Navigating the Narrowing Passages of CD: a focus on the role of IUS!

Nov 20, 2025

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A 37-year-old female with no significant medical history was first seen by GI during a hospital admission [7/27/2024 – 7/30/2024]

for small bowel obstruction

- HPI:
  - 2 months history of progressive intermittent RLQ abdominal pain
  - + nausea and decreased PO intake but no emesis
  - 10 pounds weight loss since symptoms started
  - No change in bowel frequency, typically having 1 BM per day with no urgency or bleeding

Past Medical History

- Anxiety/depression
- Kidney stone

Past Medical History

- Cystourethroscopy w/ ureteroscopy, laser lithotripsy and stent placement (1/2023)

Home Medication:

- None

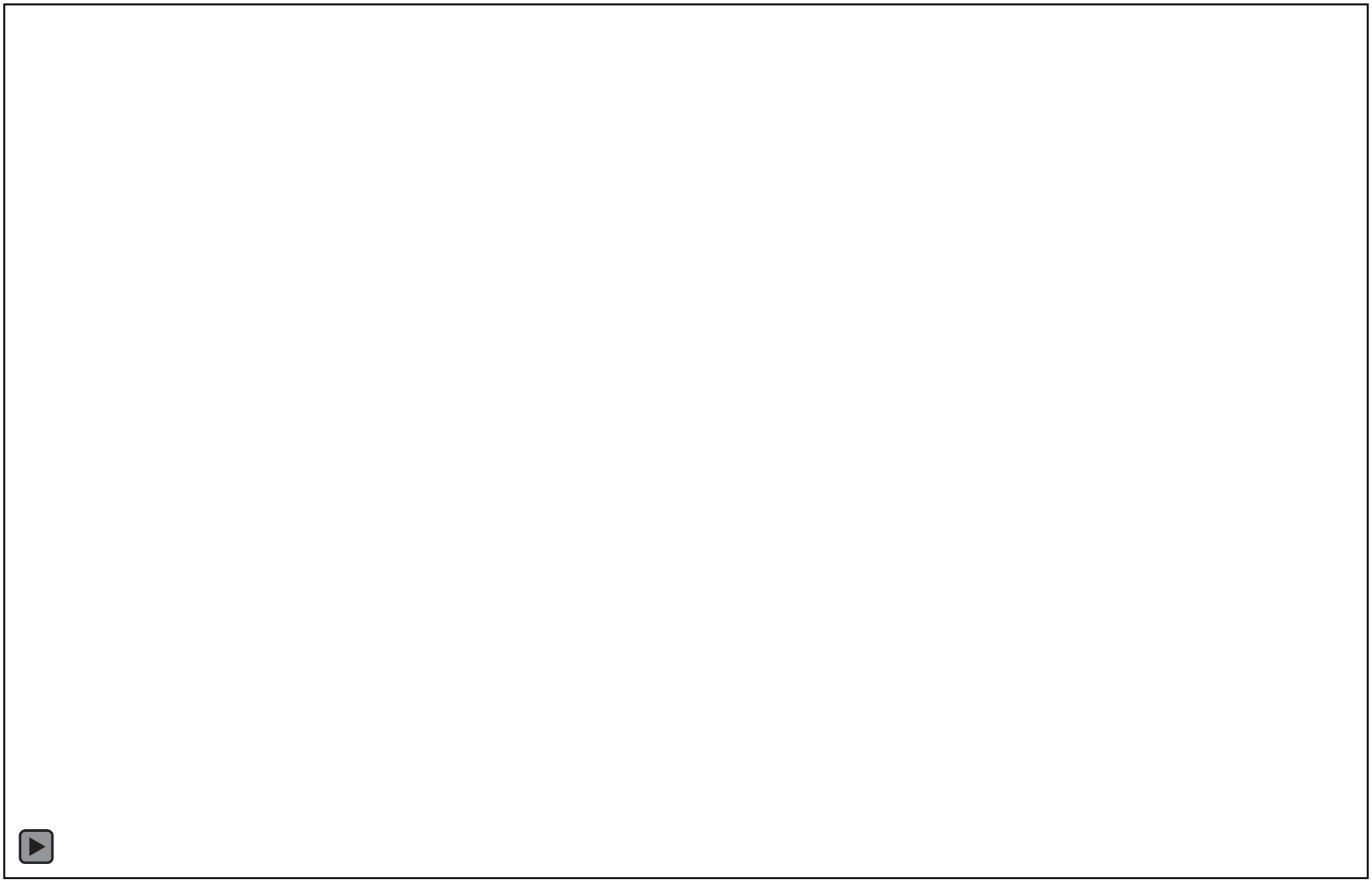
Family History:

- No family history of IBD, celiac disease or GI malignancies

Social History:

- Nonsmoker. No illicit drug use. Only occasional alcohol consumption. Married, had 3 children, all healthy

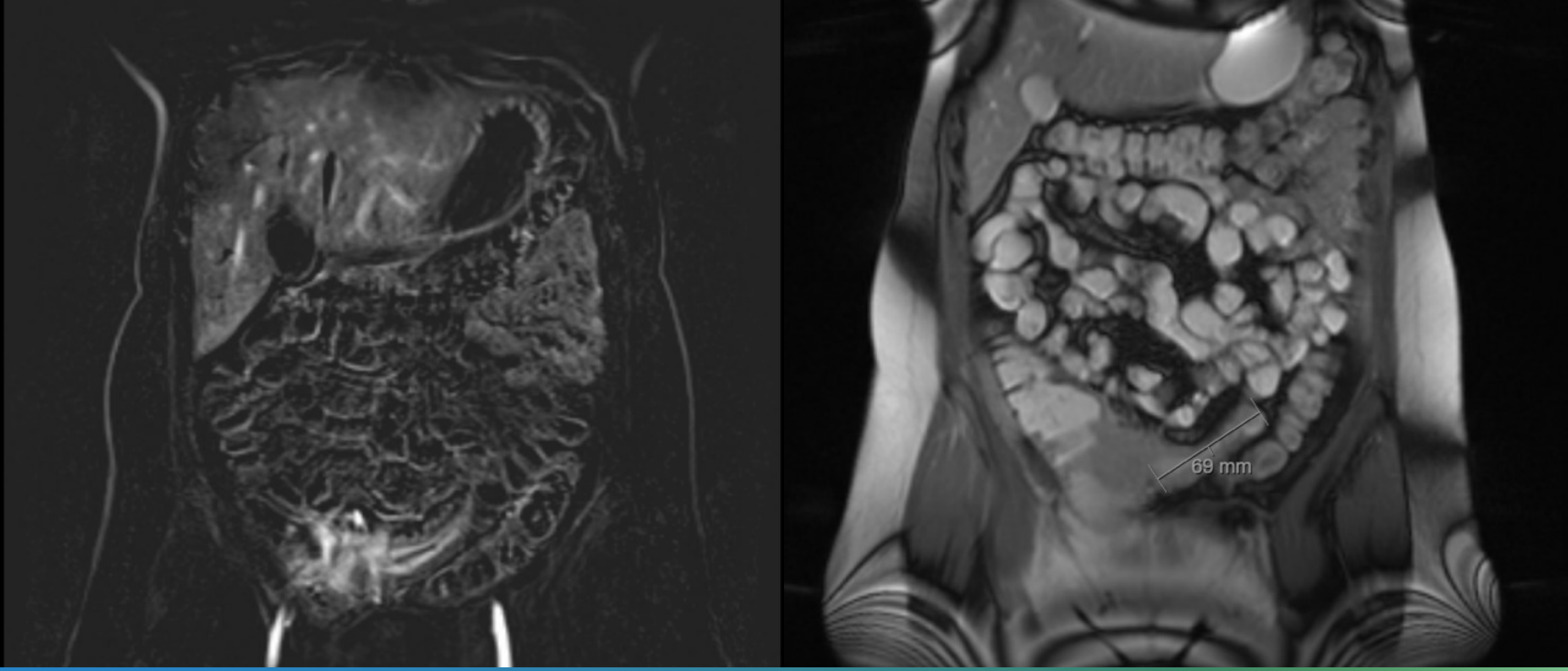
CMP	• Normal kidney function and electrolytes • Normal liver enzymes • Albumin: 4.1
CBC	• WBC 10.3 • Hgb: 10.2L • MCV: 77 • PLT: 264
CRP	• 146H [0-8]
Fecal calprotectin	• 572



Hyperenhancing progressive distal ileum wall thickening extending into the ileocecal area with possible component of intussusception. There is mesenteric stranding and a pattern of small bowel obstruction with transition point at the ileocecal area.

DDX: inflammatory mass, possible IBD but neoplastic process not ruled out

- Suspected Crohn’s disease!
    - Managed conservatively with bowel rest, NG decompression and fluids with improved symptoms



MR enterography

Intestinal Ultrasound

Mural Findings

- Bowel wall thickness (BWT)
- Bowel wall stratification (BWS)
- Bowel wall vascularity

Extramural Findings

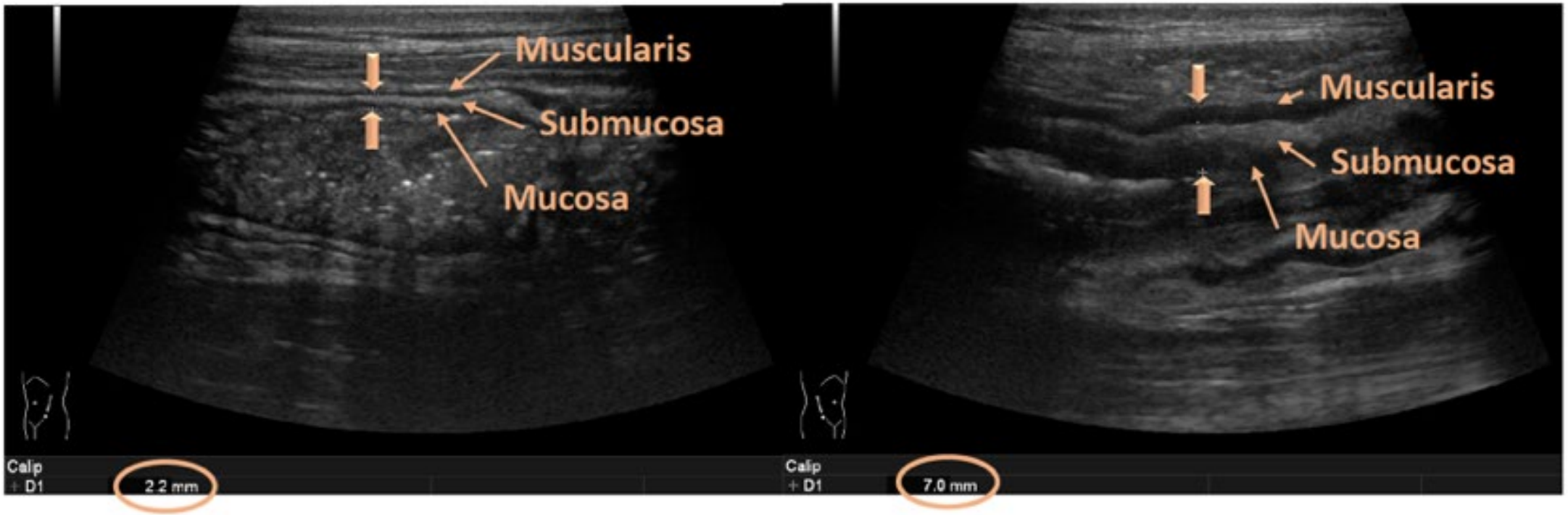
- Mesenteric fat hypertrophy
- Lymph nodes
- Free fluids

