ABSTRACT BOOK

38th IRANIAN CONGRESS OF RADIOLOGY

20th IRANIAN CONGRESS OF RADIOGRAPHIC SCIENCES ASSOCIATION

9-12 May 2023

ISSN:2588-5545

مسئولیت محتوای خلاصه مقالات بر عهدهٔ نویسنده مسئول مقاله می‌باشد.

General Information

Venue.
International Conference Center of Tehran Milad Tower, Tehran, Iran
Organizer:
38th Iranian Congress of Radiology (ICR 2023) is organized by the Iranian Society of Radiology.
Date:
May 9-12, 2023
Language
The language of the congress is English and Persian
Secretariat Registration
Registration fee includes: • Admission to scientific sessions and commercial exhibition
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 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 ICR2023 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 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.isr.org.ir.
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 the lobby of conventional Center. 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. مسـئولیت محتـوا و نـگارش بـر عهـده نویسـنده مسـئول مقاله می باشـد.

List of Top 5 Scientific Abstracts of ICR2023

Effectiveness of Pelvic Ultrasound in the Diagnosis of Central Precocious Puberty and Differentiation from Similar Conditions
Elham Zarei
Comparison of Mammography and Electroimpedance Mammography as a Breast Screening Modality
Nasrin Ahmadinejad
Temporal Changes of Lung Computed Tomography Findings Pulmonary COVID-19 Infection
Bita Abbasi
Trastuzumab Conjugated PEG-Fe3O4@Au Nanoparticles as an MRI Biocompatible Targeted Nano-Contrast Agent: In-vitro and in-vivo Study
Tohid Mortezazadeh
Evaluating the Temporal Changes of Sinus Density in Patients with Acute Cerebral Sinus Vein Thrombosis
Bita Abbasi

ICR 2023

INVITED SPEAKER ABSTRACTS

SCIENTIFIC ORAL ACCEPTED ABSTRACT ICR2023

POSTER ACCEPTED ABSTRACT OF ICR2023

INVITED SPEAKER ABSTRACTS (20TH IRSA)

SCIENTIFIIC ORAL ACCEPTED ABSTRACTS (20th IRSA)

SCIENTIFIIC POSTER ACCEPTED ABSTRACTS (20th IRSA)

INVITED SPEAKER ABSTRACTS

Dental Imaging & OPG: What a Radiologist Should Know about Practical Tips of Taking Optimal Images and Medico Legal Aspects*

Mehrdad Panjnoush, MD

Associate Professor
Tehran University of Medical Sciences (School of Dentistry), Tehran / Iran

Abstract:

Dental radiographs are essential to providing comprehensive patient care. Radiographs allow clinicians to see conditions invisible to the naked eye and, when combined with oral assessments, provide valuable information about the patient's health. Dental imaging includes intraoral techniques, such as bitewing and periapical X-rays, along with extraoral techniques, such as cephalometric and panoramic images. Intraoral radiography enables clinicians to clearly see the dentition and supporting structures, as well as diagnose alveolar bone loss and caries. Extraoral radiography, including panoramic imaging, provides a larger field of view and assists in diagnosing conditions of the maxillofacial region.

The aims of this lecture regarding intra- and extra-oral imaging are the following tips:

- The purpose of dental and panoramic radiography in dental practice.
- The formation of the dental and panoramic images and correct imaging techniques.
- Errors commonly made when capturing dental and panoramic images,
- Last but not least, the points to be mentioned regarding the interpretation of dental and panoramic images will be discussed.

MSK Nuclear Medicine Imaging: What Radiologist Needs to Know

Mahasti Amoui, MD

Associate Professor of Nuclear Medicine
Shohada-e Tajrish Hospital, Shahid Beheshti Medical University of Sciences

Abstract:

Bone scintigraphy with technetium-99m–labeled diphosphonates is one of the most frequently performed in Nuclear Medicine Departments. Whole body bone scintigraphy is not specific, but its excellent sensitivity makes it useful in screening for many pathologic conditions in a single examination. Moreover, some conditions that are not clearly depicted

on anatomic images can be diagnosed with bone scintigraphy.

Bone metastases typically appear as multiple foci of increased activity randomly scattered prominently throughout the axial skeleton, although they occasionally manifest as a single lesion or areas of decreased uptake. Bone scintigraphy is also useful for evaluating disease extension and their malignant changes in polyostotic benign tumors as exostosis and in Paget disease.

Tri-phasic bone study is carried out immediately after radiotracer injection and imaging of perfusion, blood pool and delayed bone uptake. A combination of focal hyperperfusion, focal hyperemia, and focally increased bone uptake is virtually diagnostic for acute osteomyelitis in patients with nonviolated bone. Traumatic processes can often be detected, even when radiographic findings are negative. Most fractures are scintigraphically detectable within 24 hours, although in elderly patients with osteopenia, further imaging at a later time is sometimes indicated. Athletic individuals are prone to musculoskeletal trauma, and radionuclide bone imaging is useful for identifying pathologic conditions such as plantar fasciitis, stress or occult fractures, “shin splints,” and spondylolysis, for which radiographs may be nondiagnostic. Bone scintigraphy could reveal avascular necrosis in patients with negative radiographs. Aging of vertebral compression fracture and battered child syndrome and are important entities for patient management and in forensic medicine.

Radionuclide bone imaging will likely remain a popular and important imaging modality for years to come.

Ultrasound of Elbow, Wrist, and Small Joints

Masih Rikhtehgar, MD

Assistant Professor of Radiology
Iran University of Medical Sciences

Ultrasound Examination of elbow and wrist allows a low-cost, non-invasive and dynamic evaluation of tendons, nerves, and ligaments.

Higher resolution of surface structures and dynamic capability of ultrasound makes it unique tool for evaluation of common pathologies of elbow and wrist to name a few medial and lateral epicondylitis, nerve entrapment and instability, arthritis, bursitis can be diagnosed with ultrasound with high specificity and sensitivity high frequency linear probe (7-15MHz) should be used in elbow and wrist, however, probes with smaller footprint are more suitable for small joints such as wrist in this lecture we divide elbow to 4 compartments as Anterior, Medial, Lateral and Posterior and show how to evaluate each compartment and its anatomic structures,in wrist section, dorsal and volar components are evaluated at the end common MSK procedures of elbow and wrist are reviewed

TFCC Tear Imaging

Masih Rikhtehgar, MD

Assistant Professor of Radiology
Iran University of Medical Sciences

TFCC is a cartilaginous and ligamentous structure in the ulnar side of the wrist that acts as stabilizer and shock absorber of carpus.

Considering various anatomical components, MRI is a problem solver in TFCC pathologies which is a quite common cause of ulnar side wrist pain.

The pathology of TFCC can involve any component and can be traumatic or degenerative in nature.

In this lecture we present a brief introduction to TFCC normal anatomy and common pathologies focusing on pearls and pitfalls:

- Technique and MRI sequences
- Normal anatomy of TFCC complex
- TFCC tear and pitfalls
- Palmer classification
- Differential diagnosis and mimics
- Case presentation (pictures based and DICOM files)

Knee Ligaments Tips and Pearls

Mohammad Reza Movahhedi, MD

Paytakht Mediacal Imaging Center, Tehran

The most important ligament injury in the knee joint is ACL tear which is common in athletes so proper diagnosis is crucial for appropriate treatment and maintaining the sports activity of the patient.

I will talk about MRI findings in ACL tear including primary and some of secondary signs and more importantly the possible associated injuries in ACL tear including meniscal tear which is seen in approximately 40 – 80% of the patients and also posterolateral and anterolateral corner injuries.

We discuss the important hints we should remember while reporting ACL tear that will help the physician and the patient for a better prognosis of treatment.

I will then discuss the medial supporting structures of the knee including MPFL and also the important hints that we should remember while reporting

Meniscal Injury: Radiologist and Knee Surgeon Common Session and Panel

Leila Aghaghazvini, MD
Pooneh Dehghan, MD
Seyed Hassan Mostafavi, MD
Arash Sharafat Vaziri, MD
Sohrab Keyhani, MD

Meniscal injury and tearing is an important subject. Determining the accurate description and classification of tear pattern could help in surgical and treatment planning.

On the other hand there are some normal variants can predispose to tearing and also some normal anatomic structures can mimic tearing so it is crucial to be familiar with these items.

MRI is the modality of choice for evaluating of meniscal tears and treatment approaching.

In this panel we will discuss the most challenging types of meniscal tears with focus on surgeon point of view and review some cases.

MRI of Thumb UCL Tears

Shahriar Kolahi

Assistant Professor of Radiology
Tehran University of Medical Sciences
Imam Khomeini Hospital Complex, Tehran, Iran

Ligamentous injury of the thumb and capsular disruption are often subtle enough to be missed.

In this tutorial we will discuss anatomy, etiology and clinical features of normal and injured Ulnar Collateral Ligament of Thumb. We will also discuss classification of UCL injuries and review MR findings of normal and injured UCL.

Capsule of 1st metacarpophalangeal joint, UCL and adductor aponeurosis are all will be accounted for in this tutorial and some MR imaging review will be held.

We hope that this tutorial brings off a thorough explanation about UCL and its injuries.

Lateral Hindfoot Impingement

Leila Aghaghazvini, MD

Professor of Radiology
Tehran University of Medical Sciences, Tehran, Iran

Extra articular hind foot impingement is a non- traumatic type of impingement results from lateral contact of bony structures due to valgus deformity and is defined as talo-calcaneal impingement and calcaneo-fibular impingement or both of them, So we could follow specific involvement in talocalcaneal and sub-fibular region.

In this presentation we will describe the terminology and pathology and discuss about the mechanism and imaging finings with focus on MRI

MRI of Common Pathologic Conditions of Meniscus, Cruciate Ligaments, and Posterolateral Corner Ligaments

Reza Alizadeh, MD — Ex-Assistant Professor of Iran Medical University

1. At first a brief normal anatomy of meniscus, anterior and posterior cruciate ligaments and posterolateral corner knee ligaments will be reviewed.
2. Then MRI finding of meniscal injury and normal variation of meniscus such as
   a) discoid meniscus
   b) longitudinal, horizontal, radial, flap tears
   c) complication of meniscal tear such as parameniscal cyst will be presented.
3. Then ACL injury such as
   a) partial and complete tear
   b) direct and indirect signs of ACL tear
   c) and differential diagnosis like mucoid degeneration of ACL will be discussed.
   d) Normal Post-operative change of ACL graft and MR imaging of ACL graft retear also will be reviewed.
4. Then interesting cases of posterolateral corner injury such as
   a) fibular collateral ligament tear,
   b) popliteal tendon tear,
   c) popliteofibular ligament tear,
   d) arcuate ligament
   e) popliteomeniscal fascicles
   f) and biceps tendon tear cases will be presented.

Spinal MRI Degenerative and Traumatic Disorders: Practical Points in Reporting.

G. Reza Bakhshandehpour, MD, IBR. — Parseh Medical Imaging Center, Tehran. Iran
M. Reza Movahhedi, MD, IBR. — Paytakht Medical Imaging Center, Tehran. Iran
Amir Bakhshandehpour — Hacettepe University Medical School, Ankara. Turkey
Ali Bakhshandehpour — Başkent University Medical School, Ankara. Turkey

Back pain is a prevalent medical condition that affects people of all ages and backgrounds. However, as experienced radiologists know, interpreting spinal MRI findings may not be as straightforward as it may seem. It requires a profound understanding of various factors, such as damage to skin, muscles, and ligaments, anomalies in facet joints and their orientation, and DJD changes in vertebral bodies. Additionally, discopathies,

adjacent vessels and nerves, and disorders of the abdominopelvic structures from the infracostal level superiorly to the inferior gluteal folds inferiorly can all contribute to back pain.

Furthermore, the leading causes of low back pain, such as disk bulge, disk protrusion, and even disk extrusion, are also visualized in asymptomatic persons and are not specific findings. Additionally, approximately 30% of patients with clinical symptoms may have normal MRI or CT scans in the supine position. Therefore, it is crucial for radiologists to understand the limitations, pitfalls, and solutions associated with these issues.

It is worth mentioning that Spinal Mechanical instability is the most common cause of chronic back pain. Therefore, radiologists must have a comprehensive understanding of this concept, its interpretation, and its diagnosis techniques.

In Conclusion:

Radiologists› familiarity with the considerations mentioned above is vital in interpreting MRI findings in patients with back pain. This understanding can help prevent unnecessary medical procedures and surgeries and improve the accuracy of MRI interpretations, ultimately leading to better outcomes for patients.

Keywords:

Mechanical spinal instability, spinal traumatic and DJD changes, Dynamic lateral flexion and extension, magnetic resonance imaging

DXA Bone Densitometry Interpretation: The Practical Tips

Alireza Ehsanbakhsh

Associate Professor of Radiology
Birjand University of Medical Sciences,
Birjand, Iran

Abstract:

DXA bone densitometry is the most sensitive and accurate method for bone mass evaluation and osteoporosis diagnosis. However standard scan acquisition and image analysis is crucial for correct diagnosis.

Central DXA for Diagnosis: The WHO international reference standard for osteoporosis diagnosis is a T-score of -2.5 or less at the femoral neck. The reference standard from which the T-score is calculated is the female, white, age 20-29 years, NHANES III database. Osteoporosis may be diagnosed in postmenopausal women and in men age 50 and older if the T-score of the lumbar spine, total hip, or femoral neck is -2.5 or less. In certain circumstances the 33% radius (also called 1/3 radius) may be utilized.

Skeletal sites to measure: Measure BMD at both the PA spine and hip in all patients. Forearm BMD should be measured under the following circumstances: 1- Hip and/or spine cannot be measured or interpreted. 2-Hyperparathyroidism 3- Very obese patients (over the weight limit for DXA table).

DXA Report: Items That Should Not Be Included:

1- A statement that there is bone loss without knowledge of previous bone density
2- Mention of “mild”, “moderate”, or “marked” osteopenia or osteoporosis

3- Separate diagnoses for different ROI (e.g., osteopenia at the hip and osteoporosis at the spine)
4- Expressions such as "She has the bones of an 80-year-old," if the patient is not 80 years old
5- Results from skeletal sites that are not technically valid
6-The change in BMD if it is not a significant change based on the precision error and LSC

Pediatric and Whole-Body DXA Bone Densitometry Interpretation

Alireza Ehsanbakhsh

Associate Professor of Radiology
Birjand University of Medical Sciences
Birjand, Iran

Abstract:

The finding of one or more vertebral compression (crush) fractures is indicative of osteoporosis, in the absence of local disease or high-energy trauma. In such children and adolescents, measuring BMD adds to the overall assessment of bone health.

The diagnosis of osteoporosis in children and adolescents should not be made on the basis of densitometric criteria alone. In the absence of vertebral compression (crush) fractures, the diagnosis of osteoporosis is indicated by the presence of both a clinically significant fracture history and BMD Z-score ≤ -2.0. A clinically significant fracture history is one or more of the following: 1) two or more long bone fractures by age 10 years; 2) three or more long bone fractures at any age up to age 19 years. A BMC/BMD Z-score > -2.0 does not preclude the possibility of skeletal fragility and increased fracture risk.

The posterior-anterior (PA) spine and total body less head (TBLH), are the preferred skeletal sites for performing BMC and areal BMD measurements in most pediatric subjects. Other sites may be useful

depending on the clinical need. Soft tissue measures in conjunction with whole body scans may be helpful in evaluating patients with chronic conditions associated with malnutrition or with muscle and skeletal deficits.

Bone Age Imaging: The Practical Tips

Elham Zarei, MD

Assistant Professor of Radiology
Ali-Asghar Children Hospital
Iran University of Medical Sciences (IUMS)

Bone age is one of biological indicators of maturity used in clinical practice and it is a very important parameter of a child's assessment, especially in pediatric endocrinology

The bone age of a child indicates level of biological and structural maturity better than

the chronological age calculated from the date of birth.

Although there have been attempts to assess bone age by examinations of specific bones, such as the clavicle or iliac bone (Risser sign) ,in pediatric endocrinology, the most widely used method of bone age assessment is by performing a hand and wrist radiograph of the non-dominant hand and its analysis with Greulich-Pyle or Tanner-Whitehouse atlases.

In this presentation, I review different methods of bone age assessment.

DXA Bone Densitometry Interpretation: Interactive Case Review (Workshop)

Alireza Ehsanbakhsh

Associate Professor of Radiology
Birjand University of Medical Sciences
Birjand, Iran

Abstract:

In this workshop several challenging cases have been presented to teaching and training. Also some cases with technical error and non-standard scans from spine and hip and wrist have been shown for education. In another part of the workshop, how to work with the FRAX software to assessment of bony risk fracture is explained.

Hybrid Imaging Benign and Malignant MSK Tumors

Mehrdad Bakhshayeshkaram, MD

Professor of Radiology
Shahid Beheshti University of Medical Sciences

- Tracer uptake pattern s in bone: Focal, multifocal, diffuse, and mixed
  - o Diffuse marrow hyperplasia can be mimic marrow infiltration by myeloma
- False-negative F-18 FDG PET/CT: High-dose steroid administration (within 10 days)
- Compete F-18 FDG response before stem cell transplant associated with higher overall (92%) and event-free (89%) survival
- Assessment of treatment response
  - o Negative F-18 FDG PET 60 days following stem cell transplant associated with excellent prognosis
  - o Persistent F-18 FDG activity following induction therapy associated with early relapse
- Early identification of disease recurrence or progression
  - o Patients with relapse often found to have new sites of disease on F-18 FDG PET/CT
  - o Identification of target site for biopsy

F-18 FDG PET/CT

- Focal hypermetabolic lytic bone lesion or extramedullary site on F-18 FDG PET/CT
  - o Bone (97%)
  - - Diffuse marrow infiltration
  - - Focal lytic bone lesions

- Breakout lesions: cortical disruption of osseous lesions
  - o Extramedullary disease (EMD)
  - Lymph nodes, pleura, testis, skin, nasopharynx, tonsils, paranasal sinuses, liver, lung, spleen, muscle
- Useful for initial diagnosis and staging (55-90% sensitivity) and restaging
  - o Diffuse marrow uptake on F-18 FDG PET/CT usually indicates elevated plasma cell papulation
  - o Negative whole-body F-18 FDG PET/CT in patients with monoclonal gammopathy reliably identifies stable MGUS
- Limited sensitivity in detecting diffuse bone marrow disease; MR more sensitive
- More sensitive as compared to MR for EMD (96% sensitivity, 78% specificity)
  - o Associated with advanced disease and poor prognosis
  - o Clinically and radiographically detected in 10-16% of patients, at autopsy in 63% of patients
  - o More common in younger patients
  - o More aggressive myeloma types (nonsecretory myeloma, IgD myeloma, poorly differentiated), rapidly progressive, treatment resistant
  - o Greater frequency with increasing duration if disease

Radiomics and AI in MSK Imaging: The Future of Imaging

Behzad Aminzadeh, MD

Associate Professor of Radiology
Mashhad University of Medical Sciences
Mashhad - Iran

Radiomics and artificial intelligence (AI) have emerged as promising tools in musculoskeletal (MSK) imaging, offering a range of applications that improve image quality, diagnosis and treatment, and ultimately enhance patient outcomes. AI has enabled more efficient and precise image acquisition preparation, including protocol selection, prioritization, and artifact reduction, leading to higher quality images. In the diagnosis phase, AI has enabled automated diagnosis, automated measurement and screening, aiding in decision making for clinicians. AI algorithms also aid in implant detection, allowing for faster and more accurate diagnosis of implant-related complications. In the treatment phase, AI can assist in treatment selection and predict patient response to therapies, leading to improved outcomes. Overall, the integration of radiomics and AI into MSK imaging is expected to continue to transform the field and improve patient care.

Assignment of Gestational Age in the 1ST, 2nd and 3rd Trimester

Amirhossein Hashemiattar, MD

Assistant Professor of Radiology
Department of Radiology
Mashhad Medical Sciences
Islamic Azad University, Mashhad, Iran

Gestational age (GA) assignment has a crucial role in proper timing of most obstetric cares, management of many obstetric problems especially SGA, estimation of the due date and even in some legal issues.

Conceptional age is popular in embryology and other medical basic sciences, but from a clinical point of view menstrual age is more acceptable. Although the first day of the last menstrual period (LMP) is used as clinical establishment of GA, it could be misleading up to 20% of cases. Measurement of Crown Rump Length (CRL) in 7 to 11 weeks is considered the most accurate index to establish GA. Assignment of GA in the 2nd and 3rd trimester is done by other ultrasonographic parameters such as Head Circumference (HC), Biparietal Diameter (BPD), Femur length (FL) and Abdominal Circumference (AC), but they are less accurate in comparison with CRL in 1st trimester. In the 2nd and 3rd trimester combination of multiple parameters is more accurate than a single parameter.

Common Misdiagnosis & Mistakes in the 2nd Trimester Anomaly Scan

Elham Keshavarz, MD

Department of Radiology, Mahdieh Hospital, SBMU

Congenital malformations occur in 3-4% of live births. Their prenatal detection is performed by ultrasound screening. Any announcement about a suspected malformation is a source of stress for the parents, and misdiagnosis during ultrasound screening can lead to expensive and sometimes iatrogenic medical interventions.

Overall, the false-positive rate was 8.8% and the rate of diagnostic misclassification 9.2%. The highest false-positive rates were found for renal and gastrointestinal tract malformations, and the highest diagnostic misclassification rates for cerebral and cardiac malformations.

In this lecture, we aim to explain the false-positive diagnosis of ultrasound screening for congenital malformations in the second trimesters of pregnancy.

Placental Membrane Abnormalities (Uterine Synechiae, Amniotic Band Sequence)

Narges Afzali, MD

Associate Professor of Radiology
Mashhad Medical Sciences
Islamic Azad University, Mashhad, Iran.

Uterine synechiae have generally been considered benign findings in pregnancy. Comparison of pregnancy outcomes between women with and without uterine synechiae in a large perinatal database shows that uterine synechiae are associated with significant increase in the risk of PROM, placental abruption, and cesarean delivery for malpresentation. The risks of placenta previa, fetal growth restriction, stillbirth, and preterm delivery were not significantly different.

Amniotic band sequence results from in utero entrapment of fetal parts by fibrous bands, which leads to malformations that can affect multiple organ systems ranging from simple band constrictions to major craniofacial and visceral defects. There is typically an asymmetric distribution of these defects especially in the limbs. The cause of amniotic band sequence is unclear. The incidence varies from 1 in 1200 to 1 in 15,000 live births.

Ultrasound diagnosis is based on a spectrum of features involving extremities, craniofacial region and trunk, may be isolated or in combination. Random anomalies that do not follow a pattern should lead to suspicion for amniotic band sequence. Demonstration of bands in not necessary for the diagnosis. Anomalies in extremities include absent digits or portions of limbs, swollen distal arm or leg resulting from constrictive amniotic bands. Craniofacial anomalies are facial cleft, asymmetric microphthalmia, severe nasal deformity, encephalocele. Trunk anomalies include severe spinal deformities, chest wall and abdominal wall defects such as ectopia cordis, gastroschisis-like bowel herniation, omphalocele-like liver herniation, and bladder exstrophy. The most extreme manifestation is body stalk anomaly.

The incidence of chromosomal abnormalities or genetic syndromes is not increased. Prognosis and treatment depends on the severity of deformation. Body stalk anomaly is lethal. There is no increased risk of recurrence.

First Trimester Screening in Multiple Pregnancy

Zeinab Safarpour Lima, MD

Assistant Professor of Radiology
Shahid Akbarabadi Clinical Research Development Unit (ShACRDU)
Iran University of Medical Sciences
Tehran, Iran

There are challenges for aneuploidy screening in multifetal gestations and no method of screening for aneuploidy in twins is as accurate as in singleton pregnancies. In addition to limitations associated with screening tests, diagnostic testing in twins

seems to confer a higher risk of loss.

NT can provide a fetus-specific risk of aneuploidy. This is beneficial in multiple pregnancies, particularly in higher-order multiples for which there is currently no validated aneuploidy screening test.

Similar to NT, the presence or absence of the fetal nasal bone (NB) is specific to each twin.

The detection rate for Down syndrome in twin pregnancies can be increased by combining maternal age and NT with maternal serum analysis, although it is important that chorionicity be taken into consideration.

Cell-free DNA screening can be performed in twin pregnancies. Overall, performance of screening for trisomy 21 by cell-free DNA in twin pregnancies is encouraging, but the total number of reported affected cases is small.

Because maternal serum screening has not been adequately studied in higher order multiple and there are limited data regarding the utility of cell free DNA screening in multiple pregnancies, NT screening is still worthwhile for identifying a potentially abnormal fetus in a multiple gestation.

Key words: NT, cell-free DNA, aneuploidy screening

4-chamber View and Situs: Normal and Common Abnormalities

Behnaz Moradi, MD

Associate Professor of Radiology,
Department of Radiology
Yas Complex Hospital
Tehran University of Medical Sciences (TUMS),
Tehran, Iran.

Congenital heart anomalies (CHDs) are one of the most common forms of congenital anomalies and are responsible for about 40% of perinatal deaths. 4-chamber view is the most important plane for evaluation of the main cardiac structures, the position, the size, the cardiac axis, the contractility, and the rhythm of the heart. The detection rate of this view is about 69% for all complex heart anomalies. Some CHDs as conotruncal anomalies can't be evaluated by this view. The image should be magnified and the cine-loop function should be used to analyze phases of the heart cycle. Inadequate examination is likely to be the most common cause of heart defects being overlooked in this view. The heart should ideally be assessed between 20 and 22 weeks› gestation. For increasing detection rate, teaching should not only include how to obtain this plane but it should also focus on the patterns of detectable anomalies. We should know, not all heart defects are already present in 1st or 2nd trimester; they may develop in utero later.

Targeted Ultrasound of Nonpalpable Lesions, Where Should I Look for What?

Sepideh Sefidbakht, MD

Shiraz University of Medical Sciences, Shiraz, Iran

Targeted ultrasound of nonpalpable breast masses is a crucial yet undervalued skill in breast imaging. Targeting nonpalpable lesions seen in mammogram is necessary for two main purposes, for biopsy and for characterization of the lesions. Correct targeting of the nonpalpable lesions seen in ultrasound and mammography either 2D or 3D is not only important for biopsy but also for full evaluation and characterization of the lesions. We will discuss simple rules for evaluating nonpalpable lesions in ultrasound using mammographic images;

Educational Goals:

- Looking for a nonpalpable lesion seen in MG; The Four Golden Rules
- 3D depiction of lesions in CC view; The Four Golden Rules of the CC view
- 3D depiction of lesions in MLO view; The Four Golden Rules of the MLO view
- Tomosynthesis, the golden rules
- Case-based practice of targeted ultrasound

Contrast Enhanced Mammography, An Overview and Case Presentation

Parisa Aminzadeh, MD

Fellow of College of Radiologists Australia and New Zealand (FRANZCR)
Consultant Radiologist ST Vincent Hospital
Director of Training ST Vincent Breast Screen
Co-Director Radiology Australasian Society of Breast Disease (ASBD), Melbourne, Australia

Contrast enhanced mammography (CEM), utilizes IV contrast to detect tumour neovascularity.

This functional imaging modality, enables detection of enhancing lesions in the breast, with dual energy digital mammography, including a pair of images for each view. A low energy image which is a standard mammogram and a high energy image for detection of contrast uptake. Then these two images are combined, and glandular tissue subtracted, highlighting contrast uptake, improving cancer detection comparing with mammography and ultrasound.

CEM, has also demonstrated to have comparable sensitivity, but higher positive predictive value in cancer detection in comparison with MRI.

Therefore, it could be used in staging of patients with breast cancer, response to treatment post neoadjuvant treatment and screening women at increased risk of breast cancer.

CEM is more cost effective and efficient test comparing with MRI, but involves injection of iodinated contrast, more radiation than mammography, which is still within acceptable limits.

During this talk we will review techniques, clinical applications, pitfalls and future direction of CEM and review few cases.

US-guided VAB (workshop)

Nasrin Ahmadinejad, MD Tehran University of Medical Sciences

Vacuum-assisted breast biopsy is an accurate and safe method that can help decision-making in the diagnostic process and can be an alternative for excisional surgery in some therapeutic circumstances.

VABB is a technique enabling the removal of all visible lesions while potentially reducing false negative rates and underestimation rates.

We are going to talk about the diagnostic and therapeutic Indications of VABB and it›s technical challenges.

Multi-Disciplinary Management Of Patient›s Candidate For NACT (Panel Discussion)

Nasrin Ahmadinejad, MD Tehran University of Medical Sciences

New breast cancer cases reached 2.26 million in 2020, replacing lung cancer as the world's most extensive cancer(IARC). Therefore, research on the diagnosis and treatment of breast cancer has significant value.

In clinical practice, early breast cancer lesions can be directly treated by surgical resection, but for localy advanced breast cancer or early metastasis, direct surgical resection cannot achieve the best therapeutic effect. NAC, one of the standard treatments for most breast cancers, refers to a systemic chemotherapy administered prior to the local treatment modality for primary tumors.

It is of great importance to timely and accurately evaluate the efficacy of NAC for breast cancer.

we are going to discuss about the indications and role of imaging on NAC .

Distortion in DBT

Fahime Zeinalkhani, MD
Assistant Professor of
Tehran University of Medical Sciences
Tehran, Iran

Abstract:

Architectural distortion defines as the deformation of the normal structure of breast. Architectural distortion is a suspicious abnormality for the diagnosis of breast cancer.

architectural distortion is also more difficult to diagnose because it can be subtle and variable in presentation.

Digital breast tomosynthesis (DBT) is a

three-dimensional (3D) imaging technique aiming at overcoming some limitations of mammography. It has the potential of improving the visibility of breast structures by reducing overlap of tissues. Therefore, the detectability of lesions is potentially increased while false positives (FPs) due to tissues superimposition can be more easily discarded.

Digital breast tomosynthesis (DBT) has been shown to decrease the patient recall rate and improve the sensitivity and accuracy of mammography .DBT may have the most potential impact in cases of subtle mammographic findings such as architectural distortion

Missed Breast Cancers in Mammography

Simin Alerasool

Radiologist, MD
Tehran, ICR 2023

Mammography is the standard of reference for the detection of breast carcinoma, yet 10%–30% of breast cancers may be missed at mammography.

Missedbreastcancersarebreastmalignancies that are detectable at retrospective review of a previously obtained mammogram that was prospectively reported as showing negative, benign, or probably benign findings.

Medical errors are a substantial cause of morbidity and mortality and the third leading cause of death in the United States. Errors resulting in missed breast cancer are the most common reason for medical malpractice lawsuits against all physicians

Possible causes for missed breast cancers include dense parenchyma obscuring a lesion, poor positioning or technique, incorrect interpretation of a suspect finding, subtle features of malignancy. The most commonly missed and misinterpreted lesions are stable lesions, benign appearing masses, one-view findings, developing asymmetries, subtle calcifications, and architectural distortion.

The various cognitive processes can lead to unconscious bias in breast imaging that result in missed breast cancers, such as satisfaction of search, in attention blindness, premature closing, and satisfaction of reporting.

In this presentation it is tried to show some examples of either of the above mammographic features based on the RSNA July august 2020 and RSNA 2003 and also some of our real cases in private practice in order to have some minimization strategies in each of the commonly missed and /or misinterpreted breast lesions, as well as, reducing the more common cognitive biases in breast imaging.

Staging of Axilla by Imaging in Newly Diagnosis Breast Cancer

Elham Keshavarz, MD

Department of Radiology
Mahdieh Hospital, SBMU

The management of newly diagnosed breast cancer includes axillary staging, as the axilla is the primary site of lymphatic drainage for most breast cancers. Axillary ultrasound (US)

plays an important role in the initial imaging evaluation of women with both early-stage and locally advanced breast cancer. Identification of axillary metastases guides treatment decisions including recommendation for neoadjuvant chemotherapy (NAC), the choice of axillary surgery, and the decision of whether to proceed with adjuvant radiation therapy. As axillary surgery continues to evolve toward minimally invasive techniques with less morbidity, the value of axillary US in the patient with newly diagnosed breast cancer continues to grow.

In this lecture, we aim to explain the staging of axilla by imaging in newly diagnosis breast cancer.

Nonmass Enhancement in Breast MRI

Khadijeh Bakhtavar, MD

Associate Professor of Radiology
Tehran University of Medical Science (TUMS)
Tehran- IRAN

According to the Breast Imaging and Reporting Data System (BI-RADS), one of the main challenges of MRI is diagnosing the non-mass enhancement (NME).A wide variety of benign and malignant processes can manifest as non-mass enhancement, which is defined as an area of enhancement that does not meet criteria for a mass, such as having nonconvex borders or intervening fat or fibroglandular tissue between the enhancing components.

The BI-RADS lexicon provides standard descriptors for the distributionof NME including; Focal, linear, segmental, regional, multiple regions and diffuseand also for internal pattern of non-mass enhancementas homogeneous, hetereogenous, clumped and clustered ring pattern.

Non-mass enhancement is usually assessed as suspicious and managed with core needle biopsy (BI-RADS 4).

Second-look breast ultrasound is helpful to look for a correlate that can be targeted for ultrasound-guided rather than MRI-guided breast biopsy.

There are limited data supporting a probably benign assessment for certain types of non-mass enhancement (BI-RADS 3). Anecdotal experience suggests homogeneous non-mass enhancement in a focal, regional, or multiple regions distribution on baseline examination may fit this category.

In some clinical situations, enhancement could be transient and related to hormonal status. For instance, a premenopausal patient may be scanned in a suboptimal part of her cycle, or a postmenopausal patient may be taking hormone replacement therapy. If this is suspected but the finding is not clearly background parenchymal enhancement, the non-mass enhancement may be assessed as probably benign (BI-RADS 3) with a recommendation for a very short interval follow up (2-3 months), timed for week 2 of the patient›s cycle or after suspending hormonal therapy .

The Role of PET- CT in Breast Cancer

KhadijehBakhtavar, MD

Associate Professor of Radiology
Tehran University of Medical Science (TUMS)
Tehran- IRAN

Positron emission tomography (PET) with 18F-fluorodeoxyglucose(FDG) is relatively sensitive for detecting breast lesions which are larger than1 cm, but insensitive for low-grade lesions and lesions less than 1 cm. PET is not currently used in screening or diagnosing primary breast cancer.

PET may be more cost-effective and accurate with dedicated breast imaging PET machines. High-resolution positron emission mammography (PEM) is an approved device to perform PET imaging of the breast. Advantages of PEM are higher spatial resolution and shorter imaging time. PEM may be of value to define extent of disease for surgical planning, detect multifocal or bilateral disease, and monitor response to therapy.

Breast lesions are sometimes detected as incidental findings on PET studies performed for other indications and should be reported when discovered.

In some studies, in female patients undergoing FDG PET/CT for reasons other than breast

cancer, unexpected foci of breast uptake were identified in 0.82% of patients.

In one study PEM had an index lesion depiction sensitivity of 93%which was significantly better than whole body PET (68%).

Sensitivity is highly dependent on tumor size and grade. Detection rate for T1a and b tumors (< 1 cm)is low, and tumors < 0.5cm (T1a) will likely not be detected.

Sensitivity increases substantially for T2lesions (2–5 cm) and T3 lesions (> 5 cm).

PET is less sensitive but more specific than MRI for characterizing and detecting breast lesions.

MRI has superior sensitivity for lesions < 1cmand lobular carcinoma.

PET/CT for evaluation of neoadjuvant response is superior if performed early (after

the first or second cycle of therapy) than later.

The accuracy of MRI was superior to PET/CT after completion of therapy, but PET/CT outperformed MRI for intratherapy assessment.

Imaging of Breast Prosthesis

Behnaz Moradi, MD

Associate Professor of Radiology
Department of Radiology, Yas Complex Hospital
Tehran University of Medical Sciences (TUMS)
Tehran, Iran.

The most popular cosmetic surgery is breast augmentation worldwide.Breast implants have two types: single lumen or double lumen. Single lumen implants contains either silicone or saline.Capsular calcification, mild pericapsular fluid and

folding are normal imaging findings. Some complications can occur early or late. Early post-surgical complications include infection and hematoma. Delayed complications are capsular contracture, implant rupture, and implant related malignancy.

In imaging some features are indicative of breast implant tear (intra or extracapsular) and breast MRI is the best way for detecting implant rupture.Capsular contracture is the most common delayed complication noted in patients with smooth-walled silicone implant. BIA-ALCL is a type of lymphoma that can occur around breast prosthesis especially in implants with textured surfaces. This is a immune system cancer, not a type of breast cancer.

How to Localize Breast Masses by Wire and Marker?

Nahid Sadighi, MD

Radiologist
Associate Professor of Radiology.
Tehran University of Medical Sciences
Cancer Institute, Tehran-Iran

With the advent of screening methods, most of the breast cancers are diagnosed when they are small and can be treated using breast-conserving surgery. Since these tumors are non-palpable, they require a localization step that helps the surgeon to decide which tissue needs to be removed. The most popular localization technique is a wire placed into the

tumor before surgery, usually using ultrasound or mammography guidance. Afterwards, the surgeon removes the tissue around the wire tip. However, this technique has several disadvantages: It can cause the patient discomfort, requires a radiologist or another professional specialized in breast diagnostics to perform the procedure shortly before surgery, and 15–20% of patients need a second surgery to completely remove the tumor. Therefore, new techniques have been developed but most of them have not yet been examined in large, prospective, multicenter studies.

Marker insertion within a tumor is performed to make sure that it will not be lost after biopsy or NACT and if too small or no tumor residue is left, then the marker in its bed can be localized by wire.

This will be a hands on workshop that will give the opportunity for the audience to learn the tips and tricks of the aforementioned procedures.

Role of Imaging in Staging and Pre-surgical Localization in Breast Conserving Surgery

Nahid Sadighi, MD

Radiologist, Associate Professor of Radiology.
Tehran University of Medical Sciences
Cancer Institute, Tehran-Iran

Demand for breast-conserving treatment needs pre-operative staging of disease.

Breast MRI is superior to MG, US and CBE in determining the size of the primary tumor as well as additional sites of otherwise occult malignancy. Delineation of the extent

of disease is critical because staging will determine treatment choices and patient outcome.

MRI in women with newly diagnosed breast cancer influences surgical management by more extensive primary tumor, such as the presence of DCIS around the mass or IDC.

The goal of BREAST "CANCER STAGING" is to show;

- tumor extent, multifocality, multicentricity
- local spread to the skin and nipple
- nodal involvement
- invasion deep to fascia
- the detection of contralateral disease and evaluation of patients with positive surgical margins

The breast cancer 'core' treatment team includes the surgeon, oncologist, pathologist and radiologist.

The role of radiologist changes during the diagnostic and treatment phases of disease. She or he diagnoses the disease, performs the biopsy, pre-surgical planning, pretreatment localization and evaluation of treatment and operative success.

This panel will be a sample multidisciplinary team discussion, between radiologists and an expert breast surgeon about real cases, in which the radiologist has had a major role in planning of the patient's treatment.

Acute Aortic Syndrome :Diagnosis, Prognosis and Treatment

Maryam Moradi, MD

Professor of Radiology
Isfahan University of Medical Sciences
Isfahan, Iran.

Abstract:

The term, acute aortic syndrome (AAS) has been introduced in 2001 to describe a group of patients who experience intense and acute chest or back pain.Acute aortic syndrome has been attributed to three underlying ethiologies including aortic dissection (AD), intramural hematoma (IMH) and penetrating atherosclerotic ulcer (PAU). Considering rapid acquisition , excellent diagnostic performance and also wide availability, , multidetector CT (MDCT) has become the modality of choice for patients who are suspected for AAS.

This presentation aims to review varriable presentations of AAS in MDCT, as well as focusing on difficult and chalanging cases and their differential diagnosis . Also protocol of CT acquisition and related tricky points will be discussed.

Congenital Heart Disease: Role of CT and CMR

Sanaz Asadian, MD

Assistant Professor of Radiology
Rajaie Cardiovascular Medical and Research Center
Iran University of Medical Sciences, Tehran, Iran

Although prenatal screening has improved enormously recently, congenital heart disease (CHD) is still prevalent. Clinicians encounter several challenges when designating the management strategy for a patient with simple or complex CHD. Traditional imaging modalities, consisting of chest X-ray, chest computed tomography, echocardiography, and conventional angiography, have assisted in the diagnosing and planning of palliative or curative techniques for CHD cases for many years.

Following the outstanding development of the CT-scanners, cardiovascular CT angiography became a part of patient evaluation in cardiovascular disorders, including CHD. Moreover, in recent decades, cardiac magnetic resonance (CMR) imaging has developed tremendously, resulted in a more precise cardiac functional and morphological evaluation. In some entities, a comprehensive CMR examination may eliminate the need for repetitive echocardiographic assessments. It is especially of value in evaluation of CHD, in which most patients are irritable children.

In this session, we aimed to describe the cardiac CT-angiography and CMR protocols, indications, and findings in common CHDs.

