



international bowel
ULTRASOUND GROUP

Non IBD

Prof. Giovanni Maconi, MD

University Hospital Luigi Sacco
Milan, Italy



Disclosures

Abbvie, Alfa Sigma, Johnson & Johnson, Samsung, Takeda

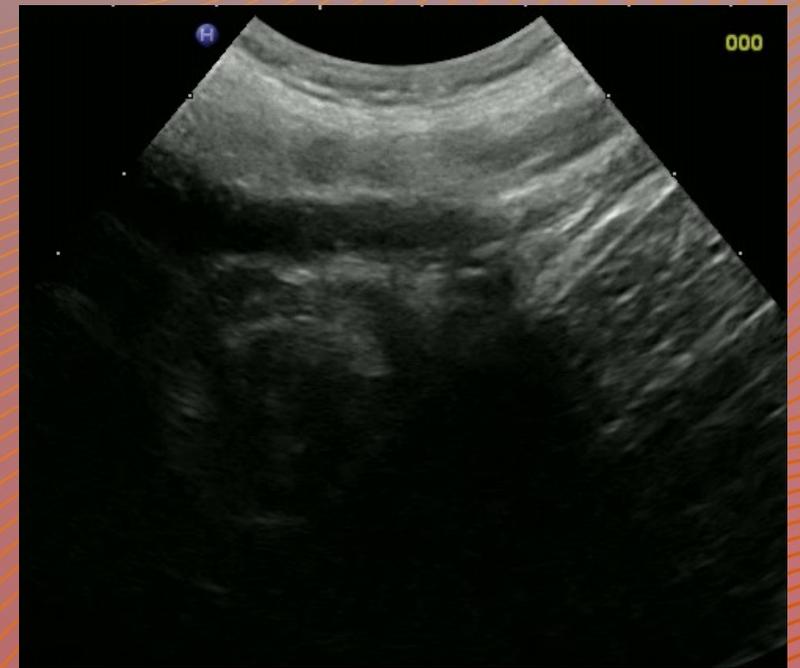


Non IBD

- 1) Chronic diseases that may share symptoms with IBD
- 2) Inflammatory disorders that mimic IBD
- 3) Acute Diseases that may complicate IBD



Male 18 yr Diarrhea, Bloating and Weight loss



Left upper quadrant



Celiac disease

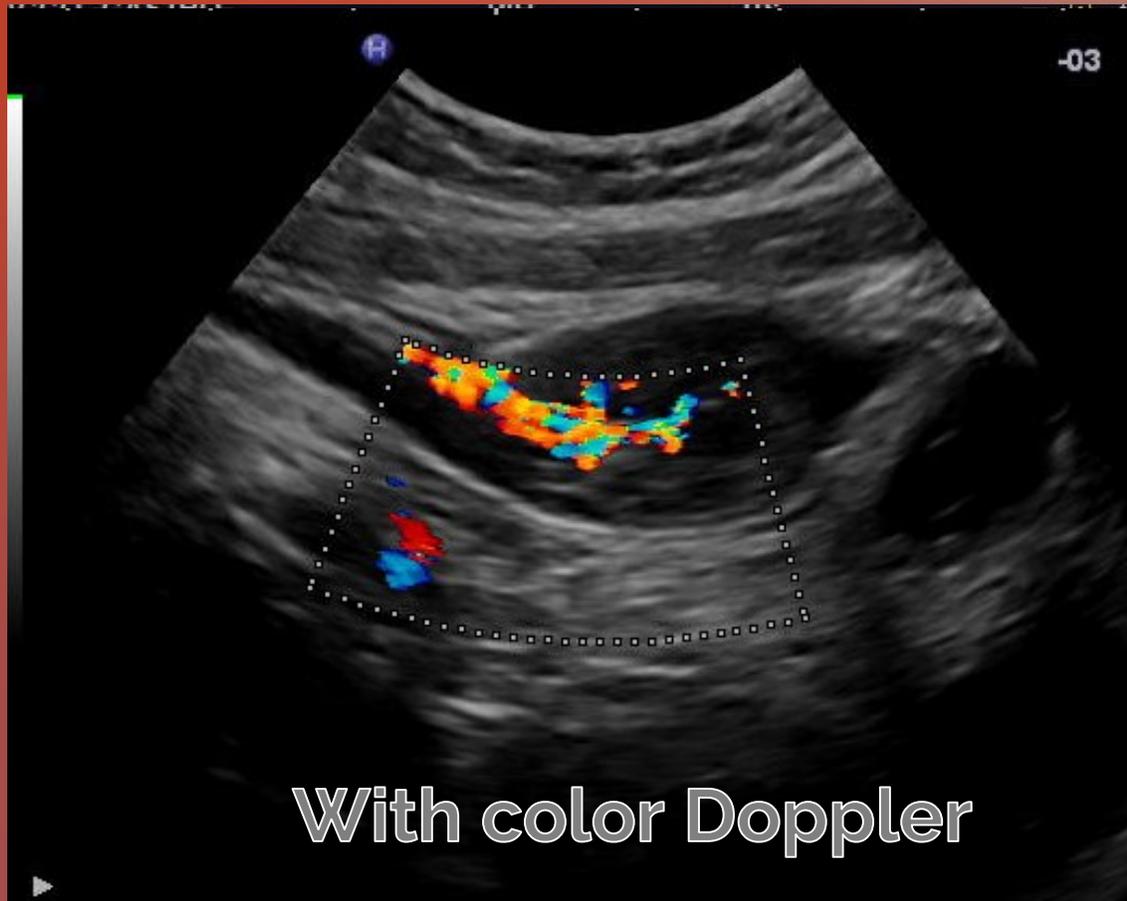
US parameters	Sens %	Spec %
Increased gallbladder volume (r.v. \leq 20mL)	73 (46-99)	96 (92-99)
Dilated small bowel loops + increased fluid content (r.v. \leq 2.5 cm)	92 (76-100)	77 (70-84)
Thickened small bowel wall (r.v. \leq 3 mm)	75 (50-99)	91 (86-95)
Increased peristalsis	83 (62-100)	87 (82-92)
Free abdominal fluid	50 (22-78)	96 (93-99)
Enlarged mesenteric lymph nodes (r.v. \leq 5 mm)	42 (14-69)	97 (95-99)





Male 5 yr

Sporadic rectal bleeding, recto-sigmoidoscopy neg.



Clinical data of 17 patients evaluated with colon hydrosoneography including 11 patients with juvenile polyps and one with pseudopolyps

Patient No	Sex	Age (years)	Duration of bleeding	Hydrosoneography	Colonoscopy	Pathology
1	M	2.3	1 y*	2x2.5 cm polyp in descending colon. Echo follow up	Large polyp in descending colon	JP
2	F	4.0	1 y*	1.1x2.5 cm polyp on posterior wall of rectum	Rectal polyp	JP
3	F	5.5	1 m†	1.8x1.3 cm polyp on posterior wall of rectum	Rectal polyp	JP
4	M	7.0	2 w	0.8x0.6 cm polyp in mid-rectum	Rectal polyp	JP
10	M	6.0	3 w	No finding	Flat sessile polyp less than 0.5 cm	JP
11	M	0.7	1 m	No finding	Multiple hyperplastic polyps in ascending colon	NA
12	M	5.5	2 w	No finding	Multiple small ulcers from caecum to descending colon	NSI
13	M	5.0	1 w	No finding	Proctitis	NSI
14	F	10.0	1 m	No finding	No finding	NA
15	M	5.4	5 y	Enlarged rectum	Anal fissure	NA
16	M	2.0	1.5 y	Small polyp 0.5x0.5 cm in descending colon	No finding	NA
17	M	5.0	2 w	0.8 cm polyp with hazy margins in mid-rectum	Pseudomembranous colitis, colonic ulcers, rectal pseudopolyps	NSI

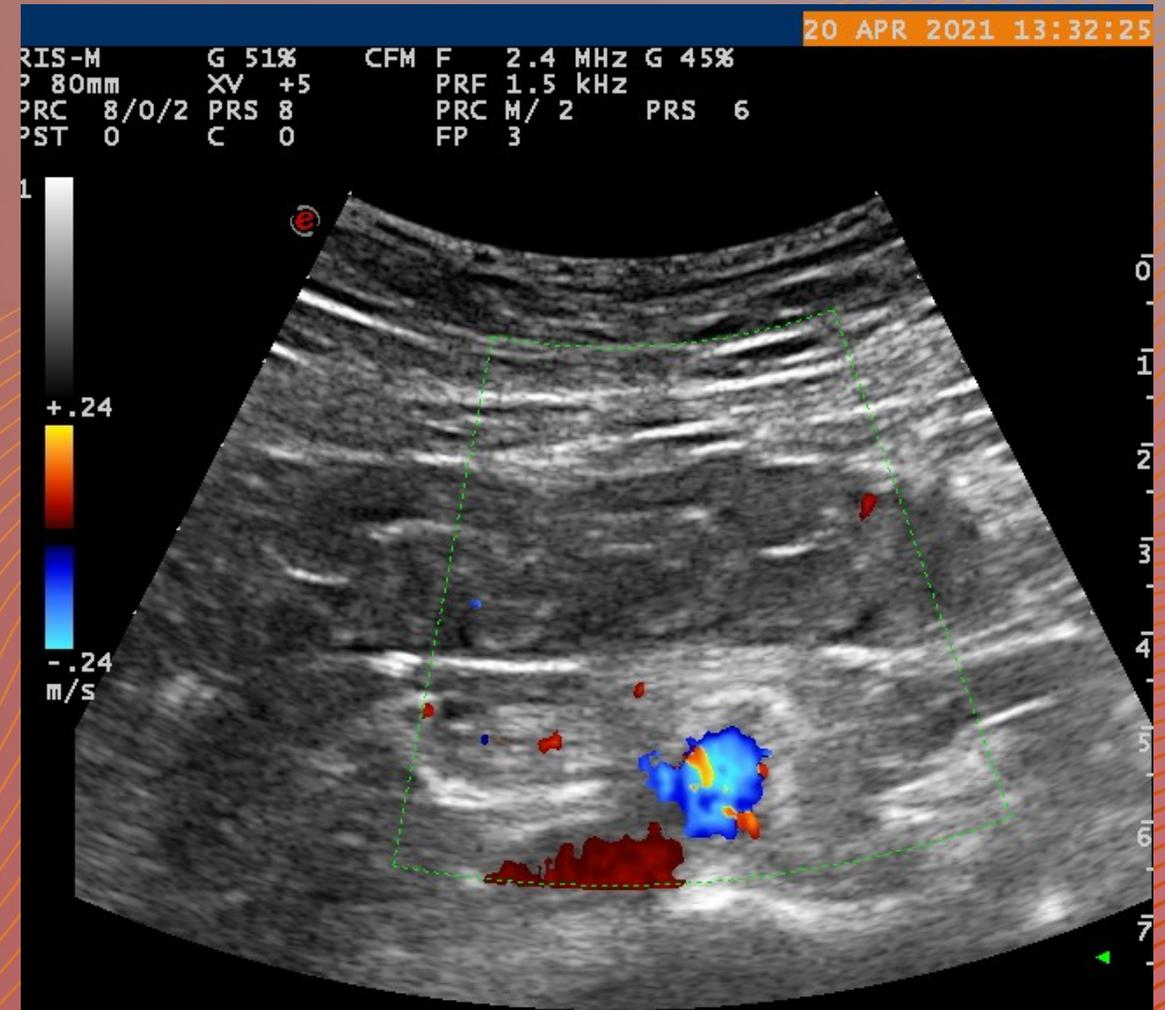
“Ultrasound identified 11 polyps in 10 patients, missing two patients with small polyps less than 0,5 cm in diameter”.

Solitary juvenile colonic polyps



Female, 69 yr

Abdominal pain, rectal bleeding, diarrhea (recent onset)



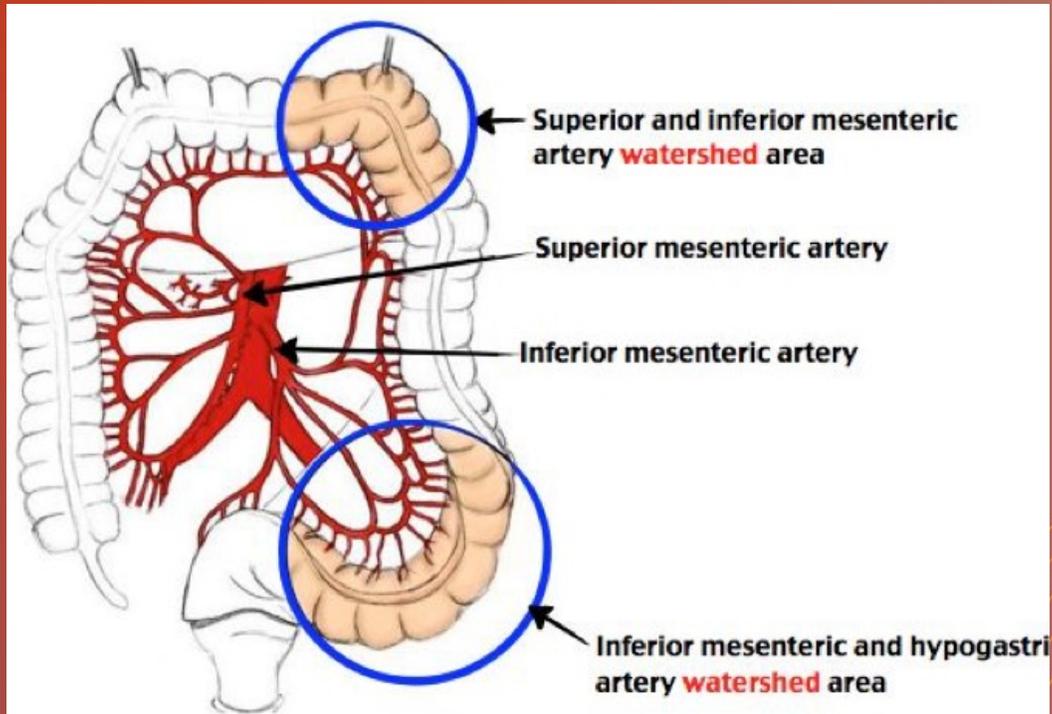


Female, 69 yr
Abdominal pain, rectal bleeding



Ischemic colitis

Ischemic colitis



Global Low Flow States

- Heart failure
- Myocardial infarction
- Sepsis
- Hemorrhage



1: 2000 visits at ED

Clinic: advanced age, sudden pain, diarrhea / hematochezia

Self-limiting alterations if absence of transmural necrosis

Long thickened section > 10 cm

Most frequent site: splenic flexure descending and sigmoid c.

