-FUNCTIONAL MAGNETIC RESONANCE IMAGING IN IDIOPATHIC GENERALISED EPILEPSY (IGE)

Neda Sameri*
Department of Radiologic Technology, Faculty of Paramedicine, Ahvaz Jundishapur University Of Medical Sciences, Ahvaz, Iran
Mohammad Hossein Jamshidi
Department of Radiologic Technology, Faculty of Paramedicine, Ahvaz Jundishapur University of Medical Sciences,Ahvaz,Iran.

Combining Electroencephalography (EEG) and functional Magnetic Resonance Imaging (fMRI) has opened a new window into the exploration of epileptic discharges, allowing the investigation of the whole brain noninvasively. It has become a clinical tool in the localisation of the epileptic focus and has uncovered unexpected mechanisms in generalised epileptic discharges. While in focal epilepsy the main aim is to identify the brain area of spike generation, in patients with IGE the aim is to identify networks to better understand the pathophysiological background of these epilepsies. IGE is characterised by EEG with generalised spike-wave discharges (GSW) typically arising from normal background activity. Animal models of IGE show that thalamocortical loops play an important role in the generation of GSW. Early EEG-fMRI studies investigated adult patients with idiopathic generalised epilepsy who showed short GSW paroxysms in the EEG. These studies confirmed that the thalamus is activated during GSW, but also showed a deactivation in default mode areas. The GSW-associated decrease in BOLD signal in default mode areas may indicate a disturbance of this physiological resting activity. While these studies were performed on adult patients with long-standing medically treated epilepsy, Moeller and colleagues investigated absences in drug-naïve children with newly diagnosed epilepsy and confirmed a thalamic activation along with deactivation in default mode areas and the caudate nucleus. But how are absences initiated? Animal studies in genetic models of absence epilepsy strongly suggest that GSW are triggered in a restricted region of the somatosensory cortex. A sliding window analysis of human absences showed that default mode areas and the caudate nucleus were involved significantly earlier than the thalamus. Early patient-specific BOLD signal changes could mirror a cortical focus. There are inconsistent results regarding the question whether BOLD signal changes might occur prior to GSW: while preceding BOLD signal changes are reported in some adult patients with GSW, children with polyspike-wave paroxysms and a group analysis of absences, no preceding BOLD signal changes are detected in other studies. Early parietal BOLD signal changes prior to absences support the hypothesis that changes in activity within the default mode areas could facilitate the occurrence of GSW. One might assume that conflicting results may be explained by different analyses techniques and different groups of patients. A recent study showed that it might be possible to detect epileptic activity in the fMRI data without the help of an EEG: based on a wavelet model of the fMRI data, Lopes and colleagues could detect similar results compared to an EEG-based fMRI analysis. Another recent approach uses altered functional connectivity as a predictor for the surgical outcome of epilepsy.
Keywords: EEG, fMRI, Epilepsy.

PaperID:238

FUNCTIONAL MAGNETIC RESONANCE IMAGING IN PARKINSON'S DISEASE

Neda Sameri*
Department of Radiologic Technology, Faculty of Paramedicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran
Mohammad Hossein Jamshidi
Department of Radiologic Technology, Faculty of Paramedicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.

Parkinson's disease (PD) is a progressive neurodegenerative disorder of unknown cause characterized by four cardinal features: slowness of movement (akinesia), rigidity, tremor at rest, and postural instability. Functional neuroimaging techniques, such as positron-emission tomography (PET), single photon emission computed tomography (SPECT), and functional magnetic resonance imaging (fMRI), have been widely used to study function and dysfunction of neural networks. Early neuroimaging studies of patients with PD mainly involved PET measurements of regional cerebral blood flow. Further, fMRI is widely available and has better spatial and temporal resolution, the latter allowing for analysis of event-related activity. This makes PET and fMRI valuable complementary tools for studying changes in neural networks in PD. Resting-state fMRI (RS-fMRI) measures spontaneous low-frequency (<0.1 Hz) fluctuations in the blood-oxygen-level-dependent (BOLD) signal in the whole brain while participants are at rest. These regional BOLD signal fluctuations are temporally correlated within functional brain networks and thus provide an index of functional connectivity. RS-fMRI is particularly suited for functional connectivity studies of the motor system in PD patients with motor disability. Since RS-fMRI does not require patients to engage in a motor task, the connectivity patterns are not confounded by task performance. using pharmacologically modulated fMRI, dynamic changes in neural activity can be assessed by scanning patients during a period from the absence until emergence of involuntary movements. Such studies are necessary to improve our knowledge of pathophysiological changes underlying hyperkinetic movement disorders. Network analyses of resting-state as well as task-related fMRI have been shown to be sensitive to changes caused by PD. Longitudinal studies could help to better understand the effect of progressive neuro degeneration on neural networks and to relate activity patterns to emerging symptoms or side effects. Such studies could render possible to detect patients vulnerable to side effects and used to tailor therapy to the underlying pathology of the individual patient.

Keywords:
fMRI, Parkinson's Disease, progressive neurodegenerative.

PaperID:239

NEURAL RESPONSE TO TONAL-MODULAR STIMULATION: AN FMRI STUDY OF RAW MUSIC

Mohammad Reza Zamani*
Amirkabir Univerity of Technology
Kourosh Abdollahifard
Iran Society of Radiology

For a cheerful life, we use different kinds of pleasure making mechanisms like social inductive and physical pleasure all with natural determined results by overusing, abusing or somehow sub using musical and photographical products in response of sense satisfaction. Seeing, hearing, touching, tasting, smelling are the ways to evoke and make the pleasure in mankind. In this study, we use functional magnetic resonance imaging (fMRI) to explore the functional pleasure and sadness networks in brain while listening to modulated music. We focus on modular stimuli, major and minor modules. In the current paper, we compare neural state images of 10 participants and apply an established music-evoked tonal task in a functional neuroimaging context to identify the brain regions involved in pleasure. The results clearly demonstrate the difference between two modular stimuli, major and minor modules. The involved regions are amygdala, hippocampus, parahippocampal gyrus, and temporal poles, which proves our claim. These structures have previously been implicated in the emotional processing of stimuli with (negative) emotional valence; the present data show that a cerebral network comprising these structures can be activated during the perception of auditory (musical) information. Modulated music showed activations of the inferior frontal gyrus (IFG,

inferior Brodmann's area (BA) 44, BA 45, and BA 46), the anterior superior insula, the ventral striatum, Heschl's gyrus, and the Rolandic operculum. The imaging process has been done in the National Brain Mapping Lab (NBML) with the 3T MRI and the image processing steps have been done using MATLAB 2018, SPM, and DPABI toolboxes. The fMRI task is two musical tracks composed my Piano by one of our group members in Iran.

Paper ID:241

THE ROLE OF HIGH-FREQUENCY ULTRASOUND IN DETERMINING THE EXTENT OF INVOLVEMENT OF ENDOMETRIAL CARCINOMA: A CLINICAL TRIAL

Awat Mamghaderi*
Dr Nahid Ghahremani Imaging Center
Vahideh Alizadeh
Tamin Ejtemayi Clinik, Naghadeh, Iran

Introduction:

Endometrial carcinoma is one of the most common cancers in women that causes more than 30% of women to undergo surgery. Knowing the scope of cancer cells without radiation and expensive methods can help the surgeon in cutting Appropriate surgical area. Objective: Regarding the contradiction in exact methods for finding the limits of carcinoma cells, the aim of this study was to investigate the role of high-frequency ultrasound in determining the extent of involvement of endometrial carcinoma.

Methods:

In this clinical trial study, 50 patients with endometrial cancer were included in the study after available sampling. Prior to surgery, all patients were examined by ultrasonography with high frequency and pathologically. Tumor size was recorded before and after surgery and the results were compared with non-parametric test.

Results:

The mean tumor depth was 19.56 ± 12.23 mm in ultrasound scan and 16.14 ± 8.28 in the pathological method, indicating a significant difference (p= 0.004) indicating the accuracy of ultrasonography is.

Conclusion:

High-frequency ultrasound can be useful in accurately determining the size of cancer cells in women with endometrial cancer for surgical cutting and reducing the complications of other diagnostic methods.

Keywords:

High-frequency ultrasonography, Endometrial cancer, Pathological examination

Paper ID:245

BLOOD OXYGEN LEVEL-DEPENDENT (BOLD) IMAGING OF TUMOR HETEROGENEITY

Mohammad Hossein Jamshidi*
Department of Radiologic Technology, Faculty of Paramedicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.
Ali Fatemi
Department of Radiology, University of Mississippi Medical Center, Jackson, MS 39216, USA

Abstract:

Imaging of intrinsic tissue susceptibility relative to oxygenation using a gradient echo sequence to exploit the paramagnetic effect of varying concentrations of intravascular deoxyhaemoglobin and the resultant effect on the signal returned is also being explored as a potential biomarker of disease aggressiveness and response. This is of interest as tumor hypoxia is a known poor prognostic factor. Increasing levels of deoxyhaemoglobin leads to an increase in the T2 relaxation time of a tissue due to the local magnetic field inhomogeneity and effects on spin-spin relaxation of protons. The quantifying measure usually applied is R2* (1/T2*), calculated from a logarithmic plot of T2* signal intensity against echo time, and is representative of the signal intensity in a particular voxel. Results will be dependent on the concentration of red blood cells present, and by inference, vascular density and blood flow. The majority of the exploration of BOLD imaging as a biomarker has been in the preclinical setting, but several human studies have emerged in recent years. In a study of 107 renal masses with corresponding histological confirmation of pathology, 91 were malignant and 16 benign. BOLD MRI of these masses and calculation of the R2* of the whole lesion found good intra-observer agreement for the measurement using two observers (ICC 0.75, 95%CI 0.69–0.79)

with sensitivity and specificity of up to 71% and 78%, respectively, in distinguishing benign from malignant lesions. The area under the curve equaled 0.79/0.78. A small study of seven women undergoing preoperative neoadjuvant treatment for locally advanced breast cancer utilized BOLD imaging with a 6-minute 100% oxygen breathing challenge at baseline, during and after therapy. The study found that in the three participants who achieved a complete response (CR) to treatment, there was a significantly greater BOLD response to the oxygen breathing challenge at baseline (change in mean signal intensity >12% on oxygen in CR group versus <3% in partial response or stable disease groups, $p < 0.001$). The greatest change in signal was seen within the first 2 min of the breathing challenge. In a group of 24 patients with locally recurrent uterine cervical tumors, one study showed that 22 tumors demonstrated elevated R2* values when compared to benign or fibrotic lesions. This suggested intratumoral hypoxia and decreased tumor perfusion pre-therapy. Subsequently 18 of those 22 cases showed a significant regression in the hypoxic fraction post-treatment, and there was also a positive correlation between pre therapy hypoxia and the decrease in the size of the tumor post-treatment ($p = 0.01$). In three cases non-responsive to treatment, there was a greater chronic hypoxic fraction which did not change post-treatment. Relatively few studies examining the clinical utility of R2* imaging have been carried out in human subjects.

Keywords:
BOLD MRI, Imaging, Tumor Heterogeneity.

Paper ID:246

BRAIN TUMOR RESECTION UNDER INTRAOPERATIVE MRI GUIDANCE

Mohammad Hossein Jamshidi*
Department of Radiologic Technology, Faculty of Paramedicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.
Yazdan Salimi
Department of Medical Physics and Biomedical Engineering, School of Medicine, Shahid-Beheshti University of Medical Sciences, Tehran, Iran.

Abstract:

Currently, there is no generally accepted management standard for primary brain tumors. With the exception of patients with intractable epilepsy and symptomatic mass effect, the role of surgery remains controversial. However, an increasing number of studies suggest a beneficial effect of gross total tumor resection on overall- and recurrence free survival in patients with low- and high-grade gliomas. The fundamental goal of neurosurgery is to target, access and remove intracranial lesions without causing damage to normal brain tissue or vascular structures. The overall concern is the preservation of neurological function, which requires precise delineation of functional anatomy and correct definition of the resection target volume. Intraoperative MRI has become the method of choice for achieving the safest and most accurate resection of glial neoplasms. Visual inspection is often unreliable in distinguishing tumor from normal brain tissue. Compared with visual inspection and other imaging modalities (CT, ultrasound), MRI has a much higher sensitivity in detecting these lesions. However, the usefulness of preoperatively acquired MR images for surgical guidance is limited by changes in brain configuration, which inevitably occur during surgery. At the outset of any given procedure, surgical manipulations and anesthesia result in a change in the anatomic position of brain structures and intracerebral tumors. For example, the initial loss of cerebrospinal fluid (CSF) following a craniotomy, as well as retraction and resection of tissue, tissue hydration state, partial arterial CO2 pressure, all play a role in the intraoperative brain shift. Hence, localization and targeting of brain tumors based on preoperatively acquired images is unreliable. In fact, literature data show that, in the absence of intraoperative image updates, visual inspection of the surgical field alone fails to detect residual tumor otherwise accessible for resection. Another major challenge when attempting gross total tumor resection is determining the relationship between lesion and functionally critical cortical areas and white matter tracts. A recent analysis of a large patient series harboring supratentorial gliomas, operated on with intraoperativeanatomic MRI guidance, has shown that the main predictors for incomplete tumor resection are, besides large tumor volume and oligodendroglioma histopathology, tumor involvement of eloquent cortex and large fiber tracts, such as the corticospinal tract. These findings underscore the importance of multimodal imaging, such as fMR and DTMRI for surgical guidance.