Advanced Coronary CTA

Ali Mohammadzadeh, MD

Associate Professor of Radiology
Rajaei Cardiovascular Center, IUMS, Tehran, Iran

Abstract:

In the last decade, the introduction of new functional CCT applications ,namely as CCT perfusion(CCTP) imaging and CT derived Functional Flow Reserve (FFR-CTA) has opened a door for accurate assessment of hemodynamic significance of stenosis. The new CCT technologies, thus share a unique advantage of assessing both myocardial ischemia and patient specific coronary artery anatomy, providing intergraded anatomical / functional analysis.

Both CT-FFR and CT -MPI perform well in detection of functional CAD which improve diagnostic performance significantly. IN clinical practice ,there techniques are mainly used for accurate assessment of intermediate coronary artery lesion with laminar narrowing of 30-90 % with regards to select appropriate revascularization candidate with unique modality following Coronary CTA.

The main focus of this presentation is to discuss these two modalities in details and their clinical application in CAD patients.

Acute and Stable CAD, Role of CCTA

Ramezan Jafari, MD

Associate Professor of Radiology
BUMS, Tehran, Iran

In stable angina, it is critical to determine the presence and extent of obstructive or non-obstructive coronary atherosclerotic disease, the mechanism of myocardial ischemia and ruling out other DDXs, in order to managing symptoms and preventing major adverse cardiovascular events (MACE) including MI or death from cardiovascular disease (CVD) by initiating optimal treatment.

These patients were routinely evaluated with a variety of noninvasive tests such as electrocardiography (ECG), exercise treadmill test (ETT), stress echocardiography, single photon emission computed tomography (SPECT), and stress radionuclide scintigraphy or stress cardiac magnetic resonance imaging (CMR).

These functional tests assist in diagnosing CAD and provide prognostic information by detecting inducible myocardial ischemia as a marker of the underlying CAD, But in all cases cannot completely help in the diagnosis of obstructive CAD, coronary artery anomalies or other DDXs such as PTE or dissection, so direct visualization by a noninvasive imaging modality such as CCTA seems to be the best choice and CCTA can changes diagnoses, improves diagnostic certainty and changes management, leads to more appropriate use of invasive coronary angiography, and reduces fatal myocardial infarction.

In low- to intermediate-risk patients with acute chest pain, CCTA is not only safe, but potentially allows for reduced costs and LOS, and the diagnosis of non-coronary causes of acute, life-threatening chest pain that may otherwise be missed.

The role of CCTA in higher-risk patients (such as those with confirmed NSTEMI) is evolving and it may provide a safe means of identifying patients without obstructive disease, for whom medical therapy may be sufficient.

CCTA can also aid in plaque characterization, which can facilitate personalized therapeutic interventions and distinguish culprit from non-culprit lesions, or even non-atheromatous causes of ACS.

Keywords: CAD, CCTA, stable angina, ACS

4D Flow

Kiara Rezaei Kalantari, MD

Shahid Rajaei Cardiovascular Medical and Research Center

Four-dimensional flow magnetic resonance imaging (4D flow MRI) is a novel imaging technique that allows for the visualization and quantification of blood flow dynamics in the cardiovascular system. This technique enables the measurement of blood flow velocities and directions in three dimensions over time, providing a comprehensive understanding of hemodynamics.

4D flow MRI has a wide range of clinical

applications, including the assessment of congenital heart disease, valvular heart disease, and cardiovascular remodeling. It provides valuable information on blood flow patterns, turbulence, and wall shear stress, which are important factors in the pathogenesis of cardiovascular diseases.

In addition to its diagnostic utility, 4D flow MRI has the potential to guide treatment planning and monitor treatment efficacy. For example, it can be used to evaluate the hemodynamic impact of interventions such as valve repair or replacement, and to assess the effectiveness of therapies such as pharmacologic agents or lifestyle modifications.

Despite its many advantages, 4D flow MRI has some limitations, including longer acquisition times and post-processing requirements. However, ongoing technical advancements and improvements in software algorithms are likely to address these limitations and enhance the clinical utility of this imaging modality.

In conclusion, 4D flow MRI is a valuable tool for cardiovascular imaging that provides comprehensive information on blood flow dynamics. Its clinical applications are diverse and expanding, and it has the potential to guide treatment decisions and monitor treatment efficacy.

Congenital Anomaly of Aorta

Mohammad Davoodi, MD

Associated Professor of Radiology
Tehran University of Medical Sciences, Tehran-Iran

Congenital variants and anomalies of the aorta and aortic arch are important to recognize as they may be associated with vascular rings, congenital heart disease, and can have important implications for prognosis and management. The purpose of this session is to review cross-sectional imaging techniques used in the evaluation of the aorta and aortic arch, describe the embryology and anatomy of the aortic arch system, discuss aortic arch variants and anomalies, and review other malformations of the aortic arch, including interrupted aortic arch,double aortic arch , hypoplastic aortic arch, and aortic coarctation. Arch anomalies can be associated with symptoms, such as dysphagia lusoria in the setting of left aortic arch with aberrant right subclavian artery. Arch variants that form a vascular ring, such as double aortic arch, can result in respiratory distress due to tracheal compression. Certain arch anomalies are strongly associated with congenital heart disease, including right aortic arch with mirror image branching. Noninvasive imaging at CT angiography and MR angiography allows for comprehensive evaluation of the aortic arch and branch vessels in relation to surrounding structures. Familiarity with the spectrum and imaging appearances of aortic arch variants, anomalies, and malformations is essential for accurate diagnosis and classification and to guide management.

The Role of Cardiac MRI in Non- Ischemic Cardiomyopathy

Marzieh Motevalli, MD

Rajaie Cardiovascular Medical and Research Center
Iran University of Medical Sciences

Cardiac magnetic resonance (CMR) imaging has major rule in the diagnosis, assessment and prognosis of cardiomyopathies. Technologic advances in CMR imaging have resulted in images with high spatial and temporal resolution and excellent myocardial tissue characterization.

CMR is a valuable technique for detection and assessment of the morphology and functional characteristics of the non-ischemic cardiomyopathy. It has acceptance the imaging modality that can provide additional information to echocardiography and angiography.

CMR of left and right ventricular structure, function, tissue characterization with late gadolinium enhancement, T1 and T2 mapping and strain enable diagnosis and differentiation the etiology of non-ischemic cardiomyopathies.

A major role for cardiac MR imaging in cardiomyopathies is to identify myocardial scar for diagnostic and prognostic purposes. So Gadolinium based contrast media in CMR can depict myocardial edema, infiltration, and fibrosis. In addition, the presence and extent of LGE in cardiomyopathies are associated with adverse cardiovascular outcomes and poor responses to standard medical and interventional therapies. Thus, CMR has a major role to play in determining diagnosis and assessing prognosis for patients with non –ischemic cardiomyopathies.

This presentation recommended cardiac MR imaging appearances of the different non-ischemic cardiomyopathies.

TEVAR Approach : Pre & Post Procedure CTA

Parham Rabiee, MD

Abstract:

Thoracic endovascular aortic repair is an established method in treatment of Aortic Events which shows good out come in acute complicated or chronic dissections.

Most of the learning objects in pre TEVAR approach is in diagnosis of underlying pathologies, the Artery of Adamkiewicz and collateral circulations.

Although appropriate technical measurements are also important.

The Most prominent factor in evaluation of post TEVAR patients is Endoleak .Close surveillance in Post TEVAR patients is also the fundamental approach.

State of the Art: Coronary CTA

Shapour Shirani, MD
Head of Imaging Department
Tehran Heart Center, Tehran,Iran

Abstract:

Since the introduction of computed tomography about 50 years ago, imaging of beating heart has been a big challenge for medical imaging innovators. Imaging the anatomy and physiology of heart demands temporal, spatial, and contrast resolution greater than for any other organ system in body.

Immense progress has been achieved in using CT for evaluation of coronary stenosis, plaque composition, cardiac function, myocardial perfusion and regional ventricular wall motion.

Major accomplishments and future directions of cardiac CTA will be discussed in this review.

Cavitary Pulmonary Lesions

Hussein Soleimantabar, MD
Assistant Professor of Radiology
Imam Hossein Hospital
Shahid Beheshti University of Medical Sciences,
Tehran, Iran

Abstract:

Cavitary pulmonary lesions are a common finding on radiology imaging studies, and can be caused by a variety of underlying conditions. These lesions are characterized by the presence of a hollow space within the lung tissue, which may be filled with fluid, air, or debris. The differential diagnosis for cavitary pulmonary lesions includes infectious causes such as tuberculosis and fungal infections, as well as non-infectious causes such as malignancy and vasculitis. Radiologic features that may aid in distinguishing between these various etiologies include the size and shape of the lesion, the presence of surrounding inflammation or consolidation, and the pattern of enhancement on contrast-enhanced imaging studies. It is also essential to distinguish a cavity from other pathologic conditions such as air cyst, bullae, cystic bronchiectasis and emphysema. Accurate diagnosis of cavitary pulmonary lesions is essential for appropriate management and treatment planning.

Chest Trauma

Masoomeh Raoufi Assistant Professor of Radiology

Shahid Beheshti University of Medical SciencesChest trauma is a common presentation in emergency departments and can result in significant morbidity and mortality. Radiology plays a crucial role in the diagnosis and management of chest trauma patients. Imaging modalities such as chest X-ray, computed tomography (CT), and ultrasound are commonly used to evaluate the extent of injury, identify associated injuries, and guide treatment decisions. Chest X-ray is often the initial imaging modality used to assess for pneumothorax, hemothorax, rib fractures, and pulmonary contusions. CT is more sensitive for detecting injuries such as aortic rupture, cardiac contusion, and diaphragmatic rupture. Ultrasound can be used to rapidly assess for hemopericardium or pneumothorax at the bedside. Radiologists must be familiar with the imaging findings of chest trauma to provide accurate diagnoses and aid in patient management.

Practical Approach to Imaging Interpretation of Interstitial Lung Disease:

Soheyla Zahirirfard, MD Radiologist, Erfan Hospital

Diffuse lung disease presents a variety of high-resolution CT findings reflecting its complex pathology and provides diagnostic challenge to radiologists.

We describe a practical approach to high resolution CT diagnosis of diffuse lung disease emphasizing

1 analysis of distribution of the abnormalities,
2 interpretation of pattern in relation to distribution,
3 utilization of associated imaging findings and clinical information and,
4 chronicity of the findings.

This practical approach will help radiologists establish a way to interpret high resolution CT leading to Pin point diagnosis or narrower differential diagnosis of diffuse lung disease.

Role of PET/CT in Lung Cancer

F-18 FDG PET/CT Findings

Mehrdad Bakhshayeshkaram Professor of Radiology
Shahid Beheshti University of Medical Sciences

- Avoids nontherapeutic thoracotomy in 20% by detecting previously occult distant disease
- Negative F-18 FDG PET: Does not exclude microscopic disease; does not preclude mediastinal/hilar surgical staging

- Increasingly used in simulations for radiation treatment planning
- Early glucose metabolic response predicts long-term patient survival
- Prognostic data from F-18 FDG PET: ↑ SUV associated with aggressive neoplasm, poorer prognosis
- Useful for monitoring response to cytotoxic and biologic therapy
- False-negative PET: Tumor with low metabolic rate (low-grade adenoCA, adenocarcinoma in situ, carcinoid), tumor < 10 mm "stunned" tumor post therapy, high serum glucose (competition)
- False-positive PET: Nonmalignant, metabolically active conditions (active inflammation, infectious, granulomatous disease)

Contrast Media: What Must Radiologists Know before Use?

Hoda Asefi

Assistant Professor of Radiology
Department of Radiology, Sina Hospital, Tehran University of Medical Sciences, Tehran, Iran.

Contrast media are widely used and are indispensable in diagnostic imaging. Like other pharmaceuticals they are not devoid of risk. Adverse side effects from contrast media administration vary from minor physiological disturbances to rare severe life-threatening situations and we should be Prepared for prompt treatment of contrast media reactions and appropriately trained personnel, equipment, and medications should be available. Therefore, such preparation is best accomplished prior to approving and performing these examinations. familiarity with presentations of contrast media reactions and their treatments must be part of the environment in which intravascular (IV) contrast media are administered.

referring physician and the radiologist should be sure that there is a valid clinical indication for contrast media administration, assess patient risk versus potential benefit of the contrast-assisted examination, and be aware of Imaging alternatives that would provide the same or better diagnostic information.

Most common side effects of IV contrast media administration are allergic-like and physiologic reactions and contrast-associated acute kidney injury.

Patients with a prior allergic-like or unknown-type contrast reaction to the same class of contrast medium should take oral or IV premedication before contrast media administration.

most important risk factor for contrast-associated acute kidney injury is pre-existing severe renal insufficiency and administration of low osmolality contrast media and Volume Expansion may lower the risk.

In this session we will briefly review common contrast media side effects and how to prevent or treat them.

Normal Variants and Benign Findings in PET Scan

Samira Mirzaei, MD Assistant Professor at TUMS, Sina Hospital

Normal uptake of FDG occurs in many sites of the body and may cause confusion in interpretation particularly in oncology imaging. Clinical correlation, awareness of the areas of normal uptake of FDG in the body and knowledge of variation in uptake as well as benign processes that are FDG avid are necessary to avoid potential pitfalls in image interpretation.

Clinical correlation, awareness of the areas of normal uptake of FDG in the body and knowledge of variation in uptake as well as benign processes that are FDG avid are necessary to avoid potential pitfalls in image interpretation.

Brown fat uptake is also a confusing issue that should be considered for image interpretation.

PET CT imaging has the ability to correctly attribute FDG activity to a structurally normal organ on CT.

The discussion in this session will focus on the range of normal sites of FDG uptake in brain, spinal cord, heart, head and neck, chest, abdominopelvic, bone and bone marrow.

FDG PET/CT: Artifacts and Pitfalls

Hoda Asefi

Assistant Professor of Radiology
Department of Radiology
Sina Hospital, Tehran University of Medical Sciences, Tehran, Iran.

Fluorodeoxyglucose positron emission tomography (FDG PET)/CT is commonly performed for evaluation of malignancy, and combines the most sensitive imaging modality (PET)with the highest resolution cross sectional imaging modality (CT). Artifacts present on PET/CT include

those from both the PET and CT portions of the examination and also artifacts related to the examination's dual acquisition technique and associated process of PET attenuation correction.

They are categorized into three main categories: radiotracer related, patient related, and instrument related artifacts.

Radiotracer-related artifacts usually occur due to an error during the radiotracer injection process. It has three main subtypes: hot clot artifact (due to pulmonary micro emboli of coagulated blood containing FDG), dose extravasation (at injection site), and scatter artifact (intense accumulation of radiotracer in bladder)

Main Patient-related artifacts are misregistration (secondary to motion), large size patient and beam hardening artifacts.

Attenuation correction and truncation artifacts are the most common types of Instrument related artifacts.

In this session we will briefly review these artifacts and ways to prevent or reduce them.

Distinguishing Post-treatment Changes from Malignancy at FDG PET/CT

Golnaz Moradi, MD

Assistant Professor of Radiology
Tehran University of Medical Sciences, Tehran, Iran
Golnazz.moradi@gmail.com

The differentiation of post-treatment changes from residual/recurrent tumor presents a major problem in the treatment of patients with cancer. Positron emission tomography (PET) with fluorine-18 fluorodeoxyglucose (FDG) is used to differentiate between them.

A main indication of FDG PET/CT is restaging disease after primary treatment, which could comprise of surgery, chemotherapy or radiation therapy, or various combinations of these.

It is imperative for the PET reviewer to consider the clinical scenario and treatment history when interpreting PET findings. A wide range of oncologic treatment–related effects, such as surgery or radiation-induced inflammation, drug toxicity, pseudoprogression, and hematopoietic rebound, can manifest as regions of increasing FDG activity and may be mistaken for new or progressive malignant foci.

Appropriate and timely imaging following initial treatment is important to detect residual or recurrent

disease to initiate additional therapy, which can prolong disease free survival and improve quality of life.

The aim of this lecture is to review some of common oncologic treatment- related changes at FDG PET/CT, and the utility of FDG-PET/CT in these patients to detect malignant disease.

The Impact of Infection and Inflamation in Oncologic FDG PET/CT

Mohammad Amiri

Assistant Professor of Radiology
Tehran University of Medical Sciences

18F-FDG PET/CT is an integral part of modern-day practice, especially in the management of individuals presenting with malignant processes However, due to its detection of cellular metabolism, it is not truly tumor-specific.

Unexpected and incidental foci of uptake in oncologic 18F-FDG PET/CTs are relatively common with diagnostic considerations including unusual sites of metastases, a second synchronous neoplasm, surgical or procedural interventions, as well as infection and inflammation. Given their increased uptake on 18F-FDG PET/CT, infectious and inflammatory responses have the potential to be misinterpreted as metastatic disease.

This presentation aims to provide a pictorial review and analysis of cases that depict

infective and inflammatory uptake as normal variants, pitfalls, and artifacts on 18F-FDG PET/CT oncologic imaging. The impact of this presentation is to help minimize poor imaging quality and erroneous interpretations and diminish misdiagnoses that may impact the adequate management of patients with undesirable consequences.

We are going to learn about imaging features distinguishing infection and inflammation from malignancy regarding anatomical regions (head and neck, thorax, abdominopelvic) and also discuss the differential diagnosis of infection and inflammation process in each common cancer.

Each topic has illustrative examples.

at the end of the session, the radiologist should be able to understand the Mechanism of uptake and metabolism of 18F-FDG in inflammation, infection, and tumor cells, as unusual and common incidental patterns of radiopharmaceutical uptake due to infectious and inflammatory etiologies to avoid misdiagnosis of malignancy. Differentiating inflammation and infection uptake from malignancy with the utilization of CT findings as well as patient history. additional diagnostic steps that need to be performed to confirm the etiology of abnormal patterns of FDG distribution.

Imaging in Common Pediatric Soft Tissue Masses

Mitra Khalili

Assistant Professor of Radiology
Mofid Children's Hospital
Shahid Beheshti University Of Medical Science,
Tehran, Iran

There are numerous soft tissue tumors and tumor like conditions in pediatric population. Some of them are limited to this group age because of congenital nature, however manifestation could be later with patient growth. Among different types of soft tissue masses vascular anomalies are commonly encountered in pediatric population and include vascular malformations and true tumors. Hemangioma is true vascular neoplasm and vascular malformations result from errors in vascular morphogenesis. Vascular malformations are categorized by predominant vessel type, including capillary, venous, lymphatic, arterial, and combinations.

Clinical history and physical examination can lead to correct diagnosis ,however, imaging role is for characterizing clinically indeterminate lesions and also in determining the extent of disease. In vascular malformation the most important point is distinction between high-flow and low-flow lesions because treatment plan is different. Ultrasound (gray scale and doppler) and MRI are the mainstay modalities in imaging work up and have complementary role in establishing diagnosis .The aim of this presentation is imaging approach to vascular anomalies and introducing useful criteria for diagnosis of different subtypes.

Common Mistakes in Pediatric Radiology

Elham Zarei, MD
Assistant Professor of Radiology
Ali-Asghar Children Hospital
Iran University of Medical Sciences (IUMS)

Radiological imaging is an essential part of patient management. There are many mistakes and pitfalls that are commonly encountered during pediatric imaging examination that could arise from anatomic or physiologic variants of pediatric anatomy, artifacts, operator misunderstanding or inexperienced performance.

An awareness of these pitfalls and underlying causes can improve diagnostic accuracy and helps to optimize management and reduce misdiagnosis and psychological effects on the patients and their families.

In this presentation, I discuss common mistakes which could become a source of confusion and misdiagnosis in pediatric imaging as well as some tools for avoiding potential mistakes.

Interactive Case Presentation in Pediatric Diseases

Fatemeh Zamani, MD
Assistant Professor of Radiology
Children Medical Center of Excellence, Tehran
University of Medical Sciences (TUMS), Tehran, Iran

Zahra Ghomi, MD
Assistant Professor of Radiology
Mofid Children's Hospital, Shahid Beheshti
University of Medical Sciences (SBMU), Tehran, Iran

Pediatric imaging is a specialized field within diagnostic imaging that focuses on childhood diseases, from infancy to adolescence. As children may have difficulty articulating their symptoms and discomforts, imaging plays a crucial and effective role in pediatric medicine. Given the increasing complexity and volume of literature in this area, it is essential for radiology residents and general radiologists to update and enhance their knowledge in the field continuously.

This interactive case review session presents a range of interesting cases in pediatric imaging, categorized based on CNS, musculoskeletal, abdomen, and GI pathologies. Our goal is to provide participants with practical topics in pediatric radiology; and help radiology residents and young radiologists gain more experience and confidence in interpreting pediatric imaging studies, ultimately enhancing the quality of care for their young patients.

Imaging in Seizure

Neda Pak

Associate Professor of Radiology
Tehran University of Medical Science, Tehran .Iran

Imaging has an important role in the evaluation and management of patients with seizure disorders. Structural neuroimaging with magnetic resonance imaging (MRI) assist determination of etiology of focal epilepsy and demonstrates the anatomical changes associated with seizure activity.

Mesial temporal sclerosis, vascular anomalies, low-grade glial neoplasms and malformations of cortical development has been demonstrated to be the major causes of seizure in individuals with focal seizures which could be easily diagnosed by MRI. Correct identification and localization of epileptogenic foci is a crucial preoperative step in intractable seizure, some of these patients have no abnormality on routine magnetic resonance imaging (MRI) and advanced imaging techniques, therefore, can be helpful to identify the area of concern. Positron emission tomography (PET), functional MRI, and diffusion tensor imaging–tractography are new methods.PET is the most commonly performed interictal functional neuroimaging technique that may reveal a focal hypometabolic region concordant with seizure onset.

An epilepsy-tailored MRI technique should be performed to detect subtle lesions. This includes three-dimensional (3D) T1-weighted image, gradient echo and 3D fluid-attenuated inversion recovery (FLAIR) images with isotropic voxels, Coronal and axial high-resolution T2-weighted images with 2–3 mm slice thickness. These are useful for detection of FCD and MTS.A 3D susceptibility-weighted imaging (SWI) sequence is required for microbleeds and faint calcification. Moreover, coronal T1 inversion recovery is used for better delineation of the gray–white matter interface, 3D T2, diffusion weighted imaging (DWI) for possible ischemic lesion, and post-contrast scan in case of inflammation or tumors. The use of 3T MRI is favored over regular 1.5T MRI machines and the surgical success depends on the use of advanced brain imaging techniques to identify the epileptic focus.

Imaging in Abdominal Trauma: Solid Organ Injuries

Alireza Dehghan, MD

Assistant Professor of Radiology
Radiology Department, Shiraz University of Medical Sciences, Shiraz, Iran

Abstract:

Advances in imaging technologies, in particular for CT, have caused a paradigm shift in the detection and management of abdominal blunt trauma. In the past, patients with blunt trauma underwent laparotomy for detection and potential treatment of traumatic injuries. Current treatment options for blunt solid organ injuries include non-

operative management, angioembolization, and surgery. CT scan is the diagnostic modality of choice for the evaluation of blunt solid organ trauma in hemodynamically stable patients. It is important that radiologists be familiar with the liver, spleen and kidney injury grading system based on CT features that was established by the American Association for the Surgery of Trauma (AAST). The AAST scale is the most widely used grading system across the world. Trauma surgeons expect radiologists to include AAST grading into their reports. Traumatic injuries of the pancreas are uncommon and often difficult to diagnose owing to subtle imaging findings, confounding multi-organ injuries, and nonspecific clinical signs. Imaging modalities have a vital role in diagnosis and management of pancreas trauma as well. In this presentation, we will talk about different imaging patterns of abdominal solid organs injuries and the latest AAST grading scale.

Peritoneal Interventions: A Case-based Review

Shahram Akhlaghpoor, MD

Associate Professor of Radiology
Pardis Noor Medical Imaging and Cancer Center

Abstract:

Peritoneal lesions have a variety of causes and the radiologic manifestations are complex and diverse. Routine clinical examination and radiologic examinations are of limited value for identifying the etiology and for differential diagnosis of malignant and benign lesions.

Percutaneous needle biopsy, which is easier to implement, serves as an alternative to laparoscopy. The specimens were successfully collected for histopathologic examination, and the accuracy rate was 95.1%, which was consistent with laparoscopy (93.1%), as previously reported.

One of the commonest interventional peritoneal procedures is Ascites Drainage that in malignant type long term drainage is a challenging part. It will discuss the type of catheters and procedures for peritoneal drainage including peritoneal abscess.

Recently Peritoneal Port insertion for direct peritoneal chemotherapy were gained more interest and increased. This will be done by Interventional radiologist as an outpatient procedure with Local anesthesia.

Dialysis Catheter is one the major peritoneal intervention which only about 5% were referred to interventional radiologist. Peritoneal dialysis is a cost-effective and physiologically beneficial alternative to hemodialysis with an increased survival benefit and lower complication rate.

The demand for Peritoneal Dialysis is predicted to increase in the future, and Interventional Radiology is strategically situated to become a leader in tunneled catheter placement and management.

The purpose of the present study was to shows these mentioned procedures by case base review.

Small Bowel Obstruction: When Do We Have to Worry?

Nematollah Nematollahy, MD

Assistant Professor of Radiology
Golestan University of Medical Sciences, Gorgan, Iran

Small bowel obstruction (SBO) continues to be one of the leading causes of emergency room visits and emergent surgery and is still associated with substantial morbidity and mortality rates. Most patients with SBO are treated successfully with nonoperative management. However, the mortality of SBO ranges from 2% to 8% and may increase to as high as 25% if bowel ischemia is present and there is a delay in surgical management. A challenge in the clinical management is that clinical symptoms and signs and laboratory findings are not sufficiently sensitive or specific to determine which patients with SBO are high risk for vascular compromise and ischemia from strangulation and so need immediate surgery. Imaging studies, conversely, provide invaluable management guidance.

CT is now established as the best imaging technique for the initial assessment of patients suspected of having SBO. CT helps confirm the diagnosis of mechanical SBO, locate the site of obstruction, establish the cause, and detect complications. Studies have sought to identify the CT signs of ischemia that can help accurately predict a need for emergent surgery and anticipate whether bowel resection is necessary.

Furthermore, Imaging could accurately differentiate between open-loop SBO and closed-loop SBO and determine how this difference may influence the management strategy. These issues including other worrisome imaging signs in SBO are discussed and relevant pictures will be illustrated. Finally, the ability of imaging studies to help predict the success or failure of nonoperative management will be demonstrated.

Keywords: small bowel obstruction, CT, strangulation

Hepatic Vascular Disorders: Finding Based Approach to Making the Diagnosis

Pooneh Dehghan, MD

Associate Professor of Radiology
Department of Imaging; Taleghani Hospital
Shahid Beheshti University of Medical Sciences; Tehran; Iran

The unique vasculature of liver has made its' vascular disorders of significant physiological consequences. Dual hepatic blood supply, one from the hepatic artery delivering oxygenated blood, the other from the portal vein which drains the GI tract delivering nutritive perfusion to the organ. This pattern of supply renders the organ relatively resistant to ischemia meanwhile providing substrate for its' proper function. Hepatic sinusoids assume capillary anatomy and function draining into hepatic veins which despite having two major

hepatic lobes three of them are present in the liver. Vascular hepatic disorders are classified into three main categories: A) Inflow disorders B) Outflow disorders and C) Abnormal vascular connections (which are varied and could be arterioportal, arteriovenous and portovenous). Each of these categories have distinct imaging manifestations although overlap exists in these categories. We provide a brief case-based review of radiologic findings of each of these categories of abnormalities with an attempt to correlate the findings with the resultant physiological disturbances in each of these classifications.

Basics of Abdominal Interventions: What General Radiologists Should Know

Mohammad Hossein Ahrar Yazdi

Assistant Professor of Radiology
Yazd University of Medical Sciences

Abdominal interventional radiology procedures are a set of minimally invasive techniques deployed to diagnose, treat or otherwise manage diseases and disorders of the abdomen or digestive system. These procedures typically involve the use of thin needles or catheters that are guided into the area of interest using real-time imaging guidance provided by x-ray, ultrasound, or other imaging techniques. Common procedures include abscess drainage, biopsy, angioplasty, stent placement, and embolization among others. These procedures are safe, effective, and often require little to no hospitalization or recovery time. As such, abdominal interventional radiology is rapidly evolving and charting a promising path towards improving patient care and outcomes.

Internal Hernias: Key Considerations in Imaging

Atoosa Adibi

Professor of Radiology
Isfahan University of Medical Sciences, Isfahan, Iran

The most common presentation of internal herniation is acute small bowel obstructions

The orifice that the small bowel herniates through is usually a pre-existing anatomic structure.

Pathologic defects of the mesentery and visceral peritoneum, such as from congenital maldevelopment of the mesenteries, and surgery also create potential internal herniation orifices.

CT is the gold standard imaging for evaluation of suspected internal hernias and subsequent bowel obstruction.

CT findings of internal hernias include evidence of small bowel obstruction (SBO); the most common manifestation of internal hernias is strangulating SBO, which occurs after closed-loop obstruction.

The following factors may be helpful in preoperative diagnosis of internal hernias with CT:

(a) knowledge of the normal anatomy of the

peritoneal cavity and the characteristic anatomic location of each type of internal hernia

(b) observation of a saclike mass or cluster of dilated small bowel loops at an abnormal anatomic location in the presence of SBO

(c) observation of an engorged, stretched, and displaced mesenteric vascular pedicle and of converging vessels at the hernial orifice.

Mesenteric Ischemia: From Basics to Clinical Application

Amir Reza Radmard, MD

Associate Professor
Department of Radiology, Shariati Hospital, Tehran University of Medical Sciences, Iran.

Mesenteric ischemia can be life-threatening despite the advances made in diagnosis and treatment. Acute mesenteric ischemia is potentially reversible when a timely diagnosis is made. The radiologist plays a central role in the initial diagnosis and in preventing progression to irreversible intestinal ischemic injury or bowel necrosis. The imaging findings described in the literature are either non-specific or only present in the late stages of acute mesenteric ischemia, urging the use of a constellation of features to arrive at a confident diagnosis. While acute mesenteric ischemia has been traditionally categorized based on the etiology with a wide spectrum of imaging findings overlapping with each other, the final decision for patient›s management is usually made on the stage of the acute mesenteric ischemia concerning the underlying pathophysiology. In this presentation, the pathologic stages of ischemia will be discussed. Then the various imaging signs and causes of mesenteric ischemia will be summarized. The correlation between imaging findings and pathological staging of the disease will also be emphasized. In the end, a clinical management approach will be suggested using combined clinical and radiological findings to determine whether the patient may benefit from surgery or conservative management.

Malignant and Benign Biliary Strictures: How Confident Are We?

Faeze Salahshour, MD

Associate Professor of Radiology
Tehran University of Medical Sciences, Imam Khomeini Hospital Complex, Tehran, Iran.

Biliary strictures are challenging issues. The majority of them are malignant unless otherwise confirmed. But up to 30% of biliary strictures are benign. Many of these strictures remain indeterminate after laboratory and imaging workup, and even tissue sampling. About 15-24% of patients who underwent surgery for suspected malignant biliary strictures, were finally found to have benign etiology. Detailed history focusing on alarm

signs and, a physical exam is mandatory in approaching biliary strictures. Obstructive jaundice and elevated bilirubin increase the likelihood of being malignant. PSC, Ig G4-related cholangitis, iatrogenic strictures, Mirrizi syndrome, and chronic pancreatitis are some of the benign causes of biliary strictures. Psc is characterized by multiple short-segment strictures in intrahepatic and extrahepatic bile ducts. PSC harbors an increased risk of cholangiocarcinoma, these patients should be followed with serial MRI-MRCP and CA-19-9 checking. Detecting superimposed cholangiocarcinoma in PSC poses a difficult challenge in such patients. Developing a mass is a direct sign in favor of cholangiocarcinoma. Indirect signs include progressive ductal dilation, marked ductal dilation, severe ductal narrowing and luminal obliteration, and significant ductal wall thickening. IgG4-related cholangitis may mimic cholangiocarcinoma but represent a long-segment stricture with significant circumferential smooth bile duct wall thickening that shows delayed enhancement but the bile duct lumen is preserved despite severe stricture. The pancreatic portion is most commonly involved followed by the hilar region. extra biliary involvement of the pancreas, kidneys, or retroperitoneum is an ancillary finding. Imaging findings cannot differentiate benign from malignant strictures in many cases, but the presence of a mass, more prominent bile duct wall thickening of more than 2-3mm, asymmetric wall thickening, indistinct outer margin, and luminal irregularity, bile duct luminal obliteration, relative long segment strictures more than 21mm, and portal or delayed hyperenhancement relative to the liver parenchyma are described in the literature in favor of malignant strictures.

Non-malignant Peritoneal Involvement Mimicking Peritoneal Carcinomatosis

Alireza Amir Maafi

Assistant Professor of Radiology
Zanjan University of Medical Sciences, Zanjan, Iran

Abstract:

Peritoneal carcinomatosis is a diffuse and metastatic involvement of the peritoneum. Unfortunately, there are several common and uncommon malignant and non-malignant entities that may mimic peritoneal carcinomatosis on imaging. Wide variety of non-neoplastic mimickers can be categorized into tumor-like involvements, granulomatous infections, and systemic or fat-based diseases.

Although definite diagnosis based on imaging alone is often impossible and usually the final decision is only made after tissue diagnosis, but also in some conditions, there are suggestive or characteristic radiologic findings on different imaging modalities that may help the radiologist to narrow the main differential diagnosis.

Thus this lecture reviews the important imaging features of non-malignant peritoneal involvements specially the common diseases such as tuberculosis, with an emphasis on key findings on CT scan that may suggest different type of management.

Keywords: Peritoneal Carcinomatosis; Peritoneum; non-malignant; Tuberculosis

Peritoneal Carcinomatosis: Aiding Clinicians by Quantifying Disease Burden (PCI)

Neda Pak

Associate Professor of Radiology
Tehran University of Medical Science, Tehran .Iran

Peritoneal metastases are a relatively common location for metastases, particularly from tumors of the abdomen and pelvis. Manifestation of peritoneal disease has a wide spectrum including ascites, omental caking, omental nodularity or masses, and diffuse enhancement with nodular thickening of the parietal peritoneum of the pelvis. Mesenteric effacement, luminal narrowing, bowel wall thickening, hyperenhancement indicate small bowel disease

Peritoneal cancer index (PCI) is a measure of disease spread of peritoneal carcinomatosis that can be evaluated radiographically by CT. PCI is scored across 13 abdominal regions with the composite score reflecting both tumor size and distribution producing a quantitative score. The abdomen and the pelvis are divided by lines into nine regions (regions 0-8). The small bowel is then divided into four regions. Regions 9 and 10 define upper and lower portions of the jejunum, and regions 11 and 12 define the upper and lower portions of the ileum. The lesion size (LS) of the largest implant is scored as lesion size 0 through 3 (LS-0 to LS-3). LS-0 means no implants. LS-1 refers to implants that are visible up to 0.5 cm in greatest diameter. LS-2 identifies nodules greater than 0.5 cm and up to 5 cm. LS-3 refers to implants 5 cm or greater. If an organ is coated by a mat of tumor (confluent disease) or if there is tissue adhesions, the region or site is also scored as LS-3. The lesion sizes are then summed for all regions. A numeric score from 0-39 indicates the extent of the disease.

Preoperatively, the radiologist should review a CT scan of the thorax, abdomen, and pelvis after administration of oral and IV contrast material to initially exclude extraabdominal metastatic disease.

Role of PET in Peritoneal Cavity Malignancies: Strengths and Short Coming

/ F-18 FDG PET/CT Findings

Mehrdad Bakhshayeshkaram

Professor of Radiology
Shahid Beheshti University of Medical Sciences

- Peritoneal carcinomatosis range from invisible on imaging to innumerable masses throughout peritoneum encasing and invading visceral organs.
- Appears as diffuse, low-level uptake over involved peritoneal and serosal surface
- Useful for
  - o Evaluation of abnormal CT or MRI findings suspicious or inconclusive for metastases when this information will change management.
  - o Evaluation of biochemical relapse (rising CEA or CA-125)
  - o Malignant peritoneal mesothelioma

pretreatment evaluation in patients being considered for surgery
- False-negative results occur with subcentimeter lesions, mucinous tumors, and signet ring cell cancer
- Sensitivity for detecting peritoneal carcinomatosis ranges 78-100%; highest sensitivity with suspected clinical or biochemical relapse.
- Reported sensitivity of 92% for detecting recurrent ovarian cancer
- Reported sensitivity of 94% and specificity of 77% for detecting biochemically recurrent colorectal cancer

Imaging Findings in Evaluation of Inguinal Canal and Post-treatment Complications:

Reza Naseri, MD

Assistant Professor of Radiology
Shahid Beheshti Medical University
Tehran, Iran

Ultrasonography (US) has a fundamental role in the initial examination of patients who present with symptoms indicating abnormalities of the inguinal canal (IC), an area known for its complex anatomy. A thorough understanding of the embryologic and imaging characteristics of the contents of the IC is essential for any general radiologist. Moreover, an awareness of the various pathologic conditions that can affect IC structures is crucial to preventing misdiagnoses and ensuring optimal patient care. Early detection of IC abnormalities can reduce the risk of morbidity and mortality and facilitate proper treatment. Abnormalities may be related to increased intra-abdominal pressure, which can result in development of direct inguinal hernias and varicoceles, or to congenital anomalies of the processus vaginalis, which can result in development of indirect hernias and hydroceles. US is also helpful in assessing postoperative complications of hernia repair, such as hematoma, seroma, abscess, and hernia recurrence. In addition, it is often the modality initially used to detect neoplasms arising from or invading the IC. US is an important tool in the examination of patients suspected of having undescended testes or posttraumatic testicular retraction and is essential for the examination of patients suspected of having torsion or infectious inflammatory conditions of the spermatic cord.

Ultrasound Evaluation of Dialysis Access Complications

Ramin Ebrahimi, MD

Assistant Professor of Radiology
Iran University of Medicine Sciences, Firoozgar Hospital, Tehran, Iran

Arteriovenous fistulas (AVF) and grafts (AVG) are two common modalities for hemodialysis access, AV fistulas and AV grafts are not without their problems, however, and as such have been described as both the lifeline as well as the “Achilles heel” of hemodialysis access.

An evaluation of a malfunctioning fistula

or graft must encompass a comprehensive evaluation of the access in order to identify the problem. Duplex ultrasound can help identify the existence or location/etiology of a problem in a noninvasive fashion for someone suspected to have a malfunctioning AVF or AVG, before proceeding to invasive fistulography. The most common lesions are stenoses of the outflow vein or anastomotic lesions. The possibility of a central venous stenosis can also be suggested using duplex ultrasound. Pseudoaneurysms and aneurysms do not pose as severe a threat to fistula patency but can cause compressive or bleeding issues late and should be identified and noted on any duplex ultrasound study.

The most common mode of failure of a native AV fistula is outflow vein stenosis, followed by anastomotic stenosis. The most common mode of failure of an AV graft is neointimal hyperplasia at the venous anastomosis due to turbulent flow in the area. Hemodynamically significant anastomotic stenoses are identified based on velocity criteria. High-resolution sonography defines the severity of the stenosis based on different criteria.

In many situations duplex ultrasound can be used as a first line tool to interrogate a malfunctioning AVF and to direct further invasive diagnostics or therapy such as fistulography or surgical revision. Duplex can readily identify areas of outflow vein stenosis or problems with the arterial or venous anastomosis.

What Must be Included in Report Renal Solid Masses?

Sara Besharat, MD

Assistant Professor of Radiology
Shahid Beheshti University of Medicine Sciences
Tehran, Iran

The complete characterization of an indeterminate renal mass on CT or MR images is challenging.

In patients with normal renal function, the most appropriate imaging modality to fully characterize an indeterminate renal mass is renal CT or MRI without and with intravenous contrast material.

There has been interspecialty consensus between radiologists and urologists that the following imaging features are essential reporting elements: tumor size, presence or absence of macroscopic fat, tumor characterization as solid or cystic, and tumor enhancement.

The size of the mass should be reported in three orthogonal dimensions at initial imaging. Macroscopic fat at CT is best detected on noncontrast CT images and defined as a component or focus of the mass measuring less than 10 HU. Macroscopic fat on MR images is defined as a component or focus of the mass that shows signal intensity loss after application of fat suppression or as linear or curvilinear chemical shift artifact of the second kind causing India ink (etching) artifact within or at the periphery of the mass, while the central portion of the mass matches the signal intensity of subcutaneous or visceral fat. Cystic renal masses, defined as a renal mass with greater than 75% nonenhancing components.

The main strengths of imaging for clinical staging are its noninvasive nature, the wide availability of CT and MRI, the ability to measure tumor size, the detailed visualization of most of the critical landmarks for T staging, and the ability to aid in the detection of pathologic lymph nodes, venous invasion, and distant metastases.

Cases and Key Points in Pediatric Renal Masses

Elham Zarei, MD
Assistant Professor of Radiology
Ali-Asghar Children Hospital
Iran University of Medical Sciences (IUMS)

A wide variety of mass lesions can affect the pediatric kidneys, which can be broadly classified as benign congenital processes, normal anatomic variants, primary benign tumors, primary malignant tumors, metastatic lesions, infection, infarction.

Pediatric renal mass lesion can present as an abdominal or flank mass and may be accompanied by pain or hematuria or may be an incidental finding.