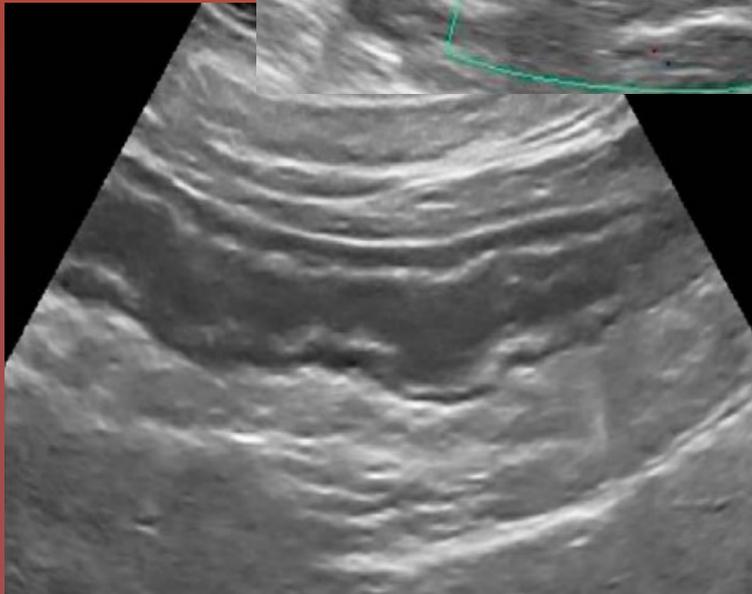
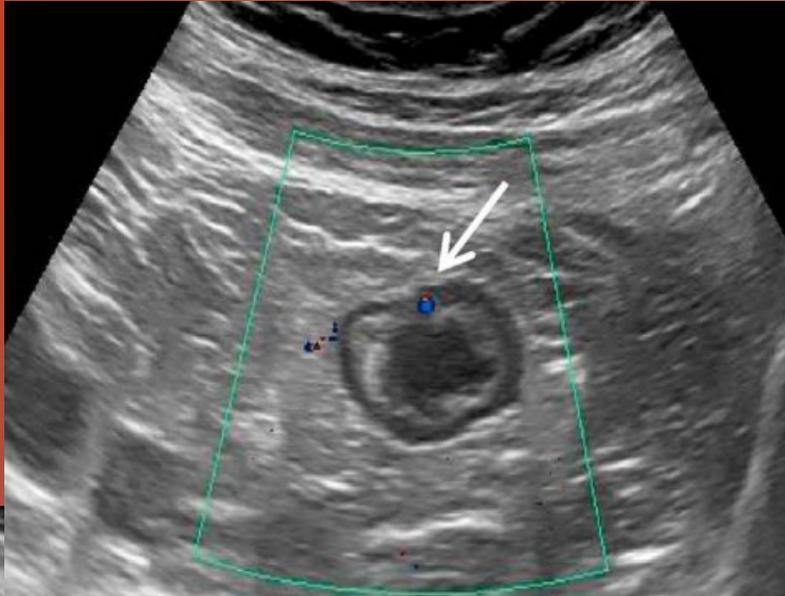
Circumferential hypoechoic thickening

Variable loss of ecostratification

Clear transition between thickened and normal intestinal tract

No or reduced blood flow on color Doppler

Ischemic colitis



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Circumferential hypoechoic thickening

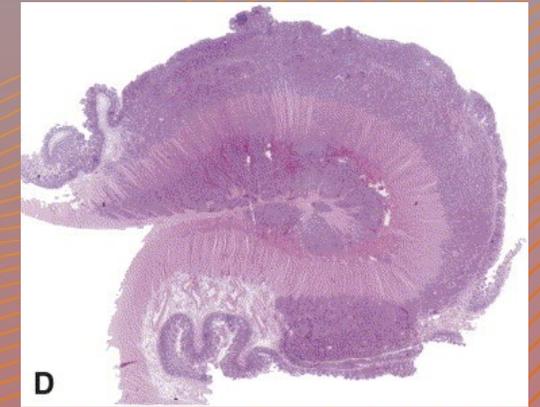
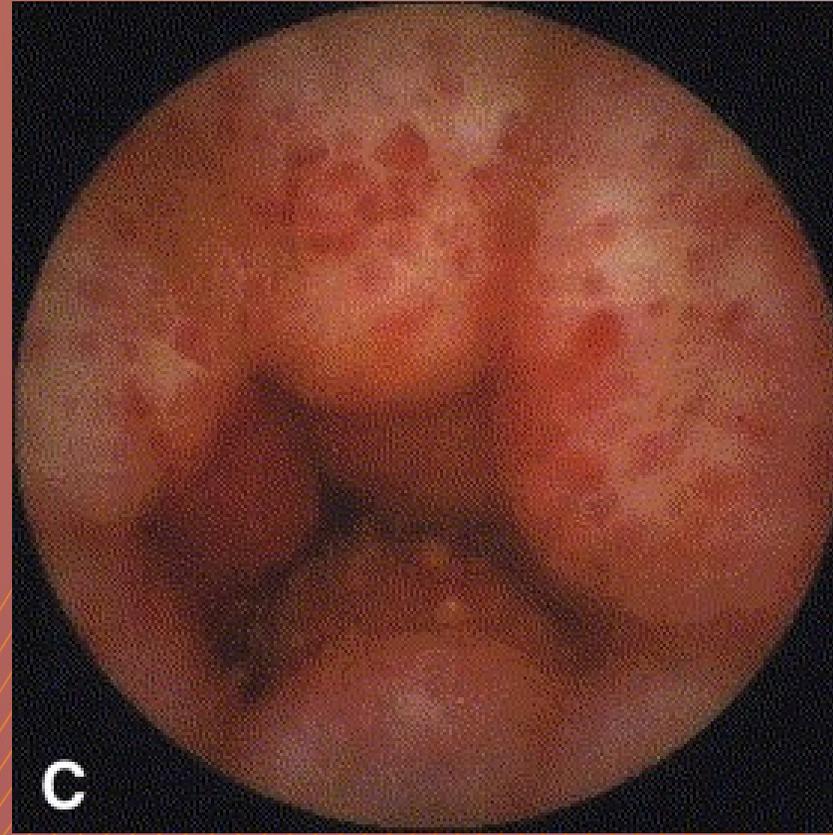
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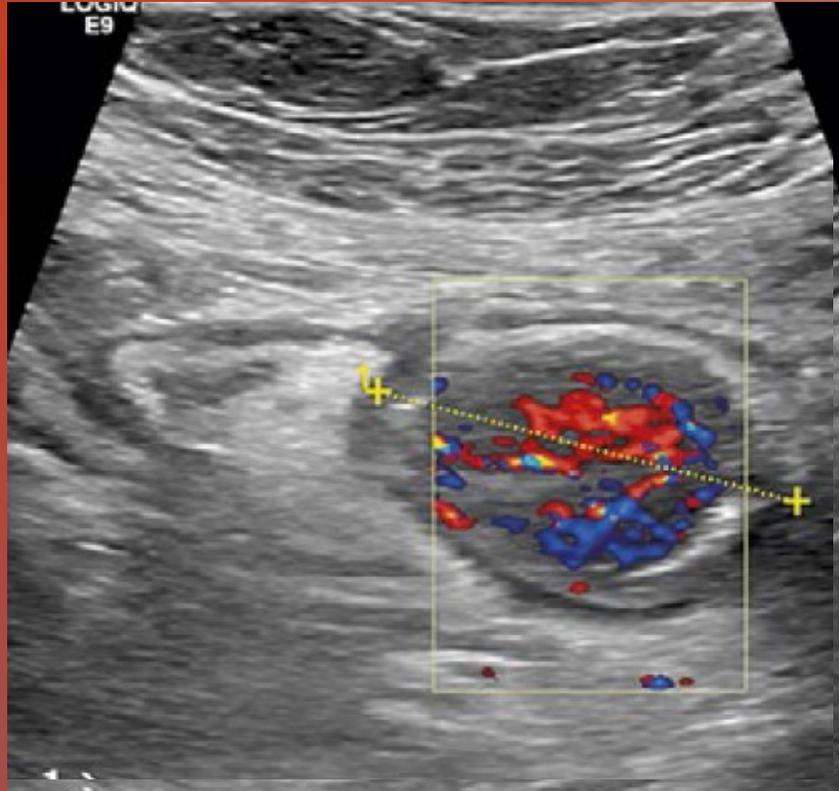