Keywords:
Brain tumor, Imaging, MRI

Paper ID:247

PET/CT-GUIDED PET/MRI IN ONCOLOGIC IMAGING

Mohammad Hossein Jamshidi*
Department of Radiologic Technology, Faculty of Paramedicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.
Yazdan Salimi
Department of Medical Physics and Biomedical Engineering, School of Medicine, Shahid-Beheshti University of Medical Sciences, Tehran, Iran.

Abstract:

PET and MRI are clinically available for roughly 25 years and both modalities are very well established in clinical practice. The clinical introduction of combined PET/ CT was the foundation of the success of hybrid imaging. However, the last decades were also marked by great improvements in MRI as an imaging modality of great clinical importance not only for morphological imaging but also functional imaging. As explained before in "PET/CT-guided" PET/MRI protocols, first a conventional PET/CT scan for staging would be performed, followed by only one bed position in PET/MRI, focusing on one or two body compartments (e.g., chest, liver, or even the whole abdomen) of interest according to the specific clinical question. Such a scenario could make sense, e.g., in primary staging of malignancies of the pelvic in general, like cervical/endometrial cancer, rectal cancer, or prostate cancer, as MRI can provide synergistic information to PET and CT in this area. Moreover, in many cases, MRI would be part of routine staging anyhow, so the time needed for the MRI can be used for the PET/ MRI, and there is no additional scan time needed for the PET component. Also in sarcoma patients, this strategy might make sense, as MRI is part of the standard workup anyway, and for FDG-PET it is known that standardized uptake value measurements can partly differentiate low-grade from high-grade tumors and have a prognostic value in sarcomas. Therefore, the benefits of MRI with its high accuracy in local staging and the benefits of PET, e.g., with the possibility to guide diagnostic biopsies could be combined and, thus, supporting correct staging, grading, and possibly also prediction and follow-up stratification. Another usefulness clinical application is therapeutic response assessment, again especially in soft tissue sarcomas. However, there are many other cancer entities, which would benefit from these imaging capabilities, e.g., neuroendocrine tumors, pancreatic cancer, or primary hepatic cancers. Some possible/future indications will be discussed at the end of this book. If the patients undergo neoadjuvant therapy, like e.g., in rectal cancer or in some cases of sarcomas, then just PET/MRI over the tumor region could be repeated for response evaluation, which would take only about 20 min scan time. In another scenario, PET/MRI would not specifically be used in a "PET/ CT-guided PET/MRI" context but as a general problem-solving tool after single modality imaging (CT or MR). Examples here could be equivocal lesions of the cervix, uterus, or ovaries and pancreatic lesions of uncertain significance or patients which had an MRI of the prostate or the breast and are rated as PRIRADS/BIRADS III. Here, PET/MRI with rather low doses could be performed to gain more information about the lesion in question.

Keywords:

PET/MRI, PET/ CT, Oncologic Imaging.

Paper ID:250

THE ROLE OF MULTIPARAMETRIC MAGNETIC RESONANCE IMAGING IN DIAGNOSIS OF PROSTATE CANCER

Mohsen Shoja*
Semnan University of Medical Sciences
Paniz Malekshahi
Semnan University of Medical Sciences
Fateme Rahimi
Ofoq Medical Imaging Center

Background:

Prostate cancer (PCa) is the second leading cause of cancer-related mortality and the most frequently diagnosed male malignant disease among men in the world. On the other hand, understanding the limitations of tumor detection, particularly in multifocal disease, is important in its clinical application. Scientific work supports the rapidly growing use of multiparametric magnetic resonance imaging (mp-MRI) as the most sensitive and specific imaging tool for detection, lesion characterization and staging of PCa. Use of mp-MRI is likely to increase, and further developments in

the technique will be important for safe adoption of focal therapy concepts.

Objectives:

To quantify MRI enhancement characteristics of normal and abnormal prostatic tissues and to correlate these with tumor stage and histological grade.

Methods:

The articles in this review were based on evaluating the detection accuracy of mp-MRI in prostate cancer. The words "Magnetic resonance imaging, Prostate, Cancer and MRI" were searched on Google scholar and Scopus. Then related articles were reviewed in recent years and all studies were approved by the Local Committee for Health Research Ethics (No.H-1-2011-066).

Results:

The development of mp-MRI offers new possibilities in detection, lesion characterization and staging of PCa due to its high resolution and soft-tissue contrast. It also detects significant prostate tumors more accurately than conventional biopsies alone. Now the limitations of conventional MRI include the lack of information on tumor grade or vascularity, both of which are known to be useful predictors of patient prognosis. Mp-MRI can provide information about the morphological, metabolic and cellular changes in the prostate as well as characterize tissue vascularity and correlate it to tumor aggressiveness. Mp-MRI includes high-resolution anatomical T2-weighted (T2W) and T1-weighted (T1W) images in combination with one or more functional MRI techniques such as diffusion-weighted imaging (DWI) and dynamic contrast enhanced (DCE) imaging.

Conclusions:

Mp-MRI prior to repeated biopsies can improve the detection rate of clinically significant PCa. Mp-MRI can provide valuable information about the histopathological aggressiveness of a PCa lesion and the tumor stage.

Keywords:

Multiparametric magnetic resonance imaging, Prostate cancer, MRI, Conventional Biopsy

Paper ID: 251

DIAGNOSIS OF NON-ALCOHOLIC FATTY LIVER DISEASE BY MAGNETIC RESONANCE ELASTOGRAPHY

Mohsen Shoja*
Semnan University of Medical Sciences
Mahdi Esfahani
Semnan University of Medical Sciences
Fateme Rahimi
Ofoq Medical Imaging Center

Background:

Non-alcoholic fatty liver disease (NAFLD) is one of the most common causes of chronic liver disease in the world and the development of that is associated with an increased risk for morbidity and mortality through hepatic (fibrosis, cirrhosis, hepatocellular carcinoma) and non-hepatic (cardiovascular disease and cancer) complications. The Magnetic Resonance Elastography (MRE) is a phase-contrast-based MRI (Magnetic resonance imaging) technique that can directly visualize and quantitatively measure propagating acoustic strain waves in tissue-like materials subjected to harmonic mechanical excitation.

Objectives:

The aim of the present review is to evaluate the currently available evidence regarding the use of MRE among NAFLD patients.

Methods:

In this review the keywords "Liver disease, NAFLD, Magnetic Resonance Elastography" were searched in PubMed and Google scholar. Finally articles from 2014 to 2019 were evaluated.

Results:

MRE is already being used clinically for the assessment of patients with chronic liver diseases and is emerging as a safe, reliable and noninvasive alternative to liver biopsy for staging hepatic fibrosis. It has a high diagnostic accuracy for identifying advanced fibrosis (stage 3–4). Multiple studies have also shown that MRE provides an accurate biomarker for detecting the presence of fibrosis in patients with chronic liver dysfunction. Indeed, MRE has been reported to be

a useful method for the diagnosis of liver fibrosis in patients with NAFLD, even in the early stages.

Conclusions:

Magnetic Resonance Elastography is considered to be a reliable, highly accurate, and precise method for assessing hepatic fibrosis in patients with Non-alcoholic fatty liver disease.

Keywords:

Magnetic Resonance Elastography (MRE), Non-alcoholic fatty liver disease (NAFLD)

Paper ID: 253

BREAST TOMOSYNTHESIS IN COMPARISON WITH DIGITAL MAMMOGRAPHY IN CANCER SCREENING

Mohsen Shoja*
Semnan University of Medical Sciences
Fateme Tat
Semnan University of Medical Sciences
Fateme Rahimi
Ofoq Medical Imaging Center

Background:

Digital breast tomosynthesis (DBT) with 3D images might overcome some of the limitations of conventional 2D mammography for breast cancer. A limitation of standard 2D mammography is the superimposition of breast tissue or parenchymal density. This may affect both sensitivity and specificity cancer detection. Also It is well established that false-positive mammography findings are associated with increased short-term anxiety as well as significant cost to the health care system. The purpose of this study was to evaluate the screening outcomes of digital breast tomosynthesis compared with digital mammography (DM) for the subgroup of patients undergoing baseline screening.

Objectives:

To compare the change in diagnostic accuracy of digital mammography and digital breast tomosynthesis in women following routine screening. Methods: In this review the keywords " digital mammography, breast tomosynthesis, screening" were searched in PubMed and Google scholar. Finally articles from 2015 to 2018 were evaluated.

Results:

Initial clinical studies of 3D mammography, suggest that addition of 3D to 2D mammography could improve cancer detection and reduce the number of false positives. Digital breast tomosynthesis has the potential to improve the accuracy of mammography by enabling the reader to view x-ray images of the breast tissue as a series of thin reconstructed sections, so overcoming the problem of overlying tissues on conventional two-dimensional images. DBT could increase the efficiency and effectiveness of screening through improvement in both specificity and sensitivity. This review shows that women younger than 50 years who are undergoing baseline screening may benefit more from digital breast tomosynthesis than from digital mammography alone and DBT screening significantly reduces the recall rate for this patients.

Conclusions:

The addition of Digital breast tomosynthesis increases the accuracy of mammography compared to digital mammography alone in the assessment of screen-detected soft-tissue mammographic abnormalities.

Keywords:

Digital breast tomosynthesis, Digital mammography, Screening

Paper ID: 254

PSEUDOACHALASIA DUE TO HODGKIN'S LYMPHOMA IN A CHILD; A CASE REPORT

Maryam Riahinezhad
Uninersity of Isfahan Medical Sciences
Neda Azin*
Radiology Resident
Amirmohammad Ghanei
Radiology Resident

Abstract:

Introduction:

secondary achalasia or Pseudoachalasia is a rare motor disorder of esophagus that caused by malignantor nonmalignant disease. It usually happen in old age.

manifestations of this disease are Dysphagia and significant weight lossand regurgitation that happen in a short duration but aren't specific. Treatment in secondary achalasia is based on the underlying disease management. Case presentation: We reported a 11 year-old male child with no medical history, admitted with presentation Sensible weight loss, diarrhea and Difficulty swallowing.Achalasia diagnosed for him.after more evaluations for determine of secondaryreason of this disease in biopsy from multiple lymph node established Hodgkin's lymphomain patient. So Pseudoachalasia due to Hodgkin's lymphoma was the terminal diagnosis for this patient that regressed after chemotherapy.

Discussion:

Difficult swallowing, dysphagia or weight loss are main symptoms in achalasia. Pseudoachalasia is a rare motor disorder of esophagus that mimics the symptoms of it, in contrast to achalasia, happen more rapid and are more progressive and usually in old age. Pseudoachalasia can be caused by two types of diseases, including malignancies and non-malignant disorders. High-resolution computed tomography (CT), EUS and magnetic resonance imaging (MRI) are useful modalities in diagnosis of Pseudoachalasia. Early diagnosis and treatment are essential for managing pseudoachalasia.

PaperID:255

FIBRODYSPLASIA OSSIFICANS PROGRESSIVA IN A CHILD; A CASE REPORT

Maryam Riahinezhad
Uninersity of Isfahan Medical Sciences
Amirmohammad Ghanei
Radiology Resident
Neda Azin*
Rdiology Resident

Introduction:

Fibrodysplasiaossificansprogressiva is a rare progressive disorder. itoccure sporadically but may be transmitted as an autosomal dominant trait with variable expression and complete penetrance. Main ectopic bone formation in connective tissue and skeletal malformation. itoccure sporadically but may be transmitted as an autosomal dominant trait with variable expression and complete penetrance.

Case Presentation:

A 4years old girl admitted with pain,progressive swelling and stiffness of neck after common cold. She had lymphadenopathy, torticuli and pain at right side of neck with no erythema and warmth. She was first child f family, NVD and her birth weight was 2800gr. She had a historyof a right occipital mass at 6 months old. After more evaluations with radiography, MRI and pathologic she diagnosed a case of fibrodysplasiaossificansprogressiva.

Disccution:

Fibrodysplasiaossificansprogressiva or myositis ossificans progressive is a rare disorder characterized by progressive fibrosis and ossification of muscles, tendon, fasciae, aponeurosis and ligament of multiple sites. It is a disabling and ultimately fatal disease. prevalence of this disease estimated 1 per 2 million. Hallux valgus, monophalangic first toe, shortened metacarpals, pseudoexostosis and macrodactyly of the first metacarp or metatars and neck muscle edema and C2-C7 facet joint fusion are main radiographic feature of this disease. In pathology, nodular fasciitis, fibromatosis and infantile fibrosarcoma are important finding. There is no cure or approved treatment for it.