Ultrasound is usually the initial imaging of choice for a suspected renal lesion in the pediatric patients. Aside from classic appearances of a few benign processes on ultrasound, evaluation with CT or MRI is required for further characterization. A clear understanding of the characteristic imaging features of renal mass lesions and associated findings can support accurate diagnosis and management decisions.

In this presentation, I aim to review usual benign and malignant renal masses that can occur in childhood and emphasizes the characteristic imaging appearances which aid in their differential diagnosis.

A Short Review in Antegrade DJ Placement

Shahram Akhlaghpoor, MD
Associate Professor of Radiology
Pardis Noor Medical Imaging and Cancer Center

Abstract:

Double J stents placement is the most common method for relieving urinary obstruction in such cases. Double J stents are generally inserted under cystoscopic guidance via retrograde route. However, retrograde placement can be difficult or even impossible, especially in patients with obstructive malignancies.

A review of literature has shown that the rate of retrograde stenting failure is significantly higher in cases of malignant compression of ureters and that in most cases of or locally advanced prostate cancer or infiltrated bladder cancer, percutaneous nephrostomy is preferable because retrograde stenting would be impossible due to encroachment of tumor into the ureteral orifices. In patients presenting with malignant ureteric obstruction, success rates for retrograde ureteral stenting have been reported to be 50%–88%.

The percutaneous antegrade ureteral stenting technique is a relatively newer technique for ureteral stenting. It can be used as an alternative route for relieving ureteric obstruction due to malignancies.

The technical success rate of ureteral stenting in published studies which have reported varying from 85% to 98%.

All procedures were performed by an interventional radiologist using ultrasound and fluoroscopy guidance. Local analgesia with conscious sedation was used. General anesthesia was only used exceptionally on the demand of the patient.

The purpose of the present study is to evaluate the indications, success rate, and complications of antegrade double J insertion.

Role of PET-CT in GU Tract:

F-18FDG PET/CT Findings

Mehrdad Bakhshayeshkaram

Professor of Radiology
Shahid Beheshti University of Medical Sciences

- Low sensitivity for primary tumor detection
  - o Sensitivity 60%, specificity 100%
  - o Many RCCs are isointense to renal parenchyma
  - o Urine excretion can mask tumor adjacent to collecting system, False-negatives
- Lymphadenopathy
  - o Regional nodal metastases usually hypermetabolic
- Distant metastases
  - o Most common
    - Lung
    - Liver
    - Bone
    - Brain
  - o Usually F-18 FDG avid
  - o Sensitivity 34-90%, specially 75-100%
    - Useful for postoperative surveillance and restaging
    - Can miss mets in liver and brain due to physiologic F-18 FDG uptake
  - o Prognostic value unclear
    - SUV has not been shown to correlate with histologic type or nuclear grade
    - No difference in survival time of PET-positive vs. PET-negative patients

Ga-68 PSMA PET/CT Findings

- PSMA: Membrane protein highly expressed in prostate cancer and other solid tumors
  - o Expressed in 80-100% of clear cell RCC tumors
- Effective in detecting metastatic lesions in patients with known RCC
  - o Better sensitivity, can find smaller metastases that are undetectable by conventional CT
  - o Changes surgical management
- Can be used in patients with renal impairment or contrast allergy

Superior Vena Cava (SVC) Syndrome

Javad Jalili

Associate Professor of Radiology
Department of Radiology Imam Reza Hospital
Faculty of Medicine
Tabriz University of Medical Sciences

- Superior vena cava (SVC) syndrome is caused by the severe obstruction or occlusion of the SVC and can result in significant morbidity and mortality
- Malignancy is the most common cause of SVC obstruction, accounting for approximately 70% of cases
- Recently the incidence of device related SVC syndrome from central venous catheters and pacemaker or defibrillator leads has been increasing
- The most common presenting symptoms include facial and neck edema, distended neck and chest veins, watering eyes, and dizziness particularly when leaning forward
- Some patients with malignant SVC syndrome

may present with life-threatening symptoms of cerebral, laryngeal, and pharyngeal edema due to sudden elevation in venous pressures from rapidly occluding SVC
- In SVC obstruction, the flow of blood is diverted to the right atrium through a collateral venous network, which can take several weeks to accommodate the usual blood flow of the SVC
- The severity of presentation of SVC syndrome is inversely related to the development of these collateral veins and the rapidity with which SVC obstruction develops
- The diagnosis of SVC syndrome is based on the clinical presentation and advanced imaging
- Contrast-enhanced CT scanning provides optimal visualization of the SVC and can localize the extent of venous blockage, differentiate thrombosis from extrinsic compression, and identify collateral pathways
- The management of SVC syndrome is evolving
- In the past, radiation therapy (RT) was considered first line treatment, particularly in patients with airway obstruction
- However, in recent years, endovascular therapy (ET) is more frequently used first, or in combination with RT, to provide rapid relief of clinical symptoms with reduced complication.

Recent Advances in Treatment of Back Pain with Interventional Radiology

Ali Mahdavi, MD

Interventional Radiologist
Imam Hossein Hospital, Shahid Beheshti University of Medical Sciences- Tehran- IRAN
<Ali-mahdavi@sbmu.ac.ir>

Introduction:

Back pain is a common problem that can significantly impact a person›s quality of life. Interventional radiology has become an increasingly important field in the management of back pain, as it offers a range of minimally invasive therapies with high success rates. In this abstract, we will discuss recent advances in interventional radiology for the treatment of back pain.

Epidural Steroid Injections:

Epidural steroid injections (ESI) are a common interventional radiology treatment for back pain. ESIs are typically used to treat conditions such as herniated discs, spinal stenosis, and degenerative disc disease. By reducing inflammation and swelling around these nerves, ESIs can provide significant pain relief to patients with these conditions.

Recent advances in ESI techniques have improved their accuracy and effectiveness. Image guidance, such as fluoroscopy or ultrasound, is now commonly used during the procedure to ensure precise placement of the injection. This has led to higher success rates while minimizing the risk of complications.

Spinal Cord Stimulation

Involves the placement of electrodes along the spinal cord, which emit electrical impulses to disrupt pain signals. Recent developments in spinal cord stimulation technology, such as the

use of high-frequency stimulation, have shown promising results in providing long-term pain relief for patients with chronic back pain who have not responded to other treatments.

Nerve Ablation Procedures:

Nerve ablation procedures use radiofrequency energy to target and destroy nerves that are causing pain in the back. This treatment is particularly effective for patients with arthritis or degenerative disc disease. Recent advancements in nerve ablation techniques, such as the use of cooled radiofrequency ablation, have increased the precision and safety of this treatment.

Conclusion:

Interventional radiology has made significant strides in the treatment of back pain, offering patients a range of minimally invasive options that can provide long-lasting relief. Spinal cord stimulation, epidural steroid injections, and nerve ablation procedures are all effective therapies that have seen recent advancements in their techniques. With ongoing research and development, interventional radiology will continue to play a critical role in the management of back pain.

Bronchial Artery Embolization Up-to-date Recommendations and Standard of Practice

Afshin Mohammadi, MD

Full Professor of Radiology
Interventional Radiology Department, Uremia University of Medical Sciences, Urmia, Iran

Hemoptysis represents a significant clinical entity with high morbidity and potential mortality. Most hemorrhages from a bronchial source arise in the setting of chronic inflammatory diseases. Medical management (in terms of resuscitation and bronchoscopic interventions) and surgery have severe limitations in these patient populations. Bronchial artery embolization (BAE) is an established treatment method for massive hemoptysis. Embolization procedures represent the first-line treatment for hemoptysis arising from a bronchial arterial source. This presentation discusses anatomical and update technical considerations and Standards of Practice for performing bronchial artery embolization to effectively treat hemoptysis.

Ultrasound-guided Radiofrequency Ablation of Locally Recurrent Thyroid Carcinoma

Hossein Chegeni

Interventional Radiologist
TIRAD Imaging Institute, Tehran, Iran

Introduction:

Thyroid cancer typically has favorable outcomes with standard surgical therapy; however, surgery may lead to several complications. Minimally invasive treatments such as radiofrequency ablation (RFA) has shown some promising signs in the

management of these cases. We aimed to evaluate the feasibility, effectiveness, and safety of RFA for non-surgical treatment of benign loco-regional thyroid carcinomas, in both well-differentiated and medullary thyroid carcinomas (DTC and MTC) that are not amenable to traditional treatments.

Methods:

We conducted a retrospective review of 48 patients with 103 recurrent tumors (81 DTC, 22 MTC) who underwent RFA in our clinic. Patients were followed for 12 to 37 months to observe the outcomes and complications.

Results:

64 tumors (62.1%) completely disappeared at the last follow-up visit with 61 (59.2%) being resolved within 12 months. Therapeutic success (volume reduction ratio (VRR) >50%) was 96% (n=99) in all patients. The mean largest diameter of treated tumors decreased from 11.2 to 2.4 mm (p-value < 0.001) and the mean volume decreased from 501 to 41.6 mm3 at the last follow-up (mean VRR = 91%). We only observed one major and two minor complications (voice changes in DTC patients) that completely resolved during follow ups.

Conclusion:

RFA is a safe and effective alternative to repeat surgeries in recurrent loco-regional DTCs and MTCs. We recommend experienced interventional radiologists to consider RFA in MTC as well as DTCs.

Effect of Ultrasound Parameters of Benign Thyroid Nodules on the Efficacy of Radiofrequency Ablation

Hojat Ebrahiminik, MD

Interventional Radiologist
Associated Professor of AJA University of Medical Science

Introduction:

Ultrasound-guided Radiofrequency Ablation (RFA) is a minimally invasive method for treating thyroid nodules (TNs). A good understanding of the factors affecting the efficacy of RFA can help achieve improved treatment efficacy and prognosis. This study investigated the relationship between the ultrasound parameters of benign TNs and the efficacy of RFA in the treatment of these nodules.

Methods:

An interventional quasi-experimental study at 2021 with a before-and-after design was conducted on 250 randomly sampled patients with benign TNs who were to receive RFA treatment. After RFA, nodule volume reduction (VR) and nodule volume reduction ratio (VRR) were measured at 1-month, 3-month, 6-month, and 1-year follow-ups.

Results:

VRR at 1-month, 3-month, 6-month, and 1-year follow-ups was 38.7%, 53.6%, 59.3%, and 59.9%, respectively. The mean of VR was statistically significant in all follow-ups (P<0.001). The VR in 28.2%, 52.1%, and 65.2% of nodules were more than 50% at 1-month,

3-month, and 6-month follow-ups respectively. The odds of RFA success were found to be 4.3 times higher for left-lobe nodules than for right-lobe nodules (OR: 4.31, P=0.002), 6.3 times higher for isoechoic nodules than for hyperechoic nodules (OR: 6.39, P<0.001), 6.2 times higher for hypervascular nodules than for hypovascular nodules (OR: 6.25, P=0.005), and 2.3 times higher for mixed nodules than for solid nodules (OR: 2.37, P=0.049).

Conclusion:

Ultrasound parameters of thyroid nodules were found to have a statistically significant effect on the efficacy of RFA. Small-sized nodules, isoechoic nodules, hypervascular nodules, and nodules with mixed tissue were found to respond better to RFA and thus have a better prognosis in terms of volume reduction after the treatment.

Pseudoaneurysm Management

Atabak Allaf Asghari, MD

Fellowship of Interventional Radiology
Faculty Member of Ardebil University of Medical Sciences

False aneurysms, also known as pseudoaneurysms, are abnormal outpouchings or dilatation of arteries which are bounded only by the tunica adventitia, the outermost layer of the arterial wall. These are distinguished from true aneurysms, which are bounded by all three layers of the arterial wall. Pseudoaneurysms typically occur when there is a breach in the vessel wall such that blood leaks through the inner wall but is contained by the adventitia or surrounding perivascular soft tissue.

Etiology

- trauma (dissection or laceration)
- iatrogenic (dissection, laceration or puncture)
  - arterial catheterization - accounts for most iatrogenic pseudoaneurysms 4
  - biopsy, surgery
- spontaneous dissection
- fibromuscular dysplasia (dissection)
- mycotic aneurysm (inflammatory digestion of the vessel wall)
- myocardial infarction (left ventricular false aneurysm)
- regional inflammatory process
  - acute pancreatitis
  - chronic pancreatitis
- vessel injury/erosion due to a tumor: relatively uncommon
- vasculitides 4
  - Behcet syndrome
  - giant cell arteritis
  - Takayasu arteritis
  - systemic lupus erythematosus
  - polyarteritis nodosa
- penetrating atherosclerotic ulcer

treatment:

- In the past, early surgical repair was recommended for the treatment of almost all pseudoaneurysms
- Recently, endovascular techniques have been widely used for the treatment of pseudoaneurysms because these techniques are minimally invasive and have a high success rate and are associated with low mortality
- in interventional radiology we have multiple options to cure these pseudoaneurysms such as embolization with coils or particles,

and using covered stent , combination of a balloon or an uncovered ("bare- mesh") stent placed across the arterial defect and packing the aneurysmal sac or direct injection of thrombin to pseudoaneurysm sac

Sandwich Occlusion This technique, which is most easily performed by placing metallic coils on either side of the aneurysm, is one that has been used more than any other and, when performed correctly, will be curative with little risk of recurrence.

New and Important Clues in Carotid Artery Stenting

Arash Khameneh Bagheri, MD

Assistant Professor of NeuroInterventional Radiology
Radiology Department of Shohaday-e-Tajrish Hospital
Shahid Beheshti University Of Medical Sciences, Tehran, Iran

Atherosclerotic narrowing (stenosis) of the internal carotid artery accounts for about 10–15% of ischaemic strokes. Carotid endarterectomy (CEA) reduces the risk of stroke in patients with symptomatic stenosis and–to a lesser degree with asymptomatic carotid stenosis. Endovascular treatment including balloon angioplasty and carotid artery stenting (CAS) has emerged as an alternative to CEA to treat carotidstenosis.

Carotid artery stenting (CAS) is established as an important minimally invasive treatment modality in primary and secondary stroke prevention in atherosclerotic carotid artery disease. Meta-analyses of large-scale randomized trials of first-generation (single-layer) stent CAS versus surgery (carotid endarterectomy, (carotid endarterectomy, CEA) demonstrated equipoise of the two treatment modalities in long-term outcomes. Single-cohort studies suggest that second-generation stents (SGS; "mesh stents") may improve carotid artery stenting (CAS) outcomes by limiting peri- and postprocedural cerebral embolism. SGS differ in the stent frame construction, mesh material, and design, as well as in mesh-to-frame position (inside/outside).

Randomized clinical trials show higher 30-day risk of stroke or death after carotid artery stenting compared with surgery. The 30-day risk of stroke or death did not differ according to operator lifetime carotid artery stenting experience or operator lifetime stenting experience excluding the carotid . In contrast, the 30-day risk of stroke or death was significantly higher in patients treated by operators with low and intermediate annual in-trial volumes compared with patients treated by high annual in-trial volume operators, So carotid stenting should only be performed by operators with annual procedure volume ≥6 cases per year.

Lung Biopsy

Mohammad Reza Sasani

Assistant Professor, Department of Radiology School of Medicine, Shiraz University of Medical Sciences, Shiraz, Iran.

Percutaneous biopsy of focal lung lesions, mediastinal or hilar masses, has become an essential part of staging of pulmonary and extra-thoracic tumors.

In lung carcinoma, aspiration biopsy results in a positive diagnosis in 80% to 90% of cases. If a cutting needle is used, a positive diagnosis is expected in 95% to 98% of patients unless the lesion is necrotic.

Lesion size (<1.5 cm and >5 cm) together with a benign histology negatively affect results of cutting needle biopsy.

Indications are such as diagnosis of lung and mediastinal lesions & tumor staging.

Contraindications are such as severe emphysema or unilateral pneumothorax, bleeding diathesis, uncooperative patients, positive pressure ventilation, pulmonary arterial hypertension when a central biopsy is contemplated, suspected hydatid cyst, and lesion <5 mm.

Technique, take the shortest possible path to the lesion and avoiding vital structures. when CT is used, ensure the final tip position of the needle is imaged before a biopsy is performed. After the biopsy the patient is turned so that the punctured side is lowermost to reduce ventilation of that lung and pneumothorax.

Complications such as pneumothorax, hemoptysis, bleeding, infection, failure, air embolism. there is a low incidence of death after needle biopsy of the thorax.

Postprocedural and Follow-Up Care check post-biopsy pneumothorax, ask patient to breathe quietly, keep patient resting for 2 to 3 hours, CXR at 1 hour and 3 hours post-biopsy, if hemoptysis occurs, it is important to reassure patient that it will stop.

Splenic Artery Embolization and Indications

Alireza Sattar, MD

Fellowship of Interventional Radiology Shiraz Medical University of Sciences

Abstract:

Transcatheter arterial embolization by interventional radiologist has a major role in some spleen related diseases.

Spleen is the most commonly injured visceral organ in blunt abdominal trauma in both adults and children and angiography with transcatheter splenic artery embolization, an alternative nonoperative treatment for splenic injuries, has increased splenic salvage rates to as high as 97%.

Thrombocytopenia, and hypersplenism with portal hypertension are the other major causes of splenic embolization.

Other less frequently cases for splenic embolization are hereditary spherocytosis, thalassemia, autoimmune hemolytic anemia, idiopathic thrombocytopenic purpura, splenic hemangioma, and liver cancer

Splenic artery aneurysms ,splenic artery steal syndrome , improving liver perfusion in

liver transplant recipients, and to administer targeted treatment to areas of neoplastic disease in the splenic parenchyma are the other causes.

The limitations exist mainly in the difficulties in selecting the arteries to embolize and in evaluating the embolized volume.

Major complications of splenic embolization include pulmonary complications, severe infection, damages of renal and liver function, and portal vein thrombosis.

Keywords: splenic artery embolization, interventional radiologist, blunt splenic trauma; portal hypertension, hypersplenism

Precutaneous Placement of Multiple Biliary Plastic Stents.

Abbas Ayoub

Interventional Radiology Fellowship
Shiraz University of Medical Sciences

Abstract:

Benign biliary strictures are the most common complications encountered in post-liver transplantation patients or post hepato-biliary surgical operations.

ERCP and percutaneous interventions are the choice of treatment of postoperative biliary strictures which are minimally invasive techniques.

we aimed to introduce a new interventional technique which resume and preserve the bile ducts patency with high success and low complication rates.

Lower Gastrointestinal Bleeding

Farzad Moradhaseli

Interventional Radiology Fellowship
Shiraz University OF Medical Sciences

Lower gastrointestinal bleeding (LGIB) is a common life-threatening condition causing significant morbidity and mortality without appropriate treatment and interventional radiology (IR) has key role in the management of gastrointestinal (GI) bleeding, especially when endoscopy fails or if the patient is a poor surgical candidate.

Computed tomography angiography (CTA) and nuclear scintigraphy can localize the source of bleeding and provide vital information for the interventional radiologist to guide therapeutic management with endovascular approach. Endovascular embolization can be performed promptly and effectively with successful outcomes.

In lower GI bleeding, embolization is generally performed with coils or liquid embolic agents because of the lack of collateral supply to the lower GI tract, embolization should be very selective.

In conclusion, catheter directed angiography and embolization is safe and efficacious in patients with lower GI bleeding.

Keywords: Lower gastrointestinal bleeding, Interventional radiology, Angiography, Embolization

Microwave Ablation of Renal Carcinoma

Peyman Moghaddam Shad

Interventional Radiologist
Laleh Hospital and Tehran Imaging Center

There are different type of energy-based ablation for renal cell carcinoma including radiofrequency ablation (RFA) which is initially most common modality used for renal ablation.

Microwave ablation (MWA) which is heat-based cytotoxicity offers faster ablation times and has less susceptibility to thermal heat sink effect.

There are multiple indication for renal carcinoma ablation including non-surgical candidate, genetic disorders with increasing likelihood of multiple bilateral renal tumors, solitary kidney with most appropriately sized lesion for ablation in tumors less than 4cm.

This procedure is contraindicated in lesion with proximity to renal vascular structures and renal hilar structures and larger than 4 cm tumors.

Most feared complications including ureteral stricture, renal failure and hemorrhage.

Complete necrosis in masses with less than 4 cm with more than 90% is expected

Management of Pleural and Pericardial Effusion

Azim Motamedfar

Assistant Professor of Radiology,
Department of Radiology, Faculty of Medicine,
Jundi Shapur University of Medical Sciences,
Ahwaz, Iran
<azexious@yahoo.com>

Pleural and pericardial effusion occur when excess fluid collects in the pleural and pericardial spaces. Dyspnea and reduced exercise tolerance will be early signs, progressing to severe in severe cases. Pericardiocentesis is the most useful therapeutic procedure for the early management or diagnosis of large, symptomatic pericardial and pleural effusion . The effect of pericardiocentesis is often immediate: the drainage of a few millilitres of the effusion significantly reduces intrapericardial and atrial pressures. Tachycardia and dyspnoea decrease . Prior to intervention, diagnosis of malignant pleural effusion and exclusion of infection should be made. Treatment focuses on palliation and relief of symptoms. Numerous interventions are available, ranging from drainage with thoracentesis or indwelling pleural catheter to more definitive, invasive options such as pleurodesis. There is no clear best approach, and a patient-centered approach should be taken.A Seldinger technique is employed, usually under ultrasound guidance, to insert a drain into the pleural and pericardial spaces. In cases where effusions are recurrent and symptomatic (e.g. malignancy) then pleurodesis and pericardial fenestration can be performed. Major and minor complications are rare include small pneumothorax, vasovagal response with transient hypotension

Bariatric Embolization of Arteries for the Treatment of Obesity (BEAT Obesity): Where We Are and Where We Go?

Mohammad Momeni

Assistant Professor
Sina Hospital, Tehran University of Medical Sciences, Tehran, Iran

Abstract:

Obesity is a global concern that leads to increased morbidity, mortality, and quality of life decrement and can lead to several comorbid diseases. Traditional therapies for obesity include lifestyle modifications, medical management and bariatric surgery. Bariatric embolization of arteries for the treatment of obesity (BEAT obesity) is a promising method to treat patients with obesity. It is a minimally invasive image guided technique performed by interventional radiologists. The procedure embolizes the gastric fundus through the left gastric artery (LGA) and, in some cases the gastroepiploic artery (GEA). BAET destroys ghrelin-producing cells by causing ischemia in the gastric fundus and decreasing ghrelin production, resulting in decreasing appetite and loss of body weight. Bariatric embolization is well tolerated and has minimal post procedural complication. The safety and preliminary efficacy of BAE for obesity have been verified by several studies.

Management of Upper GI Bleeding

Kiara Rezaei-Kalantari, MD

Cardiovascular Imaging and Interventional Radiologist
Rajaie Cardiovascular, Medical and Research Center, Iran University of Medical Science
Associate Professor of Radiology

Upper gastrointestinal bleeding is a medical emergency that requires prompt diagnosis and treatment. Vascular intervention, such as transcatheter arterial embolization (TAE) and transjugular intrahepatic portosystemic shunt (TIPS), has emerged as an effective treatment option for patients with upper gastrointestinal bleeding who have failed or are not candidates for endoscopic therapy.

TAE involves the injection of embolic agents into the bleeding vessel, which occludes the vessel and stops the bleeding. TIPS, on the other hand, involves the creation of a shunt between the hepatic vein and portal vein to relieve portal hypertension, which can reduce the risk of re-bleeding.

Several studies have shown that vascular intervention can achieve high rates of technical success and clinical success, with low rates of major complications. However, the optimal timing, patient selection, and choice of intervention remain the subject of debate.

In conclusion, vascular intervention is a valuable treatment option for patients with upper gastrointestinal bleeding who have failed or are not candidates for endoscopic therapy. Further studies are needed to optimize patient selection and treatment strategies to improve outcomes

RFA for Osteoid Osteoma

Masoud Pezeshki Rad

Associate Professor of Radiology,
Department of Radiology, Faculty of Medicine,
Mashhad University of Medical Sciences
Mashhad, Iran
<pezeshkiradm@mums.ac.ir>

Abstract:

Radiofrequency ablation (RFA) has emerged as a promising minimally invasive technique for the treatment of osteoid osteomas (OOs). OOs are benign bone tumors that predominantly affect young individuals and can cause severe pain and functional impairment. Traditionally, treatment options for OOs have included open surgical excision or prolonged medical management with nonsteroidal anti-inflammatory drugs. However, RFA has demonstrated excellent efficacy and safety in the treatment of OOs, with high success rates and low complication rates. This presentation reviews the current literature on RFA for the treatment of OOs, including the indications, technique, and outcomes of this approach. We also present a case series of some patients who underwent RFA for symptomatic OOs, with successful pain relief and no significant complications. RFA is a safe and effective treatment option for symptomatic OOs, and radiologists should be aware of this minimally invasive technique when managing patients with this condition.

Geniculate Artery Embolization

Mohammad Hossein Ahrar

Assistant Professor of Radiology
Yazd University of Medical Sciences

Geniculate artery embolization (GAE) is a minimally invasive procedure that can effectively treat chronic knee pain caused by osteoarthritis. During the procedure, small particles are injected into the geniculate arteries that supply blood to the knee joint, blocking blood flow to the affected area and reducing inflammation and pain. GAE has been found to be a safe and effective therapy, with minimal side effects and a high level of patient satisfaction. In recent years, GAE has become an increasingly popular alternative to knee replacement surgery for patients with moderate to severe knee pain. Further studies are needed to evaluate the long-term efficacy and safety of GAE and to better understand the ideal patient selection for the procedure.

Management of Anticoagulation and Antiplatelet Medication in Adults Undergoing Percutaneous Interventions

Amin Abolhasani Foroughi, MD

Associate Professor of Radiology
Interventional Radiology Fellowship, Medical Imaging Research Center, Shiraz University of Medical Sciences, Shiraz, Iran

The Patients should be first assessed by taking bleeding history. Excessive coagulation testing before an elective IR procedure does not prevent postoperative bleeding and is not advised. If the history of structural bleeding is negative and the patient is not receiving antithrombotic therapy, then no coagulation test is needed.

If the structured bleeding history is positive, then performing coagulation tests (platelet count, PT, PTT) are necessary. Coagulation laboratory assessment (platelet count, PT, aPTT, Clauss fibrinogen) is recommended for patients on anticoagulation or in the presence of other clinical conditions which may impair coagulation (such as renal or liver disease) prior to IR procedure with risk of bleeding.

Patients on anticoagulants with increased risk of thromboembolic complications planning to do elective IR procedure with low risk of bleeding can continue medication depends on type of procedure and its bleeding risk.

Patients on anticoagulants with increased risk of thromboembolic complications and are planned an elective IR procedure with moderate or high risk of bleeding, withholding anticoagulation and bridging therapy is recommended.

Patients on anticoagulants requiring an immediate emergency IR procedure with low risk of bleeding can have IR procedure with omitting a dose of drug or during medication use.

Patients on anticoagulants requiring an immediate emergency IR procedure with moderate or high risk of bleeding can be treated with reversing anticoagulation and if they are at high risk of thrombosis, bridging therapy should be initiated.

For patients at risk of bleeding, attention should be given to apply pressure at puncture sites, supportive care and monitoring of vital signs.

For patients on warfarin, discontinuing anticoagulation is recommended associated with accelerated reversal with vitamin K.

Endovascular Treatment of Brain Arteriovenous Malformations

Alireza Rasekhi

Associate Professor of Radiology
Head of Interventional Radiology Dept
Shirz University of Medical Science Shiraz Iran

Tools include:

Digital subtraction catheter cerebral angiography and reformatted cross-sectional views when appropriate is recommended in the pre-treatment assessment of cerebral AVMs .

Aim of endovascular treatment are:

1- Embolization of brain AVMs before surgical resection
2- Primary curative embolization
3- Targeted embolization of high-risk features of ruptured AVMs to reduce the risk for recurrent hemorrhage 3- Palliative embolization may be useful to treat symptomatic AVMs
4- Embolization as an adjunct to radiosurgery.

In an acutely ruptured AVM, endovascular treatment can occlude intra-nidal or flow-related aneurysms when determined to be the likely source of bleeding, especially when correlated with the pattern of hemorrhage on cross-sectional imaging.

Transvenous embolization more recently, (high complete occlusion rates and reasonably low complication rates). Proposed indications for this approach include a small (diameter <3 cm) and compact AVM nidus, deep or eloquent AVM location, hemorrhagic presentation, single draining vein, inaccessible arterial pedicles, exclusive arterial supply by perforators, or en passage feeding arteries

Imaging follow-up after apparent cure of brain AVMs is recommended to assess for recurrence. Although non-invasive imaging may be used for longitudinal follow-up, DSA remains the gold standard

Chemotherapy Port Insertion and Management of Complication

Mohammad Asare, MD

Radiologist
Department of Radiology, Faculty of Medicine, Jondi Shapur University of Medical Sciences, Ahwaz, Iran
<Mohammadasare96915@gmail.com>

Abstract:

Implantable port is also known as a portacath or subcutaneous port. A thin tube called a catheter is attached to a small reservoir called a port. It can be used to give chemotherapy or medicine into a vein, or to take blood samples. People with cancer, severe infections, kidney failure and IBD may need implanted ports. The device goes beneath your skin in your chest, arm or abdomen. Implanted port was done through puncture of IJV, Subclavian and Femoral veins. It's usually barely visible under the skin. Implanted ports can help adults and children. The port reduces your risk of Pain, bruising, bleeding and infections, Leaks of IV fluid from a vein and into nearby tissues , Vein damage (such as from strong chemotherapy) or ruptures. Early complications include hemothorax, pneumothorax, injury to large blood vessels, air emboli, cardiac arrhythmia, and malposition of the catheter.

Embolization of Renal Angiomyolipoma

Alireza Abrishami

Assistant Professor of Radiology
Department of Radiology, Shahid Labbafinejad Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

Angiomyolipoma (AML) is the most common renal benign tumor. Treatment should be considered for symptomatic patients or for those at risk for complications, especially retroperitoneal bleeding which is correlated to tumor size, grade of the angiogenic component and to the presence of tuberous sclerosis complex (TSC). In addition to size, the presence of intralesional aneurysms should be considered in any prophylactic treatment decision.

Selective arterial embolization (SAE) can be used for prophylaxis of high-risk tumor, for acute management of tumor bleeding, or as a preoperative adjunct treatment for surgery to prevent intraoperative blood loss. The bleeding vessels were selectively catheterized with 4 F or microcatheters and embolized with use of alcohol, PVA, glue or micro coils according to the size of the vessel being embolized. This minimally invasive interventional radiology technique has become the primary treatment for AMLs since several years because it is less invasive than a surgical intervention and enables targeted treatment of bleeding vessels with a low risk of severe complications.

SAE is a safe and effective technique to manage renal AMLs as a preventive treatment as well as in emergency setting, with significant reduction in tumor size during follow-up. A multidisciplinary approach remains fundamental, especially for TSC patients.

Difficult and Complicated Neurointerventions

Alireza Raseki

Associate Professor of Radiology
Head of Interventional Radiology Dept
Shirz University of Medical Science, Shiraz, Iran

Embolization is widely performed to treat brain arteriovenous malformations, but little has been reported on factors contributing to complications

Endovascular procedures mostly performed with Liquid materials including:

1- preradiosurgical embolization,
2- sole endovascular treatment,
3- Complete or near-complete obliteration of brain arteriovenous malformations

Procedure-related complications include:

1- hemorrhagic complications and
2- ischemic complications

Embolization of brain arteriovenous malformations in the infratentorial location is significantly associated with complications. Patients with complications due to endovascular procedures had worse clinical outcomes 30 days after the procedures than those without complications.

Endovascular coiling for intracranial aneurysms has become an accepted treatment with good clinical results and provides adequate protection against rebleeding and rupture of aneurysms. However, despite the experience, preparation, or skill of the physician,

complications during endovascular treatment still occur. The main complications of endovascular coiling are: procedural aneurysmal perforations by the microcatheter, micro-guidewire, or coil, and thromboembolic events.

two most common complications, aneurysmal perforation and thromboembolism during endovascular coiling, and how we can prevent or overcome these complications to achieve a satisfactory outcome.

the flow diverter has been become an important tool but a couple of complications including in stent thrombosis and jump and migration.

Management of Loco-Regional Interventions in HCC

Hazhir Saberi

Radiology Professor of TUMS.
Tehran, iran

Some patients are more susceptible to HCC (like HBV, Cirrhosis and ...). in these patients screening imaging (ultrasound) is highly recommended. In positive cases next step would be 4-phasic CT Scan or dynamic MRI for confirm diagnosis and also staging.

If there are typical signs of HCC (wash in, wash out), biopsy is not necessary in susceptible populations.

Gold standard treatment of HCC is surgery (resection or liver transplantation). In those

cases which are not candidate for surgery, Loco-Regional treatments are key players. The mostnoticeable of these are: TACE (Trans Arterial Chemoembolization) and Local Ablations (RF,Microwave, Alcohol injections & ...). Site and Size of tumors should be considered in decision forablative techniques. Limitations for RF are 1) tumors more than 3 cm or 2)subcapsular locationor 3)neighboring to large vessels, but there are less limitations in Microwave. TACE is one of thetreatment of choice in cases which are not candidate for surgery or thermal ablations(intermediate stage). There are also some limitations for TACE which the most important one is decompensated cirrhosis (child B 8,9 & C). In this technique there are two factors (Ischemia &Chemotherapy) attenuating the tumors with synergistic effect.

Generally TACE has a palliative situation in the guidelines but could be used as a

bridge for curative plan (surgery or liver transplantation) alone or in combination with

ablation techniques.

Varicose Vein Diagnosis and Treatment Workshop

Amin Abolhasani Foroughi, MD

Associate Professor of Radiology
Interventional Radiology Fellowship, Medical Imaging Research Center,
Shiraz University of Medical Sciences, Shiraz, Iran

For any patients referred to us with chief complaint of varicose vein or its fear when he or she saw small red vessels on legs, the first thing is to take history, paying attention to history of thrombophlebitis in the patients, and his or her first degrees, history of pain,

aching, itching, heaviness and cramp, then do physical examination by inspection, palpation of abnormal veins and looking for any sign of edema, skin discoloration, redness, swelling, color change, active or healed ulcers.

Using CEAP classification is necessary to approach the patient, for C0 or C1 disease there is no need for Color Doppler Ultrasound (CDU), but for C2 to C6 disease CDU can be helpful and is recommended. It is mandatory to assess the deep venous system then proceed to evaluation of superficial veins in standing position with and without Valsalva maneuver and after release of muscle augmentation. After the CDU, it is better to map the venous system and mark the abnormal parts and the points of flow reversal that cause varicosity for the patients. It is better to see the problems by inspecting the venous map in one glance.

For C1 disease Sclerotherapy either foam or liquid type can be performed for treatment.

For C2 to C6 disease considering the presence of chronic DVT or not or iliac vein obstruction or not, superficial venous reflux may be present. If the patient had deep venous problem or May Turner Syndrome, they should be treated first.

For treatment of GSV reflux, thermal ablation is nowadays the methods of choice. Other methods that are under development are Glue injection and MOCA. Foam Sclerotherapy and vein surgery are not recommended for these purposes.

Ischemic Stroke (Role of IR)

Mohammadgharib Salehi

Associate Professor of Radiology
Kermanshah University of Medical Sciences.

Spinal arteriovenous malformation (AVM) is a broad term that constitutes diverse vascular pathologies. To date, various classification schemes for spinal AVM have been proposed in literature, which helped neu- rosurgeons understand the pathophysiology of the disease and determine an optimal treatment strategy. To discuss indications and results of surgical and endovascular interventions for spinal AVM, this article refers to the following classification proposed by Anson and Spetzler in 1992: type I, dural arteriovenous fistula (AVF); type II, glomus intramedullary AVM; type III, juvenile malformations; and type IV, perimed- ullary AVF. In general, complete obliteration of the fistula is a key for better outcome in type I dural and type IV perimedullary AVFs. On the other hand, in type II glomus and type III juvenile malformations, functional preservation, instead of pursuing angiographical cure, is the main goal of the treatment. In such cases, reduction of the shunt flow can alleviate clinical symptoms. Proper management of spinal AVM should start with neurological examination and understanding of angioarchitectures, which provide criti- cal information that guides the indication and modality of intervention. Finally, close collaboration of the microsurgical and endovascular teams are mandatory for successful treatment.

Imaging Appearance and Nonsurgical Management of Female Venous Congestion Syndrome

Hamed Iraji, MD

Assistant Professor of IUMS
Tehran-Iran

Describe features of pvcs with multiple modalities us,ct,MRI,angiography and clinical symptoms

Discuss nonsurgical treatment options for pvcs (endovascular treatment procidure and percutaneous sclerotherapy)

Indication, anatomical aspect, technical aspect, complications and follow up care

Role of Microwave Ablation in Treatment of Lung Tumors

Rambod Salouti, MD

Interventional Radiologist, Isfahan

Image-guided percutaneous thermal ablation is a common excellent alternative option for treatment of non- operable primary and metastatic lung tumors. These techniques are based on heating effect on the tissue around a percutaneous applicator causing coagulative necrosis of the tumor cells. Microwave Ablation (MWA) is a commonly used locoregional interventional procedure in treatment of pulmonary tumors with satisfactory outcome.

Microwave ablation therapy is a safe effective minimally invasive tool for treatment of pulmonary tumors and considered a useful option in the multimodality treatment of patients with in-operable lung cancer. Compared to RFA, it creates larger, more spherical and less time-consuming ablation zones and is less susceptible to the heat sink effect with same complication rate. The efficacy of treat- ment is determined mainly by preablation tumor size and location in relation to the hilum.

The Renal Angioplasty and Stenting

Mohammad Reza Azimi Aval

Assistant Professor of Radiology
Interventional Radiologist
Department of Radiology, Be-sat Hospital,
AJA University of Medical Science, Tehran, iran

Percutaneous transluminal angioplasty (PTA) of the renal artery has become an increasingly widespread peripheral vascular intervention for the treatment of renovascular hypertension (HTN). Catheter-based procedures began in 1964 when Charles Dotter initially developed PTA for treating peripheral vascular atherosclerosis. Andreas

Grüntzig revolutionized the technique in 1974 when he developed a soft, flexible, double-lumen balloon catheter for use in coronary arteries.

PTA has since rapidly evolved into a widely used, versatile, and dependable vascular interventional technique. Excellent results may be achieved in the renal arteries if patients are well selected and if experienced clinicians perform the procedure

Alone or in combination with stent implantation, PTRA is increasingly used as an alternative to surgical revascularization for the treatment of RAS, which may cause HTN or jeopardize renal function. Technical success is usually achieved in more than 85% of cases; the failure rate is 10%.

PTRA-related complications occur in 7% of patients . An overall benefit on BP control is observed in 20-40% of patients with atherosclerotic RAS (ARAS) and 60-70% of those with fibromuscular dysplasia (FMD; see Outcomes). Independent of etiology, PTRA appears to be technically effective in correcting RAS. However, its position with respect to medical or surgical treatment must be better defined through randomized controlled studies aimed at comparing the clinical efficacies of these approaches.

Presentation Topic: Pre Surgical Embolization of Vertebral Hemangioma

Peyman Hashemi
Assistant Professor
Medical University of Esfahan, Iran, Esfahan

Summary of Presentation:

Aggressive vertebral hemangioma is a challenging pathology because of the high risk of uncontrolled bleeding, pending fracture, and invasion of the spinal canal with spinal cord compression and neurological deficit.

Because of its vascular nature, selective embolization of pathological blood vessels is one of the first-line treatments used to treat this pathology. Preoperative embolization, as adjuvant therapy, proved to be useful in reducing surgical bleeding and thus operative risks.

Literatures have provided evidence that preoperative embolization confers a benefit to aggressive vertebral hemangioma patient outcomes. After performing a systematic review demonstrated statistically significantly less blood loss in the group that received preoperative embolization.

Therefore, pre surgical embolization of vertebral hemangioma is considered an effective procedure to decrease post-operative morbidities and even could be a therapeutic method in some cases.

In this presentation we will review this procedure with describing:

- Anatomy of vertebral arteries
- Indications and contraindications
- Technique
- Embolizing agents
- Efficacy and outcome
- Complications

And at the end we will present some cases of our institution.

Case Presentation (Interesting Cases)

Alireza Rasekhi

Associate Professor of Radiology
Head of Interventional Radiology Dept
Shirz University of Medical Science, Shiraz, Iran

Routine interventional radiology practice is full of adventures and stress. All of IRs are facing with several observations that make them very interesting and teachingful. In a fully experienced hands, it is mandatory to document the work and present in IR gatherings. In this case review we present different IR works in different organ systems including the central nervous system, GI, pancreato hepatobilliary, cardiopulmonary, GYN and GU systems and discuss the cases with other colleagues and receive their recomengations

Recent Advance in TACE

S. Akhlaghpoor, MD

Associate Professor of Radiology
Pardis Noor Medical Imaging and Cancer Center

Abstract:

TACE has been proposed for a long time as the criterion standard for palliative treatment of unresectable HCC, and Liver Metastases and has been reported to improve the survival of many of these patients, compared with supportive treatment. According to Barcelona Clinic Liver Cancer (BCLC) tumor staging and management, TACE is recommended as the first-line therapy for unresectable intermediate stage HCC (stage B). Among the metastases some are very good responsive to TACE such as Neuroendocrine, Hypervascular metastases such as Melanoma and also cholangicarcinoma.