Female, 46 yr
Intermittent abdominal pain

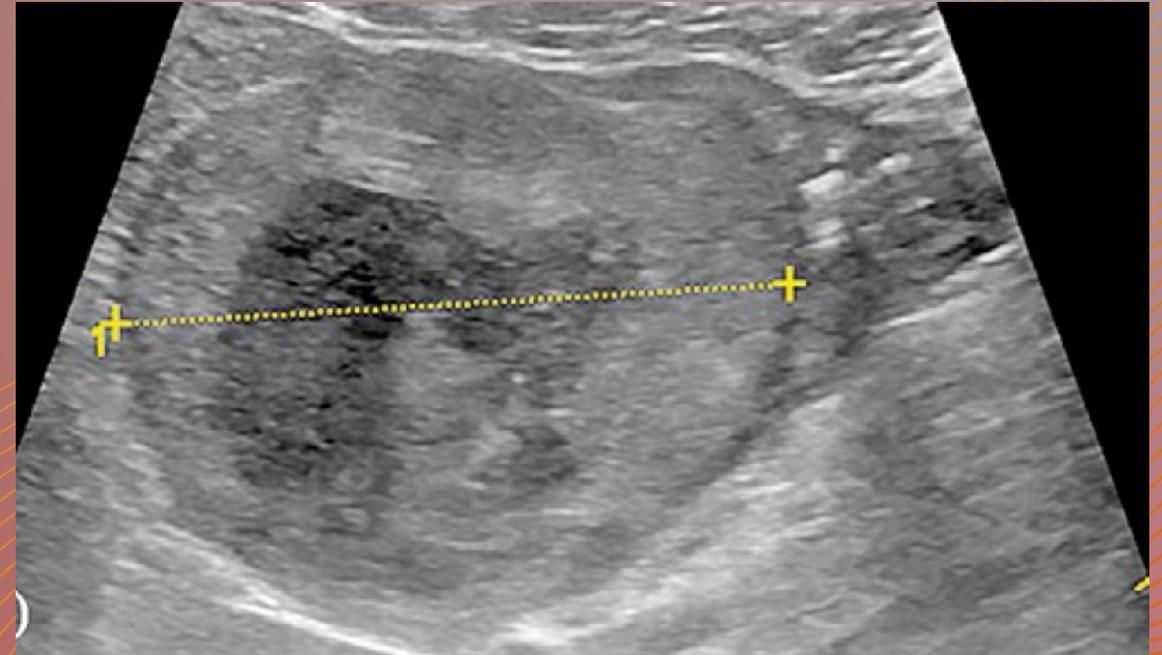


Carcinoid

NETs and GISTs

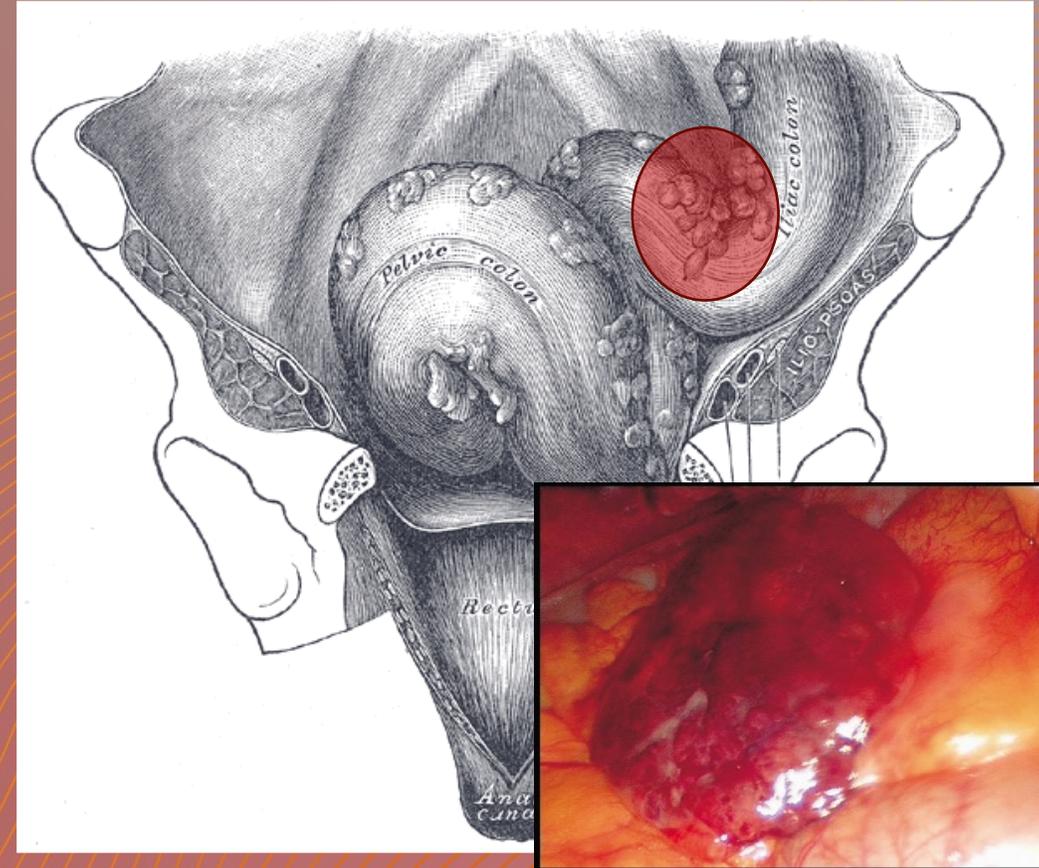


- Nodular submucosa protuberances
- Predominantly intraluminal
- Well defined, roundish or oval lesions
- Hypoechoic and hypervascularised



- Well delineated margins
- Hypoechoic masses from the muscularis
- Hypervascularised

Female 33
Acute abdominal pain



Epiploic appendagitis

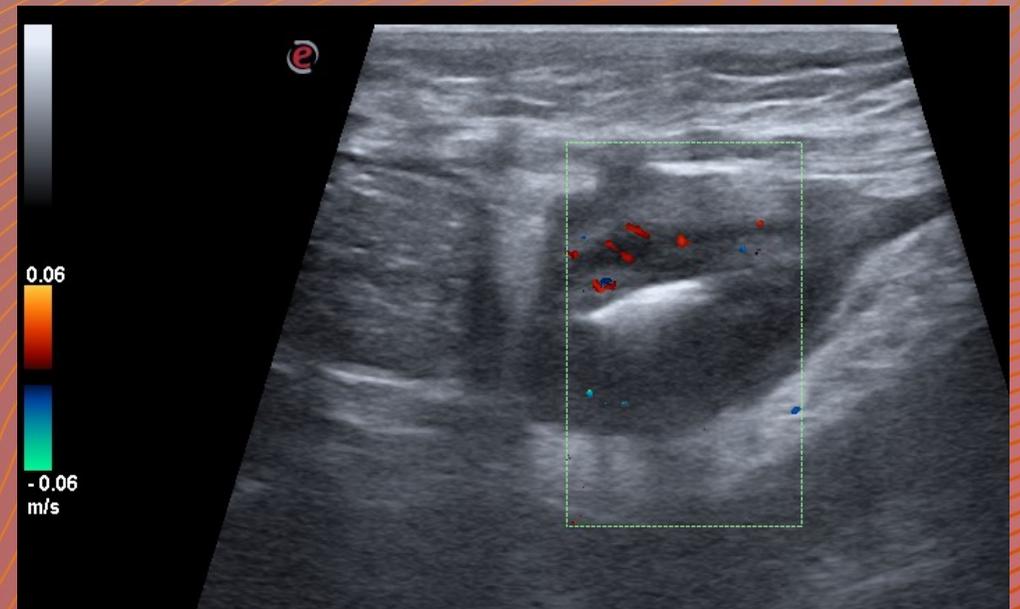


Female, 67 yr

Mild recurrent abdominal pain, fatigue and diarrhea



Bowel wall thickening in lymphoma is typically transmural, hypoechoic, with loss of wall layers, and with nearby mesenteric lymphadenopathy. Consensus levels of agreement A+: 18/20; A-: 2/20



Small bowel lymphoma

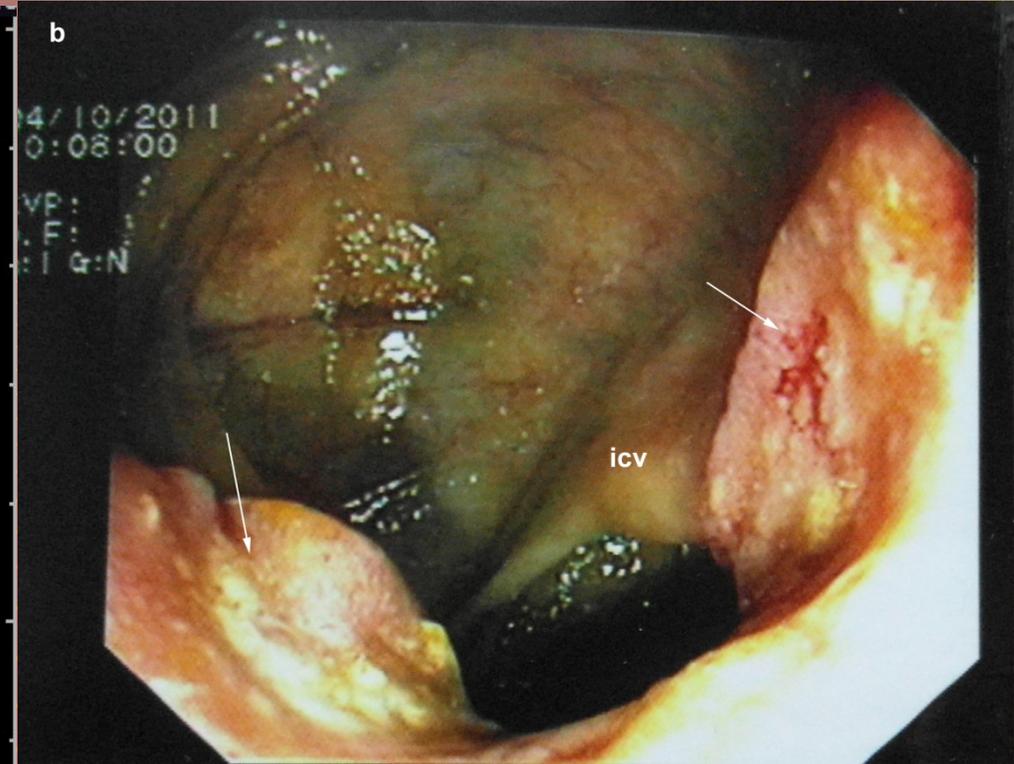
71 yo woman, left sided UC since 10 yrs

Fatigue and weight loss. Anemia

Last colonoscopy 1 yr before (not complete): remission

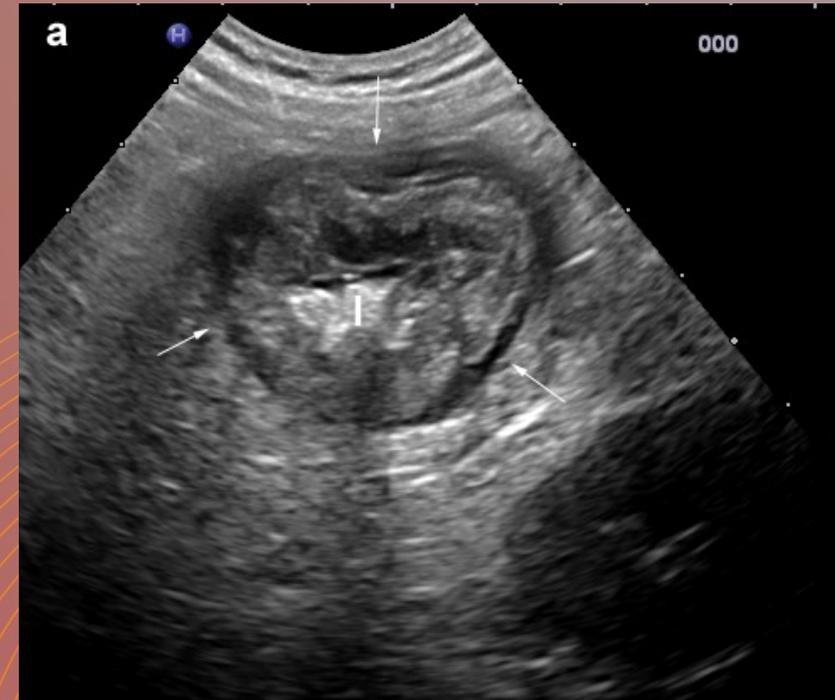


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Adenocarcinoma

Adenocarcinoma



Adenocarcinomas of the small intestine are characterized by hypoechoic segmental irregular thickening of the bowel wall (pseudokidney sign/target lesion). Consensus levels of agreement A+: 19/20; A-: 1/20

Male, 53 yr. Ileal Crohn's disease
Long standing clinical remission

**Polyp of the
sigmoid colon**



Polyps and adenocarcinoma of the colon

TABLE 4: Sensitivity and Specificity of Hydrocolonic Sonography in Detecting Polyps and Neoplastic Lesions in Adults

Study	No. of Patients	Patients With Polyps			Patients With Cancer				
		Sensitivity (TP / TP + FN)	Specificity (TN / TN + FP)	No. of Polyps \geq 7 mm ^a	Sensitivity (TP / TP + FN)	Specificity (TN / TN + FP)	T Stage ^b (TP / TP + FN)	N Stage ^b (TP / TP + FN)	No. of T3 or T4
Limberg [54]	300	41/54 (75.9)	246/246 (100)	42 (77.8)	28/29 (96.6)	271/271 (100)	23/28 (82.1)	NE	25 (85.7)
Chui et al. [57]	52	2/29 (6.9)	18/23 (78.3)	8 (27.6)	0/4 (0)	43/48 (89.6)	NE	NE	NE
Hernández-Socorro et al. [55]	104	NE	NE	NE	39/40 (97.5)	63/64 (98.4)	38/39 (97.4)	32/39 (82.0)	37 (92.5)
Dixit et al. [56]	100	2/2 (100)	NE	2 (100)	15/16 (93.8)	NE	NE	NE	12 (75.0)
Chung et al. [58]	17	NE	NE	NE	NE	NE	15/17 (88.2)	4/8 (50.0)	15 (88.2)
Düx et al. [26]	60	NE	NE	NE	24/34 (70.6)	NE	23/33 (70.0)	7/28 (25.0)	23 (69.7)
Segura et al. [59]	155	15/19 (78.9)	132/136 (97.1)	19 (100)	46/50 (92)	103/105 (98.2)	NE	NE	NE
Walter et al. [60]	100	NE	NE	NE	NE (83.0)	NE	NE	NE	NE
Elewaut and Afschrift [61]	106	9/12 (75.0)	91/94 (96.8)	NE	5/5 (100)	101/101 (100)	5/5 (100)	NE	5 (100)
Candia et al. [62]	120	40/50 (80.0)	70/70 (100)	40 (80.0)	31/32 (96.8)	88/88 (100)	NE	NE	NE
Hirooka et al. [63] ^c	56	8/13 (61.5)	NE	4 (30.8)	4/4 (100)	NE	NE	NE	NE
Overall	1,170	117/179 (65.4)	557/569 (97.9)	115 (64.2)	192/214 (89.7)	669/677 (98.8)	104/122 (85.2)	43/75 (57.3)	117 (83.6)

Note—Numbers in parentheses are percentages. NE = not evaluated, TP = true-positive, TN = true-negative, FP = false-positive, FN = false-negative.

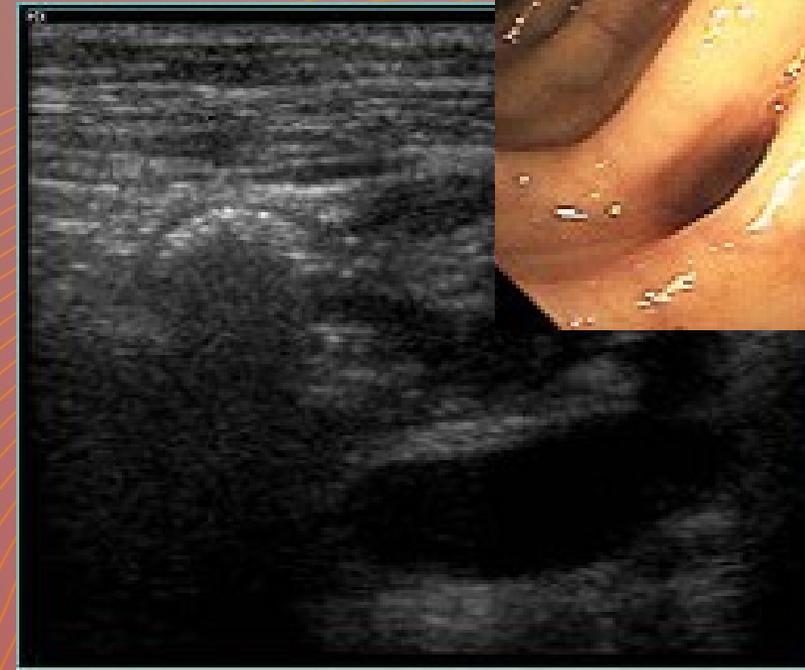
^aNo. of polyps \geq 7 mm / all polyps.