Complications

- Strictures
- Abscesses
- Fistulas

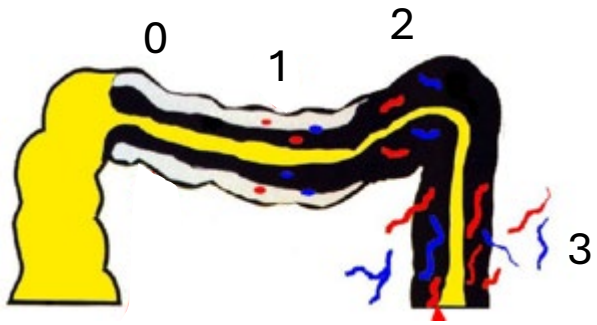
Bowel wall thickness

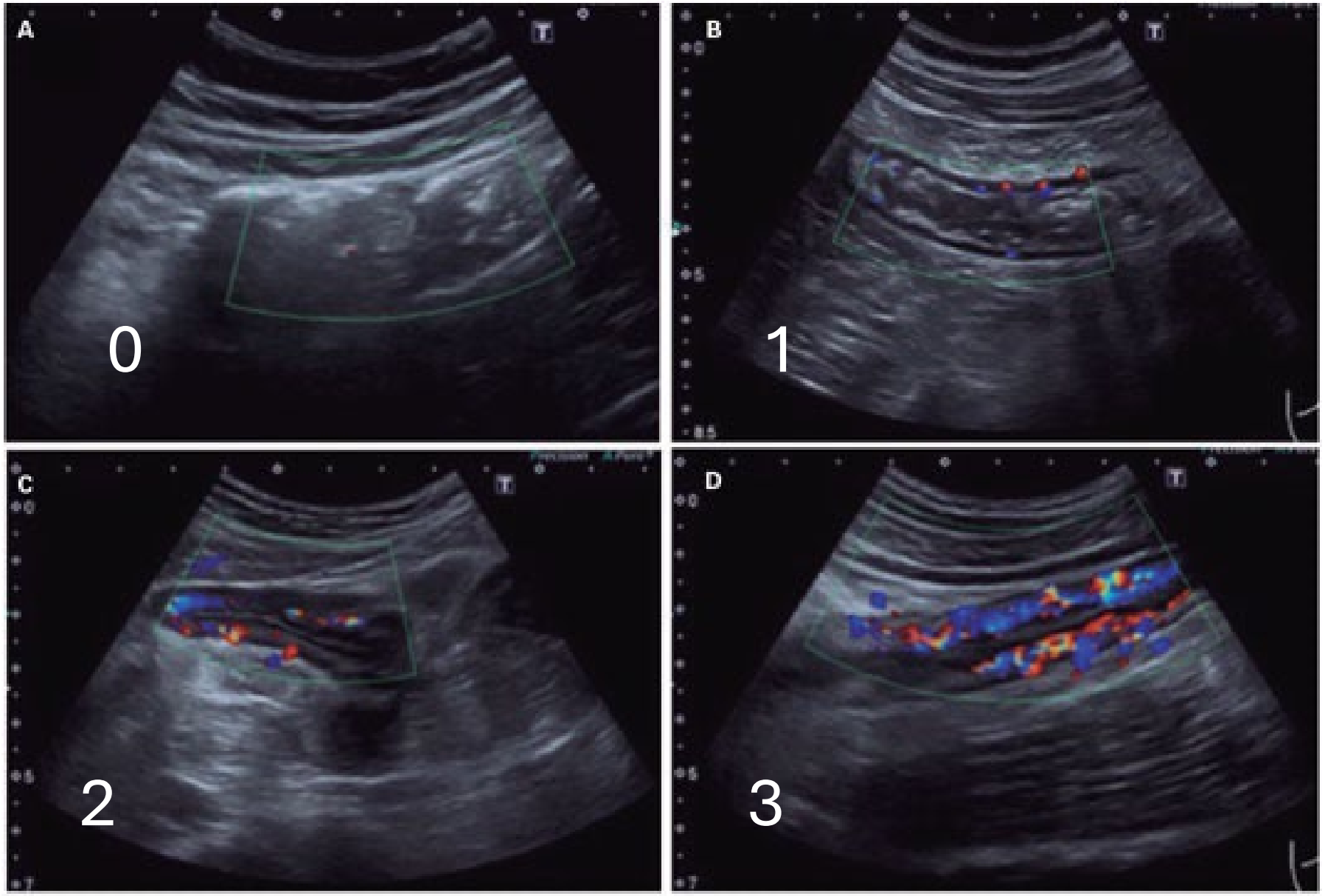
Normal value up to 3 mm in the colon and small bowel



Bowel wall vascularity

Modified Limberg Score:

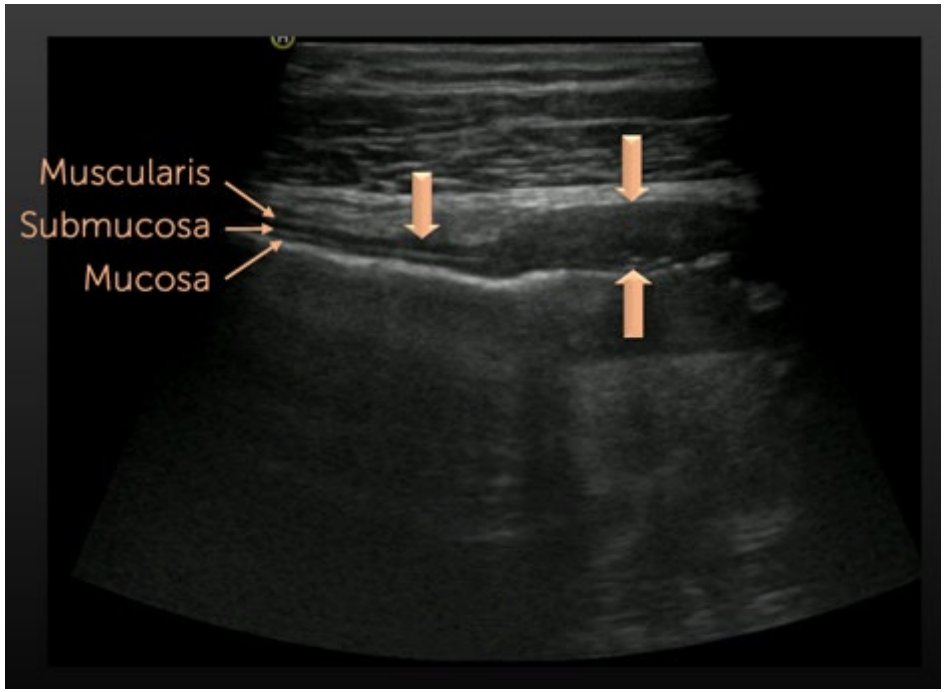


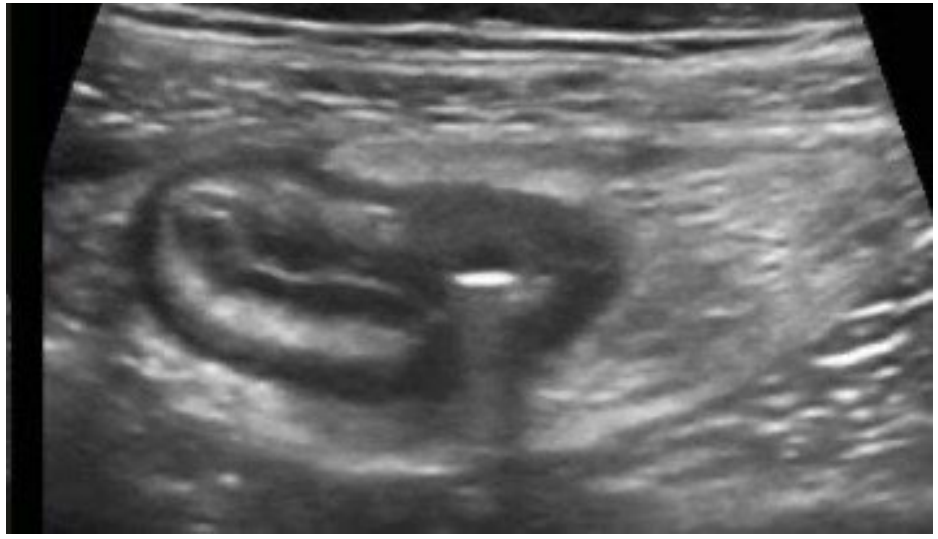


Bowel wall stratification

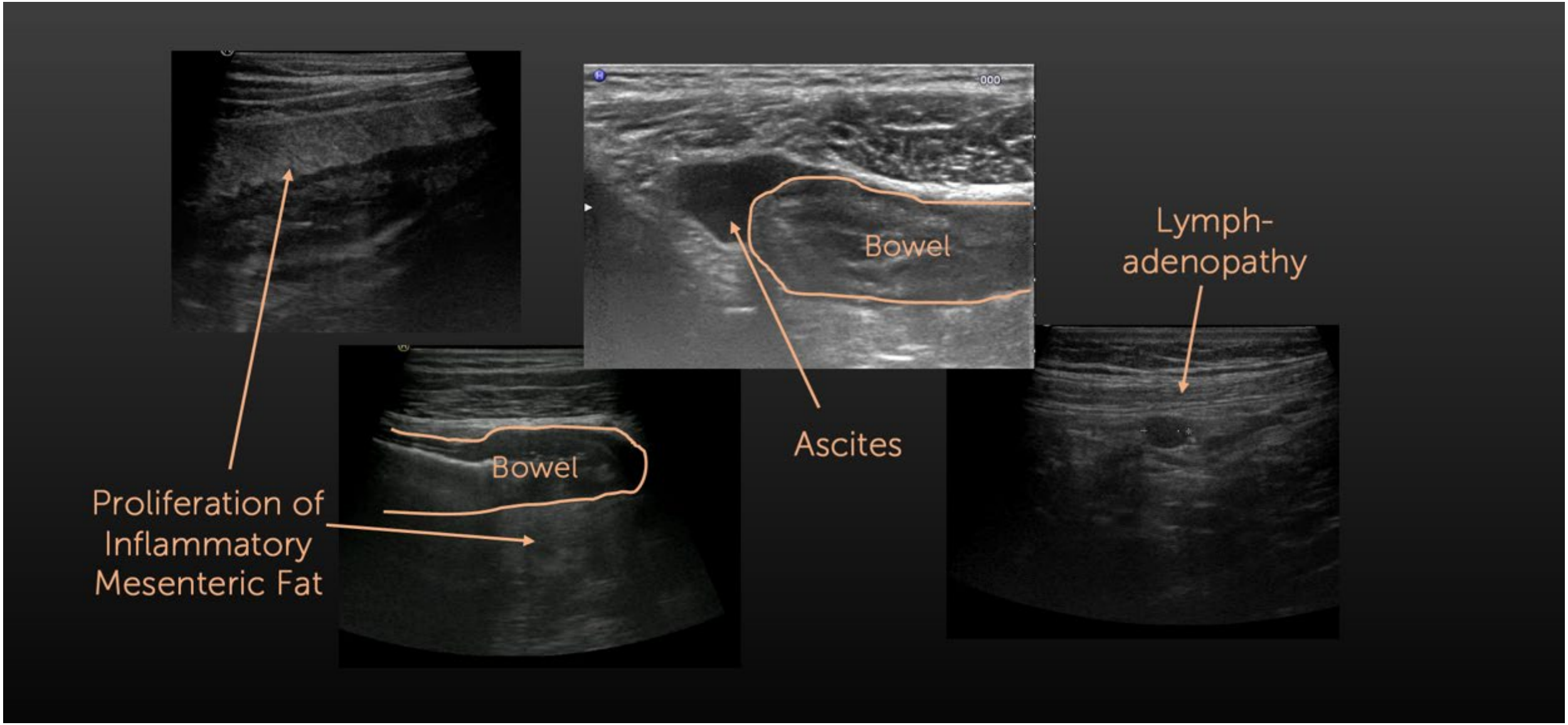
Defined as:

- Normal echostratification
- Focal (≤3 cm) disruption
- Extensive (>3 cm) disruption

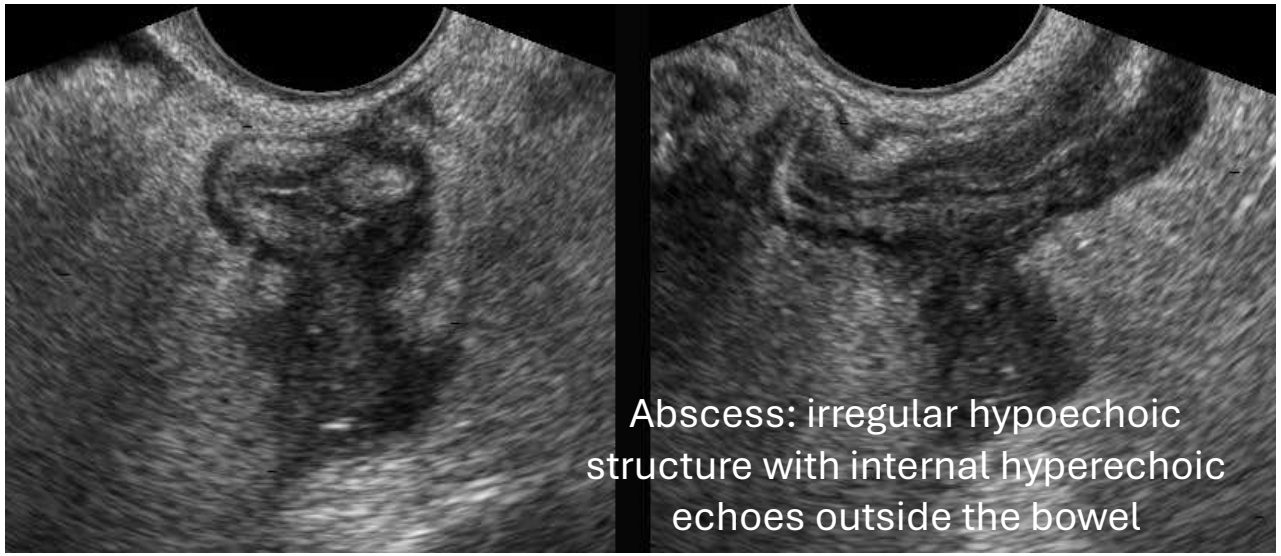




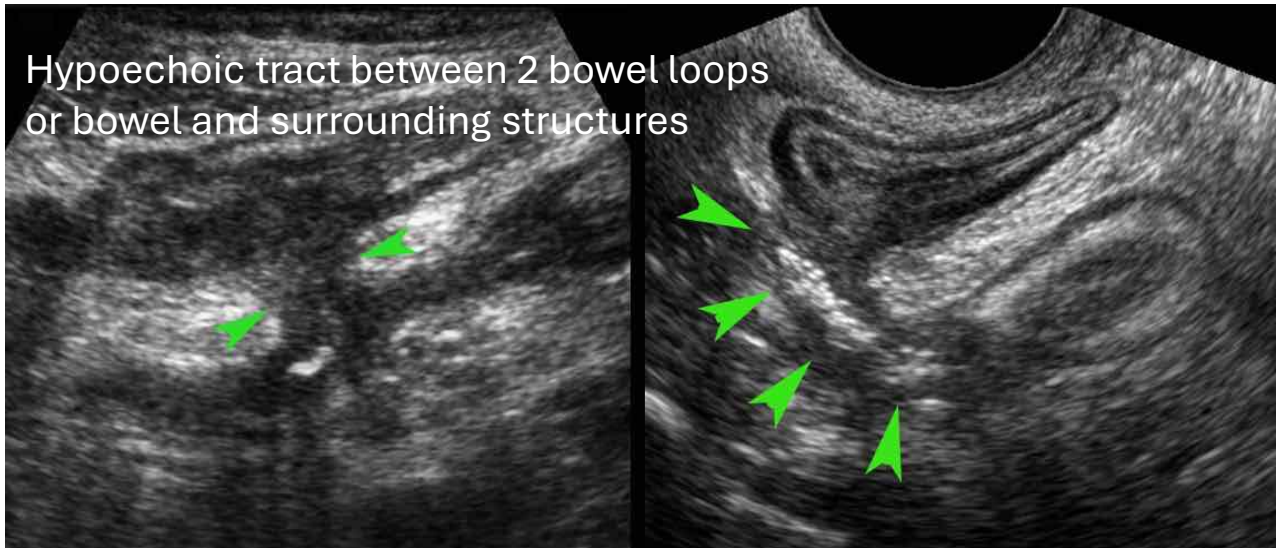
Extramural findings



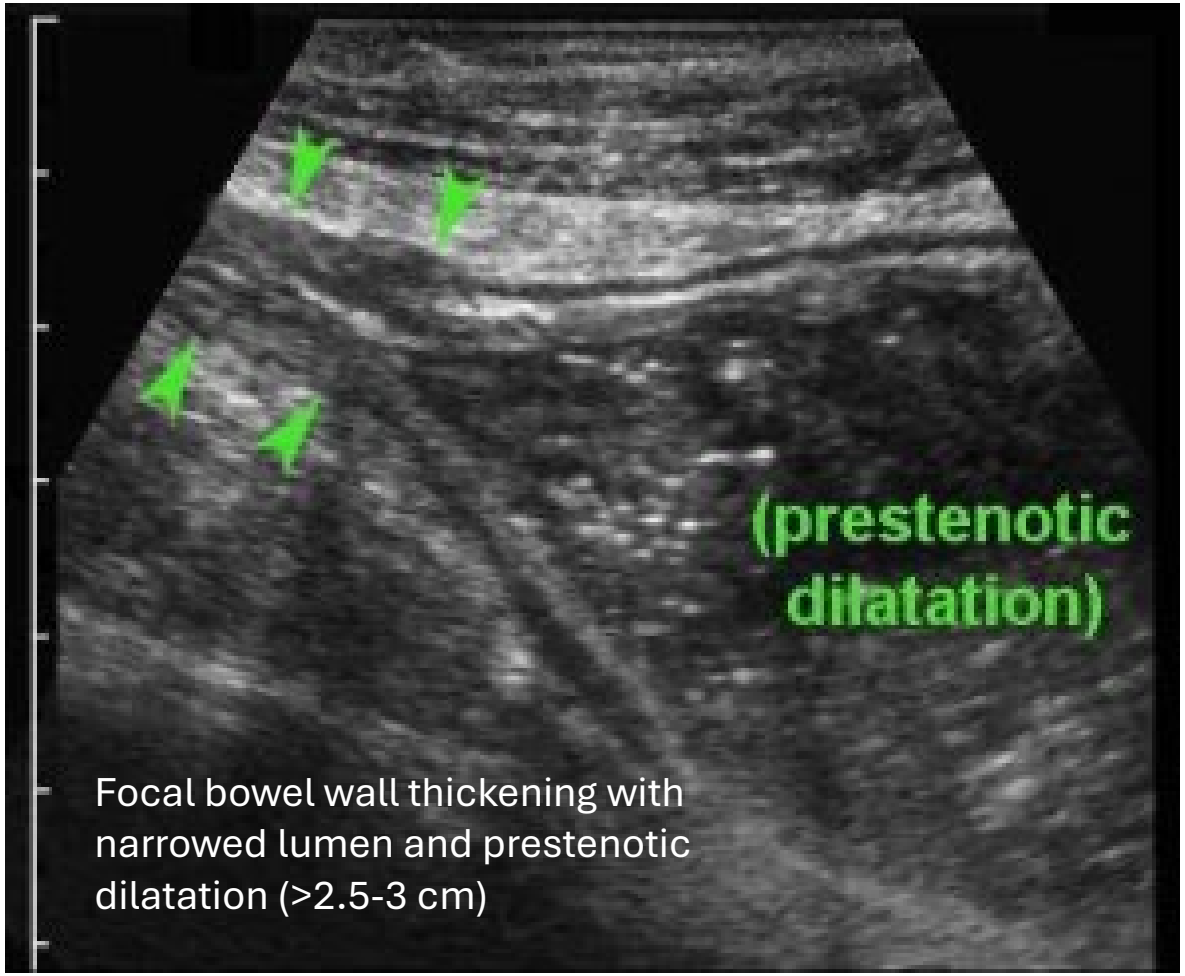
Complications



Abscess: irregular hypoechoic structure with internal hyperechoic echoes outside the bowel



Hypoechoic tract between 2 bowel loops or bowel and surrounding structures



Focal bowel wall thickening with narrowed lumen and prestenotic dilatation (>2.5-3 cm)

IUS can accurately detect inflammation and assess extent of disease in CD

- In published systematic reviews, ultrasound has a sensitivity of 85-97% for the diagnosis of CD and a specificity of 83-97%

Muñoz F, Ripollés T, et al. Gastroenterol Hepatol. 2021 Feb;44(2):158-174

J. Panes et al. Aliment Pharmacol Ther., 34 (2)(2011)

K. Horsthuis. Et al. Radiology., 247 (1) (2008)

Z. Serafin et al. J Crohns Colitis., 10 (3) (2016)

X. Ma et al. Ultrasound Med Biol., 41 (3) (2015)

U. Kopylov et al. Dig Liver Dis., 49 (8) (2017)

M. Fraquelli. Et al. Radiology., 236 (1) (2005)

A.J. Greenup et al. Inflamm Bowel Dis., 22 (5) (2016)

C. Zhu. Et al. Medicine (Baltimore)., 95 (31) (2016)

IUS is comparable to other imaging modalities in CD

At least 5 systematic reviews have been published comparing the accuracy of IUS to other modalities: most included studies were retrospective, single center experience with relatively small sample size

Performance of IUS based on disease location:

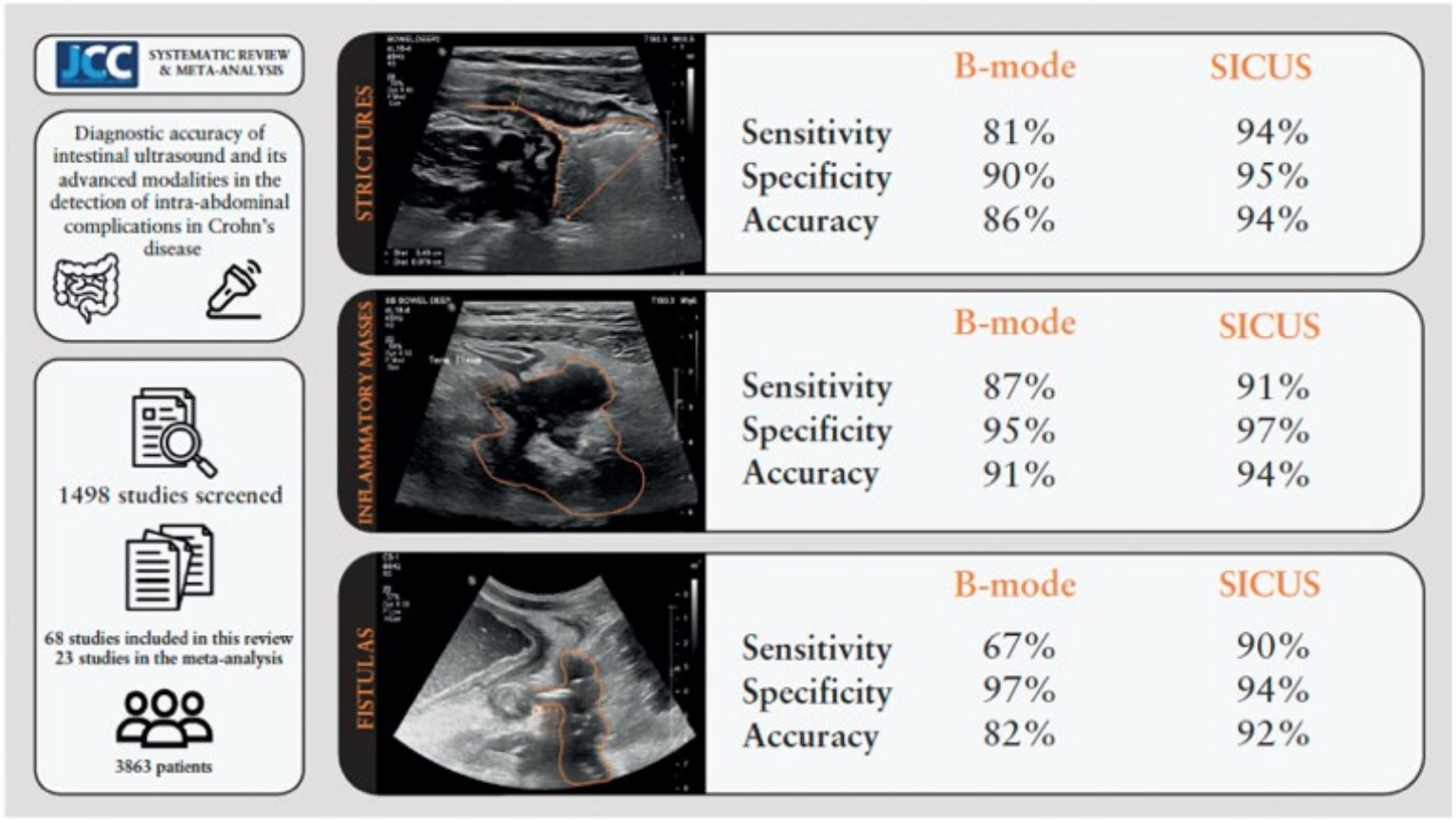
- Jejunal lesions: Se 55.6% and Sp 98.5%
- Ileal lesions: Se 92.7% and Sp 88.2%
- Colonic lesions: Se 81.8% and Sp 95.3%

	IUS	CTE	MRE
Sensitivity	85%	81%	80%
Specificity	91%	88%	88%

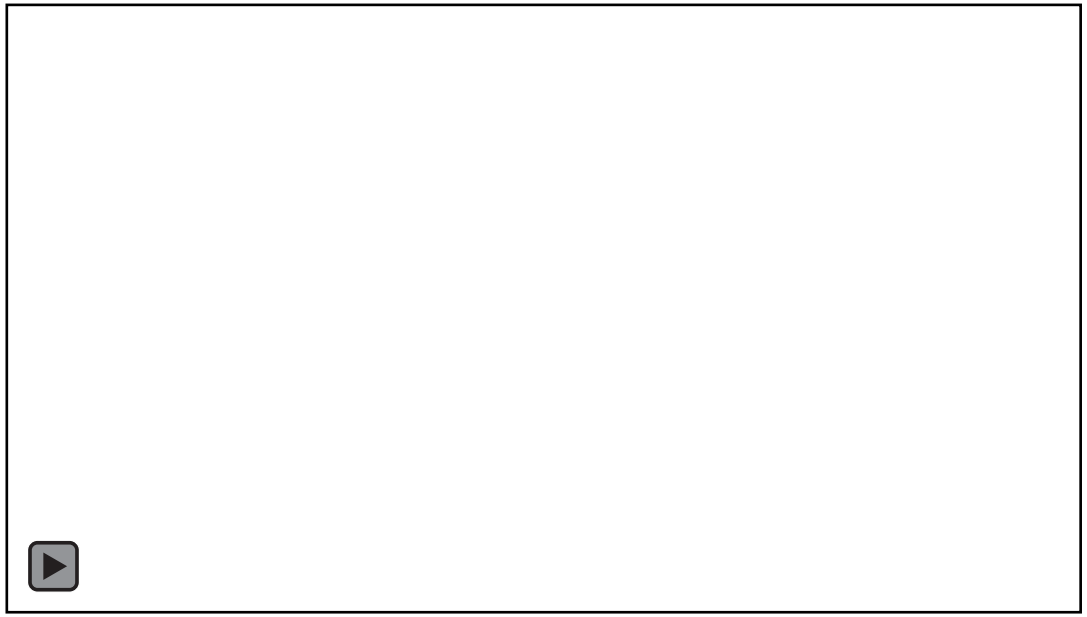
Taylor SA et al. Lancet Gastroenterol Hepatol 2018;3:548–58.
Castiglione F et al. Inflamm Bowel Dis 2013;19:991–8
Calabrese E, et al. Inflamm Bowel Dis 2016;22:1168–83:

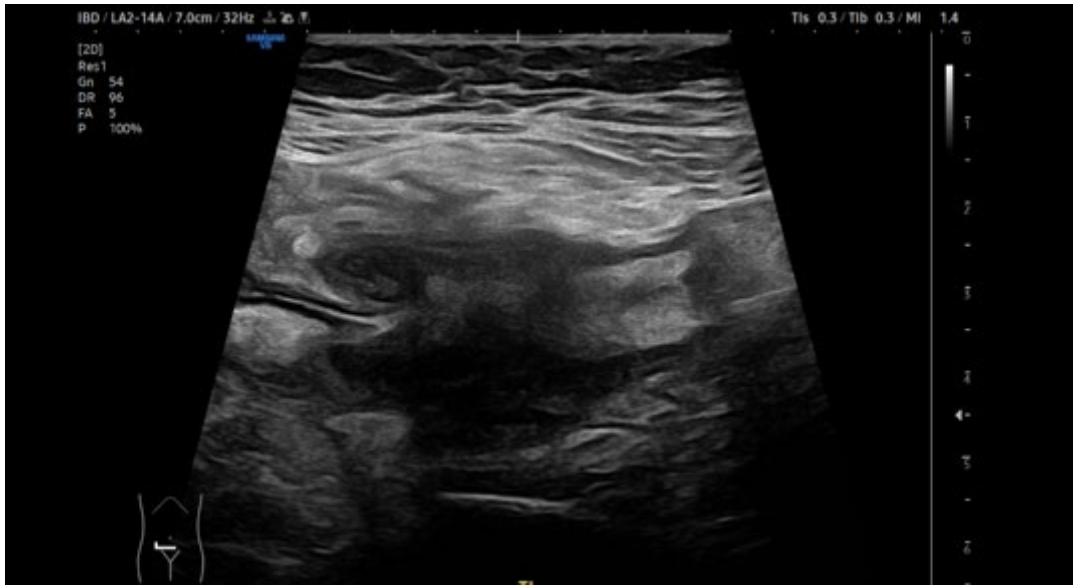
IUS is accurate in detecting complications of CD