Main component of the TACE are Instrument, Embolic Material and Chemotherapeutic Agent (Drugs).

In this presentation we will discuss new tools for TACE, recent advance in embolic agents and new drugs including Immunotherapy agents who are edge of interest nowadays. Special focus on Immuno Oncology in Interventional Oncology were also be discussed.

MSK Intervention Procedures

S. Akhlaghpoor, MD

Associate Professor of Radiology
Pardis Noor Medical Imaging and Cancer Center

Abstract:

During recent decades, the volume and range of therapeutic musculoskeletal (MSK) interventions that radiologists can offer their patients has dramatically increased.

With new materials and improving imaging modalities, as well as significant investment in research, the field of MSK interventional radiologic intervention will likely continue to expand.

As this a large field we will focus on HIP intervention procedures. These are include Biopsy, Injection, tumoral ablation, embolization and Cementoplasty.

An special focus in advanced US-guided procedures were done as a most available imaging modality that radiologist can do many of them in office base setup. We also briefly describe the relevant medications and principlesassociated with imaging-guided interventions.

Following this, we discuss individual procedures that are used to treat pain in the anterior, lateral, and posterior regions of the hip, with an overview of the relevant anatomy, common diseases, and various injection techniques.

Evaluation of Fallopian Tube Patency Infertility and ART Failure

Sharareh Sanei Sistani

Associated Professor of Radiology
Zahedan University of Medical Sciences,
Zahedan, Iran

Up to one third of infertility and subfertility causes are due to impaired tubal patency. Tubal and peritoneal diseases are the main causes of infertility. Tubal pathology can either be congenital malformation or acquired; proximal or distal; unilateral or bilateral; and, transient or permanent. Several imaging methods such as laparoscopy, fluoroscopy, saline infusion sonography, and hysterosalpingography (HSG) have been used to assess tubal and peritoneal pathology. Although laparoscopy is the modality of choice for investigating tubal patency and pelvic structure in many infertility centers, HSG is usually the initial diagnostic method for infertility workup because of its ease of performance, accuracy, and minimal risk of complications. HSG provides useful information about the size, contour, and anatomy of the inner surface of the fallopian tubes and is the gold standard for evaluation of tubal lumen. Tubal and peri-tubal pathology show various imaging manifestations on HSG. In this lecture we will discuss the radiographic features of congenital and acquired structural abnormalities of the tubal pathology, and the etiologies of occlusion or obstruction.

Isthmocele

Firoozeh Ahmadi, MD*

Department of Reproductive Imaging
Reproductive BioMedicine Research Center, Royan Institute for Reproductive BioMedicine, ACECR, Tehran, Iran

Fattaneh Pahlavan, Msc

Department of Reproductive Imaging
Reproductive BioMedicine Research Center, Royan Institute for Reproductive BioMedicine, ACECR, Tehran, Iran

Isthmocele, also is called "Niche", "Pouch", or" Uterine scar defect" develops when the cesarean section incision dose not heal completely.

In general, most isthmoceles are

asymptomatic being found incidentally on ultrasound examination. Symptoms including AUB, postmenstrual spotting, dysmenorrhea, pelvic pain, and infertility have now been associated with isthmocele. Obstetric complications of isthmocele were described in the literature, such as placenta accrete, placenta previa, scar dehiscence, uterine rupture and C.S-EP. The association between isthmocele and secondary infertility has been reported.

Various imaging methods including TVS, SHG, MRI, can be used to diagnosis isthmocele. TVS is the initial most usual method. The standard diagnosis procedure for identification of isthmocele is transvaginal sonography (TVS), however, sonohysterography has been proven to be an at least equally apt alternative method. The defect has been described on TVS as an anechoic triangle defect in the myometrium with the base communicating to the uterine cavity.

Some authors have classified the findings according to the size of the defect, a large defect is described as a myometrial reduction of >50% of the wall of the thickness. A large defect may also be classified as residual myometrium (RM) < 2.2 mm by TVS and < 2.5 mm by SHG.

Role of Imaging in Differentiation Between Malignant and Benign Uterine Mass

Narges Afzali, MD

Associate Professor of Radiology
Mashhad Medical Sciences, Islamic Azad University, Mashhad, Iran

Uterine sarcomas are rare malignant tumors arising from the mesenchymal tissues of the uterus such as the endometrial stroma, uterine muscle and connective tissue. They represent 1% of female genital tract malignancies and 3–7% of all uterine malignances. It is estimated that 0.1–0.3% of patients operated on for presumed uterine leiomyoma have a uterine sarcoma.

Misclassifying a sarcoma as a benign leiomyoma may result in no or delayed treatment or surgical treatment that is inappropriate, which would be highly likely to impact negatively on prognosis. Subjective assessment of ultrasound images could help differentiate between benign and malignant myometrial tumors.

Uterine sarcomas typically appear as solid masses with inhomogeneous echogenicity, sometimes with irregular cystic areas but only very occasionally with fan-shaped shadowing. Most are moderately or very well vascularized. There are seven ultrasound features can help differentiating leiomyosarcoma from benign leiomyoma. They include irregular tumor border, loss of normal myometrium, loss of typical benign leiomyoma feature, necrosis, cystic degeneration, absent or minimal circumferential vascularity and minimal or moderate intralesional vascularity. Diagnosis of suspected uterine leiomyosarcoma requires five out of these seven features present, four gray-scale and one color Doppler ultrasound.

A diagnostic algorithm including diffusion-weighted MRI criteria may help distinguish uterine sarcoma from atypical leiomyoma. An MRI diagnostic algorithm that included enlarged lymph nodes, peritoneal implants, high diffusion-weighted MRI signal greater than that in endometrium, and apparent diffusion coefficient less than or equal to 0.905 × 10−3 mm2/sec enabled identification of leiomyosarcoma.

Role of Imaging in Differentiation between Malignant and Benign Ovarian Mass

Parvaneh Layegh

Department of Radiology
Mashhad University of Medical Sciences (MUMS),
Mashhad, Iran

High heterogeneity is a characteristic of ovarian masses and the differential diagnosis of benign and malignant ovarian tumors is of great significance for to choose the treatment planning approach.

Clinical symptoms combined with tumor marker tests, sonography (TAS/TVS), computed tomography (CT) scans, magnetic resonance imaging (MRI) scans, etc., can often make the diagnosis of ovarian cancer, but the differential diagnosis of ovarian masses is often challenging for the radiologists and requires further judgment.

This problem has been improved by using newer preoperative imaging methods to predict ovarian tumoral subtypes (benign, borderline, or malignant), determining the origin of the tumor(ovary or the adnexa) and metastatic disease evaluation.

Ultrasound especially TVS (transvaginal) as first- line imaging modality has the most important role of is the differentiation between benign and malignant status and can be done by a combination of 2D grey-scale imaging, color and spectral Doppler. Recently, diagnostic algorithms to differentiate between benign and malignant ovarian masses have been published, based on scoring systems for ultrasound findings, including Ovarian-Adnexal Reporting and Data System (O-RADS) US risk stratification or IOTA.

In recent years, the spiral enhanced CT examination has come to be used in disease diagnosis. although it has a limited ability to tissue characterization (exception of fat and calcifications) due to poor contrast resolution of adnexal structures but It can be used to Preoperative staging and restaging after debulking surgery for malignant neoplasms and imaging of complications from ovarian cancer (such as obstruction) and Peritoneal implants.

Compared to other imaging modalities, MRI has superior ability to characterize different soft-tissue types and high contrast resolution and qualitative diagnostic value. Thus, MRI plays an important role in the diagnosis and differential diagnosis of ovarian masses.

Urinary Tract Endometriosis in Patients with DIE Teaching Point.

Leila Bayani, MD

Radiologist
Head of Department of Radiology in Arash Hospital.Tehran University of Medical Science

Endometriosis is a common gynecological problem, affecting approximately 4-13%of women in reproductive age and up to 50% of infertile women, according to different authors, it is also most common cause of chronic pain in women.

Correct site-specific diagnosis is fundamental in defining the optimal treatment strategy for endometriosis as it clearly guide surgeon to proceed patient to surgical versus conservative treatment, fertility consult, decision to refer to tertiary center or general gynecologist and Surgical list planning.

Endometriosis is scattered disease , can involved other site such as peritoneal surface which cause Deep infiltrating endometriosis or DIE.

These nodules are important as they are main reason for disabling chronic pain in endometriosis patients.

According to IDEA group (since 2016) peritoneal involvement has subclassified to anterior and posterior comportment which the anterior compartment indicated to urinary system endometriosis and DIE.

Involvement of the urinary tract occurs in approximately 1–2% of patients with endometriosis ,so many sonologists are unfamiliar in this issue.

The most common involved site is bladder, on the other hand, ureter involvement is very rare, but really it is a disaster which leads straightforward to urgent surgery.

According to these paradox, in this lecture we are going to discuss mainly about imaging point to get accurate and timely diagnosis of endometriosis of anterior compartment

Uterine Vascular Abnormalities (AVM congenital and Acquired); Teaching Point for Radiologist

Behnaz Moradi, MD

Associate Professor of Radiology
Department of Radiology, Yas Complex Hospital, Tehran University of Medical Sciences (TUMS), Tehran, Iran.

Acquired Arteriovenous Malformation (AVM), also referred to as Enhanced Myometrial Vascularity (EMV) is a vascular lesion associated with uterine intervention and is typically associated with complications of pregnancy. Retained products of conception (RPOC) are a relatively common cause of EMV. EMV means a tortuous rich vascular network within the myometrium and should have a peak systolic velocity (PSV) of ≥ 20 cm/sec. There is a growing understanding that the vast majority of EMVs do not actually represent true AVM. It was recommended by ISUOG that “EMV” is the preferred term for what was previously known as an “acquired AVM”. True uterine AVM appear identical on transvaginal color Doppler ultrasound, as well as on CT or MR angiography, and can only be distinguished from EMV on digital subtraction angiography. Spontaneous resolution can occur after 5 weeks (1 week -6 months). Depends on patient’s symptom or desire D&C and embolization can also be used as treatment options.

Intrauterine Adhesions

Maryam Niknejadi, MD
Department of Reproductive Imaging Reproductive BioMedicine Research Center, Royan Institute for Reproductive BioMedicine, ACECR, Tehran, Iran.

Fattaneh Pahlavan, MS
Department of Reproductive Imaging Reproductive BioMedicine Research Center, Royan Institute for Reproductive BioMedicine, ACECR, Tehran, Iran.

Intrauterine adhesions was first described by Joseph Asherman in 1948. It is commonly referred to as Asherman›s syndrome and intrauterine synechiae that results in infertility. It is characterized by a spectrum ranging from amenorrhea to menstrual disturbance to normal menses.

It is diagnosed by symptoms, medical history, saline infusion hysterography (SIS), hysterosalpingogram (HSG), ultrasound, and magnetic resonance imaging. Hysteroscopy is employed for the final diagnosis and treatment.

Filling defects and distortion of the uterine cavity are the most important features in HSG. The adhesion is usually seen partial, so it allows intrauterine introduction of the contrast material. Occasionally, synechia obliterate the entire endometrial cavity and obstruct the lower uterine segment. The American Fertility Society has divided the intrauterine synechia into three categories: mild, moderate, and severe; according to whether adhesions involve one-fourth, one–half, three-fourths or more, respectively; of the uterine cavity.

In the ultrasound examination, endometrium is irregular and hyperechoic bridges might be seen. Mixed pictures are seen. In some parts no endometrium is seen and in other parts normal endometrium is seen. Three-dimensional ultrasound shows a significant reduction of the endometrial cavity. There is no increase in the vascularity on color doppler examination. SIS would be a good choice to diagnose the synechia. In sagittal plane, a trans versed band can be seen that is called bow tie or butterfly wings.

MRI is superior to other imaging methods and it could diagnose the etiology of the synechia. It is able to take images above the adhesions that could not be seen using hysteroscopy. In T2-weighted MR, hypointense bands of fibrous tissue are seen.

Uterus in Cases with DIE (A primer for Radiologist)

Masoomeh Raoufi
Assistant Professor of Radiology
Shahid Beheshti University of Medical Sciences

Endometriosis is a common gynecological disorder characterized by the presence of endometrial tissue outside the uterus. The disease can cause significant changes in the uterine body, which can be visualized using radiological imaging techniques. These changes include thickening of the uterine wall, irregularity of the endometrial lining, and

the presence of cysts or nodules within the uterine cavity. Radiologists play a crucial role in diagnosing and monitoring endometriosis-related uterine changes using various imaging modalities such as ultrasound, magnetic resonance imaging (MRI), and computed tomography (CT). Accurate identification and characterization of these changes can aid in early diagnosis, treatment planning, and monitoring disease progression. Therefore, radiologists must be familiar with the typical uterine body changes associated with endometriosis to provide optimal patient care.

Differential Diagnosis of Thickened Endometrium

Fatemeh Safi
Assistant Professor of Radiology
Arak University of Medical Sciences, Arak, Iran

In the face of a thick endometrium, we should distinguish between normal or abnormal thickening based on menstrual cycle, menopausal state etc.

Abnormally thick endometrium, when proved on imaging, should be categorized based on whether the patient is pre or postmenopausal, recently pregnant or not, presence or absence of AUB, taking medication or not, ovarian morphology etc.

After ruling out pregnancy related changes including early or ectopic or molar pregnancy &RPOC, our great aim is differentiation between endometrial carcinoma, endometrial hyperplasia, polyps and ...based on gray scale morphology and color Doppler findings of endometrium on TVS.

Besides TVS, saline infusion sonography, hysterosalpingography, &MRI with and without contrast can be used for better differentiation between pathologies related to abnormal endometrial thickening.

Adnexal Torsion (Review of Radiologic Appearances)

Ahmad Soltani Shirazi, MD
Associated Professor of Ahvaz Jundishapour University

Torsion of ovary and fallopian tube or both

Are cause of 3% of gynecologic emergencies

Right side acute sever pelvic pain of reproductive age of women without febrile is the common clinical sign.

But it can occur in post-menopausal and children.

Unilateral adnexal mass, pregnancy, ovarian hyper stimulation, pelvic surgery, ovarian mass larger than 5cm and lax supporting ligaments are predisposing factor.

Enlarged ovary with heterogeneous stromal echo due to edema and infarct is the basic sonography sign. atypical midline located

Ovary with echogenic wall of follicles and free fluid are specific sign of torsion in sonography.

Doppler sign is variable and normal sonogram does not excluded torsion, because ovaries have dual blood supply.

Whirlpool sign of twisted vascular pedicle Is also specific sign in Doppler study

MRI is problem solving with visualized enlarged ovary with midline position and

Dark follicle wall which are located periphery. non enhancement of ovary

Confirmed non-viable ovary.

Oophorities, PID and ovarian metastasis Are differential diagnosis in imaging.

MR Perfusion Application in Brain Tumor's (Excluding Treatment Effects) Cases

Shervin Sharifkashani, MD

Assistant Professor of Radiology
Tehran University of Medical Sciences,
Tehran, Iran

Gliomas are the most common primary brain tumor in adults. The prognosis of brain tumors, whether primary or metastatic, is strongly related with their grades. High-grade gliomas usually have more angiogenesis, neoangiogenesis and increased blood-brain barrier (BBB) permeability. The perfusion MRI can depict tissue vascularization, angioneogenesis, microcirculation, tissue blood volume and flow. The signal changes in vessels during the passage of paramagnetic contrast agent can be calculated as relative cerebral blood volume (rCBV) and cerebral blood flow (rCBF) parameters. The increased vascular permeability causes an increase in extravasations of contrast medium and changes in rCBV and rCBF. Permeability MRI estimates vascular permeability by measuring contrast medium leakage through the BBB and has two main parameters: (1) vascular transfer constant (Ktrans), which describes the permeability of blood vessels to contrast medium based on a two-compartment pharmacokinetic model and (2) Extravascular and extracellular volume fraction (Ve), the interstitial volume in which extracellular contrast agents accumulate if they cross the BBB. The main purpose of this lecture is to describe the diagnostic accuracy of the perfusion and permeability MRI in differentiating the high- and low-grade brain gliomas and also gliomas versus primary lymphoma and metastasis.

MS and MS Mimic Cases

Amin Abolhassani Foroughi

The diagnosis of multiple sclerosis (MS) can be very challenging due to the variable clinical features and the lack of a definitive test. MRI is a proved diagnostic tool for Diagnosis of MS lesions and showing the spatial and temporal dissemination of the plaques. In addition, MRI plays an important role in ruling out differential diagnoses of MS. In this lecture the aim is to describe the typical MRI features of MS and present a series of common cases Simulating MS with especial attention to their discriminating features from MS.

The mimic diseases are neuromyelitis Optica and vasculitis, posterior reversible encephalopathy syndrome, Acute Disseminated Encephalomyelitis, periventricular multifocal leukoencephalopathy, and chronic idiopathic demyelinating polyneuropathy. There are

also multiple infectious entities that mimic MS including Tuberculosis, Toxoplasmosis, Cytomegalovirus, Herpes Simplex Virus, Varicella zoster virus, Cryptococcus Epstein Barr virus, and Human immunodeficiency virus. In addition, there are leukoencephalopathies that can present in adulthood including Cerebral autosomal dominant idiopathic leukoencephalopathy, Metachromatic leukodystrophy, Adrenoleukodystrophy, Leigh's and Alexanders disease that could be mistaken for MS.

Toxic and Acquired Metabolic Brain Lesions Cases

Maryam Haghighi Morad

Assistant Professor of Radiology
Shahid Beheshti University of Medical Sciences, Tehran, Iran

Toxic and metabolic brain disorders are not common but CNS imaging plays a significant role in determining the most probable cause and leading for treatment planning.

In born errors of metabolism and HIE may share similar imaging features with toxic encephalopathies however patients presentation is completely different in each situation.

The most affected parts of brain are deep gray nuclei, cortical gray matter and peri ventricular white matter most of the times in symmetric and bilateral distribution.

Additionally imaging has a key role in providing prognostic information in which extensive lesions of gray matter are related to poor prognosis, while lesions with solely white matter involvement can lead to a reversible state.

There are some classifications for patterns of brain involvement in toxic/ metabolic encephalopathies which are closely related to the Patho physiologic mechanism of damage.

Their identification is important because each pattern can guide us to the most likely diagnosis.

Stroke Mimic Cases and Neurotoxicity

Neda Pak

Associate Professor of Radiology
Tehran University of Medical Science, Tehran, Iran

Mimics account for almost half of hospital admissions for suspected stroke. While many underlying conditions can be recognized rapidly by careful assessment, a significant proportion of patients still receive thrombolysis and admission to ICU with unnecessary costs. Accurate diagnosis is important and MRI is necessary if stroke mimics are suspected. Stroke mimics can broadly be classified into two categories, Medical mimics 50–80% of cases and Functional mimics. Conditions that mimic stroke include metabolic disorders such as hypoglycemia, hyperglycemia, hypernatremia, hyponatremia, uremia, metabolic encephalopathy, and hyperthyroidism. Moreover, migraine, seizure, psychological disorders, demyelinating diseases, intoxication and brain tumors may also mimic stroke. MRI is the best technique to identify stroke mimics. Diagnostic evaluation can be approached based on diffusion-

weighted imaging (DWI), which can be abnormal or normal, followed by the results of other MRI sequences, such as T2-GRE and fluid-attenuated inversion recovery (FLAIR). Analysis of the signal intensity of the parenchyma, the intracranial arteries and, overall, of the veins, is crucial on T2-GRE, while anatomic distribution of the parenchymal lesions is essential on FLAIR. Among stroke mimics with abnormal DWI, T2-GRE demonstrates obvious abnormalities in case of intracerebral haemorrhage or cerebral amyloid angiopathy. FLAIR is very useful when DWI is positive by showing distribution of cerebral lesions in case of seizure (involving the hippocampus, pulvinar and cortex), in posterior reversible encephalopathy syndrome (PRES) or hypoglycaemia (bilateral lesions in the posterior limb of the internal capsules, corona radiata, striata splenium of the corpus callosum). Other real stroke mimics such as MELAS, brain tumour, demyelinating diseases and encephalitis can be diagnosed by MRI. Neurotoxicity should also be considered in patients with underlying diseases treating by chemotherapy presenting with acute neurologic symptoms.

MDCT Features of Fungal Rhinosinusitis: How to Differentiate From Other Rhinosinusitis?

Sheida Javadi, MD

Assistant Professor of Radiology
Amiralam Hospital, Tehran University of Medical Science, Tehran, Iran

Multidetector computed tomography (MDCT) is the most common modality for the evaluation of the sinonasal region which can determines the extent of disease, readily depicts osseous changes and is sensitive for detecting calcification. Radiologists need to be familiar with the different patterns of sinonasal diseases in MDCT. Fungal rhinosinusitis is relatively common and results in clinical presentations with a broad spectrum of severity. Fungal sinusitis is divided into two categories, invasive and non-invasive. The invasive category is defined by the presence of fungal hyphae in the mucosa, submucosa, bone, or blood vessels. The acute invasive fungal sinusitis is life-threatening so early diagnosis is crucial. In the non-invasive category fungal material fills the sinuses without tissue invasion, including localized fungal colonization, fungal ball, and allergic fungal rhinosinusitis. Knowledge of the MDCT features of the disease and the clinical findings will aid diagnosis, provide information for surgical planning, and ultimately improve patient outcomes.

Significant Carotid Artery Stenosis: Definition and How to Provide A Clinically Useful Report

Shapour Shirani

Head of Imaging Department
Tehran Heart Center, Tehran, Iran

Abstract:

Cerebrovascular disease is a significant cause of mortality and morbidity. Most strokes are ischemic and most ischemic strokes occur secondary to emboli, of which 15%are likely originate from vulnerable plaque at carotid bifurcation.

Doppler ultrasound has emerged as the primary noninvasive imaging modality for detecting, grading and monitoring internal carotid stenosis, due to its high sensitivity and specificity, low cost, lack of ionizing radiation and avoiding of iodinated or gadolinium containing contrast.

At present a number of different criteria are used to grade carotid stenosis. Awareness of limitations of carotid stenosis grading criteria and confounding factors of stenosis measurement are important for providing reliable final report.

Other imaging modalities maybe advised in case of no conclusive Doppler study.

Papillary Thyroid Carcinoma, Lateral Neck Lymph Nodes Ultrasound Evaluation

Maryam Haghighi Morad

Assistant Professor of Radiology
Shahid Beheshti University of Medical Sciences,
Tehran, IRAN

Papillary thyroid carcinoma has a high tendency for metastasis to cervical lymph nodes, but the significance of anatomic compartment of lymph nodes metastasis in PTC remains controversial.

The ATA risk stratification system guidelines for management of differentiated thyroid cancer considers size and number of metastatic lymph nodes regardless of anatomic compartment.

On the other hand according to eight edition of TNM staging, central and lateral lymph nodes metastasis are classified as N1a and N1b, in which N1b represents more advanced disease.

Recent studies revealed that there is no difference in prognosis of patients with isolated central or lateral nodal metastasis, however better survival belongs to these patients in comparison with concomitant central and lateral neck metastasis. Furthermore skip metastases in lateral lymph nodes without involvement of central nodes are more common in patients with upper pole tumors and PTMC. Patients with skip metastasis are treated more aggressively than ones with central metastasis but regarding new studies burden of lymphatic spread rather than anatomic compartment involvement is more useful in treatment planning.

MDCT Features of Chronic Otitis Media (COM), How to Provide A Clinically Useful Report

Hashem Sharifian, MD

Associate Professor of Radiology
Amiralam Hospital
Tehran University of Medical Sciences, Tehran-Iran

COM is a common disease and many cases need imaging for evaluation of extension of disease and possible complications. CT scan is the first step in evaluation of these patients. Useful points that should be mentioned in reports and important signs of COM are reviewed in the lecture.

MRI of Chronic Otitis Media (COM); Residual and/or Recurrent Cholesteatoma Versus Granulation

Hashem Sharifian, MD

Associate Professor of Radiology
Amiralam Hospital
Tehran University of Medical Sciences,
Tehran, Iran

Post-op. changes in COM may be confusing in many cases. This problem is more significant where there is doubt about recurrent disease, cholesteatoma or superimposed granulation formation. MRI is an important tool in differentiation between these entities. I review these findings for a precise report in these patients.

Ultrasound Evaluation of Parotid Mass Lesions: How to Differentiate?

Omid Motamedi, MD

Assistant Professor of Radiology
Rasool Akram Hospital, Iran University of Medical Sciences, Tehran, Iran

My presentation will last 30 minutes demonstrating the ultrasound features of various parotid masses particularly those that are more common such as Pleomorphic adenoma, Warthin and mucoepidermoid carcinoma.

The most important and practical part is elaboration on how helpful ultrasound examiner can be in giving surgeons and clinicians strict tips to differentiate benign from malignant parotid tumors and sonographic favors and differences that radiologist should look for and find out in exam.

On the other hand, a part of presentation is

going to be more in details clarifying whether or not we can differentiate the two most common benign parotid masses, pleomorphic adenoma and Warthin.

In conclusion, I will explain crucial points that clinicians and surgeons expect to be in that radiologist report and useless terms and words that should be filtered out.

MRI Sequences for T-staging of Laryngeal Glottis Carcinoma: Pearls and Pitfalls

Fahimeh Azizinik, MD

Assistant Professor of Radiology
Advanced Diagnostic and International Radiology Research Center, Division of Head-Neck and OB-GYN Imaging, Amiralam and Yas Hospital, Tehran University of Medical Sciences
Tehran, Iran

Abstract:

Laryngeal carcinoma is a disastrous malignancy that affects patients' quality of life, with compromise of ability to talk, breathe, and swallow. Accurate tumor staging is important in order to choose the most correct therapeutic approach based on the available options from organ preservation strategies to total laryngectomy. Approximately 70% of laryngeal carcinomas are glottic.

Although the mucosal extent of tumor and vocal cord mobility is best evaluated with endoscopic evaluation, cross-sectional imaging is essential for accurate T-staging, because only cross sectional imaging can assess the submucosal extent of the tumor, cartilage invasion, and extra-laryngeal spread. In this session firstly all cross sectional anatomy of the larynx will be reviewed, then the pearls and pitfalls of MRI sequences with topics crucial for imaging interpretation and finally comparison with CT scan will be discussed.

Some interesting cases of our academic tertiary head and neck center will be also presented for residents and radiologists.

How to Report Multiple Pregnancy in 1th and 2nd Trimester of Pregnancy

Morteza Tahmasebi, MD

Asossiate Professor of Radiology
Jundishapur University, Ahvaz, Iran

Ultrasound has revolutionised the management of multiple pregnancies and their complications. Increasing frequency of twin pregnancies mandates familiarity of all radiologist with the difference in reporting and management of twin pregnancies , we summarise the latest evidence relating to ultrasound surveillance of twin pregnancies

including first trimester assessment and screening, growth surveillance and the detection and reporting the complications of monochorionic pregnancies including twin-to-twin-transfusion syndrome, selective fetal growth restriction, twin reversed arterial perfusion sequence and conjoined twinning. who to report and what are important key points at different time of pregnancy is the issue and will be discuss in this lecture.

Uterine and Ovarian Transplantation (What Radiologisy Needs to Know)

Morteza Tahmasebi, MD

Associate Professor of Radiology
Jundishapur University, Ahvaz, Iran

Uerine transplantation (UT) is a novel treatment for absolute uterine factor infertility (AUFI) that is currently being performed under experimental protocols in multiple medical centers worldwide. As successful outcomes from this innovative procedure increase, it is likely that more centers will perform UT. Imaging is performed in multiple steps of the UT process, including preoperative imaging of potential donors and recipients, post-transplant surveillance, and monitoring of pregnancy. Radiologists working in medical centers where UT is performed should understand the role of imaging in preoperative planning and postoperative surveillance. Radiologists must be aware of the risk of vascular compromise and graft failure and their imaging features. At the end of lecture we will discuss importance of uterine artery PI as a predictor of high risk pregnancy.

HSG – CASE REVIEW

Morteza Tahmasebi, MD

Associate Professor of Radiology
Jundishapur University, Ahvaz, Iran

Sharareh Sanei Sistani

Hysterosapingography (HSG) is a valuable technique in the evaluation of the in-fertile patient. During the last de-cade, the number of women seeking infertility evaluation has increased considerably. HSG is considered a screening procedure for an infertility workup, and despite the development of other diagnostic tools such as MR imaging, hysteroscopy, and laparoscopy,HSG remains the main exam for the study of the fallopian tubes .This technique provides useful, although indirect, information outlining the uterine cavity and the fallopian tubes. HSG has been reported to have a high sensitivity in the diagnosis of uterine cavity abnormalities. The technical quality of the HSG is important to limit factors leading to misinterpretations. It is also essential for the radiologist to be familiar with the normal and abnormal radiologic findings for the correct interpretation of

HSG.This work shop describes and illustrates the hyster-salpingographic appearances of technical artifacts, normal variants, utrine anomalies and adhesion, and has great concern to fallopian tube evaluation.

MRI Evaluation of Normal Nasopharynx: Imaging Anatomy and Practical MRI Sequences

Maryam Mohammadzadeh MD

Associate Professor, Department of Radiology
Division of Neuroradiology and Head & Neck Imaging
Amiralam Hospital, Tehran University of Medical Sciences

In this session first of all cross sectional and imaging anatomy of nasopharynx will be discussed in details both in high resolution CT and MRI , followed by practical MR sequences including advanced MRI modalities.

There will be interactive case presentation of various nasopharyngeal pathologies with special attention to perineural spread of nasopharyngeal cancers which in some cases leaded to initial diagnosis.

There will also be interactive case presentation of nasopharyngeal cancer mimics focusing specially on malignant otitis externa , skull base osteomyelitis ,mucoromycosis and granulomatous disease .

Finally some cases will be shown for audience to vote based on what they learned during this session to make it even more practical.

FDG PET/CT in Treatment Response Evaluation in Oncology

Maryam Mohammadzadeh, MD

Associate Professor, Department of Radiology
Division of Neuroradiology and Head & Neck Imaging
Sina Hospital, Tehran University of Medical Sciences

During this session traditional and new response criteria in oncologic imaging will be presented and discussed in details.

There will be detailed discussion and comparison of various response criteria including WHO, RESIST 1.0 , RESIST 1.1 and PERSIST which are among the most widely used response criteria in oncologic imaging and treatment planning.

There will also be brief presentation of PET CT and it's role in treatment response specially in equivocal cases .

Finally there will be case presentation for better understanding of RESIST and PERSIST specially for academic interpretation of oncologic imaging.

Title: RIS-PACS Integration: Streamlining Workflow and Improving Efficiency in Radiology

Introduction:

Two essential components in modern radiology practice are Radiology information system (RIS) and picture archiving and communication system (PACS). The integration of RIS-PACS systems has become increasingly important to improve workflow and efficiency in radiology. In this presentation, we will review the advantages and challenges of RIS-PACS integration.

Methods:

A comprehensive review of the literature was performed to identify the benefits and limitations of RIS-PACS integration.

Results:

RIS-PACS integration offers many benefits, including improved workflow, reduced errors, enhanced communication, and increased efficiency. The seamless integration of RIS-PACS systems results in the automatic transfer of patient data, including imaging studies and reports, between health systems. This eliminates the need for manual data entry and reduces the potential for errors. Also facilitation in communicating between radiologists and other healthcare providers, allows faster and more accurate diagnosis and treatment planning. Another plus is availability of a more accurate and comprehensive source for performing researches and statistics.

The challenges concerning RIS-PACS integration include system compatibility issues, implementation costs, and potential resistance to change from staff members. However, these challenges can be overcome with proper planning and communication. Also there is still a shortage in professionals in this category.

Conclusion:

RIS-PACS integration is an essential component of modern radiology practice. The benefits of RIS-PACS integration are numerous,

including improved workflow, reduced errors, enhanced communication, and increased efficiency. Radiology practices should consider the implementation of RIS-PACS integration to streamline their workflow and improve patient care.

Diagnosis of Covid -19 Disease from Lung Images with Deep Learning

Sahar Fazel

Department of Computer Science Faculty of Computer Uuniversity of Tabriz,Iran

In this research, an intelligent CAD system for covid disease is presented based on lung images. This system is based on deep learning. For this purpose, the design and construction of the CAD system is first performed for each desired image, pre-processing operations are performed in order to improve the quality and contrast of the edges of the image, to eliminate the noises on the image and to remove the redundant parts of the image.

Then, using the deep learning technique, the segmentation of the input image and the extraction of important parts are done. After extracting the main parts, using deep learning architectures such as convolutional neural network, as well as combined transfer learning architectures, the feature extraction process is carried out in order to extract the features of segmented images. In the last step, because the features are available, the classification process is performed based on the features, and therefore the speed of the system increases. Next, a neural network architecture based on deep learning and the combination of different architectures is designed to classify and identify the type of input image between healthy and Covid-19 disease groups, and the process of training, testing and validation is implemented on it. It is possible to use the desired model to identify the covid disease. The evaluation of the results shows that the final accuracy obtained for the classification of the first scenario (healthy and viral) and the second scenario (healthy, covid, pneumonia) is about 99 and 95%, respectively. In addition, the results of the proposed method are promising in terms of accuracy, sensitivity and specificity criteria compared to recent researches; So that for the classification of the first scenario, it has a sensitivity and specificity of 100 and 99%, respectively. The proposed method can be used as a doctor's assistant during the treatment of patients by finding a way to the application field.

Keywords: covid disease - prediction of covid disease - deep learning

Late Anomaly Scan

Mohammad Ali Karimi MD, ISR Board, Obstetric Committee of ISR

Late anomalies are one of the important challenges of ultrasound during pregnancy. Anomalies such as skeletal dysplasias, diaphragmatic hernia, hydrocephalus, intestinal atresia, etc. are common examples of these anomalies. Although there are different protocols for routine second trimester anomaly scan in the 18th to 20th week of gestation, there is no specific universal guideline for late anomaly scan. We intend to explain the issue of late anomaly scan for radiologist colleagues. Familiarity with this anomalies will helps radiologists to give better services to the pregnant women and also to give a useful guidance to the referring physicians for better perinatal care.

Fetal Veins at the Cardiac Level (SC, IVC, PVs, Azygos, CS, Brachiocephalic Veins)

Mohammad Ali Karimi MD, ISR Board, Obstetric Committee of ISR

Venous anomalies are one of the important anomalies that are less noticed in echocardiography of the fetal heart. Familiarity of radiologists with these anomalies, which include anomalies of systemic and pulmonary veins, helps a lot to improve the quality of fetal echocardiography and to give better care for pregnant women. In this scientific program, we intend to have a brief description of the anatomy of systemic and pulmonary veins and describe their anomalies.

SCIENTIFIC ORAL ACCEPTED ABSTRACT ICR2023

Predictive Power of Cranial CT Scan Parameters in Outcomes of Patients with Traumatic Brain Injury based on NIRIS Scoring System in Iran

Samira Ahmadian Fard — Kashan University of Medical Science*
Hamidreza Talari — Kashan University of Medical Sciences
Esmaeil Fakharian — Trauma Research Center, Kashan University of Medical Sciences
Nahid Sadighi — TUMS
Mahdi Sharif Alhosseini — Sina Trauma and Surgery Research Center, Tehran University of Medical Sciences
Noushin Moussavi — Trauma Research Center, Kashan University of Medical Sciences

Introduction:

Traumatic Brain Injury (TBI) is one of the leading causes of death and long-term disability for people aged 35 and under. One of the diagnostic methods for its evaluation is computed tomography (CT) imaging of the brain and magnetic resonance imaging (MRI). Recently, the Neuroimaging Radiographic Interpreting System (NIRIS) is used to predict outcomes and manage these patients. The aim of this study was to investigate the predictive power of cranial CT scan parameters in the outcomes of patients with traumatic brain injury based on the NIRIS scoring system in Iran.

Material and Methods:

This retrospective cohort study was performed on 250 patients with the main diagnosis of TBI in 1398 in Shahid Beheshti University Hospital in Kashan. The patient's demographic information along with the mechanism of injury and other variables were recorded in a special form. Checklists related to the three criteria of Marshall, Rotterdam and NIRIS were scored on CT scans of each patient. NIRIS scores also examined cranial bone fractures, brain tissue contogenization, intracranial hemorrhage, cerebral herniation, and midline shifts. All analyzes were performed using STATA software version 14

Results:

The results of this research showed that there was a statistically significant difference between factors such as age, Glasgow Consciousness Scale (GCS), Marshall, Rotterdam, and NIRIS scoring criteria, as well as the final outcome in patients with TBI between the two life and death groups (P<0.001). By ROC analysis, the power of diagnosis or correctness of the results in the scoring criteria showed that the Marshall criterion for predicting the mortality of patients with traumatic brain injury (AUC=0.78) was acceptable with a sensitivity of 83.33% and a specificity of 70.56%. Regarding the Rotterdam criteria, the detection power (AUC=0.86) and sensitivity of 66.67% and specificity of 86.15%, as well as NIRIS scoring criteria (AUC=0.84) with sensitivity of 83.33% and specificity of 76.62%.

Conclusion:

In general, by examining the predictive power of skull CT scan parameters based on scoring criteria to predict mortality, it was found that the Rotterdam scoring criteria predicted mortality better than the other two criteria with a specific sensitivity of 86%.

Keywords: CT Scan; Skull; Traumatic brain injury; NIRIS.

Radiomics Science, A Horizon for Early Diagnosis of Brain Metastasis Caused by Non-small Cell Lung Cancer: A Review of the Literature

Zahra Valibeiglou
Yunus Soleymani

Tabriz University of Medical Sciences*
Department of Neuro Science and Addiction Studies
School of Advanced Technologies in Medicine
Tehran University of Medical Sciences, Tehran, Iran

Davood Khezerloo

Radiology Department, ParaMedical Faculty,
Tabriz University of Medical Sciences

Purpose:

Non-small cell lung cancer (NSCLC) is considered the second most commonly diagnosed cancer, accounting for almost 30% of adult deaths. Brain is one of the most frequent regions for NSCLC metastasis. Magnetic resonance imaging (MRI) is a common imaging modality for diagnosing NSCLC. In addition, computed tomography (CT) and positron emission tomography-CT (18-FDG-PET-CT) have complementary aid. Nevertheless, these methods are highly invasive and fail to reduce the risk of brain metastasis (BM) in NSCLC patients. Introducing noninvasive methods for predicting and monitoring NSCLC patients with BM seems to be helpful. Radiomics is the science of extracting quantitative data from medical images using mathematical algorithms and finding correlations with biological or clinical outcomes via machine learning. This study aimed to investigate whether radiomics is a valuable and predictive method for clinically managing NSCLC patients with BM.

Methods:

The keywords of "Radiomics", "NSCLC", "Brain metastasis", "MRI", "CT", "18-FDG-PET-CT", and "Machine learning" were entered into scientific databases of Google scholar, Scopus, PubMed, and Elsevier. About ten fully relevant papers were extracted and reviewed.

Results:

CT was the most used modality for the analysis of NSCLC patients with BM followed by MRI and PET. All papers indicated that textural-based radiomics features (especially gray level co-occurrence matrix group) were highly predictive of BM. Also, age and tumor location were the two important clinical factors for the prediction of BM in NSCLCs. Machine learning-based models showed an area under the ROC curve (AUC) of about [.71-0.81], [0.62-0.83], and [0.62-0.91] for clinical, radiomics, and combined (clinical and radiomics) models, respectively.

Conclusion:

It seems that radiomics-based quantitative analysis in combination with clinical factors can significantly help in the prediction of BM and better management of NSCLC patients.

Keywords: "NSCLC", "Brain metastasis", "Radiomics"

The Survey of the Effect of Adding Aspirin to Anti-migraine Drugs on the Severity of the Headache in Patients with Chronic Migraine Headaches with Lateral Venous Sinus Stenosis in MRV: A Double-blind Randomized Clinical Trial

Mohammad Shafiee — Tehran University of Medical Sciences*
Mahdi Sakhabakhsh — AJA University of Medical Science

Introduction:

One of the probable etiologies raised in patients with chronic migraine headaches is stenosis of the lateral venous sinuses of the brain, which is detectable by Magnetic Resonance Venography (MRV). In this study, we decided to the effect of adding aspirin to anti-migraine medicines on the severity of headache in patients with chronic migraine headaches with lateral venous sinus stenosis in MRV.

Materials and Methods:

The study was a double-blind randomized clinical trial. Patients were included in the study in two groups including 30 people. The first group was treated with Propranolol and Nortriptyline and the second group was treated with Propranolol, Nortriptyline, and Aspirin. The severity of headache, number of headaches during one month, and duration of headache before treatment, one, two, and three months after treatment were examined. Data were analyzed utilizing SPSS software version 19 and statistical tests T-test, Chi-square, Paired t-test, and Repeated measure.

Results:

The results showed that the mean severity of headache in the second group was significantly lower than the first group two months after treatment ($p = 0.003$) and three months after treatment ($p = 0.002$). Additionally, the number of headaches ($p = 0.001$) and duration of headache ($p = 0.043$) were significantly lower in the second group than the first group in the first three months after treatment. No statistically significant difference was observed between the frequency distribution of nausea/vomiting in the two groups.