^bStage correctly assessed by sonography / all cancers staged by histology.

^cSonographic enterocolonography with orally administered contrast material.



Male, 57 yr
Abdominal pain, altered bowel habit



Diverticular disease of the colon

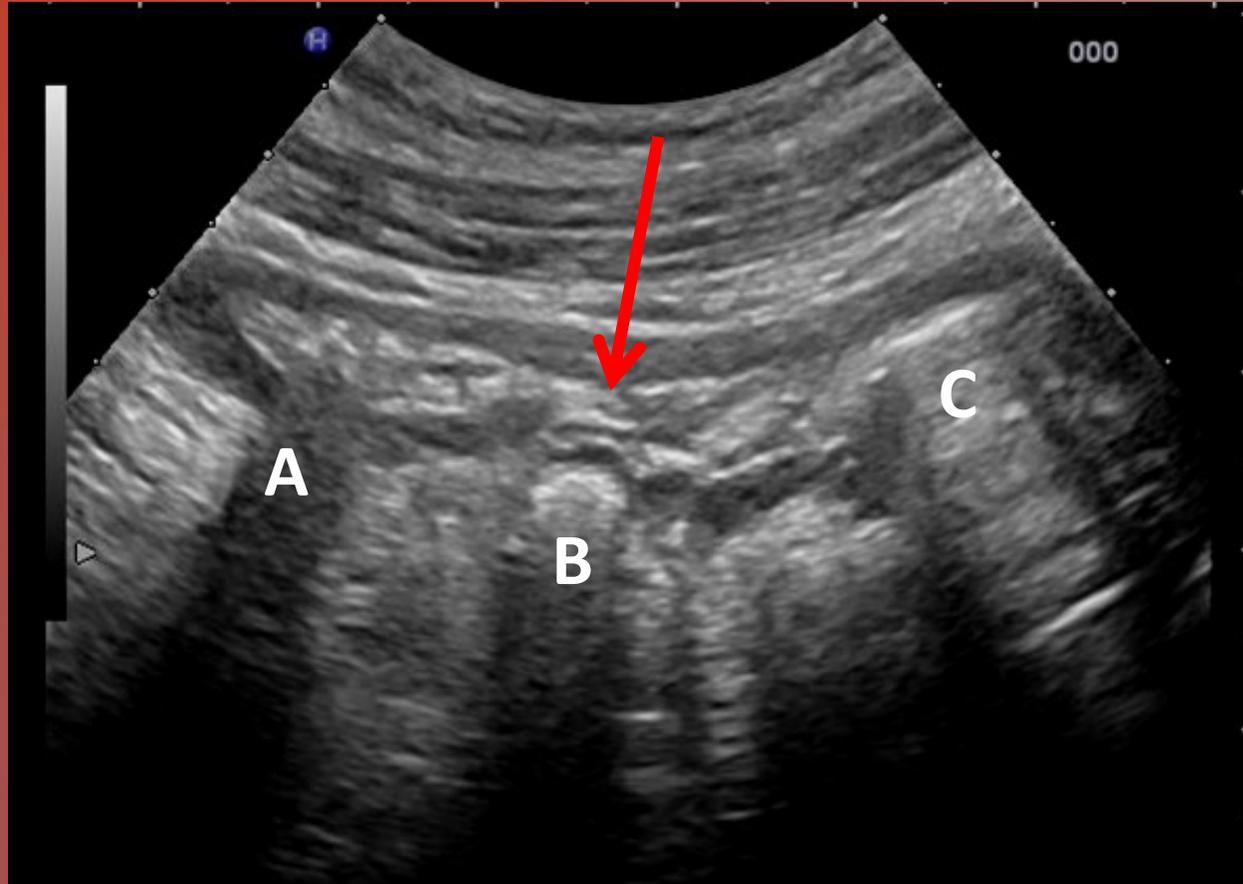
Diverticular disease of the colon



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Diverticular disease of the colon



Left sided diverticulosis

Colonoscopy (reference standard)

Prospective study - 60 patients

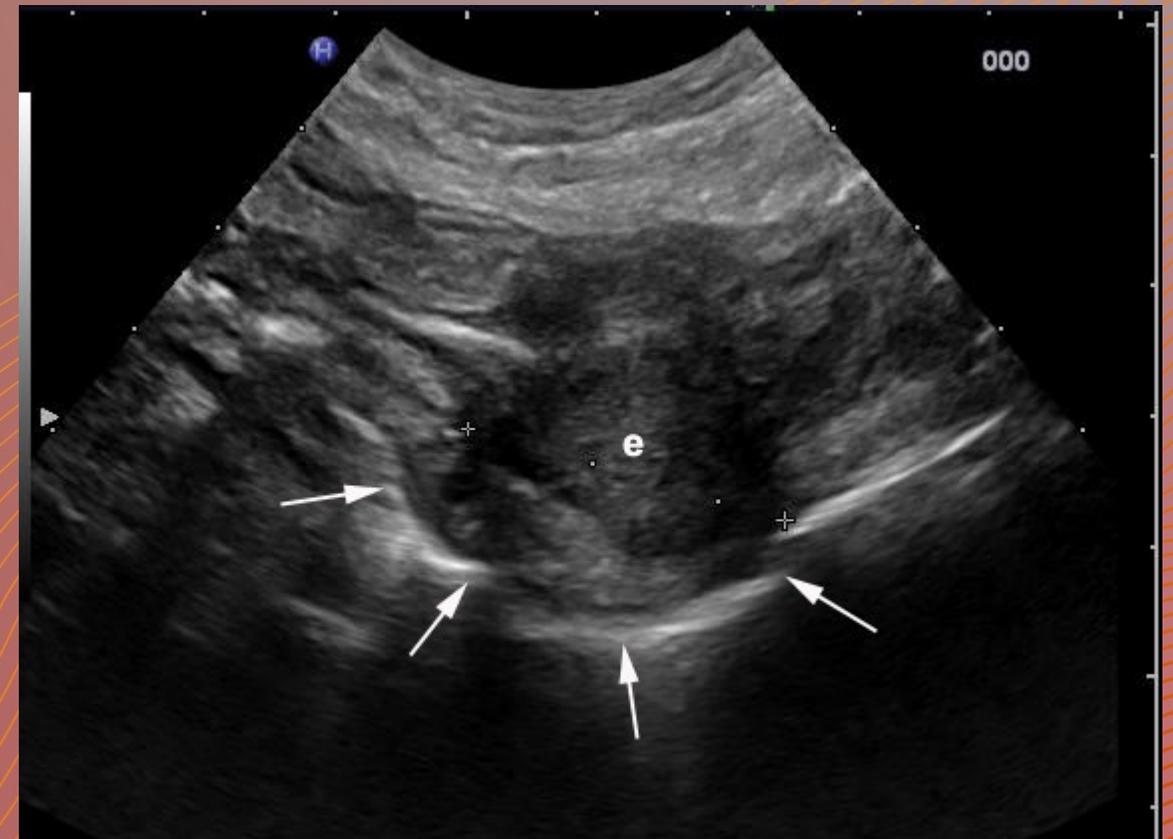
True positive US: 28/33
(sensitivity: **85%**)

True negative US: 25/27
(specificity: **93%**)