PaperID:259

PERFORMANCE OF TUNGSTEN, LEAD AND IRON NANOPARTICLE MATERIALS ON RADIATION SHIELDING

Negar Zamani*
Tabriz University of Medical Sciences
Anita Jamshidi
Tabriz University of Medical Sciences

Introduction:

At the onset of radiation exposure, free radicals are formed through ionizing reactions that are then capable of destroying normal tissues. While cells release a level of protective molecules, such as glutathione and metallothionine, they are not capable of blocking all damage, thus resulting in the death

of normal tissues and therefore, we must continue to develop strategies to protect normal tissues from radiation-induced damage. It is widely believed that nano-sized particles are able to disperse more uniformly within the matrix with less agglomerations when compared to macro-sized particles, thus improving the Xray attenuation ability of the material. Moreover, some researchers have also tried to synthesise nano-sized filler-reinforced polymers for radiation shielding by virtue of the size effect in X-ray attenuation.

Material and Methods:

In first study that was done with N.Z. Noor Azman and etal Characteristics of X-ray transmissions were investigated for epoxy composites filled with 2–10 vol% WO3 loadings using synchrotron X-ray absorption spectroscopy (XAS) at 10–40 keV.another study done with El- Zomor St the increment in mass attenuation coefficientsμm and linear attenuation coefficient μby using Lead nanoparticles material with chemical composition (93.69% Pb& 0.86% Al & 5.45% O) instead of bulk lead (Pb)and Iron (Fe) material have been investigated and Mont Carlo simulation model (MCNP5) was provided.

Result:

The results confirmed the superior attenuation ability of nano-sized WO3-epoxy composites in the energy range of 10–25 keV when compared to their macro-sized counterparts. From this study we notice that the valuesof μmand μof Lead nanoparticles material are greater than bulk Lead and Iron material and also the values are decreasing with increasing the photon energy, and its HVL was less than bulk lead and Iron shield.

Conclusion:

This study makes it clear that Lead nanoparticles can be beneficial to address the issues of radiation shielding cost effectiveness. Also showed that MCNP5 is an effective code on Nano size studies and standardized geometry can be useful for further investigations. The work presented in this review article will address the effectiveness of nanoparticles in radioprotection in a variety of cells and in animal models during radiation exposure which will encourage the development of innovative and new approaches to radiation protection, using nanotechnology.

Keywords:
Tungsten, Lead, Iron, Nanoparticle, Radiation Shielding

PaperID: 262

EVALUATION THE CORRELATION BETWEEN THE RADIOGRAPHIC AND CT-SCAN MEASUREMENT OF CARDIOTHORACIC RATIO

Feryal Saadi*
Feryalsaadi
Ghasm Hanafi
Ghasmhanafi
Zohreh Abedifar
Zohrehabedifar

Abstract Background:

Although the cardiothoracic ratio (CTR) is generally considered to be less than 0.5 as a normal heart size based on chest radiograph (CXR), a small number of heart size assessments have been performed using CT-scan.

Objectives:

This study aimed was to evaluate the correlation between the radiographic and CT-scan measurement of cardiothoracic ratio.

Methods:

The study was conducted retrospectively based on the hospital information. The CXR and CT images were performed within a week. For each patient, the CTR was calculated by the ratio of the maximum transverse cardiac diameter (C) to the largest transverse thoracic diameter (T) in both CXR and CT-Scan (T, C) methods. Two methods were used to calculate CTR by CT-scan. In the second method, the long cardiac axis (L) and the short axis (S) were used to calculate CT-Scan (L, S). The correlation of age and CTR was also evaluated.

Results:

122 males and females with age range of 17 to 90 years and mean age of 54.89±18.5345 years were studied. There was no significant difference between the mean age of male and females (P >0.05). Except 9

patients, in all patients (92.62%), the values obtained from CT-Scan (T, C) were equal or smaller than the CXR method, and the difference in mean of CTR between two methods was 1.86% per patient. In all but 3 (97.54%) cases, the values obtained from CT-Scan (L, S) was equal or less than CXR method, and the difference in mean of CTR between two methods was 0.14 per patient.

Conclusion:

The obtained CTR values showed that there was no significant difference between both standard diagnostic methods of increasing heart size, including CXR and CT-scan. There was also a positive and significant correlation between CTR and age. Therefore, CTR can be a convenient and quick way to measure the individual's heart size by using both modalities.

Keywords:

Heart Size, Cardiothoracic Ratio, Chest Radiograph, CT-Scan

Paper ID: 264

COMBINED TEXTURE FEATURE REPRESENTATION OF CT SCAN FOR SEGMENTATION OF NON-SMALL CELL CANCEROUS LUNG NODULES

Mehrdad Taki*
University of Qom
Maryam Taki
Gorgan University of Medical Science

Lung cancer is the leading reason of cancer related mortality in the word. Being 80% to 85% of lung cancers, non-small cell lung carcinoma (NSCLC) is the most common epithelial lung cancerous nodules. Even though the primary lung cancers are widely varying in their histopathological and treatment response, the early detection of them plays a crucial rules in the survival rate. In practice, chest CT (recently low-dose CT) scan could be used as an early diagnosis test for lung cancer, when the lesion is smaller and more curable. Even though the diagnosis of the small nodules in CT scan is always challenging in the radiology, the proficiency of the computer-aided diagnosis (CADx) systems in early detection of them is well investigated in the recent literatures. Different metrics is employed to measure the success of CADx systems, including the accuracy of the diagnosis, the speed, specificity-sensitivity tradeoff, and the automation level. The lung tissue segmentation is the first step of automated system, follow by searching for the nodule in the region of interest (ROI). In this article, a new nodule segmentation on the CT scan of the NSCLC in introduced. A new representation of the CT scan using the optimized combination of texture features is employed to pronounce the nodule in the ROI. Recently, the concept of radiomics, particularly texture features, in discriminating different confounders from the pathologies is extensively dug down. The texture features are used in discriminating benign versus malignant nodules, adenocarcinoma from granuloma, invasive adenocarcinoma from adenocarcinoma in situ. Due to the proved proficiency of the texture features in discriminating different anatomies and pathologies, we proposed to use them in discriminating NSCLCs from the background in the CT scan of the chest. To do so, the introduced method employed the weighted combination of the most informative texture features to introduce a new alternative representation for CT scan of the chest.

Paper ID: 265

BRAIN ACTIVATION DURING IDENTITY EVALUATION: AN FMRI STUDY

Roxana Qazvini, MD*
Ava Roozdar, MD

Aim:

Despite the fact that "self" has attracted the attention of philosophers and psychoanalysts since long ago, it has only recently become a point of investigation in psychiatry and neuroscience. Researchers attempt to discern neural circuits responsible for conception, comprehension and making judgments about self. One essential component of self-evaluation is the judgment made by person about his/her own personal identity. Considering the shortage of studies which focus on personal identity and its neural basis, we decided to design the present study and investigate brain activity during one's identity evaluation.

Method:

15 healthy right-handed subjects participated in this study to undergo an fMRI task, during which each of them made judgment about his/her identity. The task consisted of a series of statements that required a yes/no decision in two conditions: identity evaluation and general knowledge (semantic condition). We presented some statements believed to provoke thinking about identity. Participants were asked to judge whether or not the sentences could define their personal characteristics (identity condition). A number of statements requiring a basic level of general knowledge were used as control.

Results:

Data analysis for the contrast of identity vs. semantic condition revealed brain activation mostly in precuneus, anterior medial prefrontal cortex (MPFC), temporal pole (BA38) and superior temporal gyrus (BA39). Highest activation was observed in precuneus among the mentioned regions.

Conclusion:

The above findings are consistent with previous studies on self-referential stimuli processing and suggest that self-referencial processing of identity is probably correlated with a neuronal network containing the precuneus, anterior MPFC, and superior temporal gyrus (BA38, 39). However, further research is needed to yield supportive information.

Paper ID: 266

EVALUATION OF THERAPEUTIC EFFECTS OF PRP INJECTION ON KNEE CARTILAGE VOLUMETRY USING 3D SLICER, MRI AND CLINICAL FINDINGS IN PATIENTS WITH OSTEOARTHRITIS

Reza Soleimani*
Shahid Beheshti University of Medical Sciences
Seyed Ahmad Raeissadat
Physical Medicine and Rehabilitation Research Center, Shahid Beheshti University of Medical Sciences.
Elham Ghorbani
Physical Medicine and Rehabilitation Research Center, Shahid Beheshti University of Medical Sciences.
Morteza Sanei Taheri
Shahid Beheshti University of Medical Sciences
Seyed Mansoor Rayegani
Physical Medicine and Rehabilitation Research Center, Shahid Beheshti University of Medical Sciences.
Marzieh Babaee
Physical Medicine and Rehabilitation Research Center, Shahid Beheshti University of Medical Sciences.

Many studies have been published for evaluation of PRP injection in knee joint with the focus on clinical symptoms and subjective effects in patients with knee osteoarthritis. Based on these studies we evaluated the radiologic and knee cartilage volumetric effects of PRP injection in knee joints in 23 female patients with grade 1 to 3 of knee osteoarthritis in a double blind randomized clinical trial. All the knees were divided into two groups randomly and exercise was prescribed for both right and left side. PRP was injected twice with an interval of 4 weeks. Clinical findings were recorded with VAS (visual analogue scale) and WOMAC (Western Ontario and McMaster Universities Arthritis Index) and radiologic effects were evaluated with knee MRI, before and 6 months after treatment. Imaging findings were scored according to patellofemoral cartilage volume, subarticular bone marrow abnormality, meniscal integrity and synovitis. patellofemoral cartilage volumetry was done with manual segmentation of cartilage in 3D slicer (an open source software platform for medical image informatics, image processing, and three-dimensional visualization.). All of radiologic scores except subarticular bone marrow abnormality showed significant improvement in

PRP group(p-value<0.05); In comparison with control group, Patellofemoral cartilage volume and synovitis had significant improvement only in PRP group. Mean total of WOMAC and VAS improvements were higher in PRP group (20 ± 3.2 and 12.3 ± 1.6 respectively) comparing with Mean total WOMAC and VAS changes in control group which were 11.61 ± 1.3 and 8.5 ± 1.1 respectively. MRI findings and volumetric evaluation of knee cartilage are good markers for monitoring treatment in knee injections, and were concordant with clinical findings. PRP injection resulted in both clinical and radiologic improvement in patients with knee osteoarthritis.

Paper ID:267

CHALLENGES SPECIFIC TO USING DTI IN THE DIAGNOSIS AND FOLLOW-UP OF BRAIN TUMORS

Mohammad Farhadirad*
Department of Radiologic Technology, Faculty of Paramedicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.
Mohammad Hossein Jamshidi
Department of Radiologic Technology, Faculty of Paramedicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz,Iran.

Diffusion Tensor Imaging (DTI) maps the diffusion process of water molecules in tissue. The technique is mainly used to visualize brain connectivity and the relation between lesions such as brain tumors and the surrounding white matter tracts. DTI can also be used to characterize brain tumor microstructure, which makes it potentially useful in the differential diagnosis of mass lesions in the brain. DTI is readily available on most recent MRI scanners with powerful gradient coil systems. A routine based "DTI sequence" measuring diffusion in 30 directions on a 3 T scanner requires an examination time of about 4–8 min. This short sequence provides all data for the calculation of DWI and DTI parameters. The calculation of apparent diffusion coefficient (ADC) and fractional anisotropy (FA) ratios and corresponding visualizations of tumor morphology on DTI is not straightforward and requires coregistration with other complementary imaging data, such as anatomical images. The calculation of FAtumor/FANAWM and ADCtumor/ADCNAWM ratios requires the delineation of contralateral normal appearing white matter (NAWM). This requires (typically) manually outlining the tumor, NAWM, and edema, which is a time-consuming and challenging process that relies primarily on subjective assessment of tumor borders. Moreover, because white matter adjacent to glioma generally contains different proportions of vasogenic edema and tumor infiltrations, it is difficult to define an unbiased region of interest for valid grouped data analysis. DTI results are indicative for the differential diagnosis of brain tumors, and several studies have demonstrated statistical significant differences between values extracted from DTI-based analyses of different types of brain tumor. However, significant overlap between these values is commonly observed and findings are not always consistent. This suggests that methodological issues may play a significant role. For example, imaging parameters (b-value, signal-tonoise ratio) could be critical determinants for the concentration of the tumor within the white matter, whilst inconsistent regions of interest (ROI) delineation may introduce bias and inaccurate measurements. This lack of specificity makes DTI less suitable to use as a single technique in the context of routine clinical diagnostic work-up of brain tumors. In conclusion, Studies investigating the use of different DTI-derived parameters to differentiate between different types of tumorous and non-tumorous lesions in the brain have yielded promising, but sometimes conflicting findings. Differences in methodological strategies, a lack of standardization, and normative values continue to confound the interpretation of DTI-based results, limiting its utility for assessing the individual patient. Further research using improved analysis and tractography techniques should help to overcome some of these issues in the future.

Paper ID: 268

MAPPING OF RECOVERY FROM POSTSTROKE APHASIA: COMPARISON OF PET AND FMRI

Anita Baradaran*
Department of Radiologic Technology, Faculty of Paramedicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.
Pouya Javanmardi
Department of Radiologic Technology, Faculty of Paramedicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.