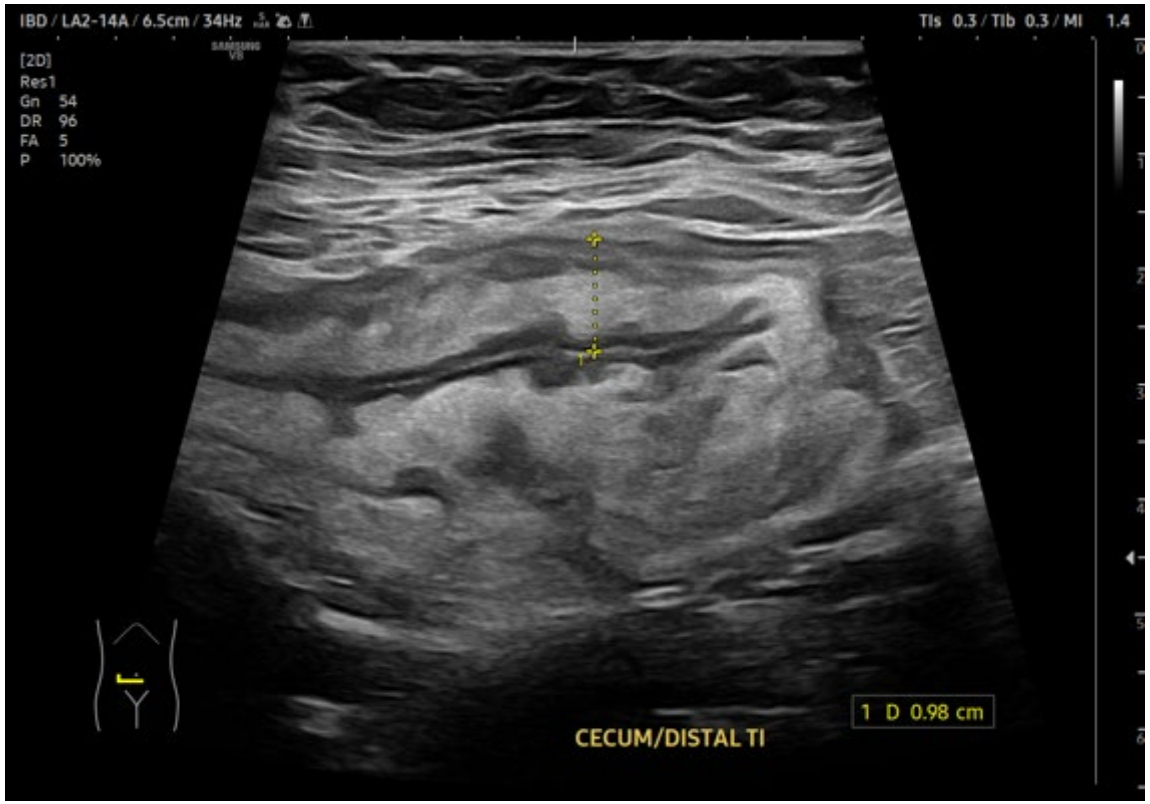
Graphical Abstract



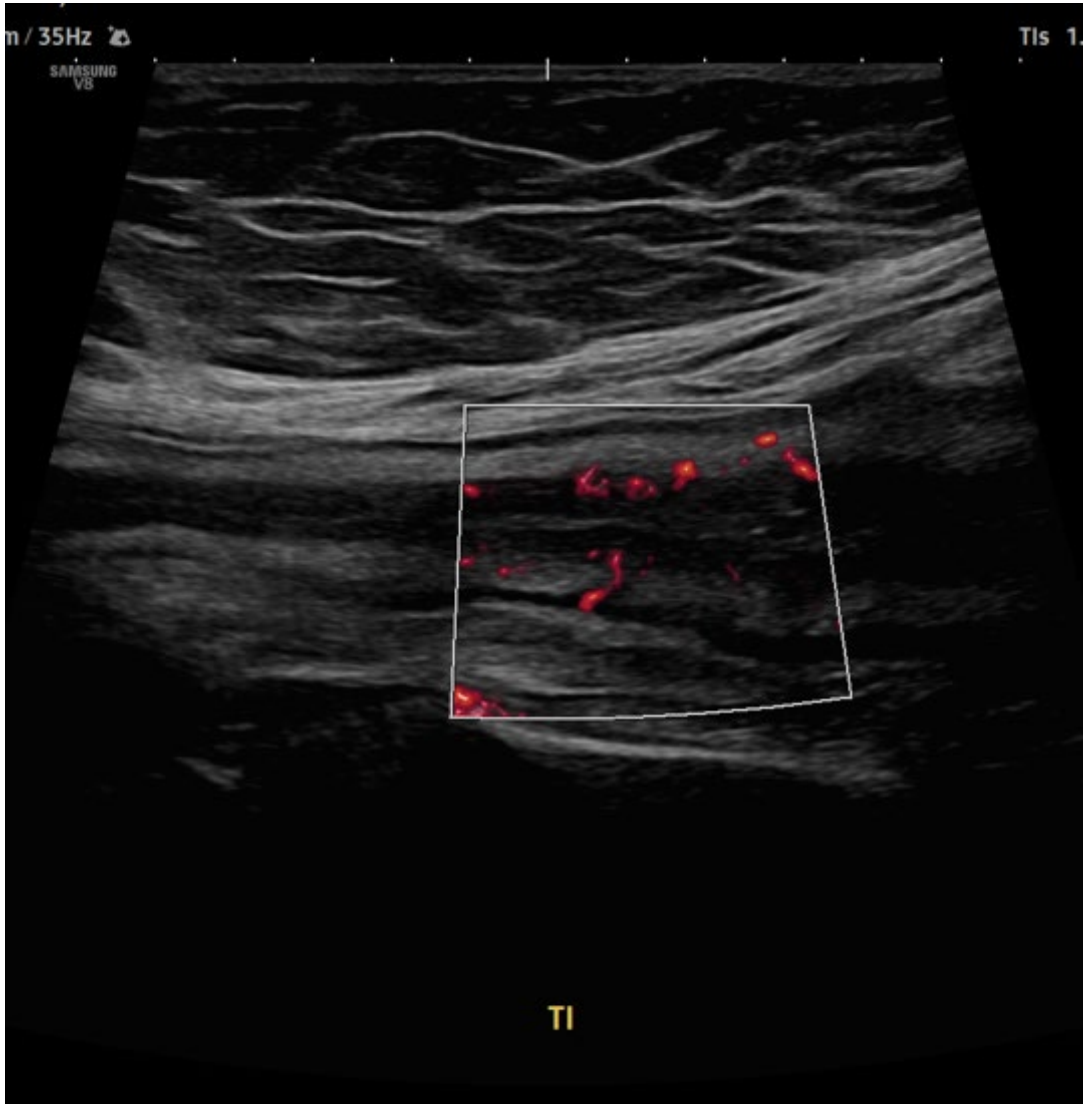
Maarten J. Pruijt et al. Journal of Crohn's and Colitis, 2024, 18, 958–972



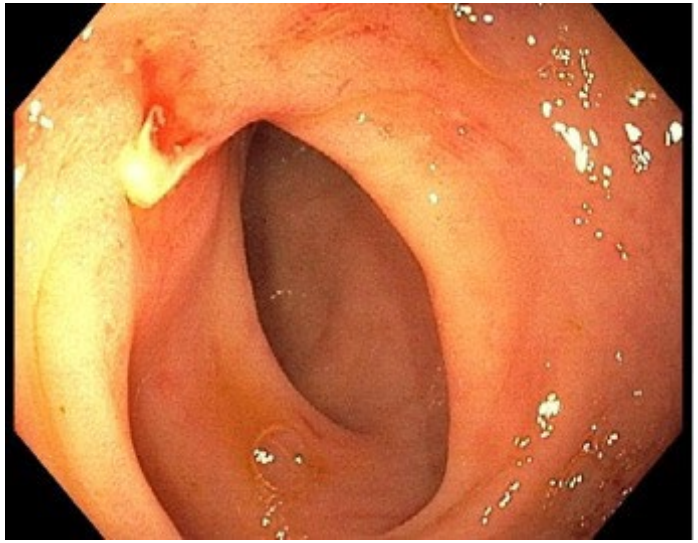

IBD / LA2-14A / 7.0cm / 32Hz
TIs 0.3 / TIb 0.3 / MI 1.4
[2D]
Res1
Gn 54
DR 96
FA 5
P 100%

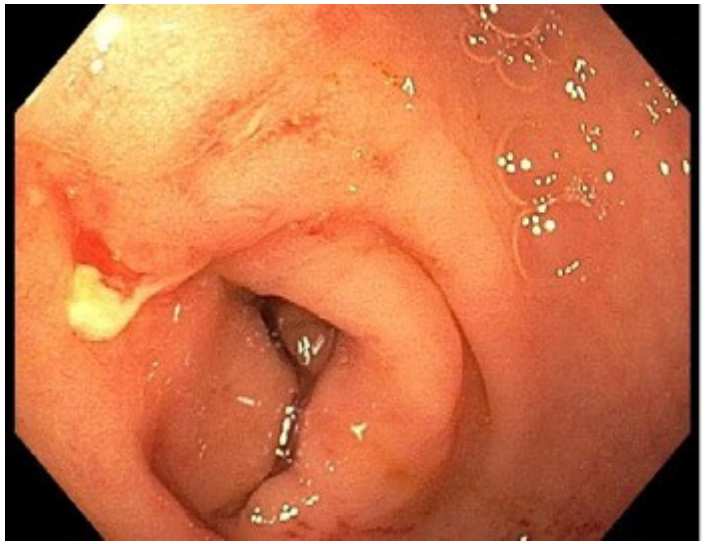

IBD / LA2-14A / 6.5cm / 34Hz
TIs 0.3 / TIb 0.3 / MI 1.4
[2D]
Res1
Gn 54
DR 96
FA 5
P 100%
1 D 0.98 cm
CECUM/DISTAL TI


n / 34Hz
TIs 0.
SAMSUNG
VB
1 D 0.45 c
TI


m / 35Hz
TIs 1.
SAMSUNG
VB
TI

- Colonoscopy:





Several shallow erosions and aphthous ulcers in the cecum, particularly in the area immediately surrounding the ileocecal valve. The valve opening was strictured and we were unable to intubate the terminal ileum

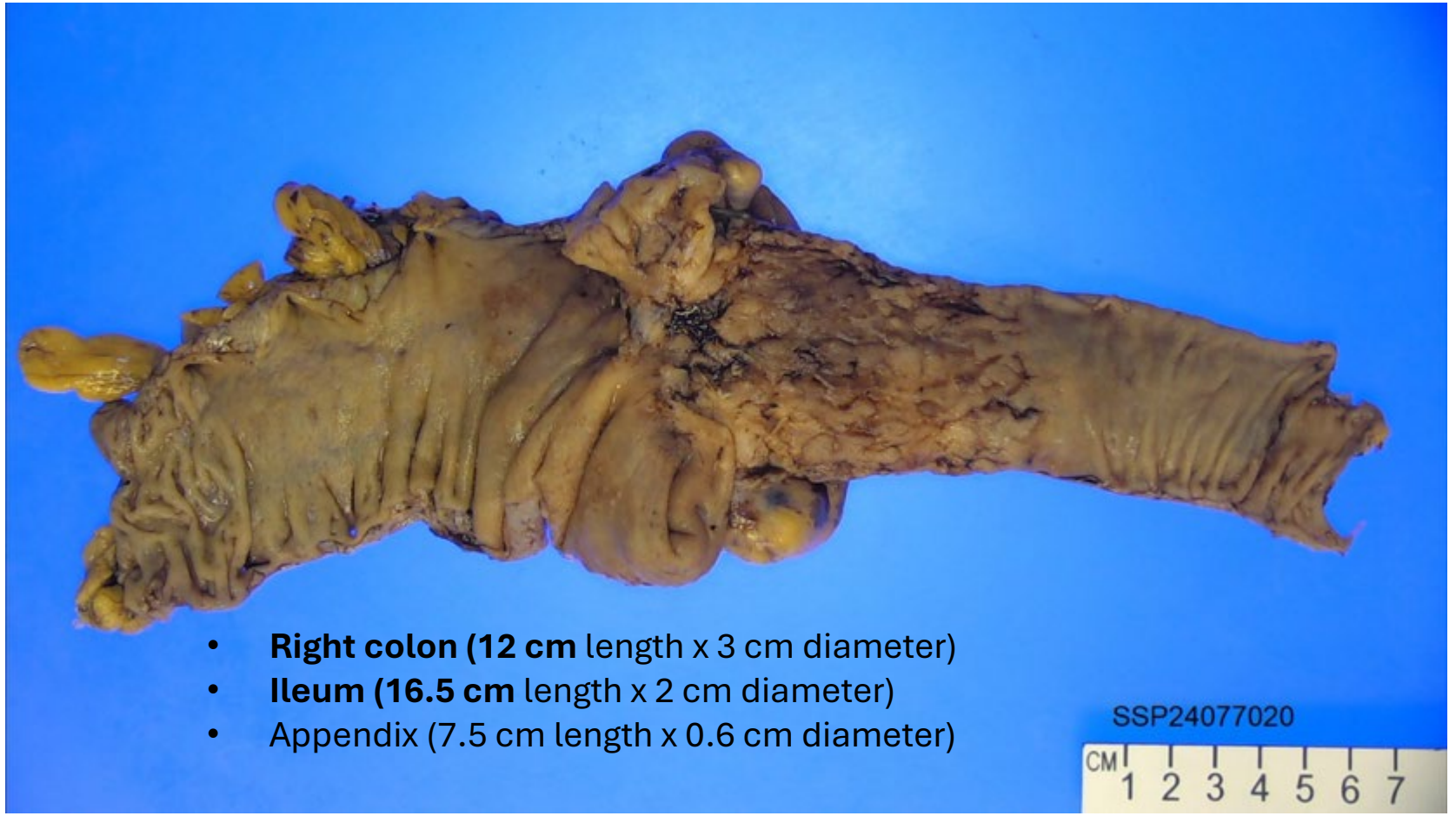
Biopsies:
- Colonic mucosa with active inflammation and separate fragments of granulation tissue and fibrinopurulent exudate, suggestive of ulcer bed.
-Negative for dysplasia.

- What to do next?

  - Would you offer medical therapy? Which one?
  - Would you recommend upfront surgery? What kind of surgery?
  - If surgery upfront, should we start medication early after surgery or monitor and treat if evidence of recurrence?