Average maximum colonic
wall thickness: **3.3mm**



Female, 37 yr Recurrent abdominal pain



Endometriosis



Female, 28 yr

Occasional finding in ulcerative colitis

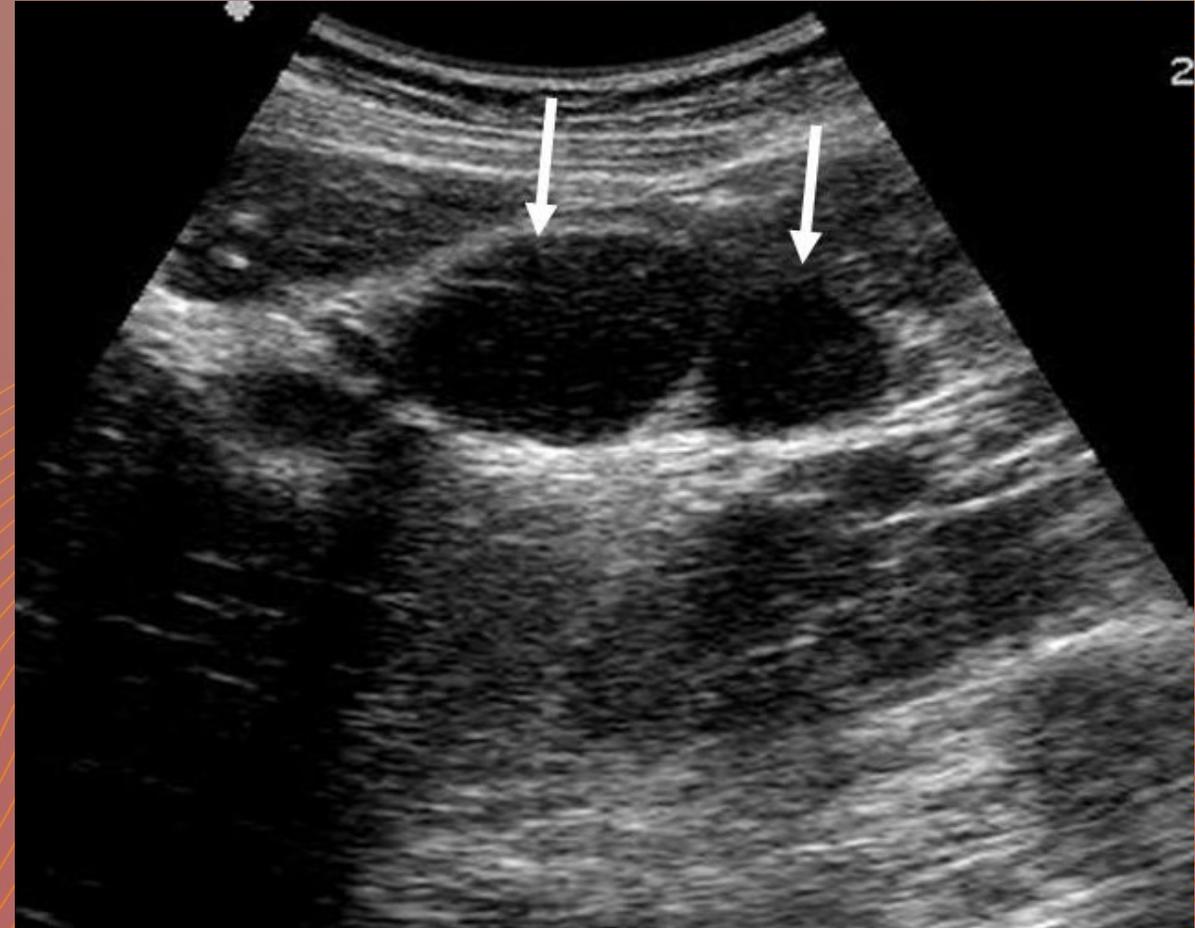


Appendiceal mucocoele

Female 17, Indian origin
Fever, abdominal pain and diarrhea

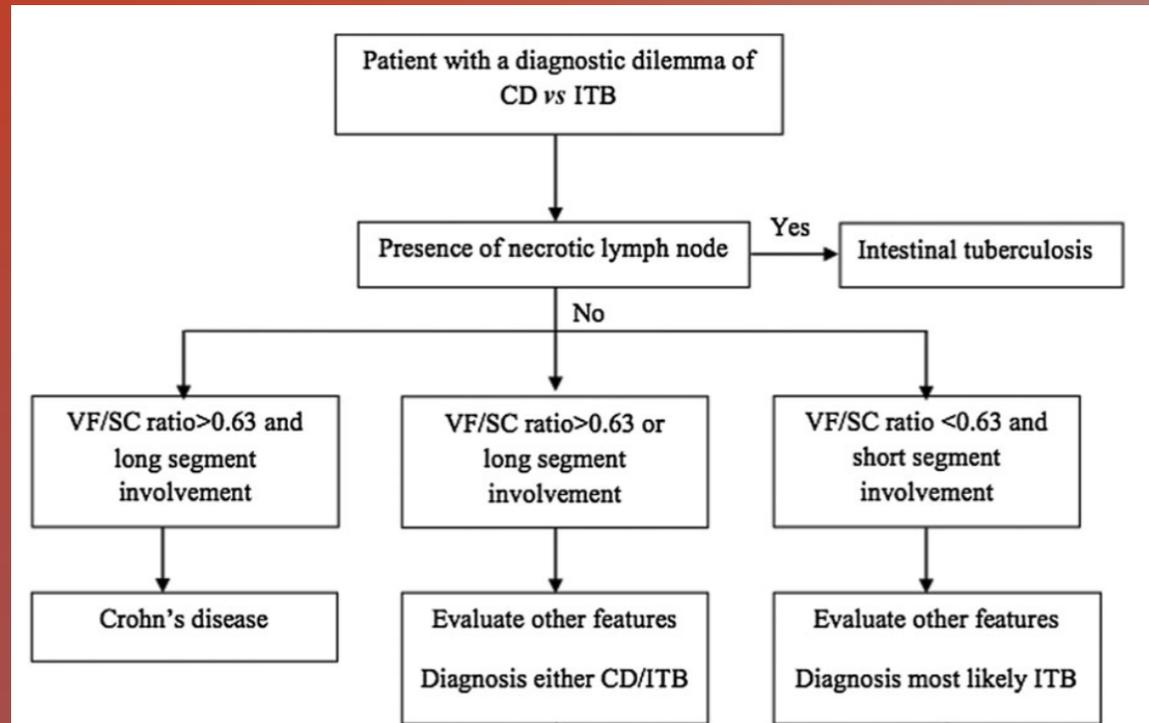


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Intestinal tuberculosis

Intestinal tuberculosis



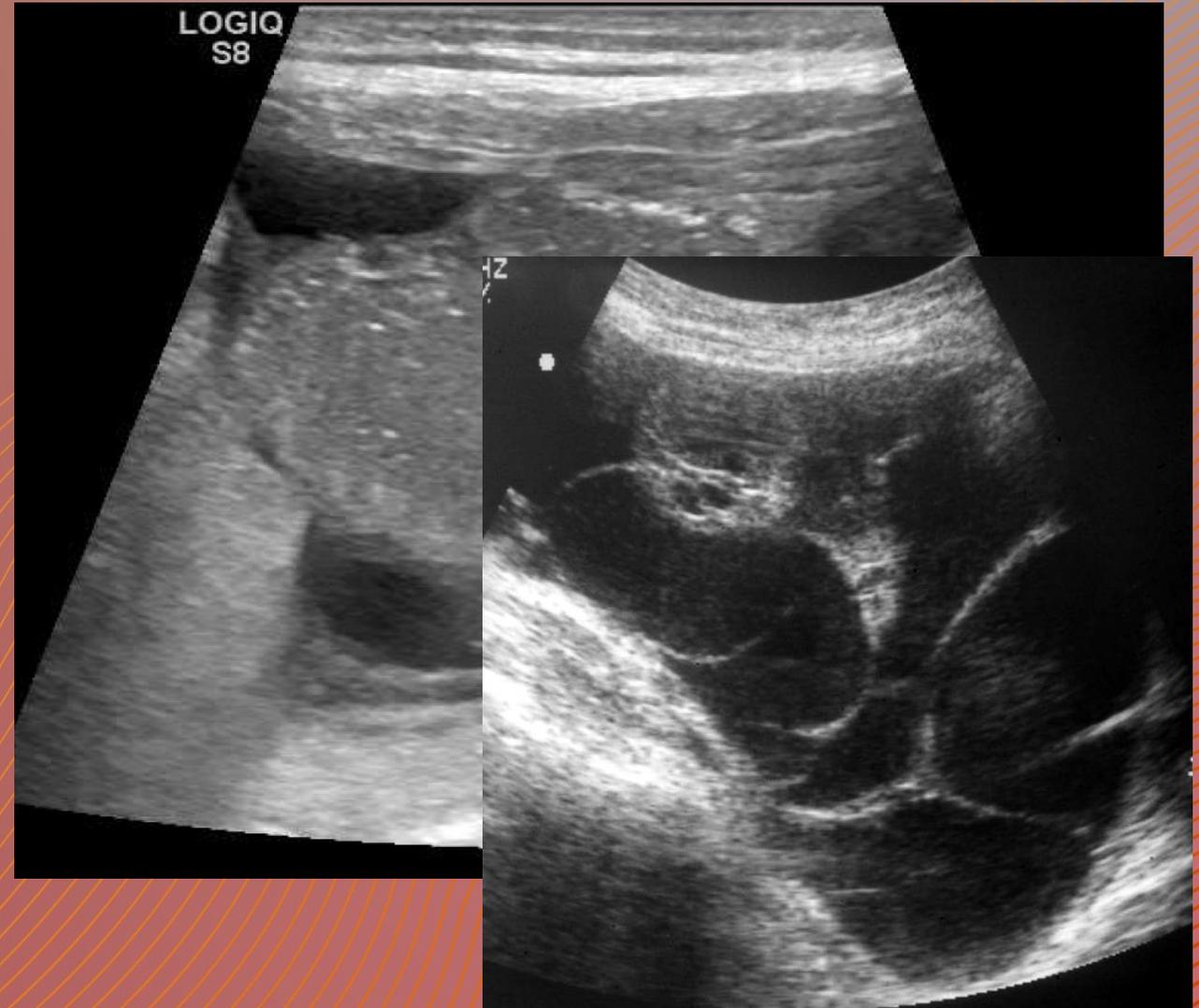
visceral to subcutaneous fat ratio on CT

Necrotic lymph nodes are exclusive for ITB,
Combination of long segment involvement and VF/SC ratio > 0.63 is exclusive for CD

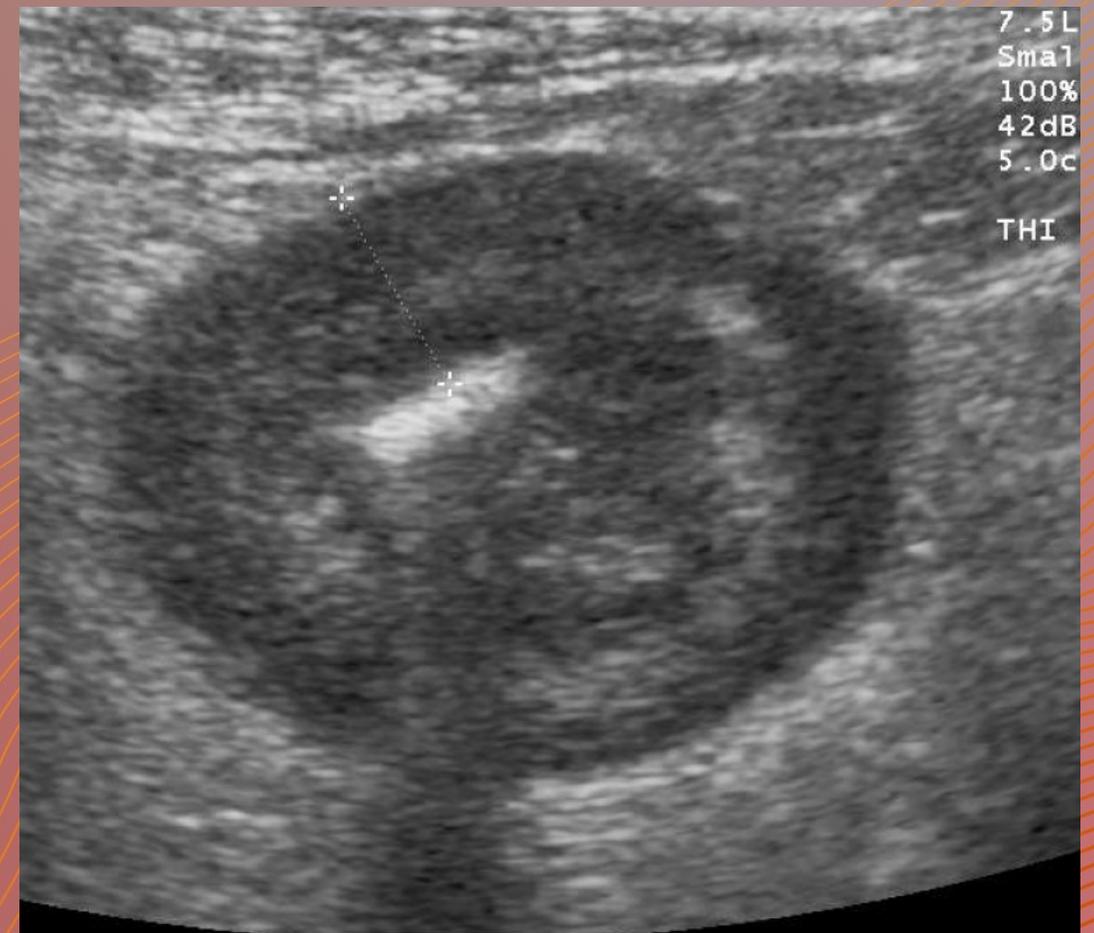


Intestinal tuberculosis

- **Mainly ileo-cecal region**
(It can affect all the gut)
- **Thickening of the walls**
- **Enlarged lymph-nodes**
- **Thickening of the peritoneum**
- **Ascites**

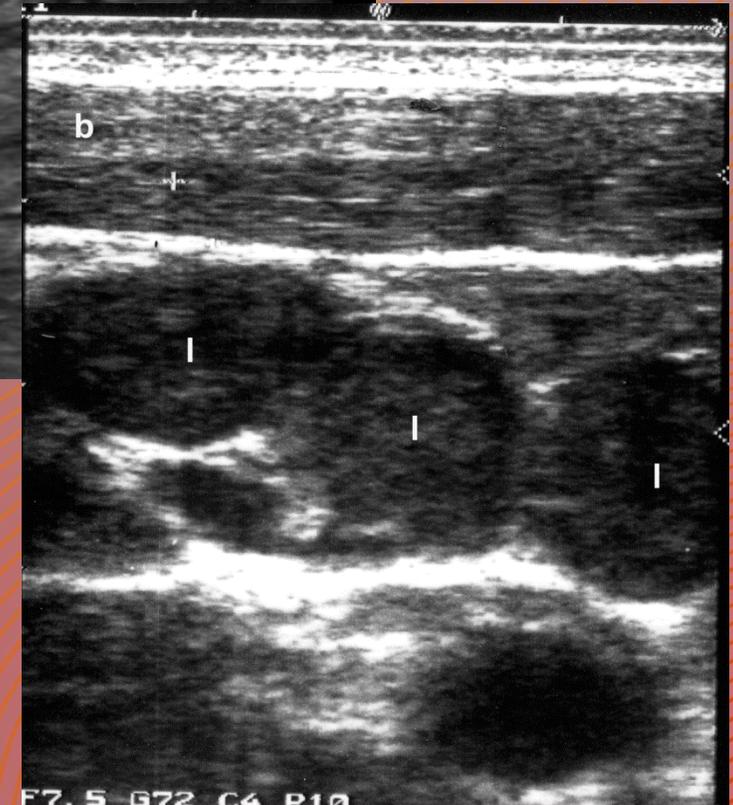
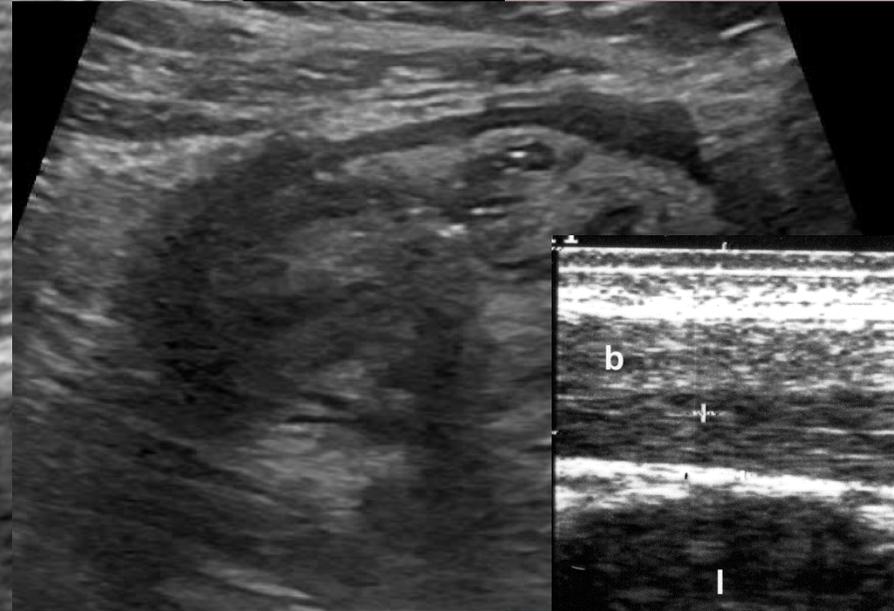
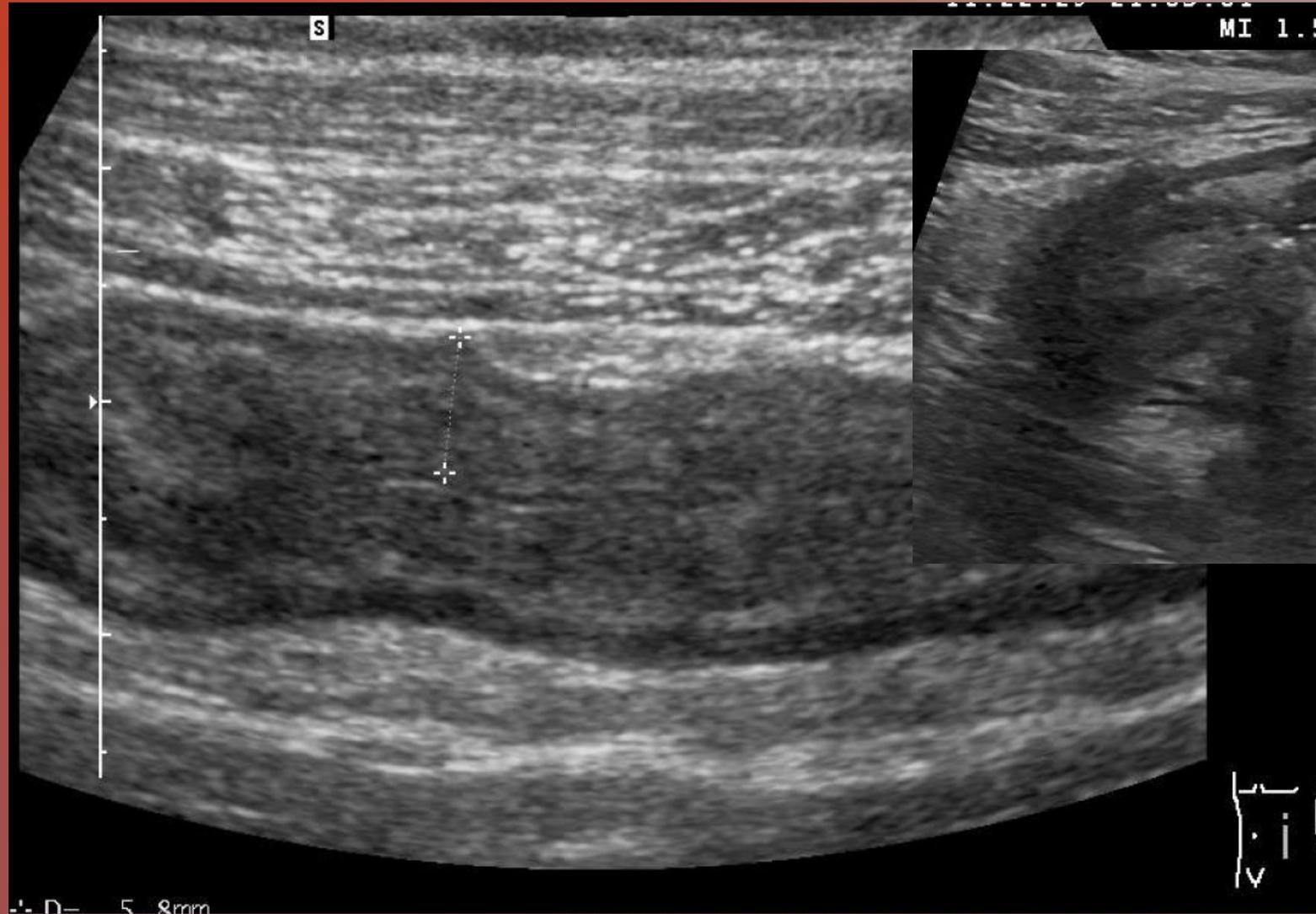