Conclusion:

The addition of aspirin to anti-migraine medicines is effective in improving the severity of headache in patients with migraine with lateral venous sinus stenosis of the brain

Evaluation of Normal Size and Normogram of Testicular Volume in Iranian Boys 0-15 Years

Mehrzad Mehdizadeh — Tehran University of Medical Sciences
Abolfazl Akbarian — Tehran University of Medical Sciences
Mohammad Shafiee — Tehran University of Medical Sciences*

Background:

In this study, we decided to investigate the normal size and normogram of testicular volume in children in patients referred to the Imaging Center of Imam Khomeini Hospital in Tehran during the years 2019 to 2021.

Material and Methods:

This study was a cross-sectional study. The study population was all boys aged 0 to 15. Using ultrasound, the volume of the testis was calculated using the formula (length * width * height of a fixed number 0.71). After collection, the data were entered into SPSS version 20 and statistical analysis was performed using statistical tests.

Results:

825 boys aged 0 to 15 years in 15 groups of 55 people were included in the study. The mean volume of the left testicle was 2.14 ± 2.02 cc, the mean volume of the right testicle was 1.93 ± 1.74 cc and the mean total volume of both testes was 3.42 ± 6.01 cc. There was a statistically significant difference between the mean BMI, height and weight between the groups ($p < 0.05$). Also, according to the results, a statistically significant difference was found between the mean volume of right testicle, left testicular volume and total testicular volume in the studied groups. There was a statistically significant difference between the mean total testicular volume in terms of BMI, height and weight; So that with the increase of the mentioned variables, the total volume of the testis in the patients increased.

Conclusions:

It can be concluded that three criteria of weight, BMI and height, affect the testicular volume in boys 0-15 years and increasing each of these variables, testicular volume also increases significantly.

Esophageal Lung Misdiagnosed As Tracheoesophageal Fistula : A Case Report

Elham Zarei — Assistant Professor*
Nasrin Hoseiny Nejad — Iran University of Medical Sciences
Alireza Eshghi — Iran University of Medical Sciences
Nima Rakhshankhah — Department of Radiology, Iran University of Medical Sciences

Esophageal lung is a subtype of communicating bronchopulmonary foregut malformation(CBPFM) in which the lung ,often on the right side, communicates with the esophagus,causing the

patient's lung to be hypoplastic and consolidated. It is usually diagnosed late in its clinical course. chest Ct scan with esophagography is highly recommended for suspicious case.

Here we describe the case of a three month old female infant who was reffered to our hospital for respiratory distress.the diagnosis of congenital esophageal lung was made after chest Ct scan and esophagography.

CBPFMs are rare entity, but in lung hypoplasia or stable one sided lung collapse in children ,especially if they have symptoms of frequent respiratory infection after feeding ,it is important to evaluate the origin of the airway to differentiate CBPFMs from sequestration and tracheoesophageal fistula.

Effectiveness of Pelvic Ultrasound in the Diagnosis of Central Precocious Puberty and Differentiation from Similar Conditions

Elham Zarei — Assistant Professor*
Nima Rakhshankhah — Department of Radiology, Iran University of Medical Sciences
Mehdi Vafadar — Iran University of Medical Sciences

Purpose:

This study was conducted with the aim of investigating the use of pelvic ultrasound and its parameters in differentiating CPP patients from similar conditions (isolated premature thelarche (IPT) and isolated premature adrenarche (IPA)) and healthy girls.

Methods:

We consecutively enrolled 183 cases from 2015 to 2019 years in different groups based on the case-control method who were referred to the Endocrinology department of Ali Asghar hospital for evaluation of precocious puberty. All cases were of Persian ethnicity, classified by clinical and laboratory findings. Pelvic ultrasonography was evaluated in all groups. A one-way analysis of variance (ANOVA) was used to compare the mean of continuous variables. Finally, Receiver–operating characteristics (ROC) analysis was used to determine the best cut-off point for ultrasonography parameters

Results:

Among a total of 183 children, 62 were classified as the control (33.87%), 93 as the CPP group (50.81%), 16 as the IPT group (8.74%), and 12 as the IPA group (6.55%). Our study shows no significant difference in chronological age and BMI of classified groups, but CPP group showed a significantly higher bone age (107.76±19.81 month) ($p<0.001$) and taller height (129.53±8.97 cm) ($p=0.003$) against other groups. All ultrasonography parameters differ significantly between CPP and control group, also a significant difference is found between CPP compared to IPT and IPA patients in all parameters except in cervix anteroposterior diameter, and ovarian volumes. The best parameters for differentiating CPP compared to study groups were uterine volume (a cut-off of 1.40, 75.27% sensitivity,75.56% specificity), transverse diameter (a cut-off of 13.5 mm, 72.04% sensitivity, 71.11% specificity), and F/C (fundus/cervix) ratio (a cut-off of 0.98, 78.49% sensitivity, 70% specificity).

Conclusion:

Pelvic ultrasound parameters may improve the diagnosis of CPP patients and can play an auxiliary role in distinguishing the treatment needed from other patients.

Comparison of Mammography and Electroimpedance Mammography As A Breast Screening Modality

Nasrin Ahmadinejad — Tehran University of Medical Sciences*
Mahsa Talebi — Tehran University of Medical Sciences
Sareh Dashti — Islamic Azad University
Soheila Koopaei — Tehran University of Medical Sciences
Ali Abouei Mehrizi — University of Tehran

Purpose:

to investigate the correlation of electroimpedance mammography findings with mammography as a screening modality.

Methods:

In this study 271 subjects who have been attended to Imam Khomeini hospital for screening MG, were enrolled. After screening MG and filling a written consent, patients undergone EIM for both breasts using the specific scanner (MEIK5.6, PKF SIM-Technika). EIM scans were interpreted by a specialist with 10 years of experience in reporting EIM scans. BI-RADS score and breast composition was determined in both modalities. Obtained results from MG and EIM scan were compared to find out their correlation. Statistical analysis was done using SPSS.

Results:

Breast conductivity of subjects were compared to the expected range according to their age. Figure1 represents the age-related electric conductivity range of the mammary gland. 84% of the subjects fell within the expected breast conductivity range (CI;5%-95%). 9% of the subjects showed lower conductivity (<5%) and 5% of the subjects fell over the expected conductivity (>95%).

Descriptive assessment of breast composition via MG and EIM is reported in table 1. After excluding missing data, MG found the breast type c (heterogeneously dense) as the most common breast composition (53%), whereas EIM reported the breast type b (scattered area of fibro-glandular density) as the most common type (81.1%). Same comparison about the reported BI-RADS in both modalities showed that both modalities report the BI-RADS score 2 (benign changes) as the most common dedicated score (MG: 60%, EIM: 50%). Using Kendal test, results represent a statistically significant ($p<0.05$) monotonous behaver in both modalities in breast composition recognition and determining BI-RADS score.

conclusion:

This study shows that EIM gives statistically significant results, correlated to MG. Electroimpedance MG evaluates the breast's conductivity using the voltage passing through the tissue between the electrode and the

scanner. The promising findings of EIM as a safe, adjunct modality should be considered in breast cancer screening programs since EIM could overcome the limitations of MG in dense breasts or the risk of ionizing radiation; furthermore, the device is cost-benefit and safe and could reduce the cost of cancer prevention and treatment across the country.

Estimation Risk of Exposure-induced Death Associated with Common Computed Tomography Procedures During the COVID-19 in Yazd Province

Majid Alizadeh — Department of Medical Physics, School of Medicine, Tabriz University of Medical Science, Tabriz, Iran
Mohammad Hosein Zare — Department of Medical Physics, Faculty of Medicine, Shahid Sadoughi University of Medical Sciences, Yazd, Iran
Tohid Mortezazadeh — Tabriz University of Medical Sciences
Hamed Zamani — Department of Medical Physics, School of Medicine, Tabriz University of Medical Science, Tabriz, Iran*

Background:

During the last decade, the increasing frequency of CT scans for a range of purposes, particularly pediatrics, has raised concerns regarding the population radiation exposure and subsequent chances of cancers. This study aimed to estimate the pediatrics radiation exposure from the five most common CT scans during the COVID-19 whitten three recent years in Yazd Province and to present a more tangible form of the doses by giving the risk of exposure-induced cancer death (REID) due to the performed CT scans. Methods: The risk of exposure-induced death (REID) was calculated by coupling the BEIR VII model and ICRP 103 data for the Asian population.

Results. Data of patients younger than 15 years of age and adult age group were retrospectively collected from 6 educational institutions located in diverse areas of Yazd Province.

Results:

The median effective doses for the five most common procedures, in adult group, were as follows: 5.20 mSv for abdomen-pelvis, 3.31 mSv for routine chest, 3.00 mSv for chest HRCT, 0.76 mSv for Brain and 0.48 mSv for sinus. The highest associated risk was tied to high-resolution CT scans for women which was estimated to be 1 exposure-induced death related to 2097 scans performed on a 20-year old patient. The highest mean effective dose for younger than 15 years was estimated for the scan of abdomen-pelvis (average, 5.24 mSv) followed by chest (average, 3.66 mSv), brain (average, 1.27 mSv), and sinus (average, 0.65 mSv) scan. Moreover, the highest REID was documented for chest scan (average, 490 excess deaths in a million scans) followed by abdomen-pelvis procedure (average, 404).

Conclusion:

Although the effective dose of CT procedures in Yazd Province increased continuously, they were comparably lower than those reported for other countries. The radiation doses and cancer risks arising from pediatric CT scans are comparable with analogous studies, yet occurrence of high variation among patients of specific subcategorization which indicates the need for further optimization. Nevertheles, findings can represent an estimation of the hazards from CT scans for the purpose of extending the knowledge of physicians as well as those who are in charge of such procedures.

Keywords: computed tomography; Cancer risk estimation; Radiation Exposure; COVID-19

FUNDING

This work was supported by Shahid Sadoughi University of Medical Sciences and Health Services. (grant number: 6627 and ethical committee consent number: IR.SSU. REC.1399.067)

High Resolution Computed Tomography (HRCT) in Patients with or Suspected of COVID-19: Determination of Effective Dose and Cancer Risk

Hamed Zamani — Department of Medical Physics School of Medicine, Tabriz University of Medical Science, Tabriz, Iran*

Afsane Mir Derikvand — Department of Medical Physics Kermanshah University of Medical Sciences, kermanshah, Iran

Majid Alizadeh — Department of Medical Physics School of Medicine, Tabriz University of Medical Science, Tabriz, Iran.

Saeid Bagherzadeh — Department of Medical Physics Faculty of Medicine, Urmia University of Medical Sciences, Urmia, Iran

Ali Mohammad Sharifi — Clinical Research Development Center Shahid Modarres Educational Hospital, Shahid Beheshti University of Medical Science, Tehran, Iran

Saleh Salehi Zahabi Salehi Zahabi — Department of Medical Physics Associate Professor of Medicine, Kermanshah University of Medical Sciences, Kermanshah, Iran)

Objective:

The increasing prevalence of coronavirus has led to an increase in the use of CT scan, which is a high exposure imaging technique to follow the treatment in these patients. Therefore, this study was designed in order to estimate organ dose and effective dose to investigate the lifetime attributable risks (LARs) of cancer incidence and cancer- related mortality in patients with or suspected of covid-19.

Material and Methods:

A total of 600 patients with or suspected of COVID-19 participated voluntarily in this

study. To estimate the cancer risk, some dosimetric parameters including dose length product(DLP), volumetric CT dose index (CTDIV), scan length, organ dose, and effective dose were used. ImPACT CT dosimetry software was also used for dose calculation i.e. organs and effective doses; and the cancer risk estimation was done based on the 2006 National Academy of Sciences Biologic Effects of Ionizing Radiation (BEIR VII) report.

Results:

The mean age of men and women was 41.87 ± 14.16 and 38.96 ± 13.74, respectively (40.5% males and 59.5% females). The mean of effective dose in women based on international commission radiation protection 103 (ICRP103) and ICRP60 was 2.36 ± 0.48 msv and 1.2 ± 0.28 msv, respectively. In men, this parameter was 2.31 ± 0.53 msv and 1.21 ± 0.45 msv based on ICRP103 and ICRP60, respectively. The mean of LAR, incidence, and mortality of cancer in men was 6.45 ± 2.22 and 6.25 ± 2.22, respectively, and in women, these parameters were 22.6 ± 10 and 14.32 ± 4.91 per 100000 people.

Conclusion:

Due to the high risk of cancer because of CT scan in people with or suspected of coronavirus, especially women due to the presence of breast tissue and thyroid sensitivity, the request of CT scan for these people should be done more carefully.

Keywords: Covid-19, Effective dose, High resolution computed topography, Risk of cancer incidence, Risk of cancer mortality

Trastuzumab Conjugated PEG - Fe3O4@Au Nanoparticles as an MRI Biocompatible Targeted Nano-Contrast Agent: In-vitro and in-vivo Study

Tohid Mortezazadeh — Tabriz University of Medical Sciences*
Yasin Ayyamy — Tabriz University of Medical Sciences
Masoumeh Dastgir — Tabriz University of Medical Sciences

Purpose:

In this study, a novel targeted MRI contrast agent based on polyethylene glycol (PEG) anchored on the surface of magnetite nanoparticles (Fe3O4@Au) and then decorated with Trastuzumab (TZ) was developed.

Methods:

The prepared system was fully characterized and relaxivity, cytotoxicity, colloidal stability, blood compatibility, in vitro cell targeting ability, cytotoxicity, and in vivo MR contrast enhancement were evaluated.

Results:

Cytotoxicity assay indicated that Fe3O4@Au-PEG-TZ had perfect cytocompatibility after 24 h and 48 h against both of SKBr-3 cancerous and MCF 10A normal breast cell lines. In vitro MR imaging experiments illustrated negative signal in cells affirming that the Fe3O4@Au-PEG-TZ NPs enable targeted contrast T2-weighted MR imaging of SKBr-3 as over-expressing HER-2 receptor cells. Besides, the in vivo MRI images of tumor bearing BALB/c mice indicated high tumor uptake and ability of Fe3O4@Au-PEG-TZ NPs to create negative contrast effect.

Conclusion:

Taken together, the developed Fe3O4@Au-PEG-TZ could be considered as an encouraging candidate for cancer diagnosis.

Trastuzumab Polyethylene Glycol Modified Gold Nanoparticle As Potential Targeted Contrast Agent in Molecular CTlimaging of Cancer Cells

Tohid Mortezazadeh — Tabriz University of Medical Sciences*
Yasin Ayyamy — Tabriz University of Medical Sciences
Masoumeh Dastgir — Tabriz University of Medical Sciences

Purpose:

The development of different effective multifunctional nano-probes for efficient targeted molecular imaging of tumors has presents a great challenge in medicine.

Methods:

Herein, we reported the in-vitro targeting of Trastuzumab (TZ) multifunctional Fe3O4 coated gold nanoparticles (Fe3O4@Au NPs) through Polyethylene glycol (PEG) linking for targeted tumor molecular computed tomography (CT) imaging method. The prepared multifunctional PEG-TZ conjugated Fe3O4@Au NPs (TZ-PEG-Fe3O4@Au NPs) were fully characterized via different procedures. MTT, hematoxylin and eosin (H&E) assays were used to evaluate the cytocompatibility of the synthesized NPs.

Results:

The findings showed that the synthesized TZ-PEG-Fe3O4@Au NPs, which have a size of less than 100 nm and are non-cytoxic at a specific concentration range, exhibit better X-ray attenuation intensity than iodine-based contrast agents at the same concentration. When compared to iodine at a concentration of 2000 g/ml, TZ-PEG-Fe3O4@Au NPs permit around 1.6 times more contrast per unit mass at 80 kVp. The created targeted NPs can be employed as a contrast agent for in vitro targeted CT imaging of cancer cells expressing the HER-2 receptor. At 80 kVp, the targeted cells' CT values were higher than those of untargeted cells.

Determining of the Amount of the Radiation Damage Risk Reduction Using Nanoparticles Composite

Parinaz Mehnati — Tabriz University of Medical Sciences
Raziyeh Mohammadi — Tabriz University of Medical Sciences, Tabriz, Iran*

Purpose:

Nowadays, lead shields are commonly used to protect against ionizing X-rays but based on recent studies, new composites have been introduced that are lead-free, more effective and useful for protection and dose reduction.

The risk of cancer is included in the stochastic and late effects of radiation exposure. Therefore, in this study, the possibility of radiation risk with the amount of received dose from the imaging methods and how to interact to damages of these were studied.

Methods:

The Matrix is a Polyethylene and the filler material is a Tin metal to be used in composite shields. Certain values are prepared according to the researcher's protocol to protect against X-rays. The risk of radiation damages was calculated in the CT scan machine and chest CT phantom along with the dosimeter embedded inside the phantom to study the received dose values. Tin-Polyethylene composite shield was used to decrease radiation risk.

Results:

Using the data related to the condition of the device in imaging such as kilovoltage, tube current, rotation time, collimation, type of CT scan machine and spiral pitch, equivalent and effective doses of organs such as lungs, heart, breast and the mediastinum was determined. PCXMC software was used to calculate radiation risk due to effective dose values.

Conclusion:

The use of Tin-polyethylene composite shield as a solution to decrease of the radiation risk and maintain the health of society was confirmed in this study. According to the principle of preferring prevention over treatment, it is recommended to use this shield especially in CT scan to reduce the risk of cancer.

Prevention of Radiation Damages Using Bismuth-epoxy Composite

Parinaz Mehnati — Tabriz University of Medical Sciences*
Mahdi Mansoori Kia — Tabriz University of Medical Science

Introduction:

Considering the increasing request for CT scan imaging due to lung and heart diseases, it is necessary to pay attention to the radiation protection of patients in CT scan. Today, lead is used as an effective protective material in imaging processes, which has a high atomic number and high attenuation coefficient. Among the disadvantages of lead protection is its toxicity and heavy weight. For this reason, researchs have been started on the production of lead-free protectives as new polymer-based materials. Therefore, in order to prevent radiation damages in CT scan, new bismuth-epoxy composite protector have been prepared in this research.

Materials:

Composite shields that have a polymer material as a matrix and a filler material as a reinforcement prepared according to the researcher's protocol to protect against X-rays. In this research, bismuth metal has been used as a filler in the epoxy matrix. In order to show the difference in the conditions of using a shield and without a shield, the amount of radiation damage prevention was measured using a dosimeter. This study was used in the CT scan device and special chest CT phantom along with the dosimeter within the phantom to study the received dose values.

Results:

The values of radiation dose changes by calculating the mass attenuation coefficients with and without bismuth-epoxy composite protection showed the changes of dose values for preventing radiation damages.

Conclusion:

The reduction of dose amounts suggested the possibility of reducing the biological effects of radiation and preserving the health of the society as the practical effects of using bismuth-epoxy composite shields. According to the principle of preferring prevention over treatment, it's recommended to use these protectors especially in CT scan.

Relationship between Thalamic Size and Volume by MRI and Disability in Patients with Multiple Sclerosis

Saeed Naghibi Azad University*

Background:

Multiple sclerosis is one of the most common neurological disorders in young adults, which myelin is damaged by pathogens throughout life as high prevalance of the disease and the fact that it is the third cause of neurologic disabilities in Adults and thalamus involvement in this disease, which can cause cognitive impairment and motor disabilities and lower quality of lif.

Purpose:

The purpose of this study is evaluating the type of thalamus involvement, changes in volume and size, the relationship between this disease and thalamus involvement, diagnosis in the early stage of the disease, and the prognosis of symptoms and the severity of the sensory and neurological involvement

Methods:

In this descriptive cross-sectional study, 40patients with Multiple sclerosis were assigned consequently considering the inclusion criteria after assigning informed consent. Then, EDSS questionnaire was completed for them. Thalamus size and volume were assesed by MRI. Then, the results were analyzed by SPSS software version 24.

Results:

In this study, 40 subjects participated in 23 women (57.5%) and 17 men (42.5%) with a mean age of 36.3 ± 9.3. Also, 15 (37.5%) were single and Twenty-five (62.5%) were married. Bachelor's degree and higher (32.5%) and housewives (30%), 8 (20%) were the most frequent

The duration of the disease was 1.4 ± 3.5 years. In the present study, the results showed significant reverse correlation between thalamus volume and disability (P> 0.05) and thalamus size and disability (P> 0.05) and direct linear relationship Between thalamus size and thalamus volume (P> 0.05).

Conclusion:

Generally, it can be concluded that in patients with multiple sclerosis, decreasing the size and volume of thalamus increases the incidence of patients' disability.

Pregnancy Associated Breast Cancer. Is There Any Difference between Clinic Pathological and Ultrasound Findings

Donya Farrokh — Mashhad University of Medical Science*
Bita Abbasi — Mashhad University of Medical Sciences

Background:

Pregnancy associated breast cancer (PABC) is defined as breast cancers detected during pregnancy or in the first 12 months post-partum, or at any time during lactation. PABC is a rare but serious occurrence in young wemen.

Aim:

This study aims to evaluate clinic pathological and ultrasound features of patients with PABC.

Materials and Methods:

From September 2015 to December 2022, 32 patients with breast cancer were diagnosed that has the inclusion criteria of PABC.Our inclusion criteria was the detection of breast cancer during pregnancy or in the first year post-partum year or during lactation. The control group who had breast cancer without PABC criteria included 32 age-matched patients who had no clinical history of recent pregnancy or lactation at the time of cancer detection. The clinic pathological and ultrasound findings of PABC and non-PABC were evaluated.

Findings:

Most PABC cases presents with palpable mass, painful breast lump or skin edema .The analysis of ultrasound findings showed that marginal irregularity, heterogeneous internal echogenicity with cystic area and non-parallel orientation were higher in PABC group .Most cases with PABC were BI-RADS 4C or 5 in comparison with non-PABC patients . There was a significant difference in pathological grading in PABC cases comparison to non-PABC group

Conclusion:

Radiologists should be familiar with imaging findings of PABC the difference between imaging findings of breast lesions in PABC and non-PABC group and recommended core needle biopsy in suspected cases.

The Accuracy of Non-contrast Brain CT Scan in Predicting the Presence of a Vascular Etiology in Patients with Primary Intracranial Hemorrhage

Bita Abbasi — Mashhad University of Medical Sciences*
Reza Akhavan — Mashhad University of Medical Sciences
Raheleh Ganjali — Mashhad University of Medical Science
Fatemeh Khojasteh — Mashhad University of Medical Science
Donya Farrokh — Mashhad University of Medical Science
Masoud Pezeshki-Rad — Mashhad University of Medical Sciences
Behrooz Zandi — Mashhad University of Medical Sciences
Jahanbakhsh Hashemi — Professor of Radiology
Ali Feyzi Laein — Mashhad University of Medical Science

Introduction:

Spontaneous intraparenchymal cerebral hemorrhages (SIPH) account for 10-15% of cases of acute stroke. stratication of these patients according to the risk of harboring an underlying vascular etiology would help for selecting the patients who mostly benet from multidetector CT angiography (MDCTA). The aim of this study was to Evaluate the accuracy of non-contrast brain CT (NCCT) in predicting the presence of a vascular etiology in patients with SIPH.

Materials and Methods:

In this retrospective study, we used NCCT criteria to predict the presence of vascular etiology in SIPH patients.

Results:

Of the 385 evaluated patients, 21.3% had an underlying vascular etiology. Independent predictors of the vascular etiology included age< 50 years, no history of hypertension and coagulation disorder, lobar hemorrhage, concurrent IVH or SAH, and signicant perilesional edema. We used the independent predictors of vascular etiology and NCCT classication to create a practical scoring system to predict the risk of vascular ICH (VICH). VICH score ≤4 had 76.8% Sensitivity and 90.1% Specicity for prediction of a positive MDCTA.

Conclusion:

The VICH score was successful in the prediction of vascular etiology in this retrospective cohort of 385 patients

Temporal Changes of Lung Computed Tomography Findings Pulmonary COVID-19 Infection

Bita Abbasi — Mashhad University of Medical Sciences*
Masoud Pezeshki-Rad — Mashhad University of Medical Sciences
Hourieh Soleimani — Mashhad University of Medical Science
Mahnaz Mozdourian — Mashhad University of Medical Science
Reza Akhavan — Mashhad University of Medical Sciences
Mona Maftouh — Mashhad University of Medical Science

Objectives:

COVID-19 infection demonstrates characteristic findings in chest CT. The optimal timing of repeated CT scans still needs to be clarified, and the optimal time to assess imaging clearance in COVID-19 is still unknown. It is crucial to have a roadmap of the imaging course of COVID-19 pneumonia to develop guidelines for prompt diagnosis of pulmonary complications, especially fibrosis, at the earliest stage.

Purpose:

To assess the temporal changes of chest CT findings in patients with COVID-19 pneumonia and evaluate the rate of a complete resolution and determine the patients are at excessive risk for residual parenchymal abnormalities.

Materials and Methods:

This retrospective observational study included 48 patients with real-time polymerase chain reaction–confirmed COVID-19 who were admitted to three academic hospitals. These patients underwent at least one initial chest CT before or after admission and at least one follow-up CT scan four weeks or more after the onset of the symptoms. All chest CTs were categorized according to time of performance into four groups, including the first week, second week, third-fourth week, and more than 28 days. Lung involvement was categorized as predominantly alveolar (ground-glass opacity and consolidation), organizing pneumonia, and reticular patterns. The severity of involvement was also evaluated by the reader.

Results:

Forty-eight patients and a total of 130 chest CT scans were evaluated. The alveolar pattern showed a gradual decrease in frequency from 91% in the first week to 9% after the fourth week of the disease but the organizing pneumonia pattern gradually increased with disease progression and the frequency of reticular pattern increased significantly after third week. Complete resolution of CT findings was seen in 17 patients (13.1%) and was significantly more prevalent in patients of younger age (p value<0.001) and with lower initial CT severity scores (p value=0.048). CT severity scores in the second week were significantly higher in ICU admitted patients (p value=0.003).

Conclusion:

There are temporal patterns of lung abnormalities in patients with COVID-19 pneumonia. The predominant CT pattern was alveolar infiltrate in the first and second weeks of the disease, replaced with an organizing pneumonia pattern in the third and fourth weeks. Progression of lung involvement was

correlated with ICU admission due to the highest CT severity score in the second and third weeks of presentation but not in the first week in patients who were admitted at ICU. Complete CT resolution was significantly more common in patients of younger age and lower initial CT severity scores.

Evaluating the Temporal Changes of Sinus Density in Patients with Acute Cerebral Sinus Vein Thrombosis

Bita Abbasi — Mashhad University of Medical Sciences*
Reza Akhavan — Mashhad University of Medical Sciences

Introduction:

Despite the studies performed to characterize the clot's features in the acute phase in non-contrast computed tomography (NCCT), no study has been conducted to evaluate the non-acute phase and the threshold density that warrants further evaluation. Herein, we assessed the temporal changes of sinus density in patients with acute CVST.

Methods:

In this cross-sectional study, we searched our Picture Archiving and Communicating System (PACS) of our hospital between January 2015 and September 2021. Inclusion criteria were patients older than 18-year- old with acute CVST, with available Contrast-enhanced Magnetic Resonance Venography (CE-MRV) as the gold standard for conrming the presence and location of thrombosis. The readers were asked to assess the images regarding any subjective abnormal hyper- or hypo-attenuation within the venous sinus structures. Changes in the Hounseld Unit (HU) of each venous segment during the time-course of the disease and the HU difference of affected sinus with other sinus segments were evaluated.

Results:

Out of 89 CT scan evaluations, 21 cases (23.6%) were performed in the acute, 38 (42.7%) presented in the subacute, and 30 (33.7%) presented in the chronic stage. In all involved venous sinuses, the mean blood density of various phases was a statistically signicant difference. The agreement of the two radiologists to report the hypodense sinus sign was reported to be 0.7.(p-value <0.001).

Conclusions:

The results of our study suggest that quantitative measurement and qualitative ndings of the hypodense sinus sign help to diagnose non-acute CVST better.

POSTER ACCEPTED ABSTRACT OF ICR2023

Intramuscular Capillary Hemangioma and Resulting Kasabach-merritt Phenomenon; A Case Report

Shoresh Barkhordari Army University of Medical Sciences*

Background:

The term "hemangioma" has been incorrectly applied to a wide variety of vascular lesions. Hemangiomas are true vascular neoplasms with evidence of increased endothelial cell turnover. This case had a variety of anatomical positions meaning that every interventionist and orthopedic had a problem in treating.

Case presentation: a 29-year-old man with an eight years history of a round red lesion on his buttock that progressed and become a huge mass so the orthopedic surgeon could not excise the lesion the first time.

Conclusion:

in this case, we had some problems with anatomy and when we occluded the main artery by CT guided interventions, a small particle detached from the artery and made the pulmonary emboli. After this intervention, the mass lesion had been excised successfully.

Keywords: Hemangioma, Intramuscular, intervention

A Case of Isolated Fallopian Tube Torsion Associated with Hematosalpinx in a 13-year-old Girl

Rahele Mehraeen Babol University of Medical Science*

Isolated fallopian tube torsion without involving ovary is a very rare condition in the pediatric population.

The incidence of IFFT is approximately one in 1.5 million females.

Several intrinsic or extrinsic predisposing factors have been identified in adults. However, in sexually inactive girls or adolescents, a possible factor is preexisting congenital malformations.

Torsion of the right tube is much more common than left, which could be related to protective effect of sigmoid colon and mesentery, or to more frequent imaging evaluations of right pelvis pain to investigate possible appendicitis.

Accompanying symptoms are very nonspecific, such as nausea, vomiting and with appendicitis-like symptoms. Because of its rarity and non-specific symptoms, it is usually misdiagnosed initially, with the expense of loss of fertility.

This condition is hard to diagnose with standard imaging tests, and surgical examination is needed to make a final diagnosis. Treatment of IFTT ranges from a wait-and-see approach to total salpingectomy and early diagnosis is

essential for conservative management. So it should be considered as a differential diagnosis in pediatric pelvic abdominal pain, especially if ultrasound study reveals a pelvic tubular structure without involvement of the ovary.

Here, we report a very rare case of IFTT associated with hematosalpinx in a thirteen years old girl, who presented with acute abdominal pain. Gray scale, color doppler ultrasound and MRI with contrast were performed and revealed the diagnosis.

Previous literature of IFTT in reproductive and pediatric age groups are reviewed and the imaging features of this patient are discussed.

Simple Cyst or Hydatid Cyst; A Challenging Case

Shoresh Barkhordari Army University of Medical Sciences*

Diagnosing simple liver cysts seems very easy. It may be more like a myth that you consider a cyst as a simple cyst and try to drain it, but the cyst comes out after draining the hydatid.

The patient is a 24-year-old soldier who was diagnosed with a simple liver cyst and was admitted to the hospital for cyst drainage under ultrasound guidance.

Pediatric Spine, Sonographic Approach

Amirreza Jahanshahi Assistant Professor of Radiology
Tabriz University of Medical Scince*

Spinal dysraphism is the second most common congenital abnormality and ultrasound provides an excellent means for imaging the spine up to three to six months of age. Fusion of the bony portion of posterior elements is complete by one year of age, but since this fusion progresses from caudal to cranial, the thecal sac can be obscured by fused dorsal elements in the lumbar region as early as three months.

Indications for pediatrics spines ultrasound include, those with cutaneous markers that place them at risk for dysraphism and if the cutaneous dimple is more than 2.5 cm from the anus and larger than 5 mm, it is considered at risk and those with syndromes that are associated with an increased incidence of dysraphism, including vertebral defects, cardiac anomalies, anal atresia, tracheoesophageal fistula, renal anomalies, and limb dysplasia associations

The spinal cord is predominantly hypoechoic, with a “central echo complex” that is echogenic. The spinal cord is normally widest in the cervical and the lumbar spine, where large exiting nerve roots are present.

Tethered Cord is a pathologic fixation of the spinal cord in an abnormal caudal location so that the cord suffers mechanical stretching, distortion and ischemia with growth and development.it is considered when, conus medullaris below L3 in a neonate and below L2/3 in older patients. Tethering may result in decreased pulsatility of the cord.

Tight filum terminale syndrome is considered when it is thickened to more than

2 mm (by fibrous or lipomatous tissue) and may occur in the absence of tethering of the cord, in which case the filum is thickened but the conus is at the normal level

Spinal dysraphism is a broad term given to groups of anomalies, where there are malformation in dorsum of embryo. Its types include spina bifida aperta: Dysraphism associated with a "dorsal mass that is not covered with skin" and spina bifida cystica: dorsal mass covered with skin and occult dysraphism (spina bifida occulta): dysraphism is present but there is no associated mass.

meningocele is a herniation of meninges alone, without spinal cord or nerve root, into defect in spinal canal

Diastematomyelia is a longitudinal split of the spinal cord and at the point of division, there may be an osseous, fibrous or cartilaginous dividing septum.

hydromyelia is a fluid accumulation/ dilatation within the central canal, therefore, lined by ependyma, and syringomyelia: cavitary lesion within cord parenchyma, of any cause (there are many); located adjacent to the central canal, therefore not lined by ependymal and syringohydromyelia: a term used for either of the above, since the two may overlap and cannot be discriminated on imaging, also known as hydrosyringomyelia!

keywords: ultrasound, dysraphism, Diastematomyelia, syringohydromyelia

Thanatophoric Dysplasia Type1; A Lethal Dysplasia

Shoresh Barkhordari — Army University of Medical Sciences*
Reza Gerami — Army University of Medical Science

Thanatophoric dysplasia type 1 (TD1) is a lethal form of osteochondral dysplasia due to mutation of FGFR3 gene. In addition to severe shortening of the limbs there is temporo-occipital lobe dysplasia along with a range of other CNS anomalies. In this report we describe the radiological and anatomical features in a fetus.We have also summarized the key distinguishing features of TD1 from other common types of osteochondral dysplasia. An accurate diagnosis is important for genetic counseling and impact on future pregnancies

Systemic Imaging Approach to Dementia

Amirreza Jahanshahi — Assistant Professor of Radiology
Tabriz University of Medical Scince*

Imaging nowadays extends beyond its traditional role of excluding neurosurgical lesions. An MR-study of a patient suspected of having dementia must be assessed in a standardized way; First of all, treatable diseases like subdural hematomas, tumors and hydrocephalus need to be excluded and Next we should look for signs of specific dementias which includes Alzheimer's disease (AD): medial temporal lobe atrophy (MTA) and parietal atrophy and Alzheimer's disease (FTLD): (asymmetric) frontal lobe atrophy and atrophy of the temporal pole and Vascular Dementia (VaD): global atrophy, diffuse

white matter lesions, lacunes and 'strategic infarcts' (infarcts in regions that are involved in cognitive function) and Dementia with Lewy bodies (DLB): in contrast to other forms of dementia usually no specific abnormalities!

Standardized assessment of the MR findings in a patient suspected of having a cognitive disorder includes: GCA-scale for Global Cortical Atrophy ,MTA-scale for Medial Temporal lobe Atrophy ,Koedam score for parietal atrophy, Fazekas scale for WM lesions and looking for strategic infarcts.

GCA-scale is used for Global Cortical Atrophy assessment and is mean score for cortical atrophy throughout the complete cerebrum

MTA-scale is used for Medial Temporal lobe Atrophy and should be rated on coronal T1-weighted images and Select a slice through the corpus of the hippocampus, at the level of the anterior pons.

Fazekas scale provides an overall impression of the presence of WMH in the entire brain and best scored on transverse FLAIR or T2-weighted images.

Strategic infarctions are infarctions in areas that are crucial for normal cognitive functioning of the brain

Koedam score is used for Parietal lobe Atrophy and In addition to medial temporal lobe atrophy, parietal lobe atrophy also has a positive predictive value in the diagnosis of AD.

keywords: dementia, MRI, Alzheimer's disease, Vascular Dementia, Strategic infarctions

COVID-19-associated Encephalopathy with Fulminant Cerebral Vasoconstriction: CT and MRI Findings

Sam Mirfendereski Isfahan Medical University*

Severe acute respiratory syndrome coronavirus 2 (SARS-Cov-2) can cause various mild to severe neurologic symptoms, leading to significant morbidity and mortality. We hereby present a fatal case of a 50-year-old male health care provider, admitted due to altered mental status due to encephalopathy, cerebral edema, and fulminant cerebral vasoconstriction caused by SARS-Cov-2. Our case highlights the importance of considering SARS-Cov-2 infection in the differential diagnosis for patients with unexplained central nervous system dysfunction and cerebral edema to prevent delayed diagnosis and render rapid treatment.

Congenital Anomalies of Pediatric Spine

Sam Mirfendereski Isfahan Medical University*

Purpose:

Pediatric congenital anomalies of spine are often encountered in pediatric centers and it is necessary for a radiologist to be familiar with these anomalies to make a correct diagnosis .it should be remembered that two or more anomalies can occur at the same time . In this article we review basic embryology of spine followed by case review of spinal anomalies

Discussion:

For make a definite diagnosis the radiologist must be familiar with embryology of spine and radiologic features of spinal anomalies and be aware that some anomalies can occur at the same time

Investigation of the Effect of Bayesian Penalized Likelihood (BPL) Reconstruction Algorithms on The FDG PET Volumetric And Heterogeneity Features: A Phantom Study

Zahra Valibeiglou — Tabriz University of Medical Sciences*
Peyman Sheikhzadeh — Department of Medical Physics and BioMedical Engineering, Faculty of Medicine, Tehran University of Medical Sciences
Masoomeh Fooladi — Department of Nuclear Medicine, Imam Khomeini Hospital Complex, Tehran University of Medical Sciences
Yunus Soleymani — Department of NeuroScience and Addiction Studies, School of Advanced Technologies in Medicine, Tehran University of Medical Sciences, Tehran, Iran
Reza Sheikhzadeh — Department of Medical Physics, Iran University of Medical Sciences
Jalil Pirayesh Islamian — Department of Medical Physics, Faculty of Medicine, Tabriz University of Medical Sciences

Aim/Introduction:

The purpose of this study is to investigate the effect of Bayesian penalized likelihood (BPL) image reconstruction algorithms with different noise-controlling factor (β-values) on the FDG PET quantitative volumetric and heterogeneity features of metabolic volume (MTV) and total glycolysis (TLG).

Materials and Methods:

The standard National Electrical Manufacturers Association (NEMA) image quality phantom that consisted of six spheres (inner diameters of 37, 28, 22, 17, 13, and 10 mm) filed with 18F-FDG solution were used for this study. The phantom was prepared with a lesion-to-background ratio (LBR) of 4:1. All images were reconstructed using OSEM+ resolution recovery and BPL using β-values of 100, 200, 300, 400, 500. The metabolic tumor volume (MTV) and total lesion glycolysis (TLG) were measured for all spheres. The relative percent error (ΔMTV and ΔTLG) with respect to true values, mean difference, standard deviation, and inter-reconstruction variabilities were quantified and evaluated.

Results:

The mean ΔMTV showed statistically significant changes between BPL reconstruction method in different β-values and OSEM, at LBR4 were (-1.83%, -13.80%, -0.60%, -0.34% and 0.03%) statistically significant. There was

also a significant difference in the, mean ΔTLG between BPL reconstruction methods and OSEM (-4.15, -2.67, -2.21, -1.81 and 1.51, respectively) was observed ($p < 0.05$).

Conclusion:

In this study, we indicated that both volumetric and heterogeneity features of ΔMTV and ΔTLG are sensitive to reconstruction algorithms. The BPL algorithm with different noise controlling factors (β value) provided different MTV and TLG values. We showed that significant differences of MTV and TLG can be obtained in low-level Beta values.

Comparative Study of CT Scan Modality with MRI Modality Findings in Patients Suspected of Covid-19

Mohammad Sobhan — Shahid Rahnemon Hospital, Yazd University of Medical Sciences*

Maryam Redaei — Shahid Rahnemon Hospital, Yazd University of Medical Sciences

Samaneh Ghasemipour — Shahid Rahnemon Hospital, Yazd University of Medical Sciences

Zahra Ameri Ahmad — Chronic Respiratory Disease Research Center, National Research Institute of Tuberculosis and Lung Diseases (NRITLD), Masih Daneshvari Hospital, Shahid Beheshti University of Medical Sciences

Purpose:

CT-scan and MRI are both best of radiologic modalities with different advantages and disadvantages. In this study we aimed to evaluate and compare the features of COVID-19 pneumonia in these two modalities.

Methods:

Fifty three suspected COVID-19 patients who presented to our emergency ward underwent chest CT and, once various features of COVID-19 pneumonia were identified, a dedicated multi-sequence chest MRI was performed on the same day with an institutional protocol. Demographic data and the morphology, laterality and location of the lesions were recorded for each case.

Results:

Thirty seven males and sixteen females with the mean age of 47.49 ± 13.86 years old were present in this case series. Fifty one cases had typical CT features with ground glass opacities and consolidations, readily visible on different MRI sequences. Thirteen cases had atelectasis which were also easily seen on MRI. The comprehensive review of MRI features for each case and representative images have been illustrated.

Conclusion:

We can suggest MRI as an alternative choice of CT-scan for diagnosis COVID-19 pneumonia according to the revealed results, it can be a logical choice in the suspected cases.