11/6/2024:

- **Robotic ileocecal resection with side-to-side anastomosis**



Histopathology:

Ileum, cecum, appendix, right hemicolectomy:

- Chronic active ileitis and colitis, consistent with Crohn's ileocolitis
- Fissuring ulcer involving ileocecal valve
- Appendix without significant histologic abnormality
- 5 benign lymph nodes

Post-operative course

- Recommended 3 months metronidazole therapy but this was not tolerated

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  - Started experiencing postprandial abdominal pain and nausea!

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  - **Fecal calprotectin = 17**

- Intestinal Ultrasound

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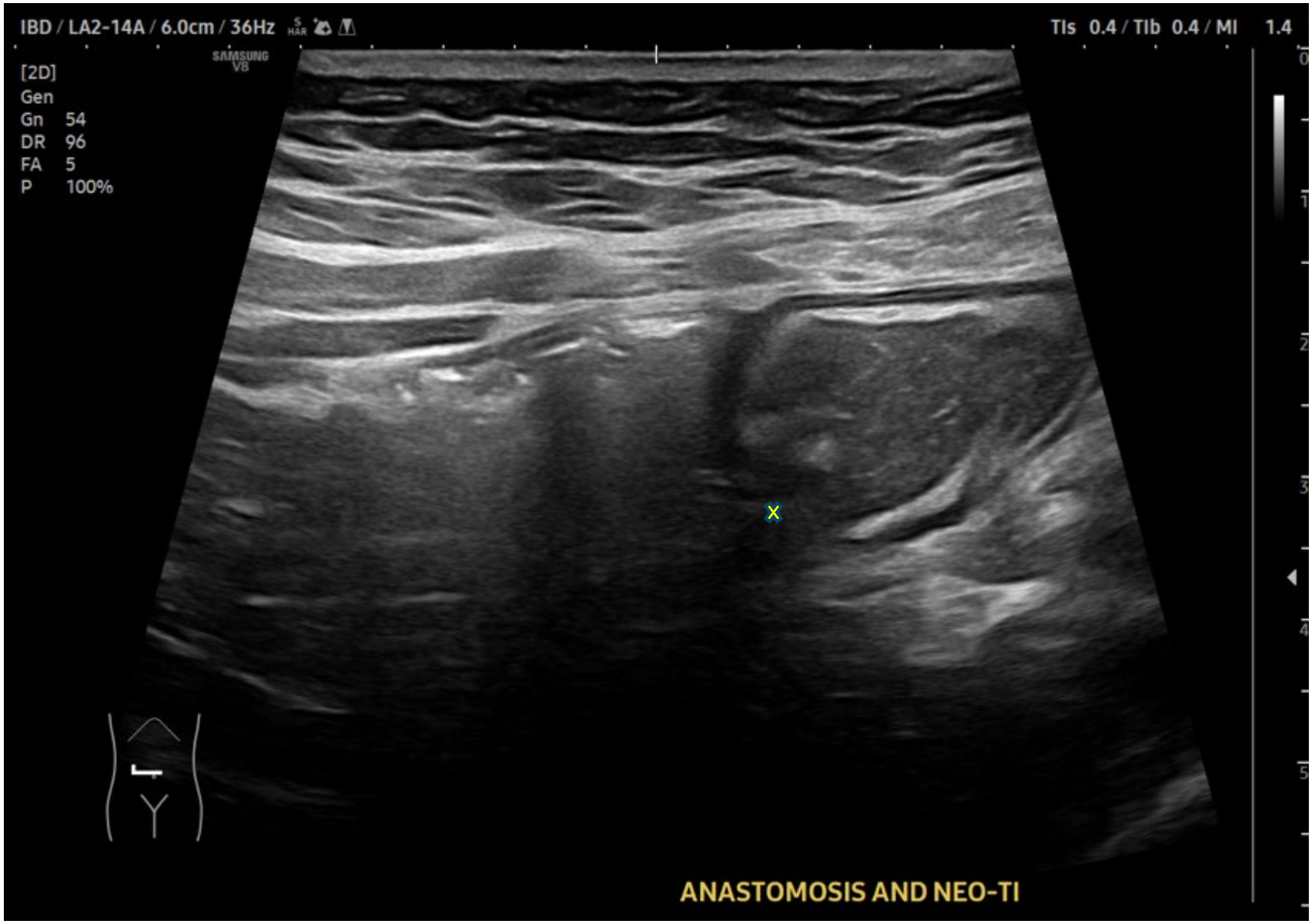

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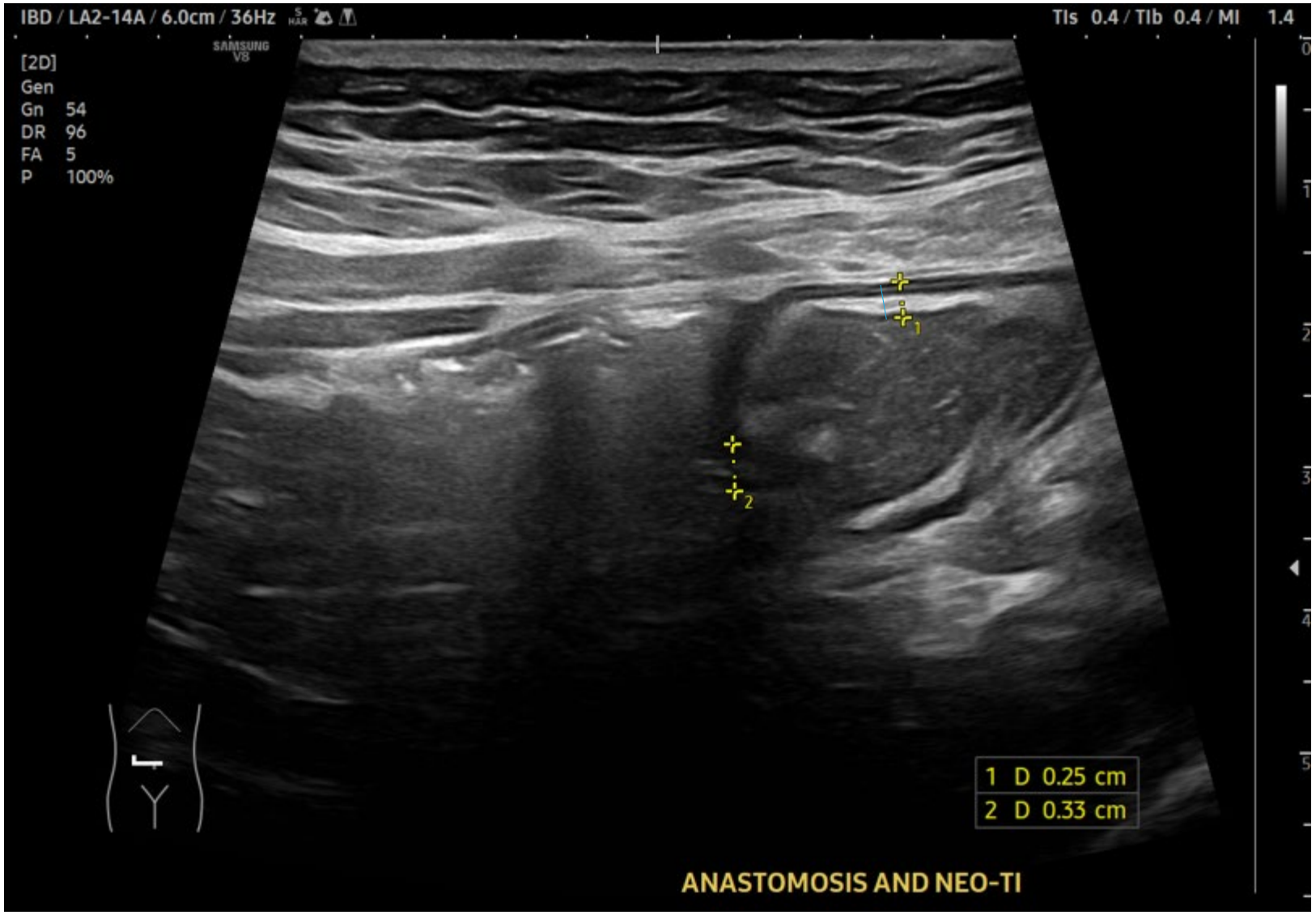
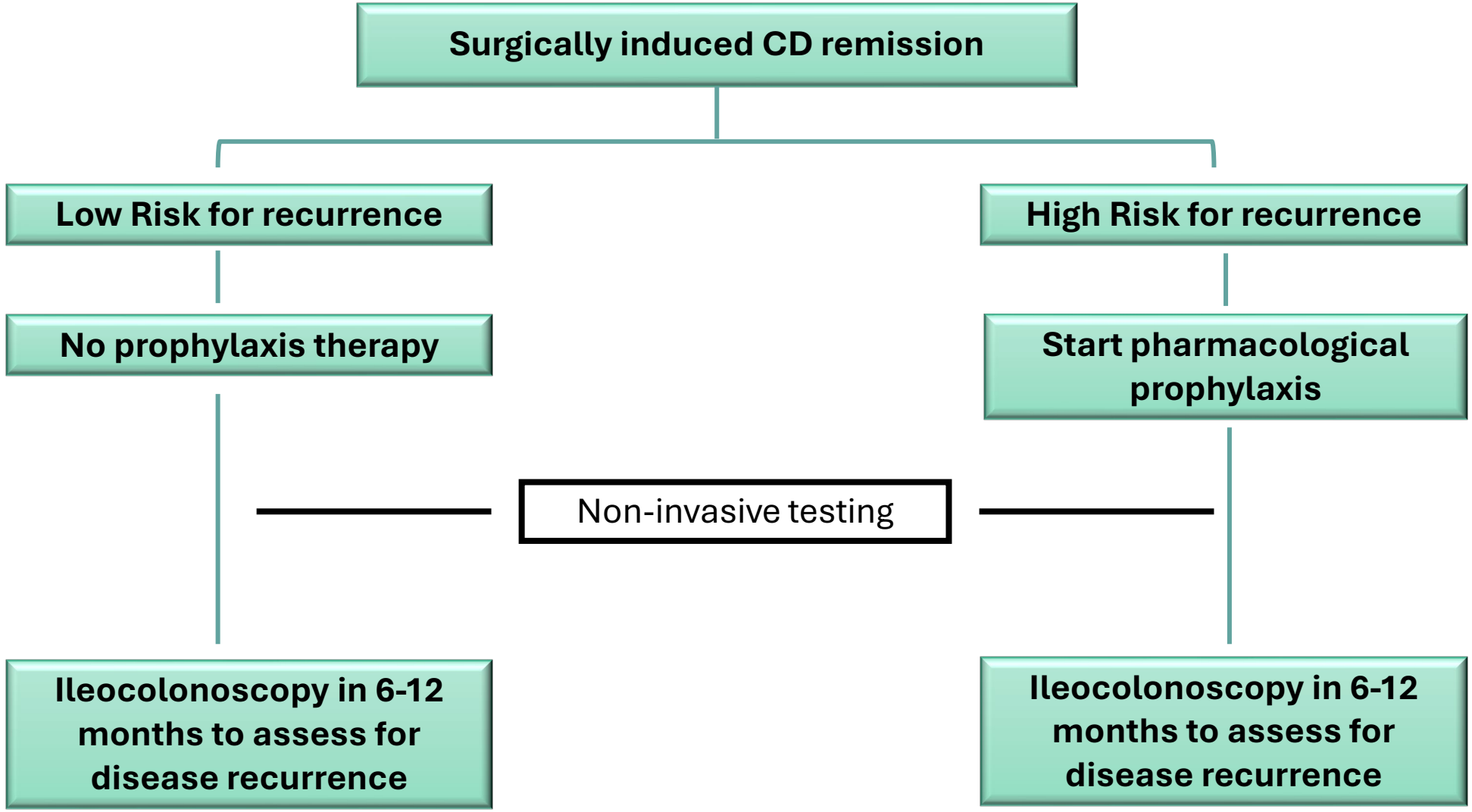


The role of Intestinal Ultrasound in post-operative Crohn’s disease management

Ileocolonoscopy is considered the gold standard for assessing post-operative disease recurrence in CD


Surgically induced CD remission
Low Risk for recurrence
High Risk for recurrence
No prophylaxis therapy
Start pharmacological prophylaxis
Non-invasive testing
Ileocolonoscopy in 6-12 months to assess for disease recurrence
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Fecal calprotectin

- POCER trial (2015)
  - FC >100 µg/g indicated endoscopic recurrence with 89% sensitivity and 58% specificity, and a negative predictive value (NPV) of 91%
  - Six months after surgery, FC <51 µg/g predicted remission at 18 month with NPV 79%

Wright EK, Kamm MA, De Cruz P, et al. *Gastroenterology*. 2015;148(5):938-947.e1.