Male 19
Acute diarrhea, abdominal pain and fever

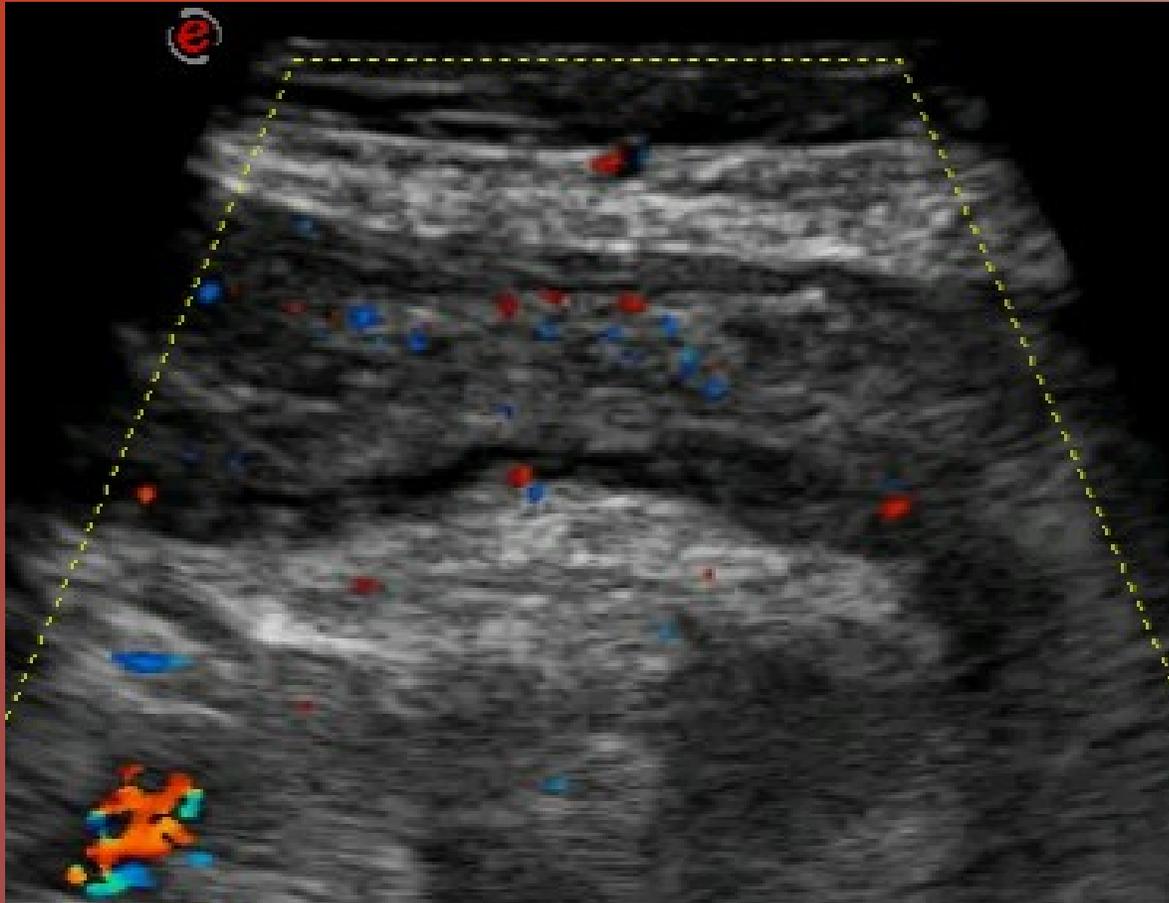


Bacterial enteritidis (Campylobacter colitis)

Bacterial enteritidis (Salmonella)

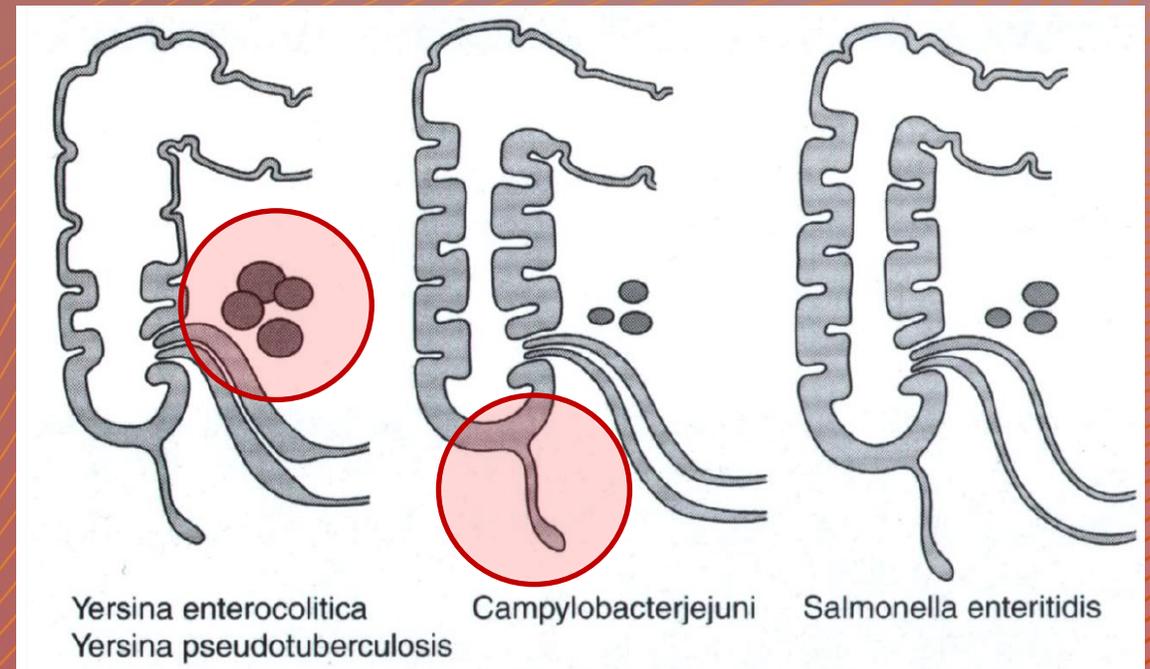


Bacterial enteritidis (Yersinia spp)



Bacterial enteritides

- Salmonella enteritidis
- Yersinia enterocolitica / paratuberculosis
- Campylobacter jejuni

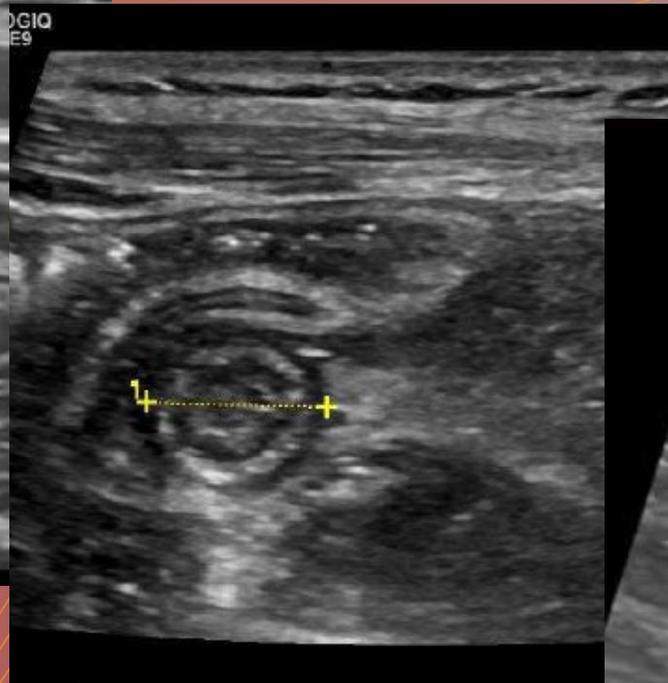
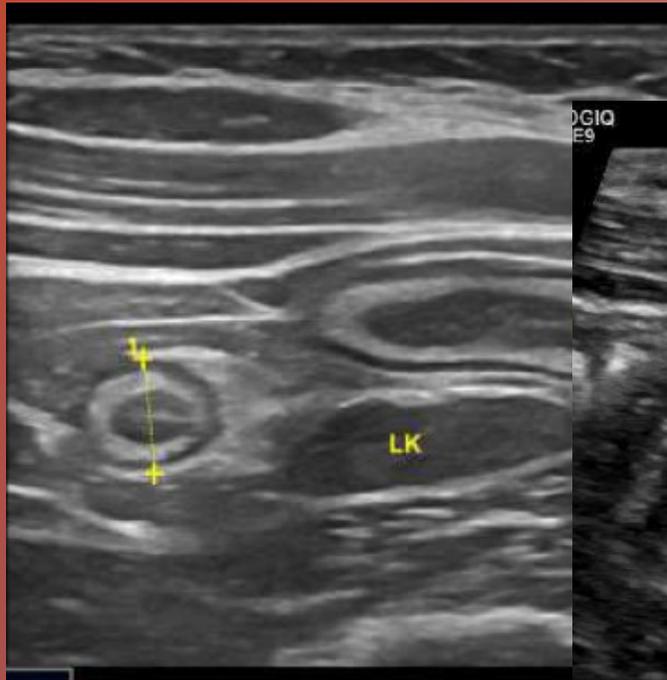


Bacterial enteritides

Acute appendicitis

Bacterial Enterocolitis

Crohn's disease



Male 69
Diarrhea, fever and abdominal pain



Pseudomembranous colitis

“Accordion sign”

