Iranian Society of Radiology

(Abdominal Imaging Committee)

Guideline on Advanced Intestinal Ultrasound in Inflammatory Bowel Disease

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Preparation and technical considerations for Intestinal Ultrasound

(Modified from: Taylor SA, et al. Eur Radiol. 2017, 27:2570–2582)

The ultrasound examination is better to be performed within 14 days prior to or after the ileocolonoscopic procedure, but not during bowel preparation or just after the ileocolonoscopy. It is recommended that imaging findings or reports of prior MR or CT enterography of the patient reassessed as a roadmap before ultrasound examination.

ADULT PATIENTS

Patient preparation and basic technique—Intestinal US patient preparation:

• It is recommended that patients should be fasted for solids for 4-6h.

• It is recommended patients should not drink any fluid for 4-6h prior to the procedure, although water is permissible.

• It is recommended that patients take two dimethicone tablets the day before the exam 6h apart.

Hardware:

• It is recommended that evaluation with both low and high frequency probes is performed.

• The optimal probe frequency for high resolution bowel imaging is 8-10MHz.

Basic technique— Intestinal US:

• It is not recommended that laxative bowel preparation is administered.

• It is not recommended that a rectal water enema is administered before a routine examination.

• Use of a spasmolytic agent is not recommended.

Basic technique— Intestinal US with oral fluid:

• There is no single preferred contrast agent for Intestinal US. Recommended agents include mannitol, PEG, sorbitol and lactulose.

• It is recommended that the optimal volume of oral contrast should exceed 500ml.

• It is recommended that ingestion time of oral contrast should be 45min.

Scan coverage:

• It is recommended that formal reporting of intestinal US should state whether the extra enteric organs were examined or not.

PEDIATRIC PATIENTS

Patient preparation and basic technique— Intestinal US Patient preparation:

• It is recommended that children aged 1-9 should not eat any solid food for 2-4h.

• It is recommended that children aged 1-9 years should be fasted by mouth for carbonated and milk beverages for 2-4h. Ingestion of still water or noncarbonated fruit juice is recommended.

• It is recommended that children aged over 9 years should not eat any solid food for 4-6h.

• It is recommended that children aged over 9 years should be nil by mouth for carbonated and milk beverages for 4-6h. Ingestion of still water or non-carbonated fruit juice is recommended.

Basic technique— Intestinal US:

• Use of laxative bowel preparation is not recommended.

• Additional colonic distension with a rectal water enema is not recommended.

• Use of a spasmolytic agent is not recommended.

Bowel Ultrasound Clinic

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Name: Age: Gender: Date:

Referring Physician:

Advanced Intestinal Ultrasound Report Template

Clinical Indication: ……

Comparison: …….

FINDINGS:

Quality of study: [Adequate/Suboptimal/Non-diagnostic]

Anatomical location	**No. of abnormal segments**	**Total length of Involvement** (cm)	**Max. mural thickness** (mm)	**Ulcer (Y/N)**	**Sinus tract (Y/N)**
Jejunum					
Proximal/mid ileum					
Distal/terminal ileum					
Cecum					
Ascending colon					
Transverse colon					
Descending colon					
Sigmoid					
Total					

Stricture		**Location**	**Total Length**	**Number**
No stricture	☐			
Probable stricture without upstream dilation (< 3 cm)	☐			
Stricture with mild upstream dilation (3-4 cm)	☐			
Stricture with moderate to severe upstream dilation (>4 cm)	☐			

Anatomical location	**Doppler grade at involved segments (0-4)**	**Elastography measurements in strictures** (kPa or m/s)
Jejunum		
Proximal/mid ileum		
Distal/terminal ileum		
Cecum		
Ascending colon		
Transverse colon		
Descending colon		
Sigmoid		
Total		

Type of fistula	**Yes/No (Number)**
Entero-colic	
Entero-cutaneous	
Colo-cutaneous	
Entero-vesical	
Colo-vesical	
Recto-vaginal	
Other….	
Total	

Mesenteric findings		**Notes**
Perienteric fluid	☐	
Fibrofatty proliferation	☐	
Lymphadenopathy	☐	Maximum SAD: ….
Collection	☐	Number: …… / Size: ……
Ascites	☐	
None	☐	

Crohn's Disease Ultrasound Activity Score *(Modified from: Sævik F, et al. JCC. 2021, 115–124)*						
Variables	**Score**					
	0	**1**	**2**	**3**	**4**	Obtained Score [0-17]
Bowel wall thickness (mm)	< 3 mm	3-4.9 mm	5-7.9 mm	> 8 mm	-	.....
Stenosis	None	Only one luminal narrowing without prestenotic dilatation	More than one luminal narrowing without prestenotic dilatation	Stenotic with prestenotic dilatation (> 3 cm)	-	.....
Total length of segments (cm)	None	< 5 cm	5-10 cm	> 10 cm	-	.....
Color Doppler grade	No mural thickening	Mural thickening without vascularization	Mural thickening with spot vascular signals	Mural thickening with longer vascular signals	Mural thickening with longer vascular signals extending to mesentery	.....
Stratification	Normal	Focal loss	Diffuse loss	-	-	.....
Fat wrapping	Absent	Present	-	-	-	.....
Fistula	Absent	Present	-	-	-	.....
Total score						.....

Ulcerative Colitis Ultrasound Activity Score *(Modified from: Bots S, et al. JCC. 2021, 1-8)*						
Variables	**Score**					
	0	**1**	**2**	**3**	**4**	Obtained Score [0-9]
Colon wall thickness (mm)	-	2-2.9 mm	3-3.9 mm	> 4 mm	-	.....
Color Doppler grade	No mural thickening	Mural thickening without vascularization	Mural thickening with spot vascular signals	Mural thickening with longer vascular signals	Mural thickening with longer vascular signals extending to mesentery	.....
Abnormal haustration	Absent	Present	-	-	-	.....
Fat wrapping	Absent	Present	-	-	-	.....
Total score						.....

- *Additional notes: ……*

- *Suggestions on Doppler findings (if needed): ……*

- *Suggestions on Elastography results (if needed): …….*

<u>Impression</u>:

- ***No definite mural abnormality in bowel.***
- ***Active inflammatory CD without luminal narrowing.***
- ***Active inflammatory CD with luminal narrowing.***
- ***Stricturing CD with active inflammation.***
- ***Penetrating CD.***
- ***Ulcerative colitis (Pancolitis, Extended colitis or Left sided colitis)***
- ***Malabsorptive disease***
- ***Neoplastic mass***

Sincerely,

Radiologist ….

Supplement: Definitions

(Modified from: Bruining DH, et al. Radiology. 2018 Mar;286(3):776-799.)

Ultrasound finding	Definition
Abnormal segment	Thick segment of bowel (Small bowel > 3 mm, Colon > 4 mm)
Ulcer	Small focal break in the intraluminal surface of the bowel wall with focal extension into the inflamed bowel wall not beyond the serosa.
Sinus tract	Wall defect that extends outside bowel wall but not to adjacent organs or skin
Stricture	Luminal narrowing with upstream dilation > 3 cm
Lymphadenopathy	Mesenteric lymph node with short axis of >5 mm in pediatrics and >10 mm in adults
Fibrofatty proliferation (Creeping fat)	Increased fat adjacent to abnormal bowel displacing bowel loops usually along the mesenteric border but can be circumferential