Giant Pedunculated Hepatoblastoma Mimicking Neuroblastoma in a 4-month-old Infant: A Case Report

Elham Zarei — Assistant Professor*
Mehdi Vafadar — Iran University of Medical Sciences

Hepatoblastoma is the most common primary hepaticmalignancy in children but pedunculated hepatoblastoma is an extremely rare entity. Accurate diagnosis can be challenging due to its extrahepatic location and possibly its thin peduncle, which is not easily identified in imaging .

Here, we report a case of asymptomatic giant palpable pedunculated hepatoblastoma in the LUQ of a four month old male infant, initially suspected of neuroblastoma based on abdominal ultrasound findings. the final diagnosis of giant pedunculated hepatoblastoma was made based on the abdominal CT scan and diagnosis was confirmed by percutaneous biopsy.

Due to the size of the tumor, complete removal of the tumor was not initially possible. therefore, the patient was treated with several courses of chemotherapy .

The tumor was shrunk and then cimpletely removed.

The patient was treated and no complications were found in the 6 month follow up.

The pedunculated hepatoblastoma is very rare but should be considered as a possibility in the case of a perihepatic mass in a pediatric patient .

CNS Manifestation of Granulomatosis with Polyangiitis in a 12-year-old Child: A Case Report

Mahsa Geravandi — Isfahan University of Medical Science*
Ali Hajihashemi — Isfahan University of Medical Science
Neda Azin — Rdiology Resident

Granulomatosis with polyangiitis (GPA) is chronic granulomatous necrotizing C-ANCA positive systemic vasculitis, most frequently in adults and typically involves the respiratory system and the kidneys.

Few cases in children have been reported yet and CNS manifestations are also rare.

Here we discuss a case of Granulomatosis with polyangiitis (Wegner) in a 12-year-old female who presented with a cough, dyspnea, fever, and high blood pressure.

Pulmonary involvement showed cavitary lesions and nodules. Lab data showed increased serum creatinine and macroscopic hematuria. patient's C-ANCA was positive. Considering such findings renal biopsy was considered and confirmed the diagnosis of GPA.

During her hospitalization, due to headache & loss of consciousness brain MR imaging was done. Evidence of Small vessel vasculitis with confluent T2 hyper signal intensity of gray-white matter junction of both parietooccipital and frontal lobes containing hemorrhagic component suggestive of Posterior reversible encephalopathy syndrome (PRES) was seen

Pelvic Neurofibroma in A Patient Presenting with Pelvic Pain and Urinary Frequency

Mahsa Geravandi — Isfahan University of Medical Science*
Ali Hajihashemi — Isfahan University of Medical Science

Pelvic neurofibromas are benign and uncommon retroperitoneal masses. They arise from Schwann cells. One of the morphologic types of this benign tumor is solitary and sporadic and not associated with neurofibromatosis type 1. Here we discuss a case of pelvic neurofibroma in a 20-year-old male who presented with chronic pelvic pain. He had no positive family history of genetic disorders and, on physical exam, just partly firm mass without mobility in the hypogastric region was detected. Ultrasound and Computed tomography scan showed pelvic retroperitoneal mass superior to the urinary bladder with extended of the rectovesical pouch and invasion to the posterior wall and dome of the bladder. The patient underwent laparotomy revealing an infiltrative retroperitoneal mass with the invasion of the bladder's posterior wall, dome, and trigone. Histopathological findings show neurofibroma.

Radiation Protection Awareness among Radiation Science Students

Zahra Farzanegan — Arak University of Medical Sciences*
Fateme Sadate Sadeghpour — Radiology Student in Arak University of Medical Sciences

Background and objective:

Based on the role of radiology and radiotherapy staff in radiation optimization, this study aimed to review the level of radiation awareness of Radiation Science students as a future diagnosis and treatment team.

Methods:

Articles were searched in PubMed, Science direct, Embase, Cochran and Scopus databases using the keywords knowledge AND radiation AND students, awareness AND radiation AND students. The authors reviewed the abstract and full text of the articles and the relevant studies were selected for systematic review.

Results:

In the studies of radiation students, 69.82% were radiology technology, 30.18% were radiation therapy, the results of the reviewed studies showed that among radiation science students, the level of awareness of radiation was 61.21% on average. The higher level of knowledge was related to the radiology (65.46%) and the lower is related to the field of radiation therapy (51.3%).

Conclusion:

The results of the research conducted in this study showed that the level of awareness regarding radiation and its effects among students studying in radiation sciences is moderate.

Keywords: Radiation, Awareness, Students

The Study of Amount of Newborns Received Dose Who Are Hospitalized in Ali Ebn Abitaleb Hospital in Intensive Care Unit, Zahedan after Doing Diagnostic and Radiology During the Hospitalization

Mehrdad Baranzehi — Radiology*
Mahdiyeh Zarei — Radiology
Zeynab Yazdi Sotoodeh — MA- MRI

Newborn babies who are admitted to the intensive care unit for various disease can be diagnosed and treated under a large number of X-ray imaging

The most important complication and risk of receiving too much X-rays is the increased probability of developing malignancies and cancers.

Conventional radiology due to, low ratio of absorbed radiation dose per graph and also a low price is one of the most important diagnostic modality in the special care unites

This study was conducted during 6 months in Ali Ibn Abi Talib Hospital in Zahedan in 2022 and 2023

in this study we are going to evaluate the amount of cumulative dose received by infants in the intensive care unit of Ali Ibn Abi Talib Hospital in Zahedan.

Correlation between Heart and Liver Iron Overload Measured by MRI T2* and Ferritin Level among Sistan and Baluchistan Thalassemia Major Patients

Zeynab Yazdi Sotoodeh — MSC of Medical Imaging Department of Radiology, Faculty Member of ParaMedicine, Zahedan University of Medical Science, Zaheden, Iran
Hamid Dahmardeh — Department of Radiology Faculty of Medicine, Zahedan University of Medical Sciences, Zahedan, Iran
Aghile Hosseini — Zahedan University of Medical Sciences*
Amir Hossein Heydari — Zahedan University of Medical Sciences

Purpose:

This study investigated the correlation between Iron overload (IOL) in liver and heart as measured by Magnetic Resonance Imaging (MRI) T2* relaxation time technique and serum ferritin levels in beta thalassemia major patients in Sistan and Baluchistan province as the population of Beta thalassemia major patients is higher in this province compared to rest of Iran. Methods: This cross-sectional study

was conducted at Ali Ibn Abi Taleb hospital in Zahedan, The MRI T2* data of liver and heart and ferritin serum levels were collected from 115 beta thalassemia major patients' history.

Results:

There was a moderate correlation between the MRI T2* and serum ferritin levels, indicating that MRI T2* could be used to effectively monitor iron status in beta thalassemia major patients.

Conclusion:

The results of this study suggest that MRI T2* technique could be a valuable, non-invasive tool for monitoring iron status in the beta thalassemia major patients.

Evaluation of the Incidence Rate of Malignancy and Its Relation with Background Radiation in Hamadan Province from 2018 to 2022.

Hamed Zamani
3. Department of Medical Physics
School of Medicine, Tabriz University of Medical Science, Tabriz, Iran

Tohid Mortezazadeh
Tabriz University of Medical Sciences

Majid Alizadeh
Department of Medical Physics
School of Medicine
Tabriz University of Medical Science, Tabriz, Iran*

Rasool Azmoonfar
2. Radiology Department
Faculty of Para Medicine
Hamadan University of Medical Sciences,
Hamadan, Iran

Background:

Humans are always exposed to natural radiation. Elsewhere in the world, there are areas with high background radiation whose annual dose exceeds the standard maximum radiation dose of a resident. Radiation-related cancers are more common in the thyroid, bone, and skin systems. Since the average annual effective dose in Hamadan province exceeds the world standard. The aim of this study is to evaluate the incidence of malignancy and its relation with background radiation in Hamadan province.

Material and Methods:

The present study is a retrospective cross-sectional study, the records of all cancer patients related to residents of Hamadan province were provided by the Health Department during the years 2018 to 2022, and after final approval from it, the identifications like age, location, Occupation, and type of tumor were written and recorded. Results: The Spearman's rho for all malignancies studied is not close to 1.

On the other hand, the P-Value also shows a value greater than 0.05 in all cases. This relationship is not statistically significant because the high dose rate in Hamadan province does not increase any malignancies. And the radiation parameter in this case does not have a negative impact.

Conclusion:

The background radiation of Hamadan province is slightly higher than the world standard value, which has no effect on the incidence of malignancy, and the background dose values close to the world standard value may prevent malignancy.

Keywords: Background Radiation, Malignancy, Radiation

Evaluation of the Relationship between Spleen Elastography Score and Spleen Size in Healthy Individuals

Farnood Rajabzadeh
Department of Radiology
Faculty of Medicine, Mashahd Medical Sciences,
Islamic Azad University, Mashhad*

Hamidreza Feizabadi
Department of Radiology
Faculty of Medicine, Mashahd Medical Sciences
Islamic Azad University, Mashhad

Purpose:

Determining the relationship between spleen elastography score and spleen size with age, sex, BMI and family history of spleen disorders in healthy people.

Methods:

This study was conducted on 54 number of hospital staff and students of the faculty and affiliated hospitals of Islamic Azad University of Mashhad during 1400-1401, who had no history of chronic liver disease, portal hypertension and hematological disorders. Spleen shear wave-based elastography was calculated by taking the average of three valid measurements in kilopascals.

Results:

The results of this research show that the average score of spleen elastography in healthy people is 18.12±3.01 kilopascals, and it has no statistically significant relationship with spleen size, gender, age, and body mass index (p-value>0.05). Also, the results showed that the average size of the spleen in healthy people is 94.54 ± 13.29 mm and it has a statistically significant relationship with gender and body mass index (p-value<0.05). The average size of the spleen is greater in men than in women, and with the increase in body mass index, the size of the spleen increases. According to the correlation analysis, there is an inverse linear relationship between age and spleen size, and with increasing age, the size of the spleen decreases.

Conclusion:

The results of this study can be a reference point in the evaluation of spleen stiffness, especially in patients with liver disease.

How to Analyze and Report Densitometry

Mohammad Eslamian Noor Medical Imaging Center*

Purpose:

Densitometry is the first step in diagnosing osteoporosis. In this article, an attempt is made to review how to analyze and report Dual X-ray Absorptiometry (DXA) based on ISCD guidelines, for the hip and lumbar spine.

Method:

It is necessary to check the name, age, gender, and height of the patient first. Bone Mineral density (BMD) values are based on the mentioned variables which are compared with the BMD of 25 to 30-year-old young women to produce T-score.

* The specifications and version of the device should be mentioned since it is used in comparative densitometry.
* In lumbar and hip DXA, the patient`s position, how to control area, BMD, and choice of suitable F.N., hip, and vertebrae analysis should be explained.

Result:

* In the diagnosis section, one of the following statements should be used:
  - In postmenopausal women and men over 50 years old:
  1- Normal if T-score ≥ -1
  2- Low bone mass if -2.5< T-score < -1
  3- Osteoporosis if T-score ≤ -2.5
  4- Severe or established osteoporosis if T-score ≤-2.5 with fragility fracture.
  - In premenopausal women and men younger than 50 years old:
  1- Within the expected range for age if Z-score > -2.0
  2- Below the expected range for age if Z-score < -2.0
  3- Z-score ≤ -2.0 must be evaluated for secondary causes.

Conclusion:

* In conclusion, patients are divided into low-risk and high-risk. The patients with T-score ≤ -2.5, femoral fracture risk of more than 3 percent or major fracture risk of more than 20 percent, and the patients with fragility fracture should be treated. Patients with Z-score ≤ -2.5 should be also evaluated for secondary causes of bone loss.
* Other complementary studies done by DXA machine, like T.B.S, hip geometry, VFA, forearm lateral lumbar or distal femoral DXA, whole body, and body composition, should be mentioned.

Accuracy of MRI Versus Laparoscopy in the Diagnose of Pelvic Endometriosis

Saeed Naghibi Azad University*

Background:

Endometriosis is one of the most common diseases in women whose timely and accurate diagnosis can be helpful in controlling, treating and preventing recurrence. Due to the invasiveness of the laparoscopic procedure,

it is necessary to consider non-invasive procedures more and more.

Purpose:

We aimed to investigate the correlation between diagnostic values of MRI with Laparoscopy as a gold standard for endometriosis diagnosis.

Methods:

A descriptive Analytic study was done on 58 women referred to private gynecology clinic who were candidate for diagnostic laparoscopy with endometriosis suspected. All woman underwent MRI imaging and laparoscopy; all images were examined by radiologist. The finding was analyzed in SPSS.V20. P value < 0/05 was considered to be significant.

Results:

According to this study, the frequency of endometriosis in women was 45 (77.6%) based on MRI, while the frequency of endometriosis was 48 (82.8%) based on diagnostic laparoscopy. The sensitivity of MRI to detect endometriosis was 79.17% and its specificity was 30.00%. (P = 0/527).

Conclusion:

According to this study MRI may be able to detect small endometrial lesions that cannot be diagnosed by laparoscopy.

Keywords: Magnetic resonance imaging, Laparoscopy, Endometriosis, Diagnostic Value.

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

Keywords: Cross sectional cerebellum, gestational age, Ultrasonography.

The Elasticity of the Sternocleidomastoid Muscle before and at the End of Three-dimensional Conformal Radiotherapy

Asma Khodadadi — Tarbiat Modares University*
Dr Mokhtari Dizaji — Tarbiat Modaresh University
Reza Ghalehtaki — Tehran University of Medical University

Purpose:

Sternocleidomastoid muscles are one of the most important neck muscles, which play an important role in the position of the neck. Head and neck Radiotherapy is the cause of severe Sternocleidomastoid muscle contractions. The aim of this study is to present a non-invasive method based on the extraction of muscle biomechanical parameters resulting from high-frequency ultrasound images to extract muscle dose response.

Methods:

Sequential ultrasound images were recorded with a 14 MHz frequency imaging system. The muscle's mechanical parameters were extracted by the motion estimation algorithm (block-matching). Reproducibility and validation of the method were done manually. Correlation between two automatic and manual methods was done with Pearson correlation analysis. The block-matching algorithm was used to estimate the muscle wall's longitudinal movement. In this method, two blocks with specific dimensions were selected as reference blocks in the first frame. The way it works is to find the blocks in the next frames that have the most compliance with the reference blocks. The longitudinal displacement vector is the result of the difference between the two blocks in different frames. By using this algorithm, one patient with tongue cancer was examined once before the start of radiotherapy and again at the end.

Results:

A significant correlation between automatic and manual methods was obtained with a correlation coefficient of more than 0.79. Muscle's shear modulus increased significantly at the end of radiotherapy which indicated an increase in muscle stiffness during the 60 Gy absorbed dose ($p<0.05$).

Conclusion:

In this study, a non-invasive method based on the extraction of muscle biomechanical parameters with processing of high-frequency ultrasound images to follow up radiation damage is concluded. The block matching algorithm is reliable for distinguishing the elasticity of Sternocleidomastoid muscle before and at the end of radiotherapy.

Investigating the Expression Level of Long Non-Coding RNAs in Response to Low-Dose Ionizing

Radiation

Mohammad Ali Pourattar* — Department of Radiobiology, Iran University of Medical Sciences, Tehran, Iran.

Morteza Talebi* — Department of Medical Genetics, Iran University of Medical Sciences, School of Medicine, Tehran,Iran. Iranian Biological resources center, Tehran, Iran.

Reza Paydar — Department of Radiation Science, Faculty of Allied Medicine, Iran University of Medical Sciences,Tehran, Iran.

Hossein Mozdarani — Department of Medical Genetics, Faculty of Medical Sciences, Tarbiat Modares University, Tehran,Iran.

Asghar Maziyar* — Radiation Biology Research Center, Iran University of Medical Sciences, Tehran, Iran.

Introduction:

Despite the growing number of studies on lncRNAs, particularly in cancer biology, there is a lack of information about their specific roles. In this study, we evaluated the expression levels of LNCs after exposure to X-ray radiation and found that ANRIL was overexpressed in response to 8Gy radiation.

Apoptosis, cell cycle and DNA repair-related LNCs may be promising avenues for further exploration of the effects of low-dose radiation and the cell sensitivity it may represent.

A Case of Isolated Fallopian Tube Torsion Associated with Hematosalpinx in a 13-year-old Girl

Isolated fallopian tube torsion without involving ovary is a very rare condition in the pediatric population.

The incidence of IFFT is approximately one in 1.5 million females.

Several intrinsic or extrinsic predisposing factors have been identified in adults. However, in sexually inactive girls or adolescents, a possible factor is preexisting congenital malformations.

Torsion of the right tube is much more common than left, which could be related to protective effect of sigmoid colon and mesentery, or to more frequent imaging evaluations of right pelvis pain to investigate possible appendicitis.

Accompanying symptoms are very nonspecific, such as nausea, vomiting and with appendicitis-like symptoms. Because of its rarity and non-specific symptoms, it is usually misdiagnosed initially, with the expense of loss of fertility.

This condition is hard to diagnose with standard imaging tests, and surgical examination is needed to make a final diagnosis. Treatment of IFTT ranges from a wait-and-see approach to total salpingectomy and early diagnosis is essential for conservative management. So it should be considered as a differential diagnosis in pediatric pelvic abdominal pain, especially if ultrasound study reveals a pelvic tubular structure without involvement of the ovary.

Here, we report a very rare case of IFTT associated with hematosalpinx in a thirteen years old girl, who presented with acute abdominal pain. Gray scale, color doppler ultrasound and MRI with contrast were performed and revealed the diagnosis.

Previous literature of IFTT in reproductive and pediatric age groups are reviewed and the imaging features of this patient are discussed.

INVITED SPEAKER ABSTRACTS (20TH IRSA)

Diffusion Tensor Imaging of the Brain

Iman Azinkhah
MSc of Medical Physics
Iran University of Medical Sciences

Diffusion Tensor Imaging (DTI) as a new imaging technique has been highly welcomed in clinical and research environments. A technique whose main purpose is imaging based on the Brownian motion of water. The two main advantages of this imaging method are examination in two scales, microscopic and macroscopic. Both the information is measured in the microscopic dimension and the information is examined in the macroscopic way such as rotation of white matter fibers. The help of this lecture is to introduce the basis of fiber routing and various methods of reconstruction and analysis of DTI images.

Learning Objects:

- Introduction of Basic Tracking
- Data Pre Processing
- DTI Analysis Methods
- Region of Interest Analysis
- Voxel-Based Analysis
- Fiber Tracking and Connectivity Analysis

Contrast Medium Administration in CT

Javad Ghasemi
BS, RT, CT Scan Application Specialist

The continuing advances in computed tomographic (CT) technology in the past decades have provided ongoing opportunities to improve CT image quality and clinical practice and discover new clinical CT imaging applications. New CT technology, however, has introduced new challenges in clinical radiology practice. One of the challenges is with intravenous contrast medium administration and scan timing. In this article, contrast medium pharmacokinetics and patient, contrast medium, and CT scanning factors associated with contrast enhancement and scan timing are presented and discussed clinical considerations risks associated with contrast agents have not been eliminated, and adverse reactions of varying degree continue to occur. Consequently, it is imperative for anybody administering contrast agents to be intimately familiar with the characteristics indications, and potential side effects of these agents. They must be able to recognize adverse reactions promptly and treat them effectively and rapidly. contrast medium pharmacokinetics factors includes , osmolality and Viscosity and contrast medium factors includes rate ,concentration and volume. Patient factors are sex, age, weight and cardiac output . Risks associated with contrast agents form a simple rash to skin eruptions and form mild breathing difficulties to respiratory distress and cessation of vital signs.

Keywords: CT scan ,Contrast medium ,side effect, osmolality ,cardiac output

MRI Accreditation Program
ACR_MRI_IMAGE_QUALITY_GUIDE

ACR–ASNR–SPR Practice Paramerer for the Performance and Interpretation of Magnetic Resonance Imaging (MRI) of the Brain

Manijeh Pakravan Tehran University of Medical Sciences

The American College of Radiology is the principal organization of radiologists, radiation oncologists, and clinical medical Physicists.

The American College of Radiology will periodically define new practice parameters and technical standards for radiologic practice to help advance the science of radiology and to improve the quality of service to patients.

Existing practice parameters and technical standards will be reviewed for revision or renewal, as appropriate, on their fifth anniversary or sooner, if indicated.

ACR Practice Parameters and Technical Standards promote the safe and effective use of diagnostic and therapeutic radiology by describing specific training, skills and techniques. The goal is to narrow the variability among radiology practices and provide guidance to achieve quality in radiology.

ACR ACCREDITATION: The Gold Standard in Medical Imaging

ACR Accreditation is a valuable tool for maintaining excellence in everything from operations to patient care.

ACR Accreditation helps assure your patients that you provide the highest level of image quality and safety by documenting that your facility meets requirements for equipment, medical personnel and quality assurance.

Goals of the ACR MRI Accreditation Program are to set quality standards for “best practice” and to help continuously improve the quality of patient care.

Primary components of the ACR program are the evaluation of:

1. Qualifications of all personnel (Physicians, Physicists and Technologists)
2. Equipment performance
3. Effectiveness of quality control measures
4. Quality of clinical images

This article is the introduction of ACR MRI IMAGE QUALITY GUIDE.

Impact of Low Dose Ionizing Radiation Induced Genome Instability on Human Health

Hossein Mozdarani, Ph.D

Department of Medical Genetics
Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran. <mozdarah@modares.ac.ir>

In modern life, human is under constant exposure to low dose natural or manmade sources of non-ionizing radiations (microwaves, radiowaves, mobile, etc.) and ionizing radiation used for medical or industrial purposes. Ionizing radiation (IR) is known as potent inducer of DNA damages through direct or indirect effcts on DNA molecule. Indirect effect of IR leads to water radiolysis and formation of free radicals and reactive oxygen species (ROS). ROS are a group of highly reactive molecules implicated in the oxidative damage of biological structures.

There are accumulating evidences indicating that cell transformation is associated with genome instability leading to an imbalance between the mechanisms of cell-cycle control and mutation rates within the genes. Genome instability can be defined as an enhanced tendency for the genome to acquire mutations; ranging from changes to the nucleotide sequence to chromosomal gain, rearrangements or loss. ROS which gives rise to various types of DNA lesions, including single-strand breaks and double-strand breaks (DSBs), and various types of base damage as well as DNA-DNA and DNA-protein cross links. Radiation induced DSBs represent the most lethal types of DNA damage, leading to cell death, if unrepaired. However, DNA damage response mechanisms may lead to two distinct outcomes: survival and the maintenance of genomic stability. The formation of ROS produces not only DNA strand breakages, but also might act as a signaling event leading to the release of cytokines or epigenetic changes, or trigger DNA repair machinery. All primary lesions induced in the DNA are subjected to cellular repair processes; however, the unrepaired or mis-repaired lesions may give rise to gene mutations and chromosomal aberrations (CA). Although DSBs are considered as serious DNA damage, they may be repaired very effectively by either one of the two different repair mechanisms namely, homologous recombinational repair (HRR) and non-homologous end joining (NHEJ). HRR is able to restore the original sequence of DNA DSB leading to a lower risk of generation of deletions and insertions at the site of DSB. NHEJ is subject to a high risk of generation of de novo mutations at the sites of DSBs. Thus, susceptibility to mutagenesis is a direct consequence of the NHEJ system joining DNA free ends. The biological importance of genomic instability and DNA repair mechanisms in cancer development are particularly well illustrated by several heritable genetic disorders known as chromosome breakage or chromosomal instability syndromes. These chromosome breakage syndromes are characterized by various defects in DNA repair, predisposition to various forms of malignancies and increased radiosensitivity. Therefore, the consequences of genome instability might be various types of ill health such as cancer, infertility and other diseases. Moreover, upon induction of genome instability following low dose IR, other cellular responses such as inherent radiosensitivity, radio-adaptation and bystander effects might be activated which might alter cellular response to radiation. Various molecular mechanisms of genomic instability and their relevance to carcinogenesis, infertility and genetic diseases will be discussed.

Keywords: Low dose ionizing radiation, Genome instability, Cancer, Genetic effects, infertility.

Quality Assurance in Medical Radiography Department

Ali Shabestani Monfared

Prof. of Medical Physics
Babol University of Medical Sciences

Quality assurance is the overall process which is supported by quality control activities. QA program will guarantee the whole dimensions of quality in a sophisticated process such as medical Imaging. Medical radiography needs to a comprehensive QA program to ensure medical imaging experts that final diagnosis has good accuracy and precision as well as acceptable radiation dose to patients, staff and society. This article tries to consider various aspects of quality assurance in medical radiography departments.

The Role of Magnetic Resonance Imaging in The Diagnosis of Multiple Sclerosis

Navid Sarmast Alizadeh

M.Sc. of Medical Imaging
MRI High-Tech Department, Pars Hospital, Thran, Iran
Imam Khomeini Hospital's Medical Imaging Center, Tehran University of Medical Sciences
<alizadeh4949@gmail.com>

Multiple Sclerosis (MS) is a chronic autoimmune disease where the immune system wrongly attacks the central nervous and is characterized pathologically by demyelination and clinically by visual, sensory, and motor problems. This immune-mediated disease is one of the most common causes of neurological disability in young adults worldwide and currently is increasing in prevalence and incidence globally.

Early and accurate diagnosis is of the utmost importance. Blood test, Spinal tap using lumbar puncture, Neurological exam and Magnetic Resonance imaging are the 4 common diagnostic tools for MS provident. MRI techniques are able to reveal a range of pathological substrates of MS lesions that include edema, inflammation, demyelination, and axonal loss. As well as being a diagnostic tool, serial MRI scanning can be useful as an objective measure to monitor lesion activity, lesion load, and response to treatment with disease modify.

The problem of identifying lesions in the periventricular region, which is a common site for MS lesions, can also be addressed by suppressing the signal from CSF yet maintaining heavy T2 weighting using a fluid attenuated inversion recovery (FLAIR) sequence. This sequence is also superior at detecting cortical/juxtacortical lesions.

A host of MRI techniques, which are able to monitor disease evolution, have been introduced for the assessment of MS. T1-W, T2-WI, PD-W, Fluid-attenuated inversion recovery (FLAIR), Magnetization Transfer Imaging (MTI), Susceptibility weighted imaging (SWI), Double inversion recovery (DIR), Diffusion-weighted imaging (DWI), Proton MR spectroscopy (MRS), Perfusion MRI, and ultra-high-field MRI are emerging as promising tools for improving our understanding of the pathophysiology of MS.

What's New in MRI technology

Latest development in MRI techniques and applications: Improving accuracy, speed and safety

Vahid Shahmaei

Clinical MRI Physicist
MRI Application Specialist

Review on workshop

Innovation in Magnetic Resonance Imaging (MRI) has been an area of increased focus in the medical industry over the past decade,

with new technologies and visualization advancements emerging at a rapid pace. Artificial Intelligence (AI) and advancement in imaging technologies have been crucial to developing more accurate results, thereby improving diagnosis and patient treatment options. Besides, recent advances in MR hardware including low Field scanners, flexible radiofrequency coils, helium-free magnets, and also accessories including wireless patient monitoring, revolutionized MRI performances and workflow. In addition, the techniques of MRI have experienced rapid development and found wide applications in recent years. The technical development is marked by the improvement and optimization of conventional MR imaging techniques and the emergence of new pulse sequences with a wide range of clinical applications such as CEST-MRI (Chemical Exchange Saturation Transfer MRI) in neuroimaging. As MR new pulse sequences have matured technically primarily for neuro applications, it has also proven to be increasingly valuable for body imaging such as free-breathing techniques for abdominal imaging and pulse sequences for volumetric liver fat detection. In this workshop, we present (1)the most recent advances in AI applications including AI-base reduction of the amount of contrast media needed for contrast-enhanced MRI and AI-powered reconstruction techniques for increasing image quality. (2) we discuss the Blue Sealed magnets for addressing helium scarcity, super flex coils for improved accessibility and performance in a wide range of anatomic postures, and also MR-compatible wireless patient monitoring to allow greater flexibility for MR technicians and performance that is competitive with bedside monitoring. (3) we review the latest pulse sequences including CEST MRI for molecular imaging, synthetic MRI for generating contrast-weighted images based on measurement of tissue properties in a single acquisition, Zero TE imaging for permitting visualization of short-T2 tissues such as cortical bone, fat-quantification techniques for quantifying of fatty accumulation in the liver and also free-breathing MRI for challenging patients who may be unable to hold their breath for an extended period of time or who have irregular respiratory rates. Finally, we present our reflections on possible future developments and current availability in clinical settings.

Quality Control in Magnetic Resonance Imaging

Iman Azinkhah

MSc of Medical Physics
Iran University of Medical Sciences

MRI equipment has unique capabilities, such as human soft tissue and anatomical imaging, optimal resolution, and physiological and even functional imaging. But these desirable features must be fully assured in terms of the accuracy of the results, so the quality control of MRI equipment can be considered as a suitable solution, which is the same in practice. The help of this lecture is to provide basic information about the quality control process of MRI equipment and the goals of each of these processes.

Learning objectives:

- Presentation of suitable quality control guidelines
- Presentation of quality control standard phantoms

- Presentation of various quality control tests, including
- Magnetic Field Homogeneity (MFH)
- Magnetic Field Drift (MFD)
- Signal to Noise Ratio (SNR)
- Slice Thickness
- Geometric Distortion
- High Contrast Spatial Resolution
- Low Contrast Object Detectability
- Percent Signal Ghosting Ratio (PSG)
- Percent Image Uniformity (PIU)

Radiology Applicationist and Technologist:

Seyed Ali Hosseini, BSC

Valve replacement by TAVI method

Involved in:

- Heart valve disease
- Causes of these disease
- CT angiography techniques for accurate measurement of aortic valve and vessels and its branches
- Measurement method and parameters and required areas for measurement

Morteza Jalilvand — Medical Rradiologist
Reza GhaseMzadeh — Bachelor of Radiology
Effat Sheidaeian — Bachelor of Radiology

MR DEFECOGRAPHY

Indecation of MRD

* obtain information about how well the pelvic muscles are working during a bowel movement.
* provide insight into rectal function.
* determine the cause of incontinence.
* determine the cause of constipation.
* diagnose and evaluate diseases affecting rectal functionand pelvic floor disorders (also called pelvic floor dysfunction), such as hernia, pelvic organ prolapse or rectal prolapse, a condition where part or all of the rectum wall slides out of place.
* provide information for surgical and treatment planning.

How does it work?

- warming gel
- inseri anal gel and vaginal gel(for female)
- Patient lies supine
- BENDING KNEES
- Both arms are up of head
- Using coil
- Multiple slices through the pelvic organe and floor

Sequences

- Locallaizer
- Ax,sag and cor T2
- Dynamic series: REST-SQUEEZE-STRAIN-DEFECT-POST DEFECT

Abnormalities to assess

- pelvic floor descent
- bladder base descent (cystocele)
- vaginal vault descent
- rectocele
- intussusception

Neurospine MRI Tips & Tricks

Ali Saeedi
MRI Application Specialist
Jaam-E-Jam Medical Imaging Center

There are several technical and physical points in regards with MRI diagnostic scanning of patients suffering from neurospine disease . it goes without saying that without taking these technical and physical points into consideration , the diagnostic procedure of the disease shall be distorted or even shall lead to fail the exposure of the disease or the defect in the worst case.

Besides the adequate knowledge of the physical parameters of the scanning sequence, the appropriate application of it shall also result in the ideal protocol optimization at the end. Therefore to have even a minute knowledge about pathologies alteration or application of individual protocol is deemed necessary and inevitable.

Hence through the following list the tips and tricks are designated to obtain the suitable answers to the similar related questions:

1- Are the scanning parameters different between elderly and youngers patients? In case of positive reply which parameters should go under alteration?
2- For better enhancement exposure resulted from contrast media injection, which parameter should be altered and what kind of parameter change shall result in contrary effect or which kind of sequences should be applied and which should be avoided?
3- What are the individual sequences for the different pathologies like arachnoid cyst, tumors, metastases, bleeding, viruses and bacterial infections, etc?
4- If and when the sequences are resulted in differential diagnosis in which scanning procedure they are deemed implemented?
5- How should be the chronology of the sequences procedure?
6- How to diagnose different kind of affective artifacts and finding a solution to tackle them?
7- Alterations of parameters optimization for making the different contrast of image .

The above mentioned questions are just part of technical points as a key to perfect scanning operation of the patient which indeed requires the knowledge of specific points for the related scanning without which the diagnostic procedure is distorted or in some cases shall be impossible.

Human Resource Management in Medical Imaging Departments (Employment & KPIs)

Mehdi Azargoon

Interviewing is an important step in the employee selection process. If done effectively, the interview enables the employer to determine if an applicant's skills, experience and personality meet the job's requirements. If you're a human resources professional, learning about the importance of recruiting and interviewing may help you support your

company more effectively. Understanding why interviews are essential and recognizing key components of a successful interview can help your company find the right candidates. Assisting your company in hiring effective employees can also reflect positively on you and may help you advance your career.

Moreover, Companies that use KPI tools effectively can foster employee and company growth. This is because it can identify improvement areas and help a company discover continuous improvement initiatives. Additionally, it can show employees' skills they can develop to help improve their work performance. KPIs should not be used in isolation to assess the individual value or contribution of your employees. Performance appraisals depend on a broad application of qualitative and quantitative feedback, which don't just focus on productivity. Your employees' worth cannot be reduced down to a number, and that is not the purpose of using KPIs.

These employee KPIs are purely intended as high-level markers to indicate overall employee productivity. They allow businesses to quickly identify potential problems, which are often the result of wider operational issues, resource availability and workflow bottlenecks.

Prostate mpMRI: Prepare for Success

Maryam Farsi, BSc.

One in every 7 men is diagnosed with prostate cancer, and approximately 27,500 deaths per year are attributed to this disease. Prostate cancer represents a broad spectrum of diseases ranging from the indolent to the highly aggressive but, in general, tends to be slower growing than most other solid cancers.

The methods based on serum prostate-specific antigen (PSA) followed by random biopsies tend to overdiagnose small indolent tumors, which begin appearing in men at a young age at autopsy and are found throughout the prostates in men ages 50 years and older.This combination of PSA screening and random biopsy has yielded disappointing clinical outcomes.

Prostate MRI has seen increasing interest in recent years. Multiparametric MRI (mpMRI) prostate allows accurate anatomical and functional imaging of the prostate gland and diagnosis of significant (intermediate and high risk) prostate cancer. mpMRI can also be utilised in active surveillance for patients with low- and intermediate-risk prostate cancer and guide targeted prostate biopsies.

The quality of the multiparametric sequences employed depends not only on the

hardware and software utilised and scanning parameters selected, but also on patient-related factors.

The radiology community is continuously working on new MRI techniques and sequences to improve PCa diagnosis.

The Role of Medical Imaging in Radiotheraputic Treatment Planing

Ramin Jaberi
PhD in medical Physics
Physics of Brachytherapy Fellowship

Behjat Haghighian
BSc Technology of Radiology
Radiotherapy department- Payambaran General Hospital- Tehran- IRAN

The radiation therapy simulator is a diagnostic x-ray machine Mounted on a rotating gantry, which provides geometric identical with those found on megavoltage therapy machines.

Formerly the use of conventional radiography for treatment Planing is predominant. The first appearance of simulator was at 1970s. The procedure in which we used simulator is called simulation in the most general sense, the term simulation defines the Procedure. We are trying to "simulate" the therapy setup before Treatment actually begins. The specific of this process depends heavily on the reasons for which it is under taken. The most common Reasons are firstly, for accuracy of radiotherapy, it can be increased because of the ability to image the location and extension of the disease and/or normal tissues relative to the treatment fields. Also the ability to more easily mark the patient externally. Secondly, the Simulation process often serves as a focal point for the planning of a Patient's and technical staff which all data pertaining to the particular patient. The last reasons that the simulator may increase the efficiency of the radiotherapy units because it allows questions of setup and planning to be resolved without actually using the Machines.

The use of ionizing radiation for cancer treatment has undergone extraordinary development during the past hundred years. The advancement of medical imaging has been critical in helping to achieve this change. The invention of computed tomography (CT) was pivotal in the development of treatment planning. Despite some disadvantages, CT remains the only three-dimensional imaging modality used for dose calculation. Newer image modalities, such as magnetic resonance (MR) imaging and positron emission tomography (PET), are also used secondarily in the treatment-planning process. MR, with its better tissue contrast and resolution than those of CT, improves tumor definition compared with CT planning alone. PET also provides metabolic information to supplement the CT and MR anatomical information. With emerging molecular imaging techniques, the ability to visualize and characterize tumors with regard to their metabolic profile, active pathways, and genetic markers, both across different tumors and within individual, heterogeneous tumors, will inform clinicians regarding the treatment options most likely to benefit a patient and to detect at the earliest time possible if and where a chosen therapy is working.

Liver MRI

Behrouz Rafiei

Protocols and Technique

MRI of the liver is routinely performed in imaging centers to diagnose benign and malignant liver diseases. The use of a contrast agent makes lesions better visible and better distinguished from normal tissue, and the use of appropriate timing is very important in obtaining different phases of dynamic liver MRI.

Two factors the cooperation of the patient and the skill of the technologist in using MR protocols are very important in obtaining the appropriate image of the liver according to the clinical conditions of the patient.

Patient's breathing movements are one of the important challenges of liver imaging, which can be solved and minimized with different methods.

The optimality of the imaging parameters in the pulse sequence used in MRI of the abdomen and liver is of special importance, which should be given more attention in the specific imaging methods of the liver, so that the use of TR, TE, FA and b value is appropriate in Along with many other details, it is very important for a liver MRI.

Various liver MRI methods such as dynamic, diffusion, MRCP, perfusion, etc., expression and pulse sequences and their effective parameters are investigated.

Phase Contrast Imaging

Professor Vahid Changizi Tehran University of Medical Sciences

Discovery of X-ray in 1895 by Roentgen established a new branch of medicine named as Radiology. Transmission and absorption of X-rays are main parameters to make image contrast in diagnostic radiology. Image contrast is introduced by x-ray absorption difference between two regions. However sometimes that difference is too small to get a reasonable contrast. That could lead a diagnostic failure.

Scientists has been studying a variety of methods to solve abovementioned problem like phase contrast imaging especially after 1965.

X-ray intraction with matter could make coherent x-ray scattering and reflected photons. Those radiations could have interferences in two types as follows:

1- Constructive interferences: Waves interfere in same phases causing constructive integration of amplitudes.
2- Destructive interferences: Waves interfere in different phases causing reduction of the resulted amplitudes, even in full opposition those will get zero.

Abovementioned amplitudes are modulated to densities that their differences make contrast. Phase contrast imaging improve the image contrast in comparison with ordinary radiology especially for soft tissues like breast, however it leaves high patient radiation dose as a big challenge.

Advanced Imaging Strategies in Brain Tumors

Hedayatollah Soroush, MSc

Diagnosis of tumours has improved considerably due to the introduction of new

imaging CT and MRI techniques. These techniques, and the contrast medium in particular, provide anatomical and structural information about brain tumours, and information about the physiology, metabolism, and haemodynamics of individual tumours. Advanced magnetic resonance techniques in neuroradiology evaluate changes at the microvascular, haemodynamic, and cellular levels of brain tumours, and in addition to structural changes, evaluate changes at the metabolic and biochemical levels DTI is an advanced magnetic resonance technique that allows visualization of white matter tracts, and describes the movement of water molecules by using two parameters, mean diffusivity (MD) and fractional anisotropy (FA), which represent the directionality of water diffusion.

With PWI it is possible to determine tumour grading non-invasively. In general, high-grade tumours have higher CBV values than low-grade tumours. PWI is also used for localization of the parts of a tumour with a high degree of vascularity for the purpose of stereotactic biopsy. PWI helps to define the edge of a tumour, which is important in planning surgical treatment radiotherapy. PWI is also used to monitor the effect of treatment on patients.

MRS is a non-invasive method and currently is part of the advanced diagnostic protocol in neuroradiology. MRS can determine pathological changes in brain tissue long before conventional techniques.

Presently, in tumour imaging, fMRI is used predominantly for the preoperative localization of eloquent cortical regions that may have been displaced, distorted or compressed by the tumour.

Neuronavigation is a common method of preoperative localization of brain tumours. It uses imaging materials of preoperative MRI examinations, 3D sequences and DTI and fMRI data, that are transferred to a computer database of a neuronavigation device.

DSA is used to detect the blood vessels supplying the brain tumours, and also to control the hypervascular tumour embolization.

The Role of Fat Suppression and Cardiac Phase Acquisition on T2 Relaxation Time, Using GraSE Sequence in Cardiac Magnetic Resonance Imaging

Sadegh Dehghani
Radiation Sciences Department
School of Allied Medical Sciences, Tehran University of Medical Sciences, Tehran, Iran
Tehran Heart Center, Tehran University of Medical Sciences, Tehran, Iran

Ebtihal Raheem Hammood
Radiation Sciences Department
School of Allied Medical Sciences, Tehran University of Medical Sciences, Tehran, Iran

Shapoor Shirani
Tehran Heart Center
Tehran University of Medical Sciences, Tehran, Iran

Sahar Asl Fallah
Tehran Heart Center
Tehran University of Medical Sciences, Tehran, Iran

Najmeh-Sadat Mousavi
Tehran Heart Center
Tehran University of Medical Sciences, Tehran, Iran

Purpose:

The aim of this study was to evaluate the regional (i.e. myocardial segments) variability as well as the overall image quality of cardiac T2 maps in systolic and diastolic phase, using gradient- and spin-echo (GRASE) sequence. Furthermore, fat suppression (FS) technique was activated in this sequence and T2 values were measured.