Male 19
Acute abdominal pain and fever



Vascular diseases

Mesenteric vasculitis

Behcet's disease

Schoenlein-Henoch purpura

Kawasaki disease

Polyarteritis nodosa

Schoenlein-Henoch purpura

Male 53

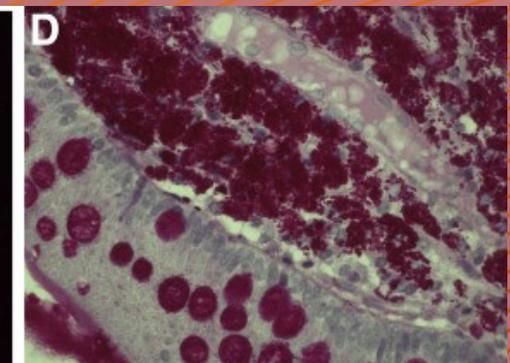
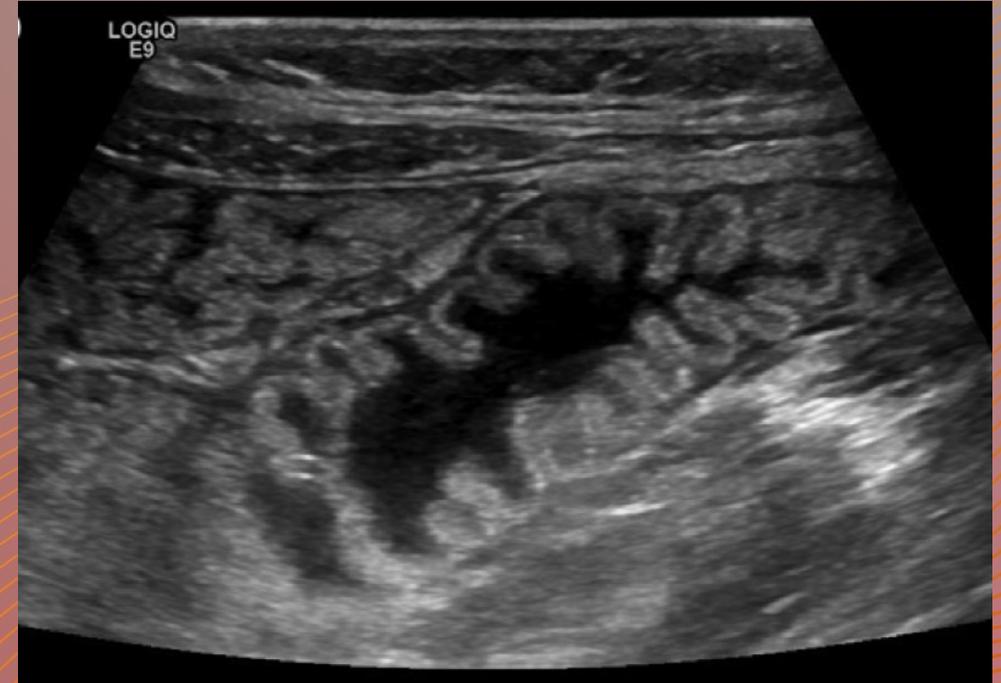
Abdominal pain, chronic diarrhoea and joint pain



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Left upper quadrant



Whipple disease

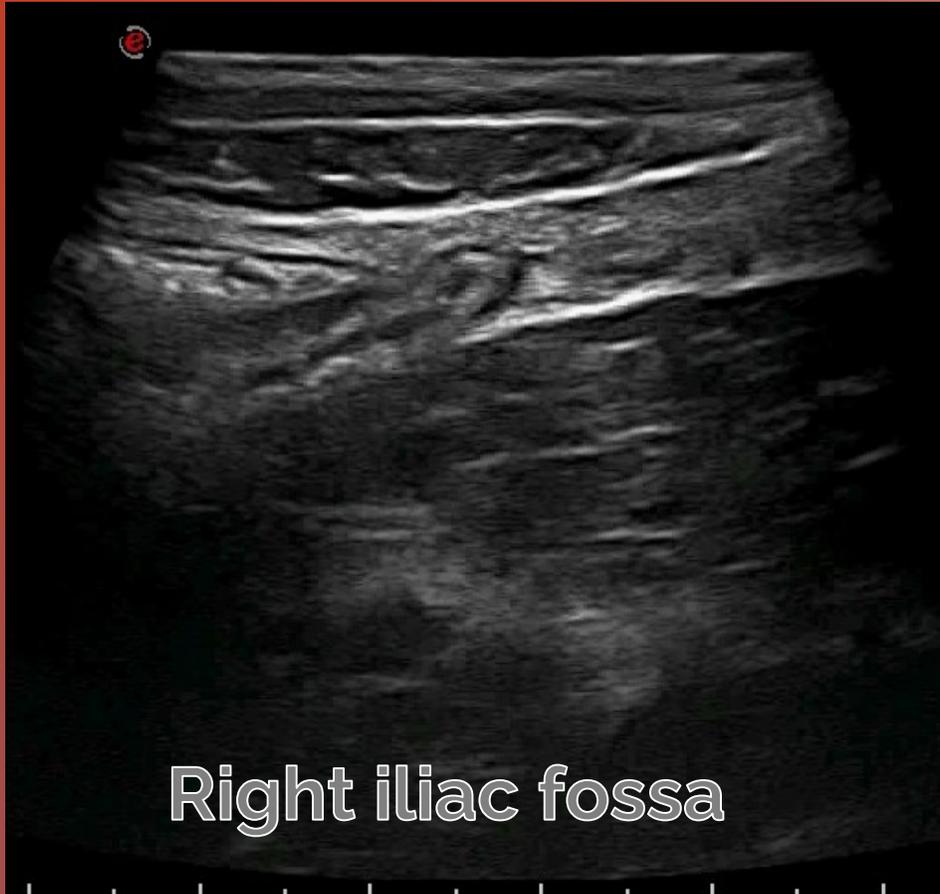
Female 67
Chronic watery diarrhoea. PPI treatment



Microscopic colitis

Male 28

Acute abdominal pain and fever



Acute appendicitis

Structural features

- Bowel thickening: ≥ 3 mm
- Diameter: ≥ 7 mm (< 6 if perforated)
- Echopattern: stratified- hypoechoic (necrosis)
- Increased vascularization at color Doppler
- Anchoic content sometimes with appendicolits
- Regular profiles
- Not compressible, no peristalsis

Site

- Right iliaca fossa/ abdomen
- Pain at compression

Extraintestinal features

- Hypertrophy of the mesentere
- Lymph nodes
- Abscesses

Acute appendicitis

US features	Univariate Analysis	Multivariate Analysis
Completely visualised appendix	2.2 (0.8–6.1)	
Transducer tenderness	4.4 (1.3–15.6)	4.7 (1.7–13.0)
Thickened appendix	6.6 (1.9–23.4)	9.4 (3.6–24.4)
Non-compressible appendix	0.8 (0.2–3.3)	
Appendicolith	2.6 (0.5–12.4)	
Hypervascularity of the appendix	1.1 (0.3–4.4)	
Peri-appendiceal fluid	0.9 (0.3–3.0)	
Peri-appendiceal fat infiltration	3.1 (1.2–7.5)	3.2 (1.4–7.4)



Male 65
Acute abdominal pain

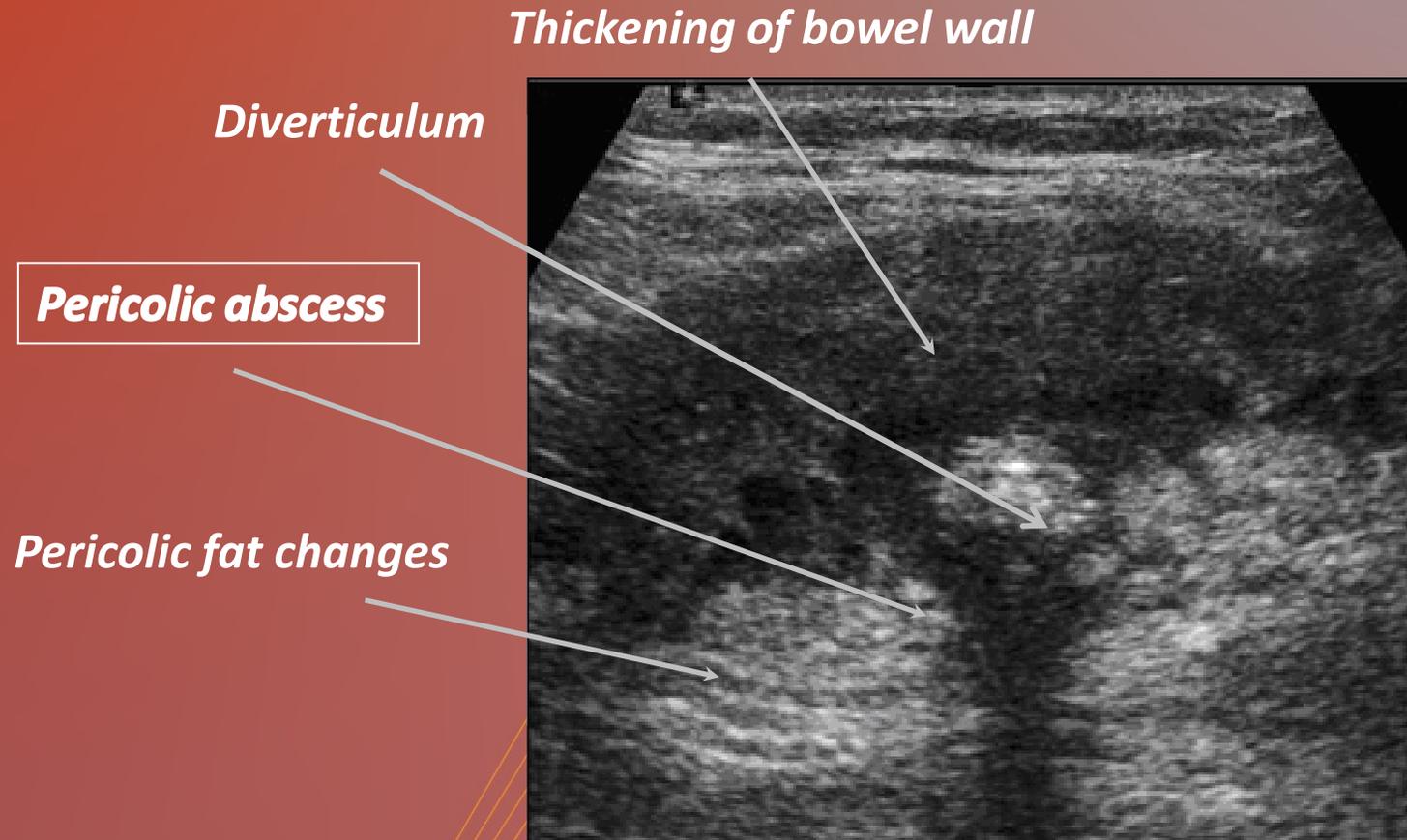


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Acute diverticulitis

Acute diverticulitis



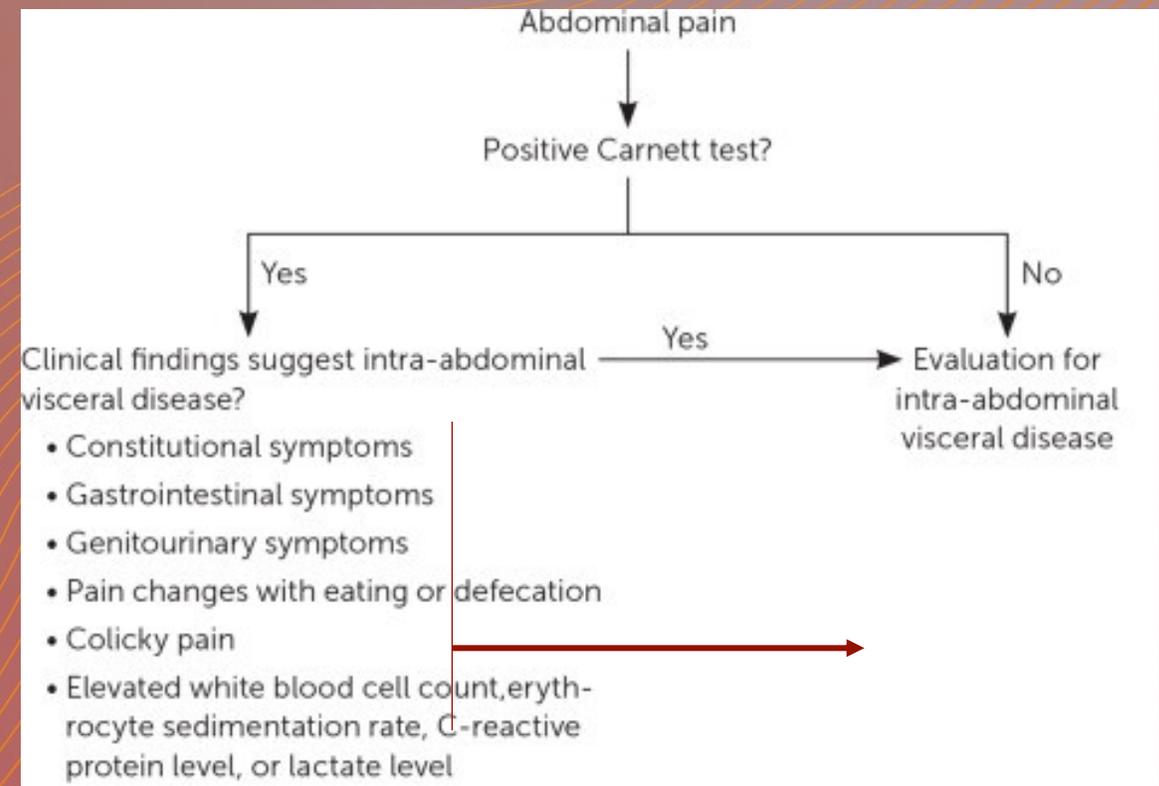
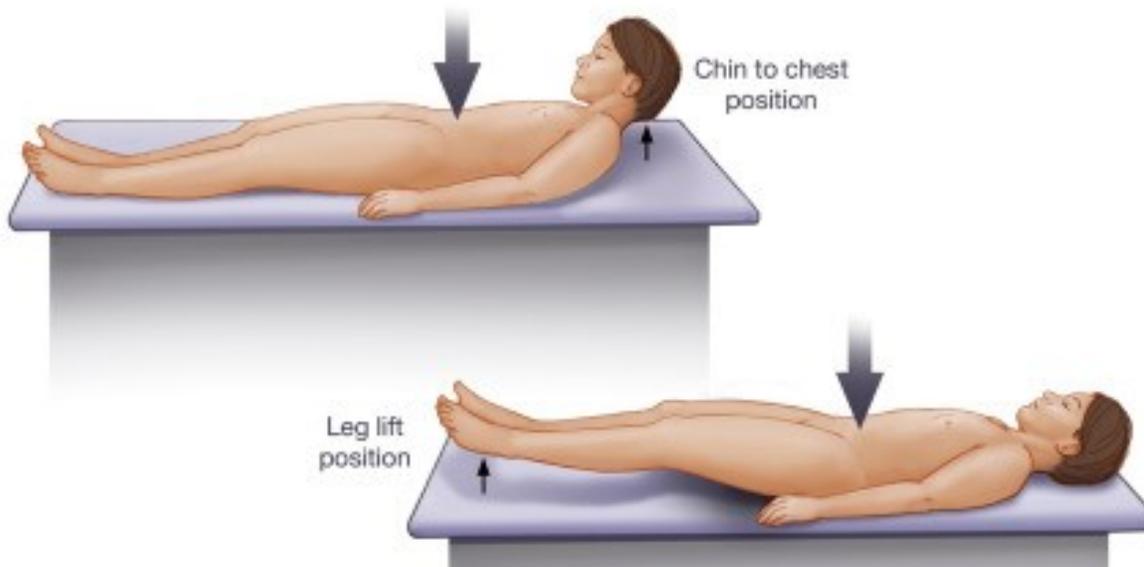