IUS in post-operative CD

IUS can detect post-operative recurrence at the anastomosis with high agreement with the standard (Rutgeerts score on ileocolonoscopy)

- Sensitivity of 94% (95% CI 0.86–0.97]
- Specificity of 84% [95% CI 0.62–0.94]

IUS BWT ≥ 5.5 mm
→ Correlates with clinical recurrence

IUS BWT ≥ 5.5 mm is a predictor of severe post-surgical recurrence [defined by a Rutgeerts score ≥ i3] with a sensitivity of 84% and a specificity of 98%

IUS BWT of ≥ 7 mm
→ independently be associated with the risk of surgery

Calabrese E, et al. Inflamm Bowel Dis 2016;22:1168–83:
Wiltens R. Et al. Gastroenterology. 2022;162:1476-1492
Rispo A, et al. Inflamm Bowel Dis 2018;**24**:977–88
Federica Furfaro et al. Clinical Gastroenterology and Hepatology 2023;21:3143–3151

An increased BWT, presence of lymph nodes and increased Fcal are independent predictors of postoperative recurrence (RS ≥ i2)

	Sensitivity, % (95% CI)	Specificity, % (95% CI)	Accuracy, % (95% CI)	PPV, % (95% CI)	NPV, % (95% CI)
BWT ≥3 mm	77 (64–87)	65 (45–81)	73 (62–81)	81 (68–90)	59 (41–75)
FC ≥50 mcg/g	83 (70–91)	64 (44–81)	76 (65–85)	81 (68–90)	67 (46–83)
Presence of lymph nodes	35 (23–48)	97 (83–100)	56 (45–66)	95 (77–100)	43 (32–56)
BWT ≥3 mm and FC ≥50 mcg/g	65 (51–78)	93 (76–99)	75 (64–84)	94 (81–99)	59 (43–74)
BWT ≥3 mm and FC ≥50 mcg/g and lymph nodes	33 (20–48)	100	66 (55–75)	100	59 (47–70)
BWT ≥3 mm or FC ≥50 mcg/g	93 (83–98)	34 (18–54)	74 (63–83)	74 (63–84)	71 (42–92)
BWT ≥3 mm or FC ≥50 mcg/g or lymph nodes	97 (88–100)	34 (18–54)	76 (66–85)	75 (64–84)	83 (52–98)

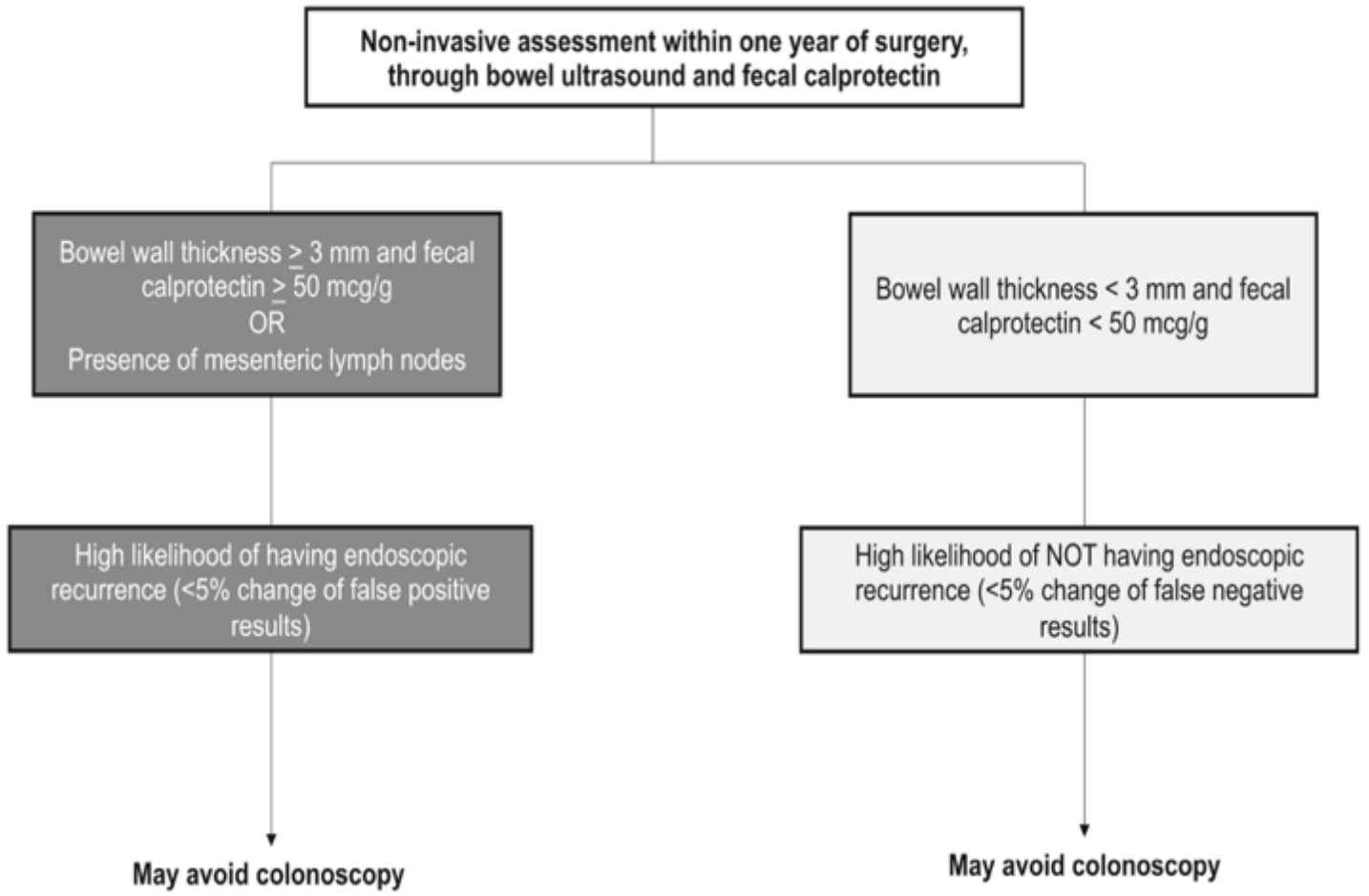
Note: Endoscopic recurrence defined by a Rutgeerts' score ≥2.
BWT, Bowel wall thickness; CI, confidence interval; FC, fecal calprotectin; NPV, negative predictive value; PPV, positive predictive value.

Federica Furfaro et al. Clinical Gastroenterology and Hepatology 2023;21:3143–3151

Furfaro et al (2023):

- The presence of lymph nodes or the combination of BWT ≥ 3 mm and FC values ≥ 50 mcg/g correctly classified 56% and 75% of patients, with less than 5% of patients falsely classified as having endoscopic recurrence

- Combination of BWT <3 mm and FC <50 mcg/g correctly classified 74% of patients with only 4.5% of patients falsely classified as not having endoscopic recurrence