Methods:

T2 maps were acquired using GRASE technique at 1.5 T (Philips Ingenia) in 6 wolunteer and 10 patients with cardiac disease. Diastolic and systolic T2-mapping were done with and without FS. The image quality and motion artefact were measured in four sequences.

Results:

In both healthy volunteers and patients, systolic readout increased the thickness of myocardium, compared to the diastolic readout. The effect of time delay (TD) was not significant on T2 values in both groups ($p > 0.05$), with slightly less T2 values in systole compared to diastole (< 5 ms). The FS technique significantly increased T2 values in both systolic and diastolic phases in both groups ($p = 0.000$) and no significant differences was shown between them ($p > 0.05$). All T2 maps were of moderate quality due to being a spin echo based sequence, but systolic TD were associated with higher variability in segmental T2 values. In tachyarrhythmia patients, systolic acquisitions produced consistently excellent T2 maps (median R (2) = 0.993).

Conclusions:

GRASE technique showed more T2 variability and less T2 values, compared to diastolic readout. Slightly shorter T2 values with more variablity in systole are mostly explained by blood motion artefact due to changing double inversion recovery (DIR) as a black blood technique to TE preparation with spoiler gradient to be able to perform this technique in systolic phase. In patients

with tachyarrhythmia, systolic T2-mapping is feasible, circumvents mistriggering and produces good quality T2 maps. This extends its clinical applicability to challenging rhythms (such as rapid atrial fibrillation) and aids the investigation of thinner myocardial segments. With further validation, systolic T2-mapping may become a new and convenient standard for myocardial T2-mapping.

Keywords: T2 mapping, GRASE technique, cardiac magnetic resonance imaging, systolic phase, diastolic phase.

Sajad Samat
Iman Azinkhah
Dr. Samira Raminfard

DTI stands for Diffusion Tensor Imaging, which is a medical imaging technique that allows visualization of the microstructural fiber architecture of the brain. DTI does not use X-ray imaging data, but rather utilizes magnetic resonance imaging (MRI). In this method, the movement of water particles in brain tissue is examined. When water particles encounter nerve fibers, their movement changes and as a result, the path and direction of these nerve fibers in the brain can be determined.

DTI is used to diagnose certain brain disorders such as cerebral atrophy, brain lesions, stroke, and more. Additionally, this technique is used as a research tool to study the microstructural architecture of the brain and the connections between different regions of the brain.

In DTI, a series of images is obtained using magnetic gradients. The structure of nerve fibers in the brain is a complex network of three-dimensional strands that are wrapped around nerve nuclei. Nerve fibers are oriented in different directions at each point in the brain, and each direction is represented by a three-dimensional vector in matrix form, known as the “diffusion tensor”.

In DTI, the structure of nerve fibers in the brain can be obtained using diffusion tensors. By analyzing these tensors, the direction and shape of nerve fibers can be determined for each point in the brain. This information can be useful in diagnosing and investigating certain brain disorders such as traumatic brain injuries, seizures, schizophrenia, and anxiety disorders.

Furthermore, DTI can be used to investigate the connections between different regions of the brain. For example, using DTI, pathways through which nerve information is transmitted in the brain can be tracked. This information can be useful in understanding brain function and related disorders such as depression, behavioral and attention disorders, and memory disorders.

In general, DTI is an advanced medical imaging technique that allows for the examination of the microstructural architecture of the brain and helps in the diagnosis and understanding of certain brain disorders.

Of course, the bands of the brain are located in nerve cells and establish connections between different regions of the brain. Below are some of the brain bands and their functions:

1. Corpus Callosum: This band is the largest brain band and connects the two cerebral

hemispheres. Its function is to connect and exchange information between the two cerebral hemispheres.
2. Internal Capsule: This band establishes connections between the brain and motor nerves and helps stimulate body muscles.
3. External Capsule: This band establishes connections between the brain and the retina of the eye, as well as between the brain and the inner ear.
4. Inferior Longitudinal Fasciculus: This band establishes connections between different regions of the retina and between the retina and the cerebral hemisphere.
5. Superior Longitudinal Fasciculus: This band establishes connections between different regions of the cerebral hemisphere and is involved in various brain functions such as working memory, cognition, and language.
6. Cingulum: This band establishes connections between the cerebral hemisphere and the hippocampus and is involved in various brain functions such as cognition, spatial memory, and emotion.

Additionally, there are other bands in the brain that are associated with their own specific functions and connections.

DTI (Diffusion Tensor Imaging) analysis is a medical imaging technique that uses the motion characteristics of water in brain tissue to examine neural bands and their connections. The principle of this method is based on the concept of water diffusion, which is used to study the dispersion of water in brain tissue.

In DTI analysis, brain images are first obtained using the DTI method. Then, using brain imaging analysis software, a diffusion tensor matrix is obtained. This matrix contains information about the direction and strength of connections between different regions of the brain.

After obtaining the diffusion tensor matrix, complex algorithms can be used to calculate information about the neural band network and its connections. One of the most common methods for DTI analysis is fiber tractography, which uses the directional map of nerve fibers to examine the dispersion of fibers and the start and end of neural bands.

DTI analysis, as a medical imaging technique, is used in the diagnosis of brain diseases and communication disorders such as schizophrenia, brain injury, Alzheimer's, Parkinson's, etc.

Dual-and Multi-Energy CT: Principles, Technical Approaches, And Clinical Applications

Mohammad Akbarnezhad
MSc of Radiobiolog & Radiation Protection
Shahid Rajaie Cardiovascular, Medical And Research Center

Farnoush Mousavi
MSc of Medical Imaging
Shahid Rajaie Cardiovascular, Medical And Research Center

Dual energy CT,also known as spectral CT, is a computed tomography technique that uses two separate x-ray photon energy spectra, allowing the interrogation of materials that have different attenuation properties at different energies.One source-based approach for dual-energy imaging is through implementation of a dual-source system, in which two independent

source-detector pairs are mounted to the same gantry at about a 90° offset. While one X-ray tube operates at a low tube potential, the other tube operates at a high tube potential (e.g., 70 kV vs. 120 kV). This scanner design has several notable advantages for dual-energy imaging.In general, unenhanced images can be avoided by using DECT for body and neurological applications; iodine can be removed from the image, and a virtual, non-contrast (water) image can be obtained. Neuroradiological applications allow for the removal of bone and calcium from the carotid and brain CT angiography. Thorax applications include perfusion imaging in patients with pulmonary thromboemboli and other chest diseases, xenon ventilation-perfusion imaging and solitary nodule characterization. Cardiac applications include dual-energy cardiac perfusion, viability and cardiac iron detection. Abdominal applications include the detection and characterization of liver and pancreas masses, the diagnosis of steatosis and iron overload, DECT colonoscopy and CT cholangiography. Urinary system applications are urinary calculi characterization (uric acid vs. non-uric acid), renal cyst characterization and mass characterization. Musculoskeletal applications permit the differentiation of gout from pseudogout and a reduction of metal artifacts. Recent introduction of iterative reconstruction techniques can increase the use of DECT techniques DECT is a promising technique with potential clinical applications.

Advanced Reconstruction Applications in Computed Tomography

Mohammad Akbarnezhad
Behnam Ranjbar
Nasim Mirzaei Rashed

In COMAPUTED TOMOGRAPHY, each pixel is assigned in the reconstituted image.

This CT number also depends on the linear attenuation coefficient of the tissues in each section.

In image reconstruction, the information collected by the detectors should be displayed as 2-D images.

The process of using RAW DATA and creating an image is called IMAGE RECONSTRUCTION.

IN CT we have 3 main reconstruction Methods:

1. Back-Projection
2. Iterative Methods
3. Analytical Methods

Nowadays, by using new Methods of image reconstruction it is even possible to reduce the Dose of the patient without reducing the quality of the image.

Recently, new algorithms for reducing noise with factors for less radiation used and in this case the quality of the image or spatial resolution and low contrast detection are maintained, and artifacts caused by metals or beam hardening and photon deficiency are reduced.

Deep Learning Techniques and Time Reduction

Mohsen Shojae Moghadam Msc. Medical physics

Machine learning is a technique for recognizing patterns that can be applied to medical images. Machine learning has been used in medical imaging and will have a greater influence in the future. Those working in medical imaging must be aware of how machine learning works. Here we introduce the new strategies that reduce time scan with remaining good sufficient and reproducible quality in imaging the body and head region .deep resolve and deep gain with deep learning reconstruction is a very active field for researchers, demonstrating great potential for the future of MR image reconstruction, including denoising, artifact reduction, and possibly even the reconstruction of multiple contrasts from one single acquisition. These technologies enable us to reduce acquisition times and improve image quality simultaneously Compressed sensing (CS) is a mathematical framework that reconstructs missing data from highly undersampled measurements. CS has been applied to MRI to achieve higher acceleration factors by incoherent k-space undersampling.we discuss this workflow and see who the time will be reduced in MRI examinations.

MR Angiography Principles and Techniques

Hassan Fatehi Msc of MRI
Farnoosh Mousavi Msc of MRI

Magnetic resonance angiography–also called MRA is a type of MRI developed for studying the arterial and venous systems. The benefits of an MRA in comparison to traditional angiography is that it is noninvasive, it lacks ionizing radiation exposure, it has the potential for a non-contrast examination and it has the ability of high-resolution volumetric images.

MRA used to evaluate an aneurysm or weakness in the wall of an artery ,a narrowing of the aorta, or aortic coarctation ,bleeding in and along the wall of the aorta ,or aortic dissection ,to find the cause of a stroke ,signs of heart disease ,narrowing or blockage of the vessels in the arms or legs ,renal artery stenosis, a narrowing of the blood vessels in the kidneys that can lead to high blood pressure and even renal failure.

MRA is a term that groups various imaging techniques based on different physical principles and is employed for diverse diagnostic purposes .MRA methods can be divided into two broad categories depending on whether they produce dark blood or bright blood. Bright blood techniques are further subdivided according to whether they are performed with or without gadolinium contrast.

Contrast-enhanced MR angiography (MRA) is a technique involving 3D spoiled gradient-echo (GE) sequences, with administration of gadolinium-based contrast agents . It can be used to assess vascular structures of almost

any part of the body. Its key features are: 1.T1 weighted spoiled gradient-echo sequence 2.Central k-space acquisition corresponding to arterial phase of the study maximizes preferential visualization of arteries3.use of gadolinium contrast to shorten T1 interval of the blood which appears bright as a result.

Non Contrast Enhanced MR Angiography is performed in several ways including: 1. time of flight angiography (TOF) 2. phase contrast angiography (PCA) 3.Three-dimensional(3D) electrocardiograph-triggered half-Fourier fast spin echo. Generally, these techniques are time-consuming as compared with contrast enhanced MR angiography.

Radioprotectors: Biological & Clinical Perspectives- Review on the Properties of Melatonin

Fatemeh Pakniyat

Assistant Professor of Medical Physics
Masih Daneshvari Hospital
Shahid Beheshti University of Medical Sciences,
Tehran, Iran.

Background

Ionizing radiation (IR) is regarded as one of the most commonly used methods for diagnostic and treating diseases including cancers; which may lead to various complications despite its many medical uses. Radiation therapy, as one of the most effective modality, plays an important role in treatment and prevention of cancer recurrence or metastasis. Due to different radiosensitivity of healthy tissues around the tumor, variable responses to IR could be obtained; which may terminate in several detrimental effects. Therefore, the acute and late toxicity of radiation therapy in healthy tissues can be expressed as a major limitation for radiation dose delivery to tumors.

Protection against the biological effects of IR could be implemented by both physical and chemical approaches. The basis of physical protection is illustrated as the use of appropriate radiation field and lead protectors or shields, radiation dose proportional to the target, reduction in duration of irradiation, and increase in the distance from the radiation source. Chemical protection is elucidated as reducing the detrimental effects of IR by natural and synthetic compounds of chemical or plant origin; which can be used orally, injectably or topically. Presence of these compounds at the moment of irradiation and free radical's production, can reduce or prevent the adverse effects of IR by distinct mechanisms. In addition to protecting patients in medical applications, radioprotectors are utilized to protect workers during occupational exposure and public members via accidental exposure. Peculiarities of an ideal radioprotector could be categorized as; 1) selective differentiation of healthy cells from tumoral 2) protecting healthy tissues, while not protecting tumoral ones, 3) optimal stability, 4) administration suitable method (preferably oral), 5) lack of drug interactions, 6) easily penetration into the cells, 7) minimum degree of toxicity and 8) accessibility and reasonable price. However, despite huge bulk of studies, non-toxic and effective radioprotector for human use has not yet been officially ascertained.

One of the known radioprotector agents is melatonin, which is a fat-soluble compound derived from the amino acid tryptophan. Melatonin (N-acetyl-5-methoxytryptamine) by molecular formula C13H16N2O2, is a hormone that is secreted at night in the absence of light by the pineal gland behind the third ventricle of the brain of all mammals, including humans. Accumulating evidence demonstrated that melatonin is a strong antioxidant, indicating its properties both in a direct (scavenging free radicals) and indirect strategies (stimulating the activation of antioxidant enzymes). The investigations exhibited by researchers reported that melatonin could alleviate the deleterious complications caused by IR in different tissues of animals such as lung, colon, eye, spleen and spinal cord. Moreover, enough published papers have manifested the radio sensitivity effect of melatonin on cancer cells through increasing cell apoptosis.

Results & Conclusion

Melatonin with several features including stimulation the activity of antioxidant enzymes (e.g. glutathione) and free radicals scavengering, inhibition of the activity of pro-oxidant enzymes, increasing the expression of anti-apoptotic genes and decreasing the expression of pro-apoptotic genes in healthy tissue, easily penetration, accumulation with the highest concentration in different parts of the cell, low toxicity, no proof of adverse effects, suitable administration method (oral), availability and cheap price could be considered as a promising radioprotector. Noteworthy to mention that the presence of two properties of radioprotection and radiosensitization simultaneously can confirm the role of melatonin as a strong unique compound. More confirming research and clinical trials could clarify the ambiguity and uncertainty of clinical use of this compound.

Radiation Dose Management in CT Scan According to Different Diagnostic Applications

Seyyed Mohammad Bagher Hosseini Nasab

With the advance of technology and the emergence of multi-slice CT scans (MDCT), the use of CT scans in medical diagnosis has increased significantly. On the other hand, the installation of CT scanners has also increased. Therefore, considering that the highest radiation dose received by the public from medical sources is related to CT scan and also stochastic effects caused by radiation such as cancer, it is important to pay attention to dose management in CT and optimization of protocols.

CTDI & DLP are the two main indexes of dose expression in CT scan, and scan parameters such as kVp, tube current (mAs), Pitch factor, scan length, and the use of automatic exposure control (AEC) affect the dose by influencing these two indicators. And finally, with the use of these indices and coefficients related to tissue radiation sensitivity, the effective dose from CT examination can be calculated and compared with other imaging modalities.

The image quality indicators that should be included in a proper imaging are parameters such as Noise, signal-to-noise ratio (SNR), and contrast-to-noise ratio (CNR). In CT scan protocols, scan parameters must be carefully selected so that these indicators are at an optimal level. The optimal limit of these indicators will be different according to the

diagnostic application of CT scan.

Of course, according to the optimization and justification principles, a compromise should always be made between the image quality and the radiation dose, so that both diagnostic quality and radiation protection are considered.

Clinical Solutions for Technical and Physical Challenges of CT Pulmonary Angiography (Based on 16 Slice Scanners)

Khosro Adelian
Ahmad Mohammadbeigi

Introduction:

Pulmonary embolism occurs when a blood clot gets stuck in an artery in the lung, blocking blood flow to part of the lung. Because of its associated risks and because CT pulmonary angiography offers similar or better information, direct pulmonary angiography is now rarely performed, except in the patient who may undergo pulmonary embolectomy. CT pulmonary angiography (CTPA) is known as the gold standard for the diagnosis of pulmonary embolism. Although development of multi-slice scanners with higher speed, lower radiation dose, bolus tracking, and test bolus has increased the quality of images and resolves the many of previous challenges; However, radiology technologists have many challenges for performing this procedure in practice. This challenges refer to patient physiopathology conditions (e.g heart output, kidney disease, breath holding problems and etc.), contrast medium (low/high Iodine concentration, dye temperature), scanner's speed an equipment with angiographic applications (Blus tracking or test bolus), type of injector (dual or single head), using low-dose protocols, and type of catheter (central or peripheral venous) will be discussed. Firstly, the fundamental principles of CTPA from the patient educations to the multi-planar reconstructions were discussed in summary. Finally, the clinical solutions were provided to decreasing the dye volume at the lowest, obtaining the best delay time, optimizing the protocol parameters, with considering the patients' safety based on the recent studies.

Results and Discussions:

Although, the patient weight is recommended for determining the contrast medium (CM) volume for CTPA, however vessels diameter and patient height must be included for calculating the contrast medium volume. Also, using dual head injector and test bolus (instead of bolus tracking) can decrease the total contrast volume to 35 mL. Temperature can increase the contrast medium viscosity and have inverse effect on the choosing the injection rate in patient with unstable veins. Using a test bolus to determine CM arrival time at two locations (i.e., ascending aorta and pulmonary trunk) can be performed to better determine the arrival time of the diagnostic CM in the target vessel of choice, especially in patient with heart failure. Using the bolus

tracking instead of test bolus can be more useful in some patient with urgency condition or for double rule-out study (CTA for Pulmonary Embolus and thoracic aorta). Craniocaudal CT pulmonary angiography is suggested in recent 16-slice scanners with short scan time equal to the patient breath holding (5-10 s). Craniocaudal had a similar degree of respiratory motion artifact to caudocranial scanning, in contrast, cause to better peak contrast enhancement in the distal pulmonary branches. Inserting the region of interest (ROI) in the nearest place to the beginning of scan is necessary, especially in scanners with high diagnostic delay time. In this way, there is not necessary to starting the scan from top of lung. Thus inserting the ROI in 1-2 cm upper than aortic arch helps to decrease the diagnostic delay and decreasing the patient radiation dose. Although, using lowest rotation time is necessary for tracking the bolus to increasing the accuracy of determining the peak contrast enhancement; however, decreasing the scan speed is more helpful in patient with insufficient heart output (high time of peak enhancement) and with tall lung. In this cases, the contrast medium has enough time to arrival to the distal pulmonary branches. The tube voltage decreasing instead of tube current should be considered in low-dose protocols. Recent studies are shown that using the lower tube voltage (80-100 kVp) can allow the lower contrast medium usage with same diagnostic value for patient with medium size. Maximum intensity reconstruction (MIP) can't be useful when the pulmonary veins are enhanced because of inappropriate timing.

Pitfalls in Breast MRI

Mostafa Robatjazi

Ph.D. in Medical Physics
Department of Medical Physics and Radiological Sciences
Sabzevar University of Medical Sciences, Sabzevar, Iran
<Email: Robatjazim@medsab.ac.ir >

MR mammography, also known as breast MRI, is a non-invasive imaging technique used to examine breast tissue. MR mammography is typically used in conjunction with other imaging techniques such as mammography and ultrasound and is often recommended for women who are at high risk for breast cancer or who have dense breast tissue that may be difficult to image using other methods. MR mammography is a valuable tool in the early detection and diagnosis of breast cancer and can be an important part of a woman's breast health screening routine.

To obtain the most accurate results, MR Mammography usually involves the use of a gadolinium-based contrast agent, which is administered intravenously during the exam. There have been studies that have shown that breast MRI without the contrast agent has no diagnostic value. Kinetic analysis of the Dynamic Contrast-Enhanced (DCE) MRI reflects perfusion of the lesion, which can help in the differentiation of the lesions. Diffusion-weighted imaging (DWI) has emerged as both a complementary and potentially alternative technique to evaluate the breast. The combination of DCE and DWI increased specificity along with sensitivity and maximized diagnostic accuracy. The combination of DCE and DWI increased

the specificity and sensitivity of the breast MRI. Although currently, DWI is not part of the BI-RADS lexicon, the inclusion of DWI is encouraged by different communities. In this presentation, we will discuss some technical pitfalls of the DCE and DWI in breast MRI.

Contrast Media Reactions: The Role of Radiation Technologist

Shaykh Sharafi. K — Parseh Medical Imaging Center MRI Department, Tehran, Iran
Erfanijo. S — Masih Daneshvari Hospital Radiology Department
Ghasemzadeh. R — Erfan Nyayesh Hospital Radiology Department
Bakhshandehpour. G — Parseh Medical Imaging Center MRI Department, Tehran.Iran

Learning Objectives:

Upon completion of this presentation, participants will be able to:

1) Recognize common sign and symptoms of Contrast media reactions.
2) Familiarize with first steps of physical and medical management of patients

Presentation Summary:

Contrast agents are substances that are used to enhance the visibility of certain lesions or tissue during medical imaging procedures such as X-rays, CT scans, MRI scans, and ultrasound. They work by altering the way that electromagnetic radiation or sound waves interact with the body's tissues, making it easier for Radiologists and clinicians to see and diagnose abnormalities.

While contrast agents are generally safe and well-tolerated by most patients, there is a risk of adverse reactions in some cases. These reactions can range from mild to severe and may include symptoms such as nausea, vomiting, itching, hives, difficulty breathing, and even anaphylaxis (a life-threatening allergic reaction).

To minimize the risk of adverse reactions to contrast agents, it is important for medical imaging technologists to carefully screen patients for any allergies or other medical conditions that may increase their risk. Patients should also be informed about the potential risks and benefits of contrast agents before undergoing any imaging procedures.

If a patient does experience an adverse reaction to a contrast agent, prompt treatment is essential. This may involve administering medications such as antihistamines or steroids to alleviate symptoms or pacing patient in special positioning or providing emergency care in cases of severe reactions.

In conclusion, while contrast agents are an important tool in modern medical imaging, it is crucial for radiation technologists to be aware of the potential risks and take appropriate measures to ensure patient safety. By staying informed about the latest research and guidelines on contrast agent use and management of adverse reactions, which we will expalin them in this presentation.

Keywords: Contrast Media, Adverse effects, Computed Tomography (CT-Scan), Radiology, Magnetic Resonance Imaging (MRI)

SCIENTIFIIC ORAL ACCEPTED ABSTRACTS (20TH IRSA)

Map of Brain Networks Extracting from Resting-State fMRI in Alzheimer's Disease, Amnestic Mild Cognitive Impairment, and Normal Aging Subjects

Fatemeh Mohammadian
Department of Medical Physics and BioMedical Engineering, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran
<masimoh7421@gmail.com>

Maryam Noroozian
Department of Psychiatry Roozbeh Hospital, Tehran University of Medical Sciences, Tehran, Iran
<maryam.noroozian.mn@gmail.com>

Arash Zare Sadeghi
Medical Physics Department Iran University of Medical Sciences, Tehran, Iran
<akcarash@gmail.com>

Hassan Hashemi
Tehran University of Medical Sciences
<hashemi_mic@yahoo.com>

Hanieh Mobarak Salari
Quantitative Medical Imaging Spectroscopy Group, Tehran University of Medical Science, Tehran, Iran
<H.M.salari73@gmail.com>

Forough Sodaei
Tehran University of Medical Sciences
<foroughsodaei@gmail.com>

Hamid reza Salighehrad
Quantitative MR Imaging and Spectroscopy Group Research Center for Molecular and Cellular Imaging, Tehran University of Medical Sciences
<hamid.saligheh@gmail.com>

Purpose:

Evaluation of the resting-state brain networks map in Alzheimer's disease, amnestic mild cognitive impairment, and normal aging subjects.

Methods:

The resting-state functional Magnetic Resonance Imaging data of 13 patients with Alzheimer's disease, 16 patients with amnestic mild cognitive impairment, and 14 normal aging subjects were evaluated using functional connectivity analysis. Preprocessing steps were realignment, slice timing correction, segmentation, co-registration, normalization, and functional smoothing. In the second-level measurement, ROI-ROI/seed-based analysis using bivariate correlation coefficient and Fisher z-transformation was performed.

Results:

Using parametric statistics (cluster threshold: $p < 0.05$ p-False Discovery Rate corrected; voxel threshold: $p < 0.001$ p-uncorrected) group

differences were found between Alzheimer's disease and normal aging and also between Alzheimer's disease and amnestic mild cognitive impairment. Using parametric multivariate statistics (cluster threshold: $p < 0.05$ p-False Discovery Rate corrected; connection threshold: $p < 0.05$ p-uncorrected), differences were found in the map of the three groups. No significant difference was found between the two groups of normal and amnestic mild cognitive impairment.

Conclusions:

The map of statistical correlation in the resting-state brain network (matrix display) of the three groups was different (The number of positive and negative correlations and the strength of connections between the nodes of the resting-state networks differed). Also, seed-based functional connectivity analysis and the resulting spatial map showed differences between Alzheimer's disease - amnestic mild cognitive impairment and Alzheimer's disease - normal aging groups.

Differentiation between Progression from Pseudoprogression in Glioblastoma Using Diffusion Weighted Imaging Techniques

Yasaman Bastanipour — Tehran University of Medical Sciences <Yasaman.bastanipour@yahoo.com>
Samira Raminfard — Tehran University of Medical Sciences <rf_samira@yahoo.com>
Mohammadali Oghabian — Tehran University of Medical Sciences <oghabian@sina.tums.ac.ir>

Purposes:

the purpose of this study is to investigate the diagnostic value of different diffusion parameters, especially the MK parameter, and compare it with the results of MRS and pathology as a standard for distinguishing true recurrence of glioblastoma from pseudoprogression.

Methods:

19 glioblastoma patients who had a new lesion with absorption of contrast material after surgery and radiotherapy were subjected to conventional MRI, DKI and multivoxel MRS imaging. Based on pathology findings and radiologist's opinion, 13 patients had true recurrence and 6 patients had pseudoprogression of glioblastoma. FA, MD and MK parameters based on the areas with absorption of contrast material in T1 images after injection, once in voxels with a volume of approximately 2.34 cm3 and corresponding to the MRS voxel and again in a smaller voxel with a volume of 0.004 cm3 was calculated. The mean differences of diffusion parameters between true recurrence and pseudoprogression of glioblastoma were compared using the Mann-Whitney test. The receiver operating characteristic curve was used to evaluate the differential detection efficiency of each parameter.

Findings and conclusions:

MK parameter between these two groups was significant with p-value=0.01. ROC analysis showed that MK parameter with AUC=0.93 with

sensitivity of 69% and specificity of 100%, also FA with AUC=0.67 and sensitivity of 67% and specificity of 69.2% and MD with AUC=0.64 with sensitivity of 83.3% and specificity of 53.8% It is able to distinguish between the true recurrence of glioblastoma and its false recurrence.

The result of MK parameter in 78% of patients was consistent with MRS and pathology results. This value for MD and FA parameters was 63 and 53%, respectively.

MK parameter has more sensitivity, specificity, accuracy, NPV and PPV than other studied diffusion parameters in differentiating true recurrence from pseudoprogression of glioblastoma.

Pathologic-based Radiation Dose: Effect of Lung Lesions and Total Severity Score on Radiation Dose in Computed Tomography Scan of COVID-19 Patients

Ahmad Mohammadbeigi
MSc of Medical Physics
Department of Medical Physics, School of Medicine, Kermanshah University of Medical Sciences, Kermanshah, Iran
<frdmbg@gmail.com>

Hojat Ebrahiminik
Dr
<dr_ebrahiminik@yahoo.com>

Ahmad Azizi
Omid Hospital, Tehran, Iran
<ahmadazizi1372@gmail.com>

Jalal Kargar Shuraki
AJA University of Medical Sciences
<drjalal2012@yahoo.com>

Purpose:

Water equivalent diameter (WED) is related to the computed tomography (CT) number. Lung lesions change the tissue attenuation properties in the COVID-19 patients. Thus, these lesions can change the CT number and affect the WED, conversion factors (CFs), and size-specific dose estimation (SSDE). We evaluated the effect of lung infection on the radiation dose in the CT scans of COVID-19 patients.

Methods:

One hundred eighty-six chest CT scans of adult COVID-19 patients were obtained from PACS under a retrospective study. All patients were categorised into five categories based on total severity score (TSS). The effective diameter (Deff), WED (Dw), conversion factor, CTDIv, and SSDE are calculated for all slices based on AAPM TG-220. One-way ANOVA test following Tukey's post hoc test is used to compare the mean of Deff, CFeff, Dw, CFw, (SSDEw) and computed tomography dose index (CTDIv) among all pairwise TSS groups. The correlation among mentioned parameters with TSS is determined by the Spearman's correlation coefficient.

Results:

Although there was no difference for Deff and CF among all TSS groups but the Dw, CFs, and PDIF were significantly higher for COVID-19 patients than healthy cases. Furthermore, our study showed that TSS is correlated with Dw

(r = 0.29, P-value = 0.001), and CFs (r = - 0.29, P-value = 0.001). (SSDE_w) was significantly different among all pairwise groups when fixed tube current (FTC) was used. We found A significant difference for (SSDEw) (On-ATCM) between healthy-moderate (P-value = 0.006) and healthy-mild (P-value = 0.04) TSS groups.

Conclusion:

Lung lesions change the Dw and CFw, which can affect the patient's radiation dose in COVID-19 paients. Increasing TSS causes a decrease in CFw and (SSDEw) when low-dose protocol with FTC was performed. Moreover, in some TSS groups, the lung lesions can affect the (SSDEw) when ATCM is used. It seems some pathologies can affect the cancer risk from CT scan exposure.

Applications of Virtual Reality in Radiology

Paria Mohebbi
Tabriz University of Medical Science
<Pmohebbi1380@gmail.com>

Nahideh Gharehaghaji
Radiology Department
ParaMedical Faculty, Tabriz University of Medical Sciences
<gharehaghaji@gmail.com

Purpose:

Currently, different imaging methods are used for diseases diagnosing which have their own advantages and disadvantages. Virtual reality (VR) is an innovative technology that uses a computer to create an artificial 3D environment in which the user can receive visual and tactile stimuli using special sensors and interact with them. VR with its unique feature has been used for different radiological procedures such as virtual angiography, cystoscopy and colonoscopy. The aim of this study was to investigate the current trends of VR in radiology.

Methods:

The articles were obtained through searching "virtual reality", "radiology", "virtual angiography", "virtual cystoscopy" and "virtual colonoscopy" from the databases of Google Scholar, PubMed, and ScienceDirect. Then, the results were summarized.

Results:

Applications of virtual reality in radiology are as following:

1. Overcoming the limitation of 2D images and appropriately viewing a 3D image from different angles
2. Performing complex medical procedures and deeper understanding of the complex structure such as tumors and vessels
3. Improving physician knowledge to early detection and treatment of diseases
4. Improving interventional radiology procedures lead to patient comfort from less painful process
5. Increasing the accuracy and efficiency of interventional radiology procedures and reducing errors lead to overall cost reduction

Conclusion:

VR is a promising technology for improving radiological procedures that can be widely used in future.

Keywords: Virtual reality, Radiology, Virtual angiography, Virtual cystoscopy, Virtual colonoscopy

PET-MRI Hybrid Imaging in the Diagnosis of Glioma

Nahideh Gharehaghaji
Radiology Department
ParaMedical Faculty, Tabriz University of Medical Sciences
<gharehaghaji@gmail.com>

Sahba Mofazal
Tabriz University of Medical Sciences
<sahba.mzl77@gmail.com>

Purpose:

Glioma is the most common malignant type of brain tumor. Magnetic resonance imaging (MRI) is used as one of the first techniques for imaging and diagnosing of glioma. Despite inherent soft tissue contrast of MRI, it has limitations such as the inability to grade the tumor, determine tumor changes after treatment, and show tumor recurrence. On the other hand, positron emission tomography (PET) can provide useful biochemical and molecular information. By combining these two imaging modalities, we can use both methods advantages. This study aims to review PET-MRI hybrid imaging in the diagnosis of glioma.

Methods:

We searched various keywords such as PET-MRI, hybrid imaging, glioma, and brain tumors in search engines such as Web of Science, PubMed, and Google Scholar. The data from the extracted articles related to the topic were reviewed.

Results:

PET-MRI provides the excellent soft tissue contrast of MRI and the information on the metabolism and activity of tumors from PET imaging. Hybrid imaging by combining PET and MRI has a better function in diagnosing glioma and determining the spread of the tumor than contrast-enhanced MRI. PET-MRI shows a higher accuracy in the diagnosis of glioma than the single imaging modalities. PET-MRI reduces the need for invasive methods for the tumor diagnosis and provides supplementary information to differentiate between high-grade and low-grade glioma.

Conclusion:

PET-MRI is a promising technique in diagnosing glioma and reducing the invasive methods, which gives us the benefits of both imaging modalities.

Keywords: PET-MRI, Hybrid imaging, Glioma, Brain tumors

Investigating and Implementing Tractography Clustering on Diffusion-Weighted MR Images of the Brain by Using QuickBundles Method with Different Features

Iman Azinkhah
Milad Hospital
< imanazinkhah@gmail.com>

Purpose:

One of the common algorithms nowadays for the segmentation of Diffusion Tensor images is the clustering method, one of the techniques of which is the QuickBundles method. Its biggest capabilities are the analysis of images using different features and metrics so that many of these features and metrics can be introduced and distributed as desired. Of course, their implementation will require the use of open-source programming languages. In this study, some of the most important features of the QuickBundles method have been implemented and compared with each other using Python.

Materials and Methods:

Necessary information for Tractography was collected from 10 completely healthy patients according to the standard conditions for all patients. After data preprocessing, Python libraries were used to perform Tractography analysis. Four features namely center of mass, middle point, arc length, and end points between the directions vectors were analyzed by the QuickBundles method on all patients. Then, anatomically and clinically, all calculated streamlines were compared with each other.

Results:

The streamlines obtained in terms of computing time are variable according to the number of streamlines so that the implementation of the center of mass feature has the least computing time. In all four features, the route map in color has been appropriate in terms of anatomical comparison, and the radiologist has reported it as acceptable.

Conclusion:

One of the most important features of the implementation of features in DTI data analysis is the appropriate speed of the QuickBundles method, especially when implemented in environments such as Python. It seems that the implementation of each feature can well express the expected results from the implementation of data analysis, such that the feature of the center of mass and the middle point to show the spatial position of the streamlines, the length of the arc to show the length of a streamline and the endpoints between the vectors to the amount of rotation of a streamline. They are very suitable for examining the mentioned features.

Image Quality and Radiation Dose Assessment in Different Cardiac CT Angiography Techniques

Amir Dareini
Tehran University of Medical Sciences
< Amir.dareini.2000@gmail.com>

Mostafa Robathazi
Sabzevar University of Medical Sciences
< robatjazi1361@gmail.com>

introduction:

Coronary artery disease(CAD) is the situation of narrowing or blockage of your heart supplying arteries lumen caused by fatty material build-up called plaque leading to impairment in oxygen delivery to the myocardium.

The standard diagnostic tool for CAD is still conventional coronary angiography which takes advantage of high resolution and identifies the presence and extent of CAD which is followed by risks and specific complications.

Computed tomography angiography(CTA) is a certified non-invasive imaging tool used as the main alternative to conventional coronary angiography for coronary artery disease assessment which is increasingly gaining importance. This procedure benefits from high sensitivity and specificity for CAD detection while, has the disadvantage of high radiation dose that due to potential cancer risk remains a non-negligible concern for physicians and radiologists so lots of strategies have been developed to reduce radiation dose-encompassing dose modulation techniques with retrospective and prospective ECG triggering and FLASH (a prospective ECG triggered data.

This study was intended to compare radiation dose and image quality across three groups of patients undergoing different CCTA methods, including prospective, retrospective, and FLASH.

Material and Method:

A dual-source scanner (384 slice, Siemens) was used for data acquisition in both FLASH and Pros/Retrospective CTA. The two major parameters of radiation dose assessment are CT dose index(CTDI) and Dose Length Product(DLP) which are used to calculate the SSDE (Size Specific Dose Estimation). A python-based software was developed by our team to read the required data including CTDI and DLP from the DICOM header and automatically calculate the effective diameter which can be used to determine the desired conversion factor and result in the geometrical measurement of SSDE.

Results:

Different parameters for radiation dose assessment, including wSSDE, gSSDE, effective dose, and exposure obtained for the three CCTA methods, including prospective, retrospective, and FLASH methods. A comparison of the CCTA methods for the same parameter reveals a significant difference in the radiation dose received by the patient.

The prospective protocol is known as the standard protocol for cardiac imaging and increasing pitch value is used to reduce radiation dose with good diagnostic accuracy.

prospective ECG-triggered data acquisition with very high pitch values (FLASH) provides images with high image quality for patients with a heartbeat of less than 60 and also a sharp depreciation in radiation dose received by the patient. the Retrospective protocol offers a

high amount of radiation dose in comparison with others and also not a good image quality in compare with prospective which is probably due to severe motion artifact.

Conclusion:

384-slice CTA enables us to visualize the coronary arteries using 3 different protocols that are selected to be performed based on the patient's heartbeats. Prospective ECG Triggered data acquisition for heartbeats<60 offers an acceptable image quality with a sharp depreciation In radiation dose. For heartbeats, more than 60 to 75 prospective scannings represent the first choice. If the heartbeat goes over 75, the retrospective is considered as the final alternative, dose reduction using a relatively low tube voltage and using tube modulation would be necessary.

Measuring the Absorbed Dose of Gonads in Prostate Cancer Radiotherapy by Treatment Design and Dosimetry Software

Omidi kiumars Sbmu
< omidikiumars@yahoo.com>

Background and Purpose:

The effect of radiation in increasing the risk of cancer and its other harmful effects has been proven. The possibility of chromosomal damage and the creation of genetic mutations has also been proven as a result of damage to DNA, and it is one of the most important and fundamental damages of radiation. Gonads in men are among the most vulnerable parts when exposed to radiation. The present study was conducted to measure the absorbed dose of gonads in prostate cancer radiotherapy.

Methodology:

This study was an experimental scientific study in which the dose reached to the gonads in radiotherapy treatments for prostate cancer was investigated and calculated. The method of measuring the radiation transmission coefficient is to measure the absorbed dose of radiation at a certain point, with and without a shield, and this coefficient is obtained by dividing the value read with the shield by the one without the shield. The amount of 70 times of radiation in this study was done with the medical linear accelerator device available (Varian X linear accelerator with MV18 photon energy), 40 times of which was by TLD chips and 30 times by the ionization chamber. Farmer type was used.

Findings:

The radiation passing through cedar blocks that was measured in this research was equal to 4%. The absorbed dose resulting from the scattering of the collimator on the head of the patient's body, etc., which in this research was between 3 and 5% in different conditions. The target was 4 to 6 percent.

Conclusion:

In the treatments of the abdominal region, the testicle is not in the radiotherapy field. But a significant absorbed dose of scattered rays reaches the testicle, which is up to 9.5%.

Keywords: radiation therapy; gonads; Prostate Cancer; Linear accelerator.

DCE Versus DWI in Breast Lesions Diagnosis

Navid Sarmast Alizadeh
MSc of Medical Imaging (MRI)
High Tech Department Pars Hospital
< alizadeh4949@gmail.com>

Milad Zarjini
MRI Technologist
< miladzarjini5845@gmail.com>

Today, Dynamic Contrast Enhancement is known as the standard MRI technique method for breast lesions imaging and breast masses screening. Despite the many advances that have been made in this method and its high capability in diagnosing and differentiating breast lesions, it can still be problematic and challenging DCE to perform. Also, this method has low specificity. In addition, due to the injection of contrast material in this method, it is not recommended for young patients and people who are allergic to MRI contrast materials.

Diffusion Weighted Imaging is a technique based on the diffusion of water molecules in tissues. Tissues in which the diffusion of water molecules is restricted in this method have abnormal signals. Due to the presence of many membrane structures Pathological tissues have limited diffusion, therefore appear as high signal in DWI images. Another ability of this method is to quantitatively set ADC values in tissues using ADC map images. Using DWI, the morphological structure and microstructures of the tissue can be quantitatively and qualitatively evaluated. This technique can be used to differentiate between benign and malignant masses. To quantitative assessment of ADC value and differentiate between malignant and benign lesions, it's necessary a cutoff point of ADC value determine. According to cutoff value, different values of sensitivity are obtained. Unfortunately, the cutoff value of ADC for differentiation between benign and malignant lesions has not been standardized and its determination requires more studies in different centers and patients.

In this article, we evaluate the different diagnosis and differentiation methods for breast lesions and compare them. Also, we evaluate and compare DCE and DWI techniques in breast lesions diagnosis and differentiation and try to provide suggestions for the cutoff value of ADC.