Abdominal pain

Is it of intra-abdominal visceral origin ?

Carnett's Sign

1. Palpate site during flexed abdomen
2. If increased pain, source is likely abdominal wall
3. If no increased pain, source is likely visceral



Abdominal pain

Is it of intra-abdominal visceral origin ?

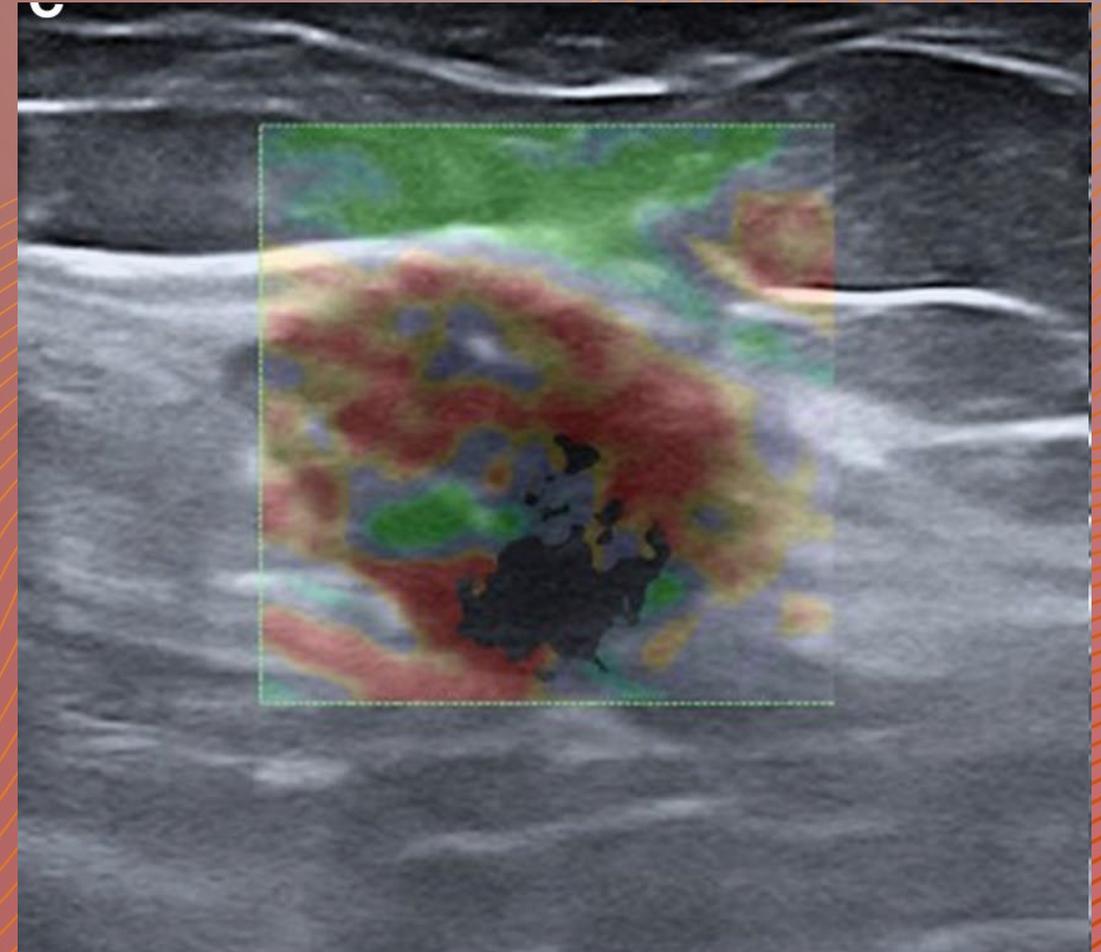
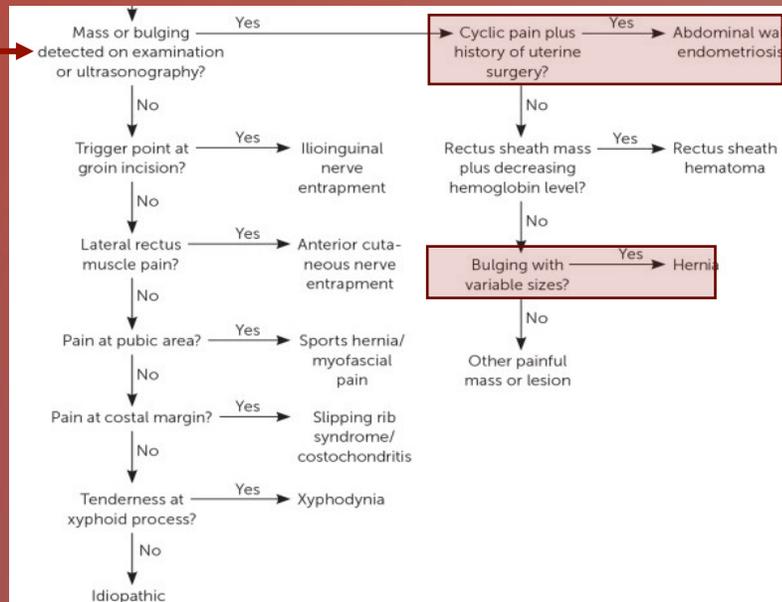
Journal of Ultrasound (2020) 23:265–278
<https://doi.org/10.1007/s40477-020-00435-0>

REVIEW PAPER



Abdominal wall sonography: a pictorial review

Ferdinando Draghi¹ · Giulio Cocco² · Filippo Maria Richelmi¹ · Cosima Schiavone²





Abdominal pain

Is it of intra-abdominal visceral origin ?

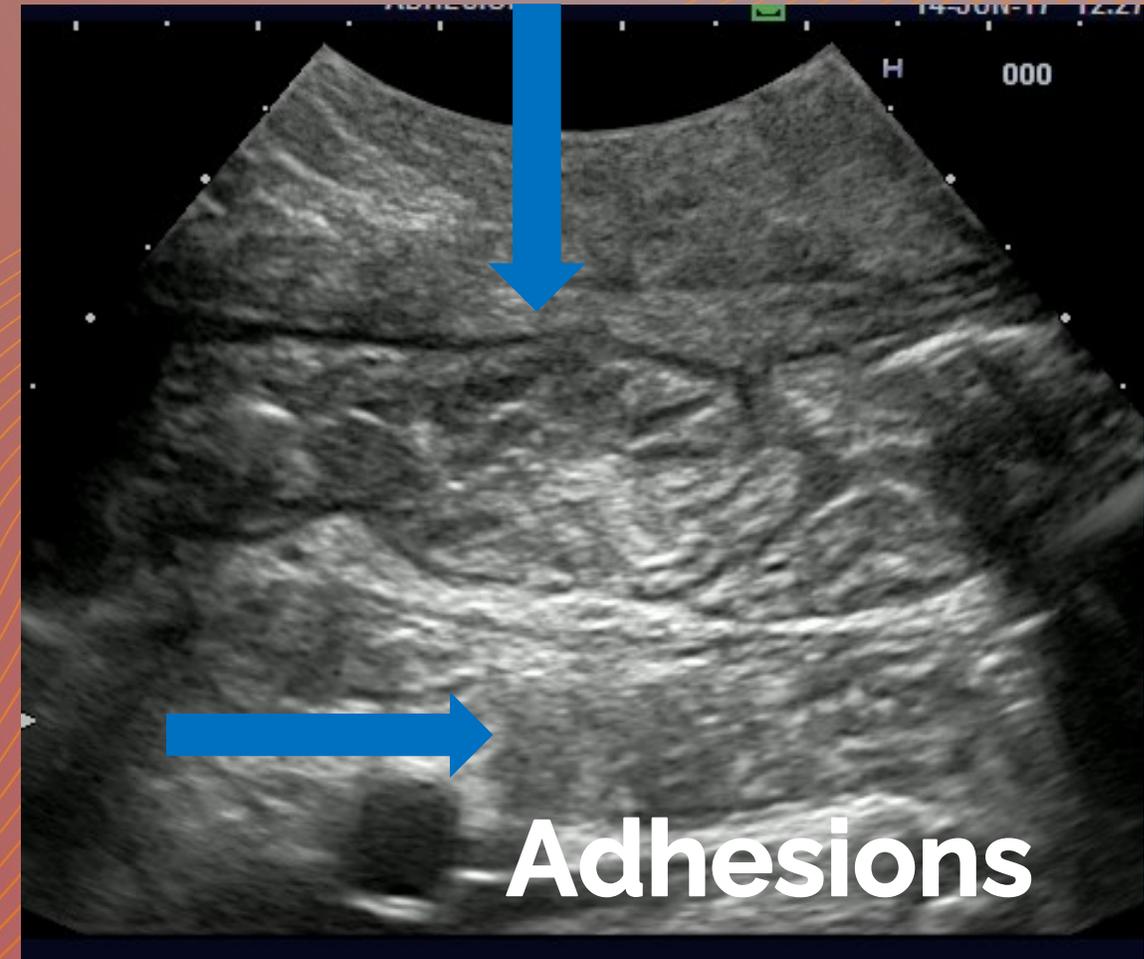
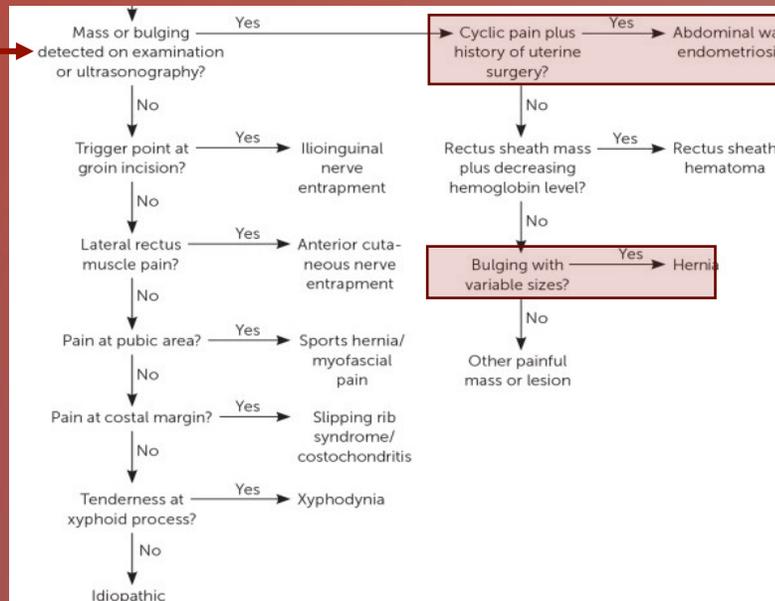
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REVIEW PAPER

Check for updates

Abdominal wall sonography: a pictorial review

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Take home message

- IUS is indicated to investigate intestinal symptoms that mimic IBD and some findings may speed up the diagnostic work up
- Symptoms in IBD may be due to other diseases that are easily detectable by IUS
- IUS may find incidental findings of the bowel in IBD patients that require other examinations

When scan IBD or suspected IBD patients remind to "think different"