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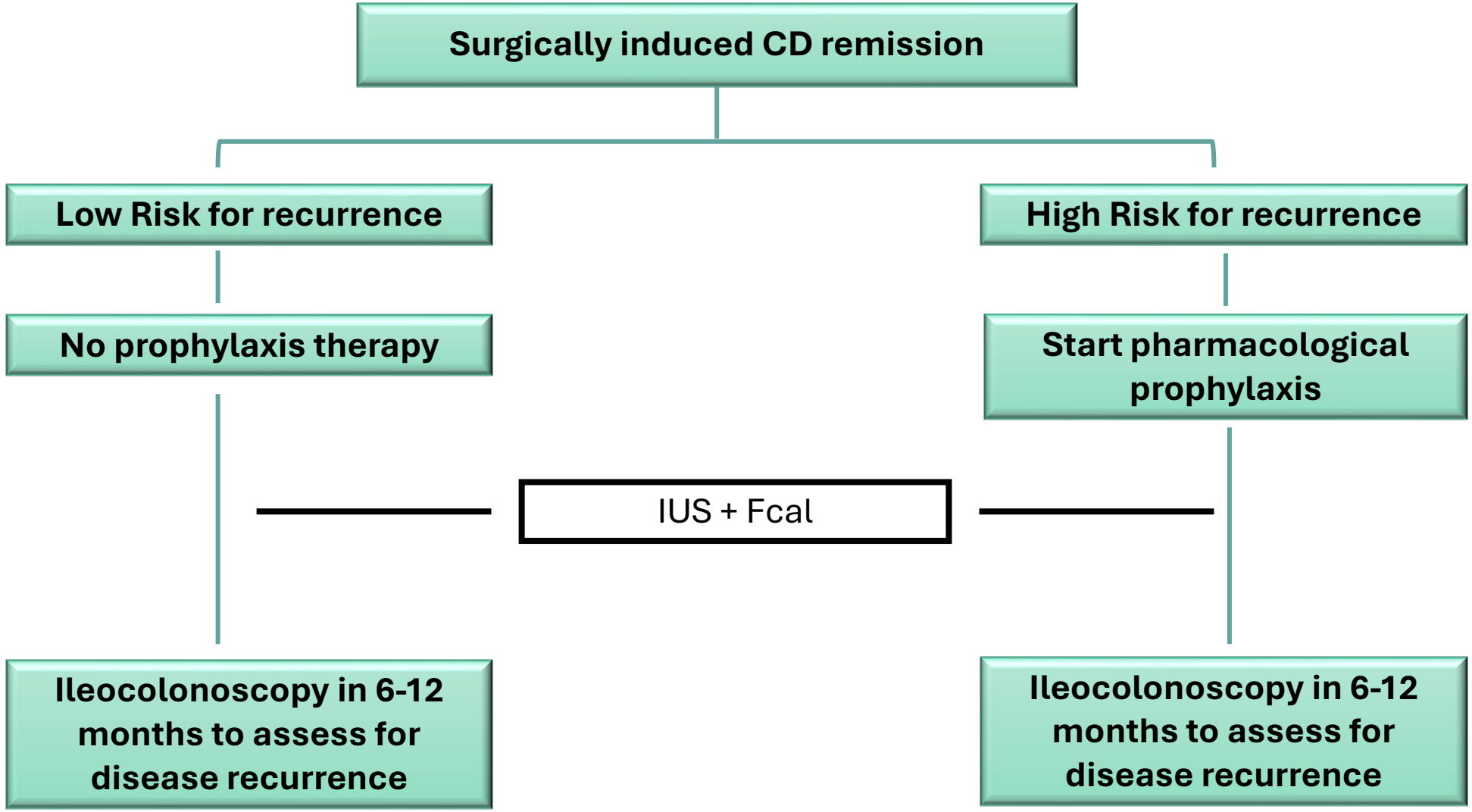
Surgically induced CD remission
Low Risk for recurrence
High Risk for recurrence
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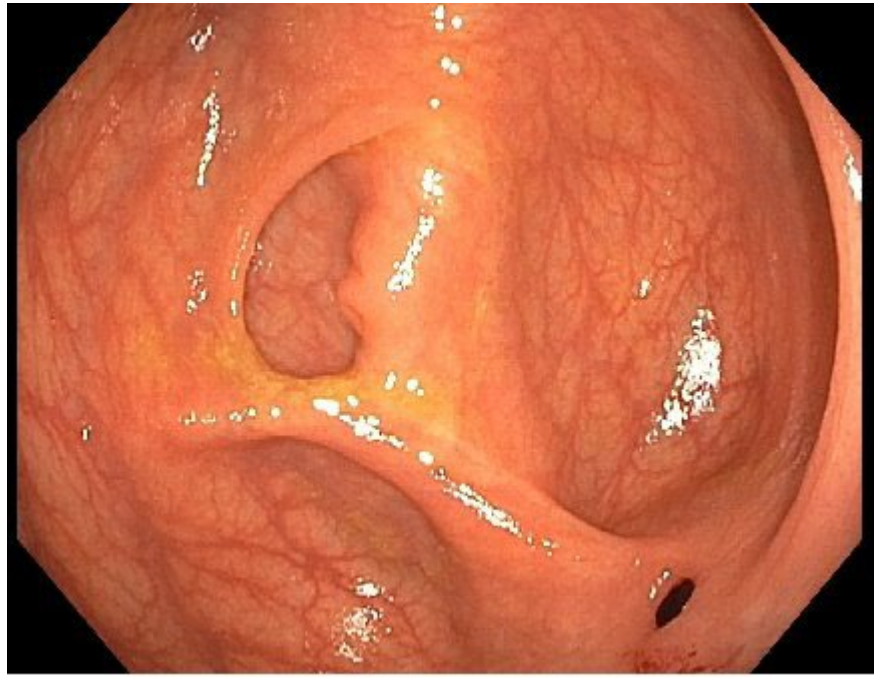
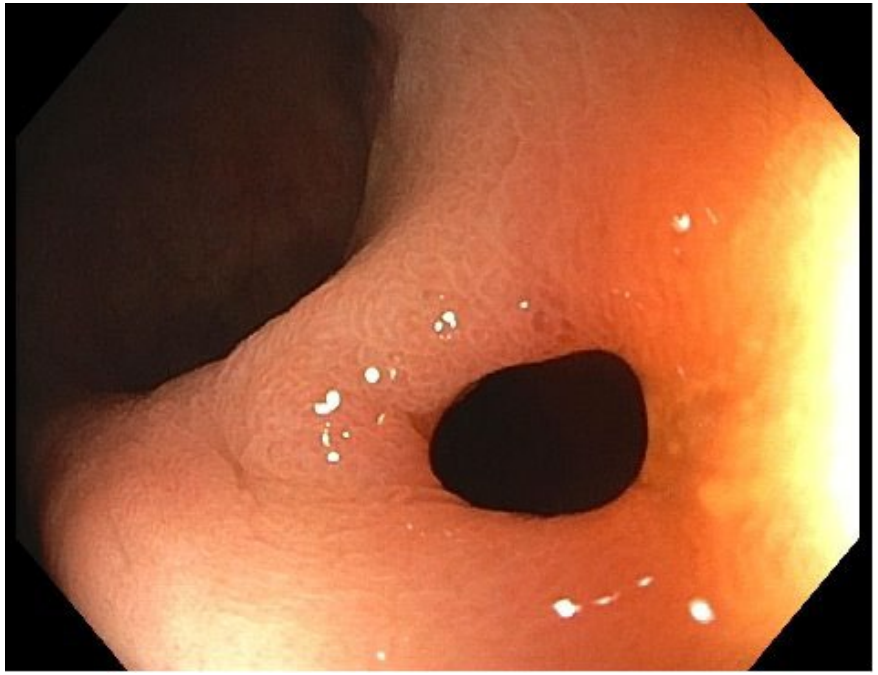
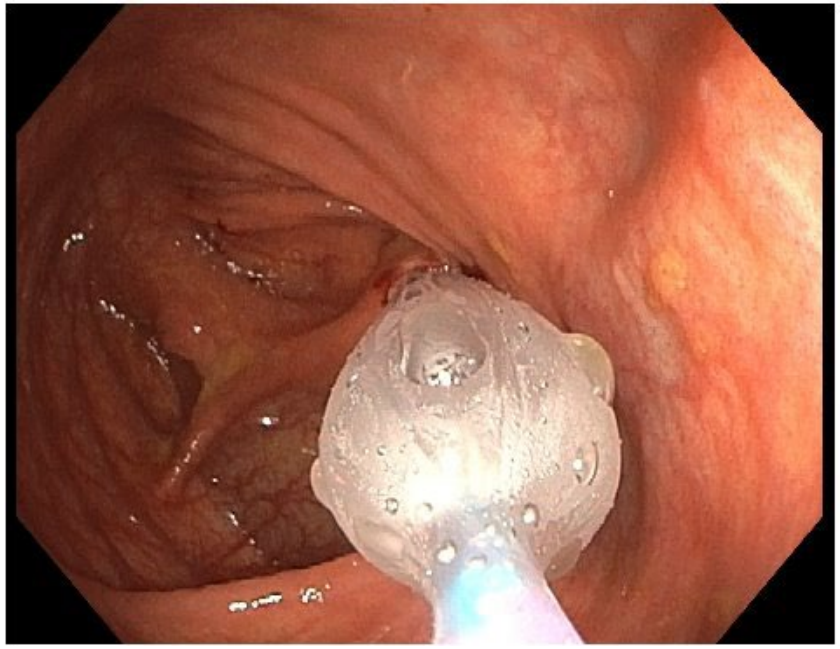
Start pharmacological prophylaxis
IUS + Fcal
Ileocolonoscopy in 6-12 months to assess for disease recurrence
Ileocolonoscopy in 6-12 months to assess for disease recurrence

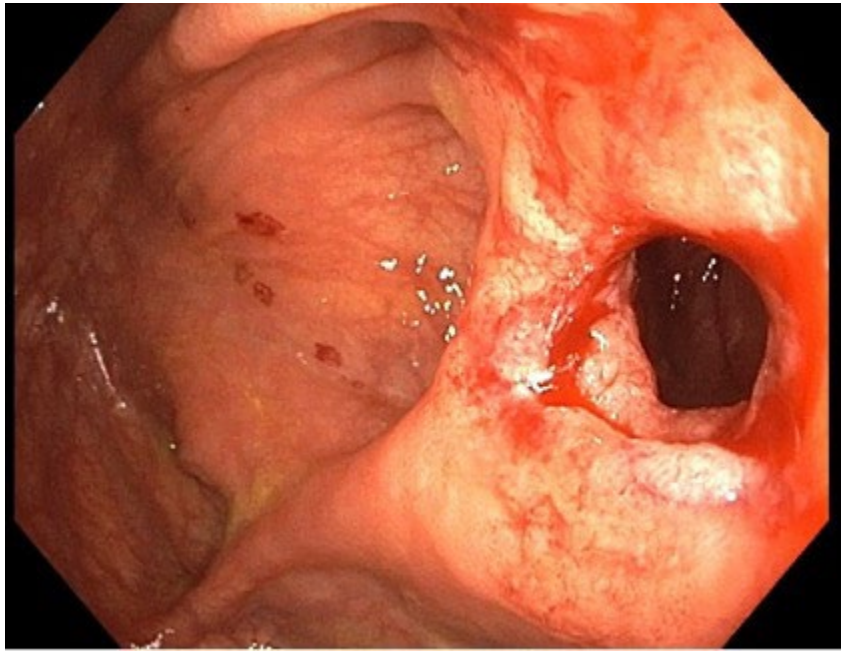
- Clinically: Started experiencing postprandial abdominal pain and nausea!
- Fecal calprotectin = 17
- IUS: mildly increased BWT (3.3mm) at the anastomosis, no hyperemia and LNs

Colonoscopy 4/30/2025



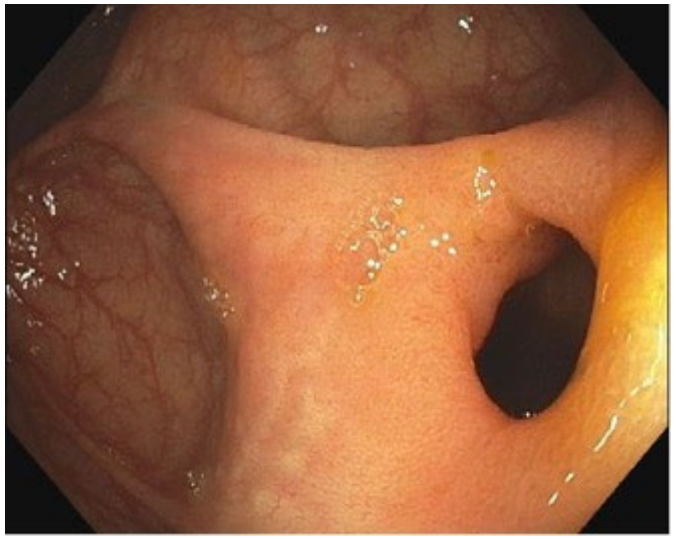


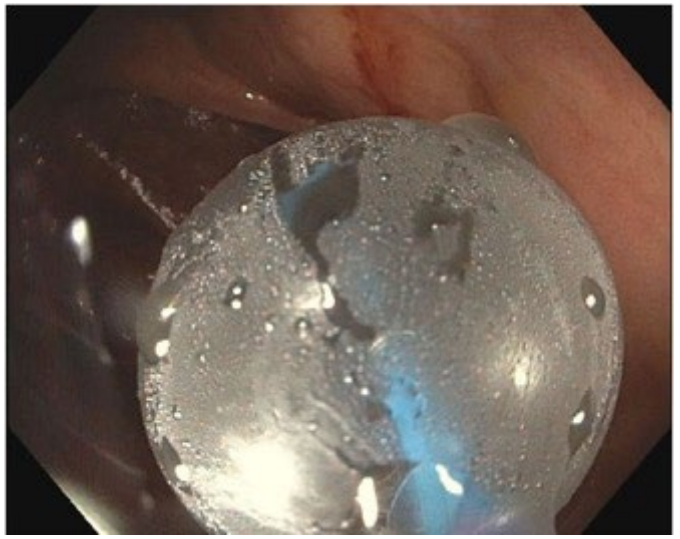