Different Magnetic Resonance Imaging Protocols for Multiple Sclerosis Diagnosis

Navid Sarmast Alizadeh
MSc of Medical Imaging (MRI)
HighTech Department Pars Hospital
< alizadeh4949@gmail.com>

Amir Dareini
Tehran University of Medical Sciences
< Amir.dareini.2000@gmail.com>

Multiple Sclerosis (MS) is a chronic autoimmune disease where the immune system wrongly attacks the central nervous and is characterized pathologically by demyelination and clinically by visual, sensory, and motor problems. This immune-mediated disease is one of the most common causes of neurological disability in young adults

worldwide and currently is increasing in prevalence and incidence globally1.

Early and accurate diagnosis is of the utmost importance. Blood test, Spinal tap using lumbar puncture, Neurological exam and Magnetic Resonance imaging are the 4 common diagnostic tools for MS provident. MRI has a major role and is the most important available tool that supports the diagnosis and monitoring of MS. This review study was aimed to evaluate different sequences for MS diagnosis and discuss each protocol hallmark.

Sequences contain Spin-Echo sequences, gradient echo sequences, Susceptibility sequences, Magnetic Resonance Spectroscopy, Magnetization transfer imaging, Diffusion Weighted imaging, USPIO sequences, and some other modern sequences.

We discussed about characteristic hallmarks and each sequence-specific application

An overview of the Minimally Invasive Method Needle of Breast Biopsy and Tomosynthesis-guided Breast Biopsy

Sama Zare Tehran University Medical Science
< sama.zare20@gmail.com>

Hengameh Khosravi Tehran Medical Science University
< hengamekhosravi54@gmail.com>

Today, accurate diagnosis of breast cancer is very important due to the growing trend of breast cancer. And the most important stage of accurate diagnosis of breast lumps is biopsy from suspicious lumps in the breast with vacuum biopsy methods under mammography or ultrasound guidance and core needle biopsy.

In this educational review article, the latest biopsy methods under the tomosynthesis guide and the training of methods, techniques and related tips and tricks and troubleshooting are described.

In the attached file, a translation of the 20th chapter of Mammographic Imaging (fourth edition) written by shelly L.Lille and wendy J.Marshall , which the presenters of this review article contributed to its translation, is provided.

In this review article, the points raised in this file have been used.

A summary of the topics presented in this educational review article is given below, the full description of which will be presented in PowerPoint.

- Biopsy Modalities
- Clinical Guidance
- Ultrasound-Guided Biopsy (Sonographic)
- Stereotactic Guidance and Overview of the Stereotactic Procedure
- positioning for stereotactic biopsy
- Acquisition and Display of the Planar Images
- Principles and instrumentation of core biopsy
- Digital breast tomosynthesis (DBT) and Benefits of DBT-guided breast biopsy
- DBT-guided biopsy procedure and technique
- Complications (vasovagal reaction, bleeding, infection) , troubleshooting
- conclusion
- And finally, a brief introduction to the methods and images of breast tomography with injection

SCIENTIFIIC POSTER ACCEPTED ABSTRACTS (20TH IRSA)

Evaluation of the Relationship between Mammary Glandular Dose and Breast tissue Thickness and Composition in Patients Referred to the Digital Mammography Department of Tehran Cancer Institute

Ozra Mashinforoush* MSc of Medical Imaging of Tehran University Medical Science <mashinforoush.1982@gmail.com>

Faired Paak Tehran University of Medical Sciences < faride.pak@gmail.com>

Soheila Koopaei Tehran University of Medical Sciences < skoopaee@gmail.com>

Nasrin Ahmadinejad Tehran University of Medical Sciences < n_ahmadinejad@yahoo.com>

Introduction:

currently, mammography is one of the best methods for breast cancer screening. One of the most important factors in breast cancer risk, as well as the dose and sensitivity of mammography is breast tissue composition and another effective factor in breast dose is thickness and size the breast.

This study was designed to investigate the relationship between glandular dose and breast tissue composition and thickness.

Method:

This cross-sectional study was performed on 286 clients in a period of six months in the second half of 2020 - 21 and demographic information, history of surgery, chemotherapy and radiotherapy through a questionnaire and information about the composition of breast tissue with a, b, c , d level According to reports, mammography images were collected by a radiologist, as well as information about the received dose of each breast and its thickness by examining digital mammography images on 1132 images. Multivariate linear regression was used to analyze the data

Findings:

Based on the results, there is a significant relationship between glandular dose and type of breast tissue (a, b, c, d)

Type a has a lower absorption dose and type d has a higher absorption dose. (P <0/05)

Also, the amount of absorbed dose of the patient has a significant relationship with the thickness and size of breast tissue, which increases with increasing thickness, the amount of absorbed dose of the patient and in MLO images due to increasing thickness, the amount of absorbed dose is higher than CC images of breast.(P <0/05)

In general, the absorbed dose is higher in patients with denser tissue and greater thickness, to whom radiation management is important.

Keywords: Digital mammography, Breast tissue composition, Glandular absorption dose, Breast tissue thickness

Pediatric Dose Assessment in Routine CT Scan Procedures

Atefeh Tahmasebzadeh
Iran University of Medical Science
< tahmasebzade@gmail.com>

Introduction:

Nowadays CT scan plays an important role in medical imaging and, as pediatrics is in the most sensitive group to radiation, optimizing radiation dose became an important issue for them.

Materials and Methods:

In this study, we examined the risk of cancer due to the common procedures of CT scan in children less than 15 years of age in children's imaging centers in Tehran province. First, by entering the desired information to measure the dose of organs as a result of CT scan of head, chest, abdomen and pelvic in NCICT dosimetry software, dose of organs and also the effective dose was measured and the value of CTDIvol, DLP and were introduced as local DRL in Tehran province and were compared with other studies conducted in other provinces and countries. Then, using the second phase of BEIR VII report, we examined the risk of cancer in research.

Results:

The results of RDRL were compared with other countries and previous data in Iran, CTDIVOL values were lower than the other national and international studies compared with except chest and abdomen-pelvic in European study, and in case of DLP, European values except chest and abdomen-pelvic scans, Tehran studies conducted in 2012, and abdomen and pelvic exams in UK ,Thailand and mazandaran studies, the others were higher than this study, also by examining the LAR value we concluded that the rate of breast, lung and colon cancers due to radiation was significant, also cancer incidence didn't show a significant differences among boys and girls(P-value>0.05), but considering the total average of all cancers, it is generally understood that the risk of cancer is higher in females in all age groups and this difference decreases by age. As a result due to the importance and significant role of CT scans in medical diagnosis its use should be with caution.

Advantages of Optical Imaging and Therapy in Diagnosis and Treatment of Thyroid Cancer

Nahideh Gharehaghaji
Radiology Department
ParaMedical Faculty,
Tabriz University of Medical Sciences
< gharehaghaji@gmail.com>

Paria Mohebbi
Tabriz University of Medical Science
< Pmohebbi1380@gmail.com>

Purpose:

Thyroid cancer is one of the most common cancers in the endocrine system. Imaging methods for diagnosis of thyroid cancer include ultrasound, computed tomography (CT) scan, magnetic resonance imaging (MRI), positron

emission tomography (PET), and radioiodine scan. Several treatment methods including surgery, radiotherapy, and chemotherapy have been used to treat thyroid cancer. On the other hand, optical imaging and therapy by use of light and its optical properties can be utilized for both diagnosis and treatment of thyroid cancer. This study aims to investigate the advantages of optical imaging and therapy in the thyroid cancer diagnosis and treatment.

Methods:

The search was done using the keywords of optical imaging, thyroid cancer, diagnosis, and treatment in PubMed, Google scholar, and ScienceDirect databases during 2018-2022 to identify appropriate studies.

Results:

Optical imaging is used in the diagnosis before, during, and after thyroid cancer treatment and increases diagnostic accuracy. Also, the optical property can be used to improve surgeons' vision during tumor resection which leads to reduced wrong damage to the thyroid and surrounding tissues. The following advantages can be mentioned for optical imaging and therapy of thyroid cancer:

- Non-invasive and non-ionizing radiation method leads to high safety
- Real-time imaging and feedback capability lead to excellent controllability
- Ease of implementation with simple equipment
- Cost efficiency

Conclusion:

Optical imaging and therapy can be considered as accurate and safe diagnostic and therapeutic method for thyroid cancer detection and treatment.

Keywords: Optical imaging, Thyroid cancer, Diagnosis, Treatment

Photodynamic Therapy in the Treatment of Eye Cancer

Paria Mohebbi
Tabriz University of Medical Science
< Pmohebbi1380@gmail.com>

Nahideh Gharehaghaji
Radiology Department
ParaMedical Faculty, Tabriz University of Medical Sciences
< gharehaghaji@gmail.com>

Purpose:

Eye cancer describes various types of tumors in different regions of the eye. The cancer treatment methods must have the least side effects on eye function and visual acuity. Currently, different treatment methods such as radiotherapy (external beam or brachytherapy), chemotherapy, surgery, and enucleation are used to treat eye tumors. Photodynamic therapy (PDT) is another cancer treatment process in which a photosensitizer is applied locally or systemically and it is selectively absorbed by the malignant tissue, then the tissue is irradiated locally. Successful PDT applications in the treatment of eye tumors have been reported. This study aims to review the role of photodynamic therapy in the treatment of eye cancer.

Methods:

The articles published during 2017-2022 were identified via searching in Google Scholar,

PubMed, and Science Direct using keywords including Photodynamic therapy, eye cancer, tumor, and treatment method. After the selection of the related studies, the required data were extracted and summarized.

Results:

Based on the review results, PDT showed the following advantages for eye cancer treatment:

- A safe treatment method with few side effects compared to other treatment methods
- A localized method has the least destructive impact on other parts of the eye, leading to the least effect on reducing visual acuity
- Non-invasive treatment without significant pain
- Easily accessible treatment with lower costs compared to other treatment methods
- An outpatient or ambulatory treatment modality without using general anesthesia
- It can be used in combination with chemotherapy, radiotherapy, and surgery

Conclusion:

PDT is considered to be a safe and tolerable treatment method for eye cancer with high local control rates and an excellent visual prognosis for most patients.

Keywords: Photodynamic therapy, Eye cancer, Tumor, Treatment method

Accuracy of Deep Learning Algorithms in the Classification of Schizophrenia Patients Using MRI Images

Sahba Mofazal
Tabriz University of Medical Sciences
< sahba.mzl77@gmail.com>

Nahideh Gharehaghaji
Radiology Department
ParaMedical Faculty, Tabriz University of Medical Sciences
< gharehaghaji@gmail.com>

Purpose:

Schizophrenia is one of the acute mental disorders that disturb patients' cognition, behavior and emotion. Its clinical diagnosis is usually based on fulfilling criteria of phenotypical features, which is time-consuming. Therefore, using the methods for early diagnosis of schizophrenia and faster therapeutic interventions is essential. Machine learning algorithms have shown good performance for schizophrenia classification, but due to the limitation in manual feature selection, they may not fully represent the neural differences associated with schizophrenia. On the other hand, deep learning algorithms, especially convolutional neural networks (CNN), can learn the fully automatic features related to schizophrenia. The aim of this study is to determine the accuracy of the deep learning algorithms in the classification of schizophrenia patients using MRI images.

Methods:

We searched the articles published in 2018-2022 in PubMed, Google Scholar, and AltaVista databases using the keywords of schizophrenia, classification, deep learning algorithms, and magnetic resonance imaging. Among the searched articles, the most relevant ones were reviewed.

Result:

According to the findings, various deep learning algorithms such as pre-trained 2D CNN, 3D Naïve CNN, modified 3D VGG with squeeze excitation (SE) and batch normalization (BN) model (SE-VGG-11BN), and 2D convolutional Autoencoder (CNN-AE) have been used for the classification of schizophrenia using structural, diffusion, and functional MRI images. The reviewed articles results showed an accuracy of 72-97% for classifying schizophrenia in MRI images using these algorithms.

Conclusion:

Deep learning algorithms showed high accuracy for the classification of schizophrenia patients using MRI images.

Keywords: Schizophrenia, Classification, Deep learning algorithms, Magnetic resonance imaging

Efficacy of Photoacoustic Imaging for Early Detection of Ovarian Cancer

Nahideh Gharehaghaji
Radiology Department
ParaMedical Faculty, Tabriz University of Medical Sciences
< gharehaghaji@gmail.com>

Paria Mohebbi
Tabriz University of Medical Science
< Pmohebbi1380@gmail.com>

Purpose:

Ovarian cancer is the deadliest of women's cancers diagnosed in the late stages, and therefore, it has a high mortality rate. There are several imaging methods for the diagnosis of ovarian tumors such as transvaginal ultrasound (TVU), positron emission tomography (PET), computed tomography (CT), and magnetic resonance imaging (MRI). Photoacoustic imaging (PAI) is a hybrid noninvasive imaging modality in which photoacoustic waves are produced as a result of thermoelastic expansion and contraction of irradiated tissue with laser light. Successful applications of PAI in the diagnosis of ovarian tumors have been reported. The purpose of this study is to investigate the efficacy of PAI in the early diagnosis of ovarian cancer.

Methods:

The articles used for this study were published from 2016 to 2022, and were obtained by searching the keywords of "photoacoustic imaging", "hybrid imaging", "ovarian cancer", and "diagnosis" in the databases of PubMed, Google Scholar, and ScienceDirect.

Results:

Photoacoustic imaging can be used as a complementary method along with other imaging modalities such as TVU for better management of ovarian cancer in the early stages. Photoacoustic imaging is a safe diagnostic method without using ionizing radiation that provides real-time detection of the tissue's functional and molecular information. It has a high sensitivity to detect cancer metastases and a good penetration depth.

Conclusion:

Photoacoustic imaging is a complementary diagnostic method for early, efficient and safe diagnosis of ovarian cancer.

Keywords: Photoacoustic imaging, Hybrid imaging, ovarian cancer, Diagnosis

Investigating the Level of Awareness, Attitude and Behavior of Female Teachers in Zahedan City Towards Breast Cancer Screening in1401

Sima Salarzaie
Zahedan University of Medical Science
< Simasalarzaie@gmail.com>

Fatemeh Salarzayy
Zahedan University of Medical Science
< fatmhsalarzayy@gmail.com>

Background and Purpose:

Due to the prevalence of breast cancer and the importance of early detection As a result of the need to use its screening methods in the society and the importance and role of women teachers, The present study aims to determine the level of awareness, The attitude and behavior of female teachers in Zahedan city about breast cancer screening has been done.

Methodology:

This research is a descriptive and analytical study, the population of which is 300 female teachers of Zahedan schools in 1401, who will be randomly selected, and the collected information will be analyzed using statistical software such as spss.

Findings:

According to the studies we reviewed, it is expected that the level of knowledge of teachers about breast cancer and screening methods is average and their attitude is positive, but most of them do not use these methods.

Therefore, in this research, the information of 300 female teachers of Zahedan schools will be collected, and after checking, it will be compared with similar studies.

Conclusion:

Women teachers due to the importance of their role in society; In order to increase their level of awareness and attitude towards breast cancer and screening programs and as a result to increase their participation in these screenings, they need to provide the necessary training in the field of breast cancer screening methods.

Keywords: Breast cancer, screening, consciousness, attitude.

Role of Nanotheranostic Systems in Diagnosis and Treatment of Ovarian Cancer

Sahba Mofazal
Tabriz University of Medical Sciences
< sahba.mzl77@gmail.com>

Nahideh Gharehaghaji
Radiology Department
ParaMedical Faculty, Tabriz University of Medical Sciences
< gharehaghaji@gmail.com>

Purpose:

Ovarian cancer is one of the malignancies of women that usually has no symptoms in the early stages and causes late diagnosis and even death in some cases. Although different imaging modalities are used to diagnose ovarian cancer, its early diagnosis and effective treatment are limited. Nanotheranostics are nanoscale materials that include diagnostic and therapeutic portions in a single platform. This study aims to investigate the role of nanotheranostic systems in the diagnosis and treatment of ovarian cancer.

Methods:

We searched the keywords "ovarian cancer", "nanotheranostic systems", "diagnosis" and "treatment" using Google Scholar, PubMed, Web of Science, and AltaVista search engines. Among the extracted articles, we reviewed the most related ones.

Results:

Different imaging modalities such as MRI, fluorescent, and photoacoustic imaging, and treatment methods such as photothermal therapy, photodynamic therapy and chemotherapy were used to diagnose and treatment of ovarian cancer by different nanotheranostics. The diagnostic part of these nanotheranostics included the components such as iron oxide and gadolinium oxide nanoparticles for MRI and CuS quantum dots for fluorescent imaging. Based on the findings, human epidermal growth factor receptor 2 (HER2) targeted iron oxide nanoparticles showed a high ability to deliver the chemotherapy drug cisplatin to the ovary's primary tumor and inhibited the tumor's growth. Additionally, CuS-MnS2 nanotheranostic presented high potential in creating necroptosis in ovarian cancer cells by photothermal therapy. Also, the resolution of photoacoustic images was increased with the use of gold nanoparticles coated with reduced graphene oxide, providing more accurate information about the size and location of the tumor.

Conclusion:

Nanotheranostic systems can play a significant role in the diagnosis and treatment of ovarian cancer.

Keywords: Ovarian cancer, Nanotheranostic systems, Diagnosis, Treatment

Comparison of a Self-Supervised Denoising Technique for Diffusion-weighted Images in Brain MR with Other Methods

Iman Azinkhah
Milad Hospital
< imanazinkhah@gmail.com>

Purpose:

One of the challenges in DW imaging is the presence of noise, which reduces SNR. The presence of noise can definitely cause incorrect quantitative calculations, and especially in DT imaging where we need accurate calculations of the connections of brain white fiber structures, low SNR will be very troublesome. In this study, several noise reduction methods have been implemented on Diffusion-Weighted MR images of brain and compared with each other.

Materials and Methods:

DW images of 10 patients were initially used in a self-supervised method to denoise. This method, which uses an entire volume to learn a full-rank local linear eliminator for that volume, can separate structure from noise without requiring an explicit model for each, using q-space oversampled DWI data. Then three conventional methods of Non-Local Means and PCA with experimental thresholding and PCA by Marcenko-Pastur method are performed on all the images. In order to compare the success rate of denoise, the SNR value in the corpus callosum region was measured on all images.

Results:

According to the calculation of SNR in each direction, the average of all directions for each method was calculated in all images. The average SNR for self-supervised, non-local means, PCA with experimental thresholding, and PCA by Marcenko-Pastur method were 24.8, 23.4, 23.7, and 23.2, respectively.

Conclusion:

It seems that the self-supervised method is more successful than other methods in denoise DW images. Unlike other methods that assume certain properties in the signal structure, this method does not make such an assumption about the signal, instead, it uses the fact that the noise in the 3D volumes of the DWI signal originates from random fluctuations in the acquired signal, which is closer to the reality of the noise event.

Prediction of Lymphovascular Space Invasion in Cervical Carcinoma Using Diffusion Kurtosis Imaging

Maryam Farsi — Tehran University of Medical Science < maryamfarsi.tums@gmail.com>
Mahrooz Malek — Tehran University of Medical Sciences < mahrooz.malek@gmail.com>
Maryam Rahmani — Tehran University of Medical Sciences < m49rahmani@yahoo.com
Behzad Amanpour — RCMCI Research Center for Molecular and Cellular Imaging < behzad.amanpour@gmail.com>
Maryam Pourashraf — Tehran University of Medical Science < maryampourashraf12@gmail.com>
Samira Raminfard — Tehran University of Medical Sciences < rf_samira@yahoo.com>

Background:

This study aimed to investigate the potential relationship between diffusion kurtosis imaging (DKI)- derived parameters and lymphovascular space invasion (LVSI) in patients with cervical carcinoma.

Patients and Methods:

This prospective study included 30 patients with cervical carcinoma. The patients underwent MRI, diffusion-weighted imaging (DWI), and DKI prior to surgery. The surgical pathology results were accepted as the reference standard for determining the LVSI status. The DKI-derived parameters, including mean diffusivity (MD) and mean kurtosis (MK), were measured. The apparent diffusion coefficient (ADC) value was also assessed.

Results:

The MD value of LVSI positive cervical carcinomas was significantly lower than LVSI negative carcinomas (p-value = 0.01). MK value was significantly higher in LVSI positive tumors (p-value = 0.01). However, the ADC value did not show a significant difference between LVSI positive and LVSI negative tumors (p-value = 0.2). MD and MK parameters showed similar diagnostic accuracy in identifying the LVSI status, with the area under the curve of 0.77 and 0.78, respectively.

Conclusion:

In this study, DKI-derived parameters were associated with the LVSI status in cervical carcinomas. Further studies with larger sample size are required to confirm these results.

Classification of Active and Non-active MS Lesions Using Various Machine Learning Models

Amir Dareini
Tehran University of Medical Sciences
< Amir.dareini.2000@gmail.com>

Introduction:

Gadolinium-based T1-weighted MRI sequence is the gold standard for the detection of active multiple sclerosis (MS) lesions. The performance of machine learning (ML) models in the classification of active and non-active MS lesions from the non-contrasted T2-weighted MRI images has been investigated in this study.

Methods:

108 Features of 75 active and 100 non-active MS lesions was extracted by using SegmentEditor and Radiomics modules of 3D slicer software. 18 ML models have been made using the 5-fold cross-validation method and each model with its special optimized parameters has been trained by using the training-validation data sets. Performance models in test data set has been evaluated by metric parameters of accuracy, precision, sensitivity, specificity, AUC, and F1 score.

Results:

The highest values of accuracy (91.9%), precision (95.5%), sensitivity (85%), specificity (95.8%), AUC (94.2%), and F1 score (89.5%) have been seen in LogisticRegression model.

Conclusion:

The performance of ML models in the classification of active and non-active MS lesions was evaluated. The results of this study show that the LogesticRegression model is the best and reliable ML model for this purpose.

Keywords: Multiple Sclerosis, Machine Learning,

Methods of Measurement of Spinal Deviation in Kyphosis and Scoliosis in Radiography

Mehri Noei
Mashhad University Medical Sciences
< noeimehry@gmail.com>

Scoliosis radiography is useful in identifying the degree of the scoliosis curvature (major/minor or primary/compensatory curves), as well as observe its progression to determine the best method of treatment

The vertebral centroid angle is considered an alternative to the Cobb angle especially in kyphosis and lordosis measurement. It is considered less susceptible to variations in the vertebral end-plate architecture

Evaluation of spinal deviation measurement methods in lateral view and ap representation in Kyphosis and Scoliosis

Distributor
GE HealthCare

36
Years
with Pride

شرکت تجهیزات پزشکی پیشرفته

نماینده‌ی کمپانی تجهیزات پزشکی
جنرال الکتریک در ایران

غرفه: رو به روی ورودی یک

تجهیزات پزشکی پیشرفته

tpp.co.ir
021-42681

Distributor
GE HealthCare

Voluson SWIFT

This changes everything.

tpp.co.ir
021-42681

تجهیزات
پزشکی
پیشرفته

HOLOGIC®

The Science of Sure

اولین دستگاه ماموگرافی به روش توموسنتر مورد
تایید FDA آمریکا و مطالعات کلینیکی

%۶۵
افزایش نرخ تشخیص
سرطان‌های تهاجمی

%۴۰
کاهش نرخ فراخوانی
بیمار و تجدید
تصویربرداری

BEST IN
KLAS
2015/2016

تکاپو طب

HOLOGIC®

The Science of Sure

سیستم توموبایوپسی پستان
به روش **استریـو تاکتیک**

تکاپوطب

13
Minutes Average
3D Biopsy Procedure

360°
۳۶۰ درجـه دسترسـی
واقعی به بافت پستان

HOLOGIC®

The Science of Sure

سیستم سنجش تراکم استخوان

تکاپوطب

Horizon
Bone Densitometer

- سیستم سنجش تراکم استخوان با تکنولوژی DXA به روش True-Fan Beam
- دارای تاییدیه FDA آمریکا
- استفاده از تیوب اشعه ایکس با ظرفیت بالا و سیستم خنک کننده روغن
- سرعت بالای اسکن از ۱۰ تا ۳۰ ثانیه
- صحت و دقت و پایداری نتایج در کوتاه مدت و بلند مدت

قابلیت دریافت اسکن های

- AP Spine/ Forearm/Dual Hip
- Whole Body Scan
- Prosthetic Hip /Orthopedics
- Pediatrics
- Infant Body Composition Assessment
- Small Animal
- Decubitus Lateral

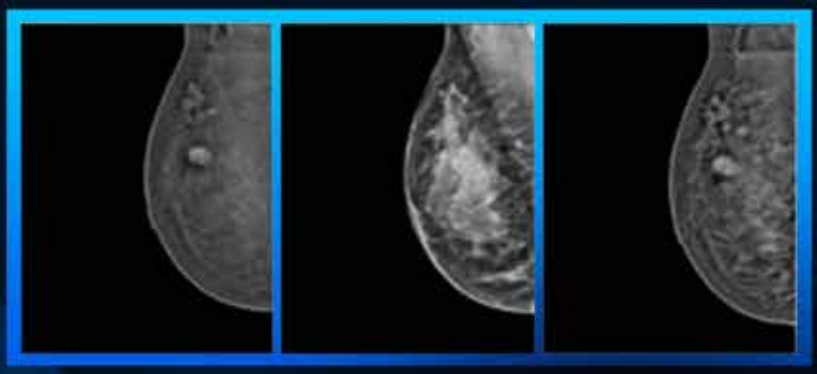
HOLOGIC®

The Science of Sure

نرم افزارها

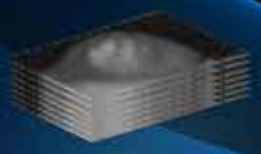
تکاپوطب

Enhanced Contrast I-View



استفاده از ماده حاجب جهت بررسی ضایعات با فعالیت متابولیکی بیشتر

Intelligent 2D



%۴۵

کاهش دوز دریافتی بیمار تا ۴۵ درصد با حفظ کیفیت تصویر

FUJIFILM

FUJIFILM Healthcare Corporation

ماورای فنون
گروه

شرکت ماورای فنون عصر
نماینده تجهیزات تصویربرداری کمپانی FUJIFILM در ایران

FDR Cross

HYBRID C-ARM & MOBILE X-RAY IN ONE

Portable Sonography

Edgell

FUJIFILM
Value from Innovation
SonoSite

آدرس: شریعتی، بالاتر از میرداماد، خیابان شواری، پلاک ۴۲
تلفن: ۰۲۱ ۲۶۷۰۰۵۰۱
www.m-f-agroup.com

FUJIFILM

FUJIFILM Healthcare Corporation

ماورای فنون
گروه

شرکت ماورای فنون عصر
نماینده تجهیزات تصویربرداری کمپانی FUJIFILM در ایران

Arietta 750

Arietta 850
DeepInsight

Arietta 650
DeepInsight

Build Confidence in Radiology Imaging

FUTUS

Arietta 65

Arietta 50

آدرس: شریعتی، بالاتر از میرداماد، خیابان شواری، پلاک ۴۲
تلفن: ۰۲۱ ۲۶۷۰۰۵۰۱
www.m-f-agroup.com

تهران فوکا

FUJIFILM
Value from Innovation

WE WILL
NEVER STOP
INNOVATING FOR
A HEATHIER WORLD

تهران فوکا

نماینده رسمی فوجی فیلم در ایران

تهران، بلوار میرداماد، شماره ۲۲۹/۱، ساختمان فوجی فیلم

تلفن: ۱۹-۲۲۲۵۴۸۱۰ فکس: ۲۲۲۲۱۰۰۲ سایت: tehranfuka@fujifilm.ir

FUJIFILM
Value from Innovation

تهران فوکا

Together, working for your health.

Integrated technologies
dedicated to **women's health.**

تهران فوکا

نماینده رسمی فوجی فیلم در ایران

تهران، بلوار میرداماد، شماره ۲۲۹/۱، ساختمان فوجی فیلم

تلفن: ۱۹-۲۲۲۵۴۸۱۰ فکس: ۲۲۲۲۱۰۰۲ سایت: tehranfuka@fujifilm.ir

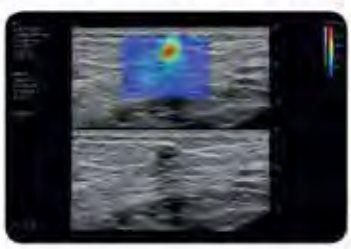
HOLOGIC
SUPERSONIC™
imagine

دستگاه های سونوگرافی پیشرفته
ساخت کمپانی Hologic Supersonic

SUPERSONIC® MACH™ 30
UltraFast Intelligence

- تحولی شگرف در دستگاه های سونوگرافی، دارای نسل جدید تکنولوژی سخت افزاری و پردازش تصاویر
- پیشرفته ترین و دقیق ترین الاستوگرافی شیر ویو
  2D Realtime ShearWave Elastography / ShearWave PLUS
  و تنها کمپانی دارای Clinical validation FDA approved
- مد های تصویربرداری هوشمند جهت سهولت کاربری و تشخیص دقیق
- مشاهده بیشترین جزئیات آناتومیکی و رزولوشن بالای تصاویر و عمق نفوذ بسیار بالا (45cm)
- مجهز به داپلر بسیار پیشرفته و دقیق UltraFast Doppler
  با امکان انجام داپلر از سه نقطه به طور همزمان

ShearWave® PLUS



The next level of SWE performance

SonicPad®

Designed to help you focus on what you see not on what you do

Transducer family

Takes imaging to a new level

شرکت تن آسا طب نوین (نماینده انحصاری کمپانی سوپرسونیک فرانسه و تراسون آمریکا در ایران)
تهران، خیابان سهروردی شمالی، کوچه کوروش، پلاک ۶۸، طبقه اول کدپستی ۱۵۵۹۷۱۳۷۱۵
فکس: ۸۸۵۲۷۶۹۴-۰۲۱ تلفن: ۸۸-۸۸۵۳۸۴۸۶ - ۸۸۵۰ ۱۳۴۴-۰۲۱
www.tanasateb.com

TANASA TEB

HOLOGIC

SUPERSONIC imagine

SUPERSONIC MACH 20
UltraFast Intelligence

UltraFast Imaging

قابلیت تصویربرداری بسیار سریع با سرعت ۲۰.۰۰۰ فریم در ثانیه که باعث افزایش رزولوشن شده و تصاویر با کیفیت و دقت بالایی را ارائه می دهد.

UltraFast Doppler

دستگاه دارای سرعت و حساسیت بسیار بالا در داپلر می باشد که کلیه تصاویر و داپلر را در فاصله زمانی ۲ تا ۴ ثانیه دریافت نموده و امکان بازیابی اطلاعات داپلر را پس از فریز کردن تصاویر، در سه نقطه مجزا به صورت همزمان به همراه اندازه گیری های دقیق سرعت خون فراهم می سازد.

2D Real Time ShearWave Elastography

الاستوگرافی شیرویو منحصـــر به فرد سوپرسونیک در تمامی پروب ها فعال بوده که تنها الاســـتوگرافی دقیق و قابل اعتماد و دارای تاییدیه امریکا یم باشـــد که امکان بررسی کلیه توده های پســـتان، تروئید،پروستات و کبد را فراهم می کند و همچنین دارای الاستوگرافی جهت بررسی عضـــلات، عصـــب و تاندونها (*MSK*) نیز می باشد.

Liver Fibrosis Assessment

دســـــتگاه دارای دقیق ترین ابزار جهت بررســـــی فیبروز کبد، با قابلیت نمایش *Real Time* و اندازه گیری بصورت کمی و کیفی بوده و همچنین دارای پارامتر های اندازه گیری و تشخیص گرید کبد چرب بصورت کمی نیز می باشد.

AngioPLUS

جدیدترین تکنیک تصویربرداری در آشکارسازی و نمایش عروق بسیار ریز با جریان و سرعت پایین بوده و امکان نمایش *MicroVascular Flow* در شکم و بافت سطحی را فراهم می سازد که امکان بررسی خون رسانی توده های مختلف را به کاربر می دهد.

TriVu

قابلیت تصویربرداری و نمایش همزمان سه مد: *2D*، الاستوگرافی *ShearWave* و *Color* که امکان بررسی همزمان *Stiffness* و خون رسانی بافت و توده های مختلف را فراهم می سازد.

Image Quality

مشاهده بیشترین جزئیات آناتومیکی در سونوگرافی بارداری، زنان، *Breast* ، *MSK*، شکم، لگن، تیروئید، اندام، کبد، کلیه و *General* با بهره مندی از تکنولوژی *Single Crystal* در ساخت پروب و نیز نرم افزارهای پیشرفته جهت پردازش تصویر در دو حالت *Real Time* و *Post Processing*

شرکت تن آسا طب نوین (نماینده انحصاری کمپانی سوپرسونیک فرانسه و تراسون آمریکا در ایران)
تهران، خیابان سهروردی شمالی، کوچه کوروش، پلاک ۶۸، طبقه اول کدپستی ۱۵۵۹۷۱۳۷۱۵
فکس: ۸۸۵۲۷۶۹۴-۰۲۱ تلفن: ۸۸-۸۸۵۳۸۴۸۶ - ۸۸۵۰۱۳۴۴-۰۲۱
www.tanasateb.com

TANASA TEB


VAim Pediatric Hip
VAid Breast
VAim Pelvis
VAim Follicle
VAim OB
Auto Bladder Volume
SMART TOOLS
VINNO G86
Live IMT
VINNO


VINNO
VAim OB

Fast

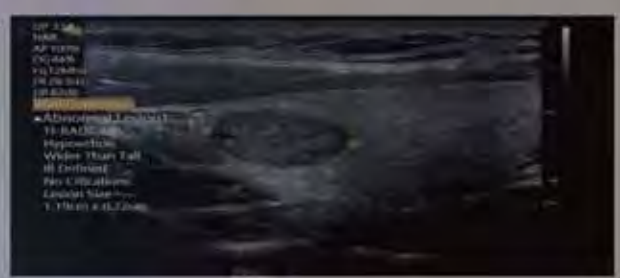
Performed by multiple titled plane waves at imaging frame rates up to 20,000 per second, is averagely 300 times faster than conventional. This speed allows for a full new range of applications and innovations in ultrasound imaging.

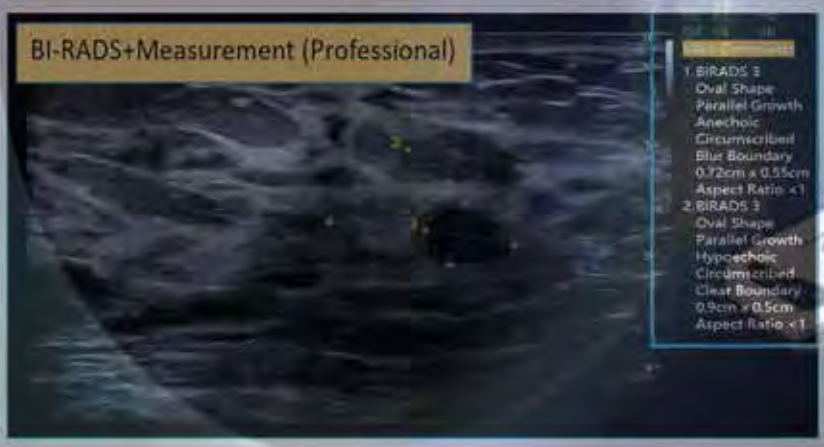
VAid Liver

With just one-button-click, VAid Liver can automatically detect common focal and diffuse diseases of the liver in real-time or on stored images and displays quantitative analysis of the lesion. VAid Liver significantly improves the efficiency and diagnostic accuracy in early screening and detection of liver diseases.

VAid Thyroid

VAid Thyroid provides a non-invasive approach for detection and assessment of thyroid nodules to avoid unnecessary interventions. It automatically detects and recognizes single or multiple lesions in real-time scanning and displays the size, border characteristics and TI-RADS classification of the lesion, which greatly improves the diagnostic accuracy and efficiency.





We pioneer breakthroughs in healthcare.

For everyone. Everywhere.

Fanavari Azmayeshgahi CO.

SIEMENS
Healthineers

Life-long Healthcare Solutions for Women

SAMSUNG

V7

Step up confidence

جدید ترین دستگاه پیشرفته کمپانی سامسونگ

با بهره گیری از به روزترین فناوری دنیا و قیمت مناسب

محصول سال ۲۰۲۳

TAKVIN
TEB تکوین طب

آدرس: تهران - خیابان خرمشهر - خیابان عربعلی - خیابان هفتم -پلاک ۱۶ تلفن: ۸۸۱۷۹۵۰۱-۸ فاکس: ۸۸۱۷۹۵۰۹

www.takvin.net info@takvin.net

تپـــاک (تدارکات پزشکی ایران کالا)

عرضه کننده سیستم‌های تصویربرداری پیشرفته پزشکی

Dynamic Digital Radiography (DDR)

The DDR can acquire up to 15 sequential radiographs ,per second and play them back as a cine loop allowing you to observe the physiological cycle and as individual radiographic images (up to 17"x 17" in size) This advancement in digital X-ray technology is FDA-approved and available in many of our systems. DDR is X-ray that moves!

Digital Radiography

AeroDR 3 HD2

KONICA MINOLTA

Ultrasound

SONIMAGE HS2

KONICA MINOLTA

PACS Scalable Solution

PACS بروزترین نرم‌افزار جامع پزشکی

مناسب برای شبکه کردن کلیه مراکز تصویربرداری

دارای نرم افزارهای مختلف برای مجهز کردن کلیه مراکز درمانی

Web server (Clipper) , Archieving Server (Med Archive)

Work Station (Med View – Med Diag – Med Stitching

Med Vet – Med Mammo & Tomosynthesis)

Medecom FDA

Laser Imager

DRYPRO ΣII

KONICA MINOLTA

Phion CT

A NEW PIONEER OF
CONE-BEAM CT

L&C AI

Computed Radiography

DIRECT DIGITIZER

REGIUS ΣII

KONICA MINOLTA

تهران، خیابان شریعتی، پایین‌تراز بهارشیراز، خیابان شهدای‌عشایر(نیرو)، پلاک۳ ، ساختمان تداک

www.tepak.ir tepak.ir (۰۲۱) ۷۷۵۰۰۲۰۹ (۰۲۱)۷۷۵۰۰۳۳۳

NOAVARAN
DARMAN ATLAS

MOONRAY
COMPACT

SIMAD
X-RAY MEDICAL TECHNOLOGY

A **Sago Medica** Company

GENORAY

PAPAYA PLUS

Combination Imaging System

NOAVARAN
DARMAN ATLAS

Helianthus DBT
HIGH RESOLUTION MAMMOGRAPHY
METALTRONICA

ALPINION
MEDICAL SYSTEMS
XCUBE 90

www.noavaran-da.com
شماره تماس : ۰۲۱۸۸۵۳۶۲۷۱

SonoScape

Caring for Life through Innovation

شمیم سلامت پاسارگاد

SonoScape

S60

Intelligence Empowers More

Elite Series

شرکت **شمیم سلامت پاسارگاد** نماینده انحصاری
کمپانی معتبر **SonoScape** در ایران

E1 EXP

Exactly To Your needs

X3

Lighten Your Imaging

آدرس : تهران ، خیابان کریمخان زند ، خیابان ایرانشهر ، خیابان آذرشهر ، پلاک ۳۸ ، واحد ۷ و ۸

تلفن : ۰۲۱۸۸۴۹۱۵۱۲

Digital Radiography / Software / OPG / C-ARM

Radiography Ceiling

Radiography Single Detector

Radiography Dual Detector

آرین درمان پژوه
ARIAN DARMAN PAJOUH

Vatech Ez Ray (PA)

C-ARM

Fire CR Dental Reader psp

Vatech Panoramic (OPG)

02141852
www.adp.co.ir

شرکت دانش بنیان مهندسی آرین درمان پژوه
تهران، خیابان مطهری، خیابان لارستان، خیابان افتخاری نیا غربی، پلاک ۲۱

ARMAN PARTO

Latest Developments in MRI
Techniques & Applications

Vahid Shahmaei
Clinical MRI
Application Specialis
MSc of MRI

10 May 2023- 20 Ordibehesht 1402 – Wednesday
Milad Tower Convention Center Hall 1, 15:00

ARMAN PARTO
شرکت آرمان پرتو تصویر

Field Service / Maintenance

Technical Support

RF Cage Construction/Site Planning

X-ray Tube Reload/Repair

Consulation

Software Development&System Upgrade

Training

Annual Service Contract

#24, No.23 , North Sarafha,
Saadat Abad , Tehran , Iran
Tel: 98 (21) 29954563 Fax:98(21)26654568
Postal Code: 1998 835 479
info@arpamedical.com
www.arpamedical.com

AGFA
RADIOLOGY
SOLUTIONS

It only takes an instant to go DR!

DR Retrofit with Dura-line panels

Dura-line detectors are built to support you with three key values - confidence, workflow and image quality - so you can focus on your patient, not your equipment.

Visit us at the Iranian Congress of Radiology 2023:
Mild Tower Convention Center, Tehran
Hall B

agfa.com » Septestraat 27 - 2640 Mortsel - Belgium

AGFA

PHILIPS

MR 5300

انتخـاب درست و هوشمندانـه

ام‌آرآی بـدون نیـاز بـه هلیـوم!

شرکت تایمـاز نماینده کمپانـی فیلیپـس

انتخابِ مسیـری روشـن، بـرای تشخیـص دقیـق [MR, CT, IGT & DXR]

شـرکت تایمـاز | TAIMAZ