One of the common problems after stroke is aphasia. Aphasia is a severely incapacitating symptom of stroke and is a main cause of functional disturbance. Estimates suggest that more than 20 % of patients suffering a stroke develop aphasia and 10–18 % of survivors are left with a persistent speech deficit. Brain mapping studies may be useful as surrogate markers in pharmacological studies targeting stroke recovery. Functional mapping, as it is widely used now, relies primarily on the hemodynamic response assuming a close association between energy metabolism and blood flow. Positron emission tomography (PET) detects and, if required, can quantify changes in cerebral blood flow (CBF) and regional cerebral metabolic rate for glucose (rCMRGlc) accompanying different activation states of the brain tissue. The regional values of CBF or CMRGlc represent the brain activity due to a specific state, task, or stimulus, in comparison to the resting condition, and color-coded maps can be analyzed or coregistered to morphologic images. Functional magnetic resonance imaging (fMRI) measures signals that depend on the differential magnetic properties of oxygenated and deoxygenated hemoglobin, termed the blood-oxygen level dependent (BOLD) signal, which gives an estimate of changes in oxygen availability. The magnitude of these changes in signal intensity relative to the resting conditions are color-coded to produce fMRI images that map changes in brain function, which can be superimposed on the anatomical image. This results in a spatial resolution of fMRI of 1–3 mm with a temporal resolution of approximately 10 s. As fMRI does not involve ionizing radiation and, thus, is also used without limitations in healthy subjects, allowing more rapid signal acquisition and more flexible experimental setups, it has become the dominant technique for functional imaging. There are some advantages of PET, however – physiologically specific measures, better quantitation, better signal to-noise ratio, fewer artifacts, and actual activated and reference values – which support its continued use especially in complex clinical situation and in combination with special stimulating technique, as trans cranial magnetic stimulation (TMS). However, PET provides a more physiologically specific signal, a better signal-to-noise ratio, and fewer artifacts in individual acquisitions. PET also provides actual activated and reference regional values, which may show a better correlation with task performance than the difference signal provided by fMRI. Additionally, magnetic stimulations can be performed during PET examinations. These advantages support its continued use in pathophysiologically complex clinical situations such as stroke and brain tumors, where CBF responses to activation may be altered and may involve unexpected components of a functional network. Finally, the best insights might come from combining result from multiple mapping modalities.

Keywords:
Aphasia, PET, fMRI.

Paper ID: 270

EVALUATING FUNCTIONAL REQUIREMENTS OF RADIOLOGY MODULE IN HOSPITAL INFORMATION SYSTEM SOFTWARE

Mehrdad Farzandipour
Research Centre for Health Information Management, Kashan University of Medical Sciences, Kashan, Iran
Zahra Meidani
Research Centre for Health Information Management, Kashan University of Medical Sciences, Kashan, Iran.
Hamidreza Tadayon
Kashan University of Medical Sciences
Razieh Dehghan Bnadaki
Dr. Shari'ati Hospital, Hormozgan University of Medical Sciences, Hormozgan, Iran.
Monireh Sadeqi Jabali*
Kashan University of Medical Sciences

Introduction:

The radiology module is one of the important modules of the hospital information system that is

used to perform radiological procedures, managing and storing films, providing radiology reports, retrieving patient data and it is essential to meet the users' functional requirement of the radiology department. Therefore, this study aimed to evaluate the radiology module based on the user's functional requirements.

Materials and Methods:

This descriptive cross-sectional study was conducted in 2016. The data were collected using the checklist including 35 functional requirements that were approved by the experts in another study by the researcher. It was completed by visiting the researcher to 16 hospitals where a hospital information system software was implemented and selected in a simple random sampling and by scoring, the score of each requirement was determined. Then, the data were analyzed by descriptive statistics and the average score of each of the requirements was determined. The scores obtained in each requirement were considered 0–20% as very weak, 20–40% as weak, 40–60% as average, 60–80% as good, and 80–100% as very good. Results: the results of the evaluation indicated that the desired requirements had been observed in 65.5% of HIS software. The lowest level of compliance with the requirements of "the ability to declare Repetitive graphs requested to the hospital departments", "the ability to transfer images between different treatment centers and clinics of the requesting physician ", and "the presence of endoscopy and colonoscopy programs according to the needs of the center" With 18.8%, 12.5% and 18.8% respectively. Discussion: Based on the results, the level of compliance users' requirements in the radiology module was good, but to improve the efficiency of the radiology information system, it needs to be improved to a higher level. Keywords: Hospital Information System, Radiology Module, Functional Requirements, Evaluation

Paper ID: 277

EVALUATION OF MRCP AND MRI (DWI) RESULTS FOR PRIMARY SCLEROSING CHOLANGITIS (PSC) IN PATIENTS WITH INFLAMMATORY BOWEL DISEASE AND ABNORMAL LIVER FUNCTION TESTS

Zahra Jahangiri Zarkani*
Department of Radiology, Shahid Beheshti University of Medical Sciences (SBMU)
Farhad Niaghi
Department of Radiology, Shahid Beheshti University of Medical Sciences (SBMU)
Pooneh Dehghan
Department of Radiology, Shahid Beheshti University of Medical Sciences (SBMU)
Sahar Rabani Khorasgani
Department of Radiology, Shahid Beheshti University of Medical Sciences (SBMU)
Hamidreza Mahboobi
Internal Medicine
Amir Sadeghi
Department of Gastroenterology, Shahid Beheshti University of Medical Sciences (SBMU)

Introduction:

Primary sclerosing cholangitis (PSC) is one of the extraintestinal manifestations of inflammatory bowel diseases (IBD), especially ulcerative colitis. By screening IBD patients with imaging modalities, PSC can be diagnosed before becoming symptomatic. The aim of this study was to evaluate MRCP and MRI (DWI) results regarding PSC in patients with IBD.

Materials and Methods:

In this cross-sectional study, 53 patients with IBD who were referred to Firouzgar and Rasoul Akram hospitals in Tehran in 2018 were evaluated. MRCP and MRI (DWI) were performed on all participants to diagnose PSC. The acquired information and the demographic data of the participants were then entered into the SPSS software for analysis. Results Among the fifty-three participants, 28 (52.8%) were male and 25 (47.2%) were female. The mean age of the subjects was 43.49 ± 12.69 years. 86.8% of the patients had ulcerative colitis and 13.2% had Crohn's disease. In 24.4% of subjects, IBD was limited to rectosigmoid and in 37.7% to left colon.

15.1% had pancolitis and in 20.8% there was small intestine involvement. In 39.6% of subjects MRCP was negative regarding PSC, among which 66.7% had negative and 52.4% positive DWI results. MRCP was reported suspicious in 20.8%, among which DWI was negative in 63.6% and positive in 36.4%. Furthermore, 52.4% had positive results in MRCP, among which DWI was negative in 60.4% and positive in 39.6%. There was no statistically significant relation between the results of MRCP and DWI regarding the diagnosis of PSC (P=0.620). Additionally, MRCP and DWI results were not associated with type and extension of IBD (P=0.313, P=0.309, and P=0.287, P=0.853, respectively).

Conclusions:

MRCP and MRI (DWI) results are not significantly correlated regarding PSC. Based on the results of this study, DWI cannot be used as a substitute for MRCP to diagnose PSC.

Keywords:

Primary sclerosing cholangitis, Diffusion-weighted MRI, Magnetic resonance cholangiopancreatography, Inflammatory bowel disease, Ulcerative colitis, Crohn's disease

Paper ID: 30

OPTIMIZATION OF RADIATION DOSE IN ADULT CRANIAL COMPUTED TOMOGRAPHY (CT): ASSESSMENT OF RADIATION DOSE AGAINST IMAGE QUALITY

Farideh Pak*
Tehran University of Medical Sciences. School of Allied Medical Sciences <fpak@sina.tums.ac.ir>
Vahid Changizi
Tehran university of medical sciences, School of allied medical sciences <changizi@tums.ac.ir>
Nnamdi Odinakachukwu Emeka Okoro1
Tehran University of Medical Sciences, School of Allied Medical Sciences <Nas4life2002@gmail.com>
Elaheh Jazayeri Ghareh Bagh
Tehran University of Medical Sciences, School of Allied Medical Sciences <ejazayeri@tums.ac.ir>
Vahid Vaez Zadeh
Tehran University of Medical Sciences, Imam Khomeini Hospital, Cancer Institute, Physics Department <vahid_v79@yahoo.com>

Abstract:

Background:

The rapid use of computed tomography (CT) is of great concern, due to significant increase in radiation exposure to patients, which could lead to deterministic or stochastic effects. Optimizing CT protocols without compromising diagnostic image quality, is a vital method of reducing radiation dose to patients. In this study, performance of one of the Tehran university's hospitals was investigated as regards to radiation dose reduction and image quality.

Materials and Methods:

To evaluate hospital performance, the image quality and radiation dose of applied protocol for cranial CT were recorded and compared with AAPM protocol. One sample t-test analysis was used to compare applied protocol with AAPM protocol.
A dedicated optimization of CT parameters (kVp, mAs and slice thickness) was performed with respect to better diagnostic image quality and dose reduction.

Results:

Increase in mAs at constant kVp and slice thickness results to increase in volume CT dose index (CTDIvol) and dose length product (DLP). Though the applied imaging parameters were lower than the AAPM recommended protocols, images produced were of reasonable diagnostic value. As it was expected, elevation of slice number led to increase in CTDIvol and DLP. Applied protocols were statistically significant ($P < 0.001$) compared to AAPM protocol as regards to kVp, mAs, slice thickness and CTDIvol. Image quality was assessed and satisfied by independent observers.

Conclusion:

AAPM protocols for cranial CT are oriented towards best image quality, but with high patient dose. Using our optimized protocols has shown to decrease patient dose without loss of diagnostic image quality.

Paper ID: 52

COMPARISON BETWEEN ULTRASOUND AND MRI FINDINGS IN FATTY LIVER GRADING

Jamil Abdolmohammadi*
Faculty Member of Medical University of Kurdistan <abdolmohammadi.jamil@gmail.com>
Mohammad Saber Ghaderian
Medical Department <saber2991372@gmail.com>

Abstract:

Background:

Introduction:Ultrasound is currently the most important diagnostic method for determining the degree of fatty liver. MRI, as complementary modality, can also help determining fatty liver. In this study, it is tried to evaluated the fatty liver degree in MRI using two different dual echo sequences (T1w and T2w).

Materials and Methods:

This cross sectional study was Performed on 25 patients from April to December of 2018 in Kowsar MRI Department of Sanandaj city. At first, patients with fatty liver underwent ultrasound by a radiologist and their degree of fatty liver was reported. Then, the levels of fatty liver were measured by 1.5 Tesla MRI Scanner Avanto model by performing T2 HASTE

dual echo and T1w in phase-out phase sequences. The differences in signal intensity of two-images per slice of these sequences were calculated in different lobes of the liver. Finally these findings of MRI images were compared to results of ultrasound.

Results:

The results of this study showed that in patients with fatty liver, the difference in the signal intensity between two images of these sequences has a significant relationship with ultrasound report in determining fatty liver grading.

Conclusion:

MRI as a complementary modality can help determine fatty liver grading.

Keywords:

MRI, Fatty liver, Ultrasound

PaperID: 102

AMID PROTON TRANSFER IMAGING: BASIC CONCEPT AND CLINICAL APPLICATION

Vahid Shahmaei*
(SBMU) <vahidshahmaei.sbmu@gmail.com>
Ahmad Mohammadbeigi
MSc of Medical Physics, Department of Medical Physics, School of Medicine, Kermanshah University of Medical Sciences, Kermanshah, Iran. <frdmbg@gmail.com>

Abstract:

Background:

Molecular imaging using endogenous molecules has generated a lot of interest because the methodology does not have the adverse effects of gadolinium (Gd) contrast agents and has clinical benefits in pediatric patients or patients with a contraindication for the use of an exogenous contrast agent.

Amide proton transfer (APT) imaging has recently emerged as an important contrast mechanism for magnetic resonance Imaging (MRI) in the field of molecular and cellular imaging which has higher sensitivity and spatial resolution than magnetic resonance spectroscopy technique.

Amide proton transfer (APT) imaging is a novel molecular MRI technique that detects low-concentration endogenous mobile proteins and peptides in tissue noninvasively. It can indirectly reflect intra cellular metabolic change and physiological and pathological information in vivo. APT imaging is able to detect tissue pH changes in stroke (where pH decreases) and identify the spatial extent and pathological grade of some tumors due to increased mobile protein and peptide.

APT imaging has added a new dimension to in vivo molecular imaging by its ability to demonstrate mobile proteins and physicochemical properties of tissue. High sensitivity in reflecting protein contents enables various applications in brain tumor imaging and stroke imaging in terms of diagnosis and treatment monitoring.

In this review, we describe the basic concepts of APT imaging, particularly with regard to the benefit in clinics from the current literature .Clinical applications of APT imaging are described from two perspectives: in the diagnosis and monitoring of the treatment response in brain tumor by reflecting endogenous mobile proteins and peptides, and in the potential for stroke imaging with respect to tissue acidity.

PaperID: 119

EVALUATION OF DIAGNOSTIC ACCURACY OF DIFFUSION WEIGHTED IMAGING SEQUENCES IN COMPARISON WITH OTHER SEQUENCES OF MULTI-PARAMETRIC IMAGING FOR DIAGNOSIS OF PERIPHERAL ZONE PROSTATE CANCER

Navid Sarmast Alizadeh*
MSc of Medical Imaging (MRI), HighTech Department Pars Hospital <alizadeh4949@gmail.com>
Fariborz Faeghi
Radiology Technology Department, School of Allied Medical Sciences, Shahid Beheshti University of Medical Sciences, Tehran, Iran <f_faeghi@sbmu.ac.ir>
Mahyar Ghafoori
Uninersity of Iran Medical Sciences <mahyarghafoori@gmail.com>

Abstract

Background: Introduction:

Prostate cancer is the most widely known cancer among men that include 25 percent of all men cancers. One of the most important advantages of

precise diagnosis of this cancer is determine type and importance of treatment. First step for diagnosis of this disease is Digital Rectal Examination (DRE) and Prostate Specific Antigen (PSA) test. But results of this tests is not reliable and have high false positives that may cause unnecessary biopsies and overtreatment. Accordingly multi parametric MRI is used as a non-invasive and precise method for this disease.

The main objective of this study is evaluation of diagnostic accuracy of different sequences of mp-MRI for diagnosis of peripheral zone cancer in prostate. Images of different sequences is reported and statistically analyzed for comparison of different sequences diagnostic accuracy.

Material and method:

The sample size in this study were 42 male patient with an average age of 66.3 who have both mp-MRI and Trans Rectal Ultra Sonography examination. Sequences of mp-MRI included DCE-MRI, MRS, DWI and T2W images. statistical results of any sequences analyzed and compared with the gold standard examination and sensitivity, specificity, diagnostic accuracy and positive and negative predictive value were obtained.

Results:

The sensitivity and specificity values were obtained 63% and 100% for DCE-MRI, 60% and 88% for T2W, 75% and 88% for MRS, 93% and 44% for DWI and 72% and 89% for combination of all sequences respectively.

Discussion and Conclusion:

Multi-parametric-MRI is a helpful non-invasive tool to help with diagnosis of prostatic cancerous lesions in peripheral zone of prostate. Diffusion weighted imaging can be really functional due to its high sensitivity. Some combinations like DWI plus DCE-MRI and DWI, T2WI and DCE-MRI can be great in increasing the sensitivity, specificity and accuracy of mp-MRI in order to be more reliable and optimized.

PaperID: 125

DETERMINATION OF THE INTRAVENOUS UROGRAPHY ENTRANCE SURFACE AIR KERMA (ESAK) DOSE AND RELATED CANCER RISK

Samad Ghasemi*
MS, Department of Medical Physics, School of Medicine Tabriz University of Medical Sciences (Irsa) <ghasemisamad02@gmail.com> ghasemisamad02@gmail.com
Parinaz Mehnati
PhD, Associate Professor, Medical Radiation Sciences Research Group, Department of Medical Physics, School of Medicine, Tabriz University of Medical Sciences, Tabriz, Iran. University of Medical Sciences, Tabriz, Iran <parinazmehnati@yahoo.com>

Abstract:

Background:

Kidney diseases have been increased in East Azerbaijan province, Iran. In this study, the Entrance Surface Air Kerma (ESAK) and cancer risk estimation of patients post IVU imaging procedures were calculated.

Patients and Methods:

Doses of ESAK estimated for 100 patients. Also, cancer risk was calculated during each IVU by Monte Carlo simulation method, CALDose_X software.

Results:

The mean ESAK dose was 18.45 mGy for total IVP imaging process. The mean risk of cancer incidence was 17.6 per 100000 patients.

Conclusion:

These results showed that in IVU high number of images was the main factor for IVU patient dose. Furthermore, the risk of cancer incidence was presented for the first time.

Keywords:

Intravenous urography (IVU), absorb dose of patient, risk of cancer incidence

PaperID: 144

ASSESSMENT OF ORGAN DOSES IN CORONARY COMPUTED TOMOGRAPHY ANGIOGRAPHY

Maede Mahmoodi*
Isfahan University <maedemahmoodi23@yahoo.com>
Ali Chaparian
Isfahan University of Medical Sciences <ali_chaparian@yahoo.com>

Abstract

Background:

Coronary computed tomography angiography (CCTA) is an important diagnostic modality for imaging of the patients with suspected cardiovascular disorders. Now, technological advances with multidetector CT have enhanced the spatial and temporal resolution achievable by CCTA, however these parameters influence the received radiation dose by patients' organs, particularly the organs that directly exposed to x- ray. This study aimed to estimate the absorbed radiation dose of organs that have received the highest dose in patients underwent CCTA.

Patients and Methods:

In this study, 185 patients undergoing CCTA by 64 MDCT scanner (Light Speed VCT GE, Healthcare) were investigated. Scan parameters such as kVp, volume CT dose index (CTDIvol), dose-length product (DLP), pitch factor, anterior-posterior and lateral diameters were recorded for each patient. Absorbed doses of organs was calculated using the ImpactDose program. Then organs with the highest dose were determined.

Results:

Organs that received the highest radiation dose were heart, lung, thymus, adrenal, esophagus, liver and stomach that received doses of 82.00±22.61, 61.42±16.33, 55.03±28.64, 44.90±20.94, 44.52±11.57, 31.83±13.52 and 22.57±11.20 mGy, respectively. For female patients, breast doses were relatively high (52.04±14.08 mGy).

Conclusions:

For reduction of the patient exposure during CCTA, use of several dose reduction strategies such as decreasing the tube current and voltage settings, use of prospective ECG triggering and automatic tube current modulation are recommended.

Keywords:

Organ doses, Computed tomography angiography, Coronary

PaperID: 163

DOSE OPTIMIZATION IN PARANASAL SINUSES BY COMPUTED TOMOGRAPHY, USING ITERATIVE RECONSTRUCTION TECHNIQUE

Rezvan Ravanfar Haghighi *
Medical Imaging Research Center, Shiraz University of Medical Sciences <sravanfarr@gmail.com>
Roya Jafary
Department of Nuclear and Reactor Engineering, Islamic Azad University, Arsanjan 73761168, Fars <royajafary1361@gmail.com>
Fariba Zarei
Department of Radiology, Shiraz University of Medical Sciences, Shiraz, Iran <zareifari@sums.ac.ir>
Alireza Shakibafard
Medical Imaging Research Center, Shiraz University of Medical Sciences, Shiraz <drshakibafard@gmail.com>

Abstract

Background:

Paranasal sinus (PNS) infection is a wide-spread disease which affects human health. Computed Tomography (CT) is an authentic diagnostic method to evaluate PNS infection. Radiosensitive organs such as eyes and thyroid glands, respectively located inside and in the vicinity of the radiation field, have to be protected from the stochastic effects of x-ray, such as cataract and cancer. Iterative reconstruction algorithm is a useful tool for radiation dose reduction without affecting image quality. The aim of this study is to use iterative reconstruction method (IMR) to reduce radiation dose to the patient in CT of PNS.

Methods:

The performance of CT machine, used in this study, was evaluated by quality control tests. Skull bone of human cadaver were scanned with protocols number 1or standard dose (120 kVp, 55 mAs), 2 (100 kVp, 55 mAs) and 3 (100 kVp, 33mAs). Axial slices of the protocol number 1 were reconstructed by FBT while iDose level 3 and IMR level 1 were used to

reconstruct axial slices produced with protocols numbers 2 and 3. Three groups of patients, 4 in each group, suspicious of sinusitis were scanned with protocols 1, 2 and 3. Image quality was assessed subjectively by two expert radiologists.

Results:

The performance of the CT system was verified by the results of the quality control tests. The subjective study showed that the image quality of the axial and coronal CT images reconstructed by IMR level 1 (in protocol number 3) and FBT (in standard or protocol number 1) are comparable. The radiation dose of protocol number 1 is 2.6 times higher than that in protocol number 3.

Conclusion:

Results of this research demonstrates that PNS CT images with 60% dose reduction with IMR level 1 can replace standard protocol with sufficient diagnostic image quality.

Keywords:

Dose reduction, Paranasal sinuous, Iterative reconstruction

PaperID: 213

QUANTITATIVE EVALUATION OF CERVICAL SPINE DAMAGE IN PATIENTS WITH MULTIPLE SCLEROSIS AND ITS CORRELATION WITH EDSS USING DIFFUSION TENSOR MR IMAGING

Amir Eftekhari*
Shaheed Beheshti University of Medical Sciences <amir.eftekhari.m@gmail.com>
Fariborz Faeghi
Radiology Technology Department, School of Allied Medical Sciences, Shahid Beheshti University of Medical Sciences, Tehran, Iran <f_faeghi@sbmu.ac.ir>
Roya Abolfazli
Tehran University of Medical Sciences <abolfazl@sina.tums.ac.ir>

Abstract

Background:

Introduction: Magnetic resonance imaging (MRI) is a powerful tool for diagnosis and follow up in multiple sclerosis (MS). However routine MR images are not able to depict subtle damages in brain and spinal cord white matter, and also there is no correlation between T2 high signal lesions and the severity of symptoms caused by the disease. Diffusion tensor imaging (DTI) is a novel MR imaging technique that can depict subtle white matter changes, and can compensate for weakness of routine MR images in diagnosis and follow up of multiple sclerosis patients. Materials and Methods: 44 patients with multiple sclerosis and 15 normal persons underwent routine MRI and DTI. Images were obtained using 1.5T Optima 450W MR scanner and SE-EPI pulse sequence with 90 diffusion directions. Obtained images was post processed using ExploreDTI software and quantitative DTI metrics were measured in cervical spine MS plaques and normal appearing spinal cord (NASC).

Results:

We found significant decrease in FA and significant increase in MD, AD, and RD in MS plaques and NAWM comparing to normal people. There was a meaningful correlation between MD, AD, and RD values in MS lesions and EDSS. No correlation was found between DTI values in NAWM and EDSS.

Discussion:

diffusion tensor imaging is a suitable diagnostic tool for early diagnosis of multiple sclerosis, and because of the correlation between MD, AD, and RD metrics and EDSS, this imaging technique can be used for better follow up in multiple sclerosis patients.

PaperID: 243

PROTECTIVE EFFECT OF OLEUROPEIN ON RADIATION-INDUCED GENOTOXICITY IN HUMAN LYMPHOCYTES

Fatemeh Amani*
Shahid Beheshti <fatemeamani92@gmail.com>

Abstract

Introduction:

The potential use of flavonoids as a radioprotector is of increasing interest because of their high antioxidant activity and abundance in the diet. The aim of this

study was to examine genotoxic and radioprotective effects of one of the most common flavonoids, oleuropein, a dietary compound is investigated for its ability to protect against Ionizing radiation induced genotoxicity and cytotoxicity in human peripheral blood lymphocytes growing in vitro.

Material and Methods:

Peripheral blood mononuclear cells (PBMC) was obtained from six healthy volunteers (3female and 3 male subjects) aged between 20 and 35 years. All volunteers were non-smokers, The donors consumed no alcohol , not receiving any therapy or medications,nor taking dietary supplements. Human lymphocytes were treated with oleuropein at concentrations (10, 50, 100 ,150 and 200 µM) for 24 h and irradiated with to 1, 2 and 4 Gy gamma radiation. The radiation antagonistic potential of oleuropein was assessed by MTT [3-(4,5-dimethyl-2-thiaozolyl)-2,5-diphenyl-2H tetrazolium bromide] assay.

Results:

The results showed that 24 hr after irradiation, with increasing radiation dose percentage of cell viability was decreased.Observations demonstrated a radiation-dose-dependent decrease in the percentage of cell viability after 24 h. It was found that Using the oleuropein as pretreatment increased increased the percentage of cell viability. LD50/24 h dose was estimated with 2.9 Gy,while 200,150,50 and 100 µM oleuropein pretreatment increased the radiation LD50/24 h to 3.36 ,3.54,3.81 and more than 4 Gy, respectively. The dose modifying factor (DMF) using the oleuropein was calculated as 1.16 ,1.23 and 1.31 and 1.72 for 200, 150 , 50 and 100 µM, respectively. oleuropein (50–200 µM) treatment improved cell viability, A highly significant dose modifying factor (DMF) was attained with oleuropein, particularly at a dose of 2 Gy radiation exposures. Also, treatment with oleuropein (50–200 µM) without irradiation did not show a cytotoxic effect in the human peripheral blood lymphocytes.

Conclusion:

Free radical scavenging and antioxidant activities are the mechanisms that these substances use to protect cells from ionizing radiation. These findings provide a basis for additional studies to help clarify the potential use and benefit of oleuropein as a radioprotector effective. against cytotoxicity and genotoxicity induced by ionizing radiation (IR) in human lymphocytes.These data have an important application for the protection of lymphocytes from the genetic damage and side-effects induced by radiotherapy in cancer patients.

Keywords oleuropein . γ-Radiation.Radioprotective effect .LD50/24 h.DMF

Paper ID: 258

PEDIATRIC CT RADIATION DOSE AT TRAUMA CENTER OF WESTERN IRAN IN COMPARISON TO A PEDIATRIC HOSPITAL USING SSDE

Ahmad Mohammadbeigi*
MSc of Medical Physics, Department of Medical Physics, School of Medicine, Kermanshah University of Medical Sciences, Kermanshah, Iran. <frdmbg@gmail.com>
Karim Khoshgard
Kermanshah University of Medical Sciences <khoshgardk@gmail.com>
Vahid Shahmaei
(SBMU) <vahidshahmaei.sbmu@gmail.com>
Majid Naderi
BSc of Radiology Technology, Radiology Technology Dept., School of Allied Medical Sciences, Tehran University of Medical Sciences, Tehran, Iran. <naderi.majid2029@gmail.com>

Introduction:

Increasing CT scan application increased the cancer risk in pediatric in recent decays. Imaging centers approach for diagnosis of disease cause to different radiation dose to patients. Because of rapid pediatrics body growth, the most important challenge to determining the radiation dose is wide variations of size in different ages. Thus, we used Size-specific dose estimates (SSDE) to achievement more accurate radiation dose assessment. In this study the radiation dose of head examinations of a general hospital (Trauma center of western Iran) is compared to a pediatric hospital to find which one has a better approach for dose management.

Materials and Methods:

We evaluated the total number of 280 CT scans in four age groups (≤1, 2-5, 6-10, 11-15 years.

Number of 35 CT scans selected for every age group in both hospitals, separately. Volume Computed Tomography Dose Index (CTDIV), Dose Length Product (DLP), default phantom (16 or 32 cm) and age were recorded in prepared sheets using PACS viewer. Water equivalent diameter (DW) and SSDE calculated using the AAPM TG-220. Third and first quartile and mean ± SD were acquired using SPSS (SPSS Inc., Chicago, IL).

Results:

Third quartile of SSDE was 19.64, 18.70, 18.49 and 18.13 mGy in general hospital; 13.78, 11.92, 11.94 and 20.77 mGy for pediatrics hospital in age groups of ≤1, 2-5, 6-10, 11-15 years respectively. Third quartile of DLP was 317.4, 344.7, 344.7 and 344.6 mGy in general hospital; 128.5, 136.5, 152.5 and 250.8 mGy for pediatrics hospital in age groups of ≤1, 2-5, 6-10, 11-15 years respectively. Third quartile of CTDIV was 18.3 mGy for all age categories in general hospital; 11.5, 11.5, 11.5, and 21.1mGy for pediatrics hospital in age groups of ≤1, 2-5, 6-10, 11-15 years respectively.

Conclusion:

General hospital gives the higher radiation dose to pediatric for head scans with the exception of 11-15 years' group. Optimizing the protocols according to the patient size is essential in both hospitals. Finally, pediatric hospital has a better dose management for pediatric CT scans.

Paper ID: 34

INCIDENCE RATE OF PHYSICAL AND VERBAL VIOLENCE INFLICTED BY PATIENT AND THEIR COMPANIONS ON THE RADIOLOGY DEPARTMENT STAFF OF EDUCATIONAL HOSPITALS OF MEDICAL UNIVERSITY, KERMANSHAH, 2017

Sogand Abbasi Azizi*
Iran University of Medical Sciences, Tehran, Iran <Kahkeshan1994@gmail.com>
Mohammadrasool Tohidnia
Kermanshah University of Medical Sciences <mtohidnia@yahoo.com>
Samira Ghomshei
Student Research Committee, Kermanshah University of Medical Sciences, Kermanshah, Iran. <www.ghomshei72@gmail.com>
Reza Rostami
Student Research Committee, Kermanshah University of Medical Sciences, Kermanshah, Iran. I <Rezarostami745@gmail.com>
Samira Moradi
Student Research Committee, Kermanshah University of Medical Sciences, Kermanshah, Iran. <msami735@gmail.com>

Abstract

Background:

Objectives: Regarding the increasing risk of violence toward employees in diagnostic and therapeutic centers, radiology staff members are often exposed to forms of violence through direct contact with patients and with many professional stresses. The aim of this study is to investigate the causes and incidence of violence against radiographers in radiology departments of educational centers and hospitals.

Materials and Methods:

In this descriptive-analytic study, violence incidence was investigated in all 121 radiographers working in radiology departments of educational centers of Kermanshah in 2016. Data were collected by a reliable and stable researcher-made questionnaire. Data analysis was also performed using descriptive statistics and T test and Chi-square tests by STATA 11 software.

Results:

The results showed that 72.7% of radiographers had experienced violence in their work environment. Verbal violence (77.3%) was the most prevalent type where patient accompaniments were the most frequent cause of violence (54.7%), most of the violence incidents were at night shift (43.6%) and over-crowdedness was the most common cause of violence in the radiology department (21.0%). The verbal violence against radiographers younger than 40 was significantly higher (P = 0.04) than the age group above 40 years.

Conclusion:

The incidence of verbal violence against radiographers in radiology departments is high which can be reduced by providing adequate human resource and equipment in radiology departments, re-training courses on the prevention and management of violent behavior and the suing the violent events against radiologists.

Keywords:

Physical violence; Radiologists of radiology department; Verbal violence

Paper ID: 39

IMAGING PERSPECTIVE IN ONCOLOGY: APPLICATION OF RADIOMICS IN DIAGNOSIS, PROGNOSIS AND TREATMENT RESPONSE OF LUNG CANCER.

Mahya Naghipoor Alamdari*
Tabriz University of Medical Sciences <naghipoor1997@gmail.com>
Ali Zendeh Ghaem
Tabriz University of Medical Science <a.z.ghaem98@gmail.com>
Samin Nasiri said abad
Tabiz University of Medical Science <s.nasiriabasabad@gmail.com>
Mona Fazel Ghaziyani
Tabriz University of Medical Science <Fazel.Mona@gmail.com>

Abstract

Background:

Lung cancer is one of the most common cancers in the world, accounting for the first place in men

(16.7%) and third in women (8.7%). During the past decades there have been many advances in the field of recognition and assessment of the cancer, such as medical imaging innovated with new hardware, new imaging agents and standardized protocols, allows the field to move towards quantitative imaging methods such as radiomics. Radiomics relies on computers to identify and analyze vast amounts of quantitative image features that were previously overlooked, unmanageable, or failed to be identified by human eyes. In radiomics images are more than pictures, they are data. Radiomics differs from computer-aided diagnosis and detection (CAD) systems. While both use medical images from computed tomography (CT) and magnetic resonance (MRI), CAD systems are designed to detect or diagnose a disease. Radiomics, on the other hand, extracts and stores features for hypothesis testing and to develop decision support tools. Radiomics is intended to supply imaging biomarkers for cancer detection, diagnosis, prognosis, treatment prediction, and monitoring even better than TNM staging. Different imaging modalities are used for radiomics analysis such as CT scan. CT images have a powerful application that exhibit strong contrast reflecting differences in the intensity of a tumor, intra tumor texture and tumor shape of lung cancer. CT provides a picture of the Whole lung nodule to consider cancer heterogeneity. We can infer phenotypes or gene–protein signatures, possibly containing prognostic information, from the quantitative analysis of medical image data. More specifically, it has been demonstrated that major differences in protein expression patterns within a tumor can be correlated to radiographic findings such as contrast-enhanced and non-enhanced regions based on CT data. This may have a clinical impact as imaging is 'personalized medicine', where treatment is increasingly tailored on the basis of specific characteristics of the patient and their disease of course with low cost. In this review, we will look through the steps of radiomics in combination with different biological experiments in oncology, specifically addressing potential applications of CT image in lung cancer and focusing on technical issues

Paper ID: 79

THE USE OF SPLIT BOLUS TECHNIQUE TO REDUCE THE NUMBER OF ACQUISITION PHASES AND RADIATION DOSE (REVIEW ARTICLE)

Mohamad Reza Choopani *
Isfahan University of Medical Science <chmhmd305@gmail.com>
Jamshid Shoushtarian
Isfahan University of Medical Science <jamshid.shoushtarian@gmail.com>
Reyhane Rafiee Vardanjani
Isfahan University of Medical Sciences <azar.rafie@gmail.com>
Maede Mahmoodi
Isfahan University <maedemahmoodi23@yahoo.com>
Foroogh Raeisi Makiani
Ziaye Hopital <r.fooroogh@yahoo.com>

Abstract:

Background:

CT multiphase protocols are essential to characterize lesions in liver, renal, pancreatic and adrenal CT. Typically 3/4 phases are acquired including acquisitions before and after administration of contrast media. Thus increasing radiation dose significantly. In split bolus technique, instead of infusing all the contrasting agents at once, injects it in several times and takes time between Injection times and thus allow a '2or3 in1' acquisition split bolus technique are most frequently used in CT Thorax Abdomen Pelvis and CT Urography acquisitions but this protocols can be applied to liver, neck and pancreatic acquisitions.

Method:

This is a review article that reviews the studies done in this field at various scientific databases.
My search strategy at searched the scientific databases were using the MESH terms "split bolus", "dual phase" , "bi-phase injection" and "single pass".

Results:

A review of studies conducted in this field , the use of split bolus technique or bi-phase injection protocols results in a reduced number of acquisitions without compromising contrast enhancement of the region of interest and reduced radiation dose Up to 53.5% in CT Urography, 43% in CT pancreas and 35-40% for liver CT.

Conclusion:

Bi-phase/split-bolus protocols should be considered as a radiation dose reduction technique. This protocol can be applied to routine CT TAP, CT Urography, CT neck and CT liver &pancreas Without compromise to diagnostic accuracy.

Keywords:

Split-bolus, Bi-phase injection, Single pass, Multiphase computed tomography, Radiation dose

Paper ID: 107

CALCULATION OF EFFECTIVE DOSE IN COMPUTED TOMOGRAPHY BY WINDOWS-BASED SOFTWARE USING COMPARATIVE COMMON METHODS IN ESTIMATING EFFECTIVE DOSE

Iman Azinkhah*
Milad Hospital <imanazinkhah@gmail.com>

Background and Objectives:

The purpose of this study is to develop a Windows-based software to provide a simple way of calculating and comparing a variety of conventional methods for calculating the effective dose of CT scan.

Materials and Methods:

CTDIvol and DLP are commonly used in computed tomography for estimate patient doses and other methods which should be used to estimate the patient's effective dose. In this study, three methods for estimating the effective dose including EDLP, SSDE, and BMI-based estimate, were compared. To perform this comparison in order to provide a simple way to calculate, a windows-based software is designed to provide the basic information in all three ways comparatively. The estimated dose data are gathered, analyzed and compared from 50 patients' chest, abdomen and pelvis. CTDIvol and DLP of All patients are taken from their DICOM data. In the SSDE method, according to AAPM report No. 204, the diameter of the AP and LAT of the patients is measured and in the EDLP method, the coefficients provided by the AAPM report No. 96 are used, and in the third method, Estimating the effective dose is done by calculating BMI in all patients and the obtained coefficients in the same method.

Results:

The estimated values of the chest region, for EDLP were always below ESSDE, while for EDLP in the abdomen and pelvis region were higher than ESSDE. For chest CT scans, the difference between EDLP and ESSDE was close to %21, but in abdominal and pelvic CT scans, it was about %42 in percentage.

Conclusion:

This study shows that SSDE method is one of the simplest methods for calculating effective dose of patients, which is closer to other reports of effective doses. Also utilization of DLP method to calculate the effective dose almost leads to overestimation results. So the study determined that BMI method is a reliable alternative rather than other methods without being underexpose to the radiation.

Keywords:

Effective dose, CTDIvol, DLP, SSDE, EDLP, DICOM, Computed tomography

Paper ID: 113

ROLE OF DUAL ENERGY CT IN HEPATOCELLULAR CARCINOMA

Fereshteh Moradian*
Tabriz University of Medical Sciences <fereshtem052@gmail.com>

Background and objectives:

Hepatocellular carcinoma (HCC) is one of the most common malignancies worldwide.Dual energy Computed tomography(DECT)has made noninvasive and certain diagnostic evaluation of Hepatocellular carcinoma.The aim of this review study was identifying the role of DECT in the diagnosis of HCC.

Materials and Methods:

For this review study we found 50 articles about evaluating of HCC by DECT with entering appropriate keywords.
We selected 10 important ones between them from 2014 to 2018,in databases such as Pubmed, Scopus and Elsevier.

Results:

Dual-energy techniques suggest the possibility of subtracting iodine from contrast-enhanced datasets to reconstruct virtual unenhanced images of the liver paranchyma.Survey examination in patients with a known extrahepatic malignancy to exclude the presence of hepatic and extrahepatic involvement is normally undertaken with a contrast enhanced computed tomography examination.

Conclusion:

Unenhaced and contrast-enhanced scaning protocol helping minimize the radiation dose recived by the patients.DECT which is performed with rapid alternation between two energy levels, can also generate computed monochromatic images,which are less vulnerable to artifacts such as beam hardening and provide a higher contrast to noise ratio than polychromatic images.The respective diagnostic sensitivity and specificty are 81.2%and 65.9% for HCC.

Keywords:

Dual Energy Computed Tomograghy, Radiation Dose,Hepatocellular Carcinoma, Beam Hardening Artifact.

PaperID: 123

CONTRAST AGENTS AND OBSERVING PATIENT SAFETY PROGRAMS IN RADIOLOGY DEPARTMENTS IN KERMANSHAH PROVINCE HOSPITALS

Fatemeh Amiri*
Kermanshah University of Medical Science <fatemehamiri22@yahoo.com>
Mohammadrasool Tohidnia
Kermanshah University of Medical Sciences <mtohidnia@yahoo.com>
Rasool Azmoonfar
Kermanshah University of Medical Sciences <azmoonfar@live.com>
Somayeh Heidari
Ilam University of Medical Sciences <Somaye1190@gmail.com>

Background:

Contrast agents play an important role in increasing the efficiency of diagnostic imaging techniques in the evaluation of vascular lesions, infections and tumors. Annually more than 70 million radiology tests performed using contrast agent materials in the world. Side effects of contrast agent can belief-threaten, so that observing safety guideline prescribed a key role in the patient's health. The aim of this study was evaluation of compliance with the instructions in the use of contrast agent materials in Kermanshah province Hospitals.

Material & Methods:

In this cross-sectional study, five centers that were active in the administration of contrast agents were studied. The data collection tool, a checklist containing 49 safety principle of contrast agent material was administered that after confirming its validity and reliability were used. Data were analyzed using SPSS16 software and findings were presented using descriptive and analytical statistics.

Findings:

Results showed that the average age of the participants

Results:

In this study 33.66 years.54% was male. 81.8% in the Radiology department and 18.2% were working in CT scan centers. 20.5% of prescribers the contrast agent assistant radiologist, and 79.5% was radiographer, respectively. 25% of them had passed training courses dealing with the acute effects of contrast agent. There was not a guideline to identify patients at high risk for adverse events and prevention and management of adverse reactions due to the side effects prescribing of contrast material in the imaging centers. This study showed that the overall safety of contrast agents in radiology departments only 2.3% appropriate and in 97.7% moderate.

Conclusion:

The results showed that the Safety observance of the use of contrast agents is not acceptable in many cases. Pregnancy and lactation control, sterile techniques during catheterization in non-inject able contrast agent was not acceptable. Monitoring the patients, use safety box in case of emergency and skilled use of defibrillator; observe this safety issues was rarely taken into consideration by prescribers of inject able contrast agents. The centers survey shows that there isn't a standard guideline to identify patients at high risk and management of side effects of prescribed contrast agent.

PaperID: 126

SUSCEPTIBILITY WEIGHTED IMAGING: A NEW TOOL IN THE DIAGNOSIS OF PROSTATE CANCER

Navid Sarmast Alizadeh*
MSc of Medical Imaging (MRI), HighTech Department Pars Hospital <alizadeh4949@gmail.com>
Mohamadreza Hosein Shahi
High Tech Dep. Pars Hospital <H10150shahi@gmail.com>
Manijeh Rezazadeh
University of Medical Science of Tehran <sh_rezazadeh@yahoo.com>
Azam Alipour
MRI Technologist <azalipour77@gmail.com>

Susceptibility weighted imaging (SWI) is a method that uses the intrinsic nature of local magnetic fields to enhance image contrast in order to improve the visibility of various susceptibility sources and to facilitate the diagnostic interpretation. It is also the precursor to the concept t of using phase for quantitative susceptibility mapping (QSM). Nowadays, SWI has become a widely used clinical tool to image deoxyhemoglobin in veins, iron deposition in the brain, hemorrhages, microbleeds, and calcification. Susceptibility-filtered phase image is especially sensitive to the differences in local magnetic susceptibility, which can be induced by both a calcification and a hemorrhage 0 SWI has also been used to detect hemorrhage in prostate cancer and to measure prostatic calcification. Conventional MRI techniques (T1WI and T2WI) have been useful in detecting prostate cancer, despite the low specificity in distinguishing prostate cancer from benign prostatic diseases, especially in the prostate peripheral zone. Since prostate cancer tissues are prone to bleeding whereas noncancerous tissues are not, SWI may provide important information for the differentiation of prostate cancer from benign diseases.Using the hemorrhage of prostate on SWI as a biomarker, their results revealed higher sensitivity and specificity for SWI than conventional MRI in the diagnosis of prostate cancer.Traditionally, CT has been used as the gold standard in detecting calcification. Nowadays, MRI is more commonly used in the prostate examination than CT because of its better soft tissue contrast. However, due to the complicated components and various proportions in calcification, the signal intensity of calcification on conventional T1WI and T2WI may vary greatly , making it difficult to detect prostatic calcification using conventional MRI techniques.This enables the easy differentiation of calcification from hemorrhage using SWI and QSM. It has been shown that the filtered phase images could identify prostatic calcification equally well as CT, but were much better than using conventional MRI.

PaperID: 147

PREVALANCE OF SPONTANEOUS PREGNANCY AMONG INFERTILE WOMEN UNDERGOING HSG WITHIN 12 MONTHS POST-PROCEDURE

Fataneh Tehrani*
Department of Reproductive Imaging, Reproductive Biomedicine Research Center, Royan Institute for Reproductive Biomedicine, ACECR, Tehran, Iran <fatanetehrani@gmail.com>
Maryam Niknejadi
Department of Reproductive Imaging, Reproductive Biomedicine Research Center, Royan Institute for Reproductive Biomedicine, ACECR, Tehran, Iran <mniknezhady1390@gmail.com>
Fereshteh Hosseini
Department of Reproductive Imaging, Reproductive Biomedicine Research Center, Royan Institute for Reproductive Biomedicine, ACECR, Tehran, Iran <hosseini.f1346@gmail.com>
Maryam Javam
Department of Reproductive Imaging, Reproductive Biomedicine Research Center, Royan Institute for Reproductive Biomedicine, ACECR, Tehran, Iran <maryam_javam@yahoo.com>

Background:

Investigation of tubal disorders is one of the important steps of infertility evaluation. Despite of the presence of advanced imaging diagnostic methods, HSG examination is the most reliable diagnostic test to assess tubal patency.

Aims:

To determine the chance of spontaneous pregnancy post-procedure of HSG using no drug or surgery intervention and laboratory methods.

Material and Methods:

This was a cross sectional retrospective study on 350 women who underwent HSG at Royan Institute, Tehran, Iran, from April 2013 to September 2013. All these infertile women entered in this study. Patient's history files, HSG images and reports were assessed to collect data. There was a follow-up phone call to each patient to obtain information if pregnancy

had occurred within 3-12 months after performing HSG. Demographic information, HSG findings and prevalence of spontaneous pregnancy were analyzed with SPSS18 software using descriptive statistics.

Results:

In total, 350 infertile women underwent HSG during the study period. 68 women were out of reach and we were unable to follow up their pregnancy, so they were excluded from the investigation. Finally, 282 patients enrolled in this study. 190 (67.37%) patients were referred with primary infertility and 92 (32.62%) with secondary infertility. The mean age of the study population (n= 282) was 30.6 years. Totally, 64 patients (22.69%) got pregnant spontaneously, 35 (54.68%) of them was infertile primarily and 29 (45.31%) of cases had secondary infertility. 55 out of 64 pregnancies (85.93%) occurred within first six months and other 9 cases (14.06%) within second 6 months after HSG. Additionally, 78.18% of these pregnancies (N=43) had occurred early before 3 months following HSG! And fortunately 61 of pregnancies ended to live birth.

Conclusion:

Our study demonstrated that fertility rate increases following performing HSG for infertile women.

PaperID: 155

WHICH IMAGING MODALITY IS BEST TO APPLY FOR PREGNANT PATIENTS?

Sadaf Mardani Afzal*
Urmia Medical Sciences University <sadaf.ma20@gmail.com>
Nasrollah Jabbari
Urmia Medical Science University <njabbarimp@gmail.com>
behnam Ghadimi
Urmia Medical Sciences University <behnam.ghadimi69@yahoo.com>

Background:

During pregnancy and puerperal-period a wide range of physiological and physical changes occur in women. These changes may increase the probability of non-obstetric diseases. The use of diagnostic imaging to detect these conditions has been a perennial favorite for many researchers.
Understanding about effects of ionization radiation on fetus and the dose received by the fetus from various imaging modalities can enable us to choose an appropriate protocol for pregnant patients.

Rationale and Objective:

To delineate the issue further, the present investigation was intended to review imaging modalities in different scenarios for patients during gestation with case of non-obstetric conditions and effects of ionizing radiation on the fetus. This investigation has important implications in radiation safety and use of intravenous contrast agents during pregnancy.

Methods:

The authors reviewed the current literatures regarding imaging of pregnant patients with abnormalities (non-obstetric disorders) and indications of different imaging modalities during pregnancy.

Result:

A careful analysis of the associated trajectory in present studies demonstrates that the exact dose received by the fetus depends on two factors, namely the precise gestational age and examination parameters. Further, the present state of research reveals that according to researches, most radiological examinations are considered to have negligible effects on fetus. The estimated dose for CT scans when fetus is out of field of view is lower than the thresholds inducing malformations and mental retardations. special considerations for decreasing dose should be provided while performing abdomen and pelvic CT scans.
Further, there was no evidence of damaging effects of magnetic resonance imaging (MRI) and ultrasound(US) examinations on fetus.
Iodinated and gadolinium based contrast materials should not be used during pregnancy unless the benefits clearly outweigh the risks.

Conclusion:

To use imaging modalities for diagnosing an adverse condition in pregnant women, US and MRI should be chosen as the preferred examinations since they do not use ionization radiations. While for important clinical diagnosis other examinations might be essential. All attempts are necessary to be made to reduce the transmitted dose to the fetus.

Keywords:

Imaging modality, Pregnancy, Ionizing radiation, Radiation safety, Intravenous contrast agents, Fetus

PaperID: 178

ACCURATE CUSTOM MADE PROSTHETICS BASED ON RADIOLOGICAL IMAGES

Aliakbar Khadem*
Azad University <khadem53@gmail.com>
Jalal Jalal Shokoohi
Iranian Society of Radiology <jalaljalalshokouhi@hotmail.com>
Minoo Tabandegan
Azad University <m.tabandegan@gmail.com>
Atiyeh Falah Tafti
Iran University of Science & Technology <atiyefalah@yahoo.com>
Ghazal Talebsafa
Azad University <ghazaltalebsafa@yahoo.com>

Abstract

Background:

Today using medical imaging for creating 3Dimensional printing human parts, device and prosthesis according to custom designed is a potential to improve surgical procedure and their efficiency. Medical 3D Printing products cusses time consuming, low costly process and accurate techniques employed. There are many types of 3D printers that used in the medical device field which are bio printers. Bioprinting possible creating human replacement organs or limbs, special prosthesis and….. Considering the wide use of 3D printers in medicine field, the accuracy of designing 3D model based on medical data and images in addition to the designer's expertise and precision software requires the acquisition of complete anatomical and physiologicaldata as medical images.

Methods:

As a general pattern for making 3D print models, after determining the construction purpose for a model that is identical with the body or custom prosthesis or special surgical tool, it can be described as this procedure. As usually medical imaging techniques, individually or in combination of some of them such as X-rays, computed tomography (CT) scans, magnetic resonance imaging (MRI) scans and ultrasounds are used to produce the original digital model. So it is important using an algorithm for prevent renewed requirement for a medical imaging scan.
Patient were scanned by computer tomography (CT) and magnified slices with optimum thickness were obtained using a desired filter and then stored in Digital Imaging (DICOM) format. After that the segmented images created as a 3D computerized model. In this next step, design will be optimized in terms of geometry, scale, surface and… . With this 3D model thresholds of custom prosthesis for attaching to bone is ready. Prosthesis is designed based on general parameters of prosthesis which can fix on patient anatomical desired position. At the end of the design phase, the model by STL format is shipped to the 3D printer for creating. This can be due to its geometrical and structural nature, requiring special changes and considerations .finally after some minutes or hours, depending on its size and orientation, model is completed and cleaning is required to remove the support material before the part is ready for use.

Conclusions:

Engineers and medical practitioners often have designs for implants or prosthesis or other medical tools.it is an important issue how should design it for best efficiency and adaptation. Make a 3D custom made prosthesis needs standards radiography images in different views, bone scan, CT or/and MRI. They are includes significant data about desired subjects and its position .The collection of these data are the main source of design and work with a 3D printer.

PaperID: 211

DOSE CONTRAST ENHANCED ULTRASOUND CAN DIFFERENTIATED BREAST MALIGNANT AND BENIGN TUMORS SUFFICIENTLY

Shirin Daliri*
Paramedical Faculty, Tabriz University of Medical Sciences, Tabriz, Iran <shirindaliri1995@gmail.com>
Davood Khezerloo
Radiology Department, Paramedical Faculty, Tabriz University of Medical Sciences <d.khezerloo@gmail.com>

Introduction:

The angiogenesis and dynamic pattern of blood perfusion in the vessels of the breast cancer masses can lead histopathologic information from invasion and tumor growth. Contrast enhanced

Ultrasound(CEUS) as a non-linear ultrasound imaging with microbubbles contrast agent is known as a strong non-invasive method with high sensitivity and specificity in the static and dynamic examinations of blood vessels. Extensive studies have been done to establish a correlation between CEUS data and histopathologic factors of breast masses in order to differentiate between benign and malignant masses. In this overview, the CEUS method is used to detect and differentiate between benign and malignant masses.

Method:

The keywords "breast cancer", "contrast enhanced ultrasound" were entered in the scientific databases of Google scholar, Scopus, PubMed, and Elsevier. About 20 fully relevant articles were extracted and reviewed. Then the sensitivity, specificity and diagnostic accuracy of this method were obtained. Results: In general, in order to correlation between CEUS and prognostic factors of breast tumors two groups of information have been analyzed include of qualitative analysis of vascular perfusion pattern, and quantitative time-related blood perfusion. The Optimal duration of Blood perfusion in breast tissue is an average of 6 minutes that can be divided in Three phases: early, mid and late. In the early phase, there is no significant difference between benign and malignant masses, but in the late phase, malignant masses are hyper-enhanced and have heterogeneous patterns, but benign masses are hypo-enhanced, and their vascular pattern is soft and homogeneous.
Important dynamic parameters include peak intensity (PI), Wash-in-time (WIT), Wash-out-time (WOT) Time-to-peak (TTP) and Area under the Curve (AUS). Malignant tumors have faster TTP time but have longer WIT time than benign masses. The PI , AUS and WOT are larger than benign masses. Nevertheless, there are also false positives that do not comply with the above rules and observations, including fibroadenoma, macinus carcinoma, cystosarcoma phyllodes and lymphosarcoma. commonly, the sensitivity and specificity of the CEUS method in differentiating between malignant tumors from benign are 87% and 97%, respectively, which is 16% higher than Doppler ultrasound. The homogeneous, heterogeneous and marginal enhancement pattern does not have meaningful diagnostic information for differentiating the masses.

Conclusion:

Because of CEUS does not use ionizing radiation, it is becoming a common tool in detecting of breast cancer. The pathological information of this non-invasive meth can lead to correlation of tumor type with prognostic factors. However, due to false positives, its results are still insufficiently reliable for routine clinical use thus need more studies to achieve a stronger standard.

Paper ID: 212

PET RADIONUCLIDES CHARACTERISTICS IN THE PROGNOSIS AND DIAGNOSIS OF GLIOMA

Davood Khezerloo*
Radiology Department, Paramedical Faculty, Tabriz University of Medical Sciences <d.khezerloo@gmail.com>
Reza Alipoor Naseri
Radiology Department, Paramedical Faculty, Tabriz University of Medical Sciences <mektafkral@gmail.com>
Shirin Daliri
Paramedical Faculty, Tabriz University of Medical Sciences, Tabriz, Iran <shirindaliri1995@gmail.com>

Background:

Prognosis and early diagnosis of glioma have an important role in management of treatment. PET provides additional insight beyond MRI into the biology of gliomas which can be used for noninvasive grading, tumor infiltration, post-treatment monitoring and prognostication. Different radiopharmaceuticals have been synthesized for PET, each of these has some advantages and disadvantages in glioma. In this study, the performance of commonly used Radionuclides for glioma imaging with PET method is surveyed and compared.

Materials and Methods:

In this study, published articles with the keywords "PET radionuclide", "glioma" were searched from the scientific databases and then the results were analysis.

Results:

Currently, the most important commercial radiopharmaceuticals used in PET imaging are in two categories: Radionuclides of glucose synthesis

such as fluorodeoxyglucose (FDG), and amino acid based Radionuclides, including: Fluoroethyl L Thymidine (FLT), methyl methionine carbonate (C-MET), Fluoroethylthirosine (FET) and and dihydroxy fluoro-L-phenylalanine (FDOPA). FDG radiopharmaceuticals is not suitable for intracranial imaging, the sensitivity and specificity reorted 53% and 55 % respectively. Amino acid based Radionuclides have less uptake than FDG in the normal brain tissue. FLT is strongly correlated with Ki67 proliferation biomarker. Its sensitivity is 91% in all glioma grades and for grade 3, 4 it is about 100%. Sensitivity of FET, MET and FDOPA are similar and about 95%, but there have a high False Positive cases because of the uptake in fractures, infections and hemorrhage. These radionuclides can indicated infiltrations, but the regions beyond T1 MRI demonstrate tumor tissue at low progression risk. Volume of tumor in these method are correlated with T2 FLAIR.

Conclusion:

There is not still appropriate technique for identification of the PET active volumes, so it seems PET cannot be yet replaced by MRI. For diagnosis it is recommended PET should be combined with MRI.

Keywords:

Glioma, PET imaging, PET Radionuclide

PaperID: 218

EVALUATION OF LUMBOSACRAL ANGLE AS NEW PARAMETERS IN PATIENTS SUFFERING FROM CHRONIC LOW BACK PAIN

Zahra Jan Amiri*
School of Alliead Medical Sciences, Shahid Beheshti University of Medical Sciences, Tehran, Iran <Zahrajanamiri@gmail.com>

Introduction:

The lumbar spine consists of five adjacent vertebrae of the mid-lower vertebral column. They participate in the lumbar lordosis, a natural curve in the spine, that is convex anteriorly. We plan to investigate the radiographic parameters of sagittal axis of the spine to assess clinical correlation.

Methods:

We have prospectively defined three parameters, including lumbar lordotic angle (LLA), lumbosacral angle (LSA) and sacral horizontal angle (SHA). We have enrolled 70 patients with chronic low back pain referred to our neurology clinic in a private hospital in Tehran for radiographical assessment, with 90 cm distant from x-ray tube and further radiological analysis was performed by an expert radiologist to correlate with clinical significance of these patients, compared with 70 otherwise healthy cases in control group. We have used SPSS version 16 and Student T-test and Chi-square test for statistical analysis.

Results:

Our study group consists of 70 patients with chronic low back pain with mean age of 56.3 years and 70 otherwise healthy patients with no complaint of low back pain, with mean age of 60.1 years old in control group. We have found that LSA angle is statistically significant in both male and female patients of case group. (P value < 0.05) Also, we have found that LLA angle is a single factor which is significantly correlated with low back pain in patients in male patients of case group. (P value < 0.05) However, SHA angle did not exhibit statistically significant correlation in patients with chronic low back pain in both groups. (P value $= 0.091$).

Conclusion:

In this prospective study, we have correlated radiographic features of lumbosacral structure of patients suffering from chronic low back pain and we have found statistically significant correlation between LSA in both genders and LLA in male patients and these finding may prompt the importance of further evaluation and investigation of bony structure of spine for better understanding and management of these patients.

PaperID: 252

THE EFFECT OF GOLD NANOPARTICLES ON THE IMPROVEMENT OF CANCER TREATMENT

Mohsen Shoja*
Semnan University of Medical Sciences
<moh3n_sh_66@semums.ac.ir>
Maryam Amerian
Semnan University of Medical Sciences
<Maryam.amerian90@gmail.com>
Fateme Rahimi
Ofoq Medical Imaging Center <roksana202moon@gmail.com>

Background:

The enhancement of radiation dose in tumors loaded with High-Z materials have been attempted for several decades, the emergence of new gold nanoparticles (GNPs) with biocompatible characteristics has motivated scientists to investigate their applications in conjunction with radiation therapy. Application of tumor-specific nanoparticles in radiation therapy has aimed to improve the radiation therapy outcomes by inducing more toxicity for tumors and less for normal tissues. Gold nanoparticles have been explored for tumor targeting, tumor imaging, and photo-thermal therapy of cancer due to their unique physicochemical and optical characteristics.

Objectives:

In this review, the studies on GNP and its applications in treating cancers were reviewed and the advantages and controversies were discussed, it examined whether the use of these gold nanoparticles is harmless to humans, whether there are short-term and long-term complications and whether this is a better way to treat cancer or not. Furthermore, Various therapeutic applications of the GNPs for cancer treatment were illustrated.

Methods:

This systematic review is about the effect of gold nanoparticles on cancer treatment. The Keywords were searched in PubMed, Google Scholar and Scopus according by MeSH keywords. Finally articles from 2014 to 2018 were evaluated.

Results:

Many studies have shown that the radiotherapy in association with GNPs killed significantly more cancer cells compared to those without GNP. Photothermal therapy with gold nanoparticles showed cancer cell destruction and in vivo effects ranging from tumor volume regression to complete remission. Nanoparticles can enhance the dose deposition phenomenon in GNP loaded tumors. But there are controversial results about the impact of photon energy and GNP size in recently published articles. Also, more biological experiments on cell lines and animal models are required to clarify the observed differences in dose enhancement effect concerning the magnitude of enhancement effect and impact of cell type in GNP-based radiation therapy.

Conclusions:

Gold nanoparticles are suited well for cancer therapeutics due to their higher biocompatibility and lesser toxicity. They can be utilized actively or passively both for the targeting of tumor cells, and effectively eliminates cancer cells without the need for high-power x-ray or multi-step therapies.

Keywords:

Gold nanoparticles, Cancer, Radiation, Treatment

PaperID: 256

IDOSE4, ITERATIVE RECONSTRUCTION TECHNIQUE IN PHILIPS CT SCANNER : BREAKTHROUGH IN IMAGE QUALITY AND DOSE REDUCTION

Omid Seraydarmansour*
(Taimaz) <mansour.omid@yahoo.com>

Abstract

Background:

Dose management is simplified with Philips Healthcare's Dose Wise philosophy [8] and theadvances embodied in the Ingenuity, Brilliance,and Mx CT platforms. Multiple components of the imaging chain have been enhanced to increase volume imaging speed, dose efficiency, and image quality, thereby

enabling opportunities for lowerdose scan protocols. As the performance of the imaging chain was increased, the limitations of image quality resulting from conventional filtered back projection (FBP) reconstruction algorithms — especially at lower doses — became apparent.
In this article, we provide an in-depth review of an innovative, 4th generation iterative reconstruction technique. iDose4 — the latest addition to Philips'DoseRight tools — that provides significant improvements in image quality combined with dose reduction capabilities.

Generations of Reconstruction:

1st-Generation Reconstruction:
Filtered back projection filtered back projection (FBP), while fast and fairly robust at routine radiation doses, is prone to image noise and artifacts that result in non-diagnostic images at extremely low doses. The clinical example in Figure 3b-c demonstrates an ultra-low-dose acquisition (93% dose reduction, 0.4 mSv) where FBP (fig. 3b) results in a significant increase in artifacts and quantum mottle noise relative to the routine-dose acquisition (fig. 3a). 4th generation iterative reconstruction techniques, such as iDose4, prevent artifacts and limit quantum mottle noise, thus providing images (fig. 3c) that are diagnostically equivalent to the routine-dose acquisition.

2nd-Generation Reconstruction:
Image baseddenoising / filtering:
Recent 2nd-generation implementations involve iterative noise reduction techniques [12, 13]. These techniques permit moderate dose reductions and remove some of the increased quantum mottle noise; however, these techniques are severely limited in their ability to reduce photon starvation artifacts, such as the streaks and image bias that commonly occur with aggressive dose reductions. Image-based artifact correction techniques may reduce the intensity of these artifacts; however, they are unable to reveal underlying clinical

3rd-Generation Reconstruction:
Basic Iterative Reconstruction Techniques
These 3rd-generation reconstruction techniques provided better reduction of streak artifacts and quantum mottle noise; however, these techniques result in (a) loss in spatial resolution (b) do not correct or prevent bias artifacts (c) shift in noise power spectrum.

4th generation Reconstruction:
iDose4 Iterative Reconstruction Technique:
iDose4 is a 4th generation reconstruction technique that provides significant improvements in image quality and radiation dose reduction.

PaperID: 274

SMART RADIOLOGY: THE EFFECT OF ARTIFICIAL INTELLIGENCE ON REQUESTS AND REPORTING OF BRAIN CT-SCAN

Hamidreza Tadayon*
Kashan University of Medical Sciences <tadayon1363@gmail.com>
Gholamreza Khadem
Shabih'khani Hospital, Social Security Organization <reza.rezaii6@gmail.com>
Sayed Mohammad Valiollahi
Shabih'khani Hospital, Social Security Organization <rezakhadem1965@gmail.com>

Background:

Smart systems are human-based simulated systems that manage the collection and processing of data, and provide suggestions to decision makers based on a rigorous judgment. Brain CT is a non-invasive diagnostic imaging that uses X-rays to provide brain images with details of tissue and brain structure. Several studies have shown that the use of this procedure, in many cases, is done without indications, so the Canadian Association of Radiologists has reported that 10 to 20 percent of the diagnostic imaging measures are requested inappropriately. The aim of this study was to evaluate the effect of computerized computer systems on the request and interpretation of brain CT-scans.

Methods:

This review study was conducted in 2018. Data collection was performed using the relevant keywords and by searching related scientific resources in the ISI, Pubmed, Scopus, and Embase databases. The retrieval resources by the two researchers were analyzed separately and the findings were presented in two separate sections: impact of artificial intelligent systems on the request for brain CT-scan and its impact on the interpretation of brain CT.

Findings:

Several studies have shown that with the implementation of Clinical Decision Support Systems (CDSS), the amount of inappropriate and unnecessary CT-scans has significantly decreased. This decline was due to the complete alignment of decision support systems with CT requesting guidelines and the provision of guide-based suggestions to caregivers. This raises the efficiency due to the efficient use of resources. Also, the use of intelligent radiology software provides ease-to-use interface to radiologists that can use it to prepare and report structured reports from complex cases. This could reduce the workload of radiologists. Examples of software in the full text of the paper are ready to present.

Conclusion:

Although information technology is trying to serve as a useful tool for the medical community, it is important to note that all intelligent tools are only auxiliary tools that serve doctors and can never replace them. The artificial intelligence tools in the field of radiology are also designed and implemented as an auxiliary tool in the community of radiologists to enhance their efficiency and reduce their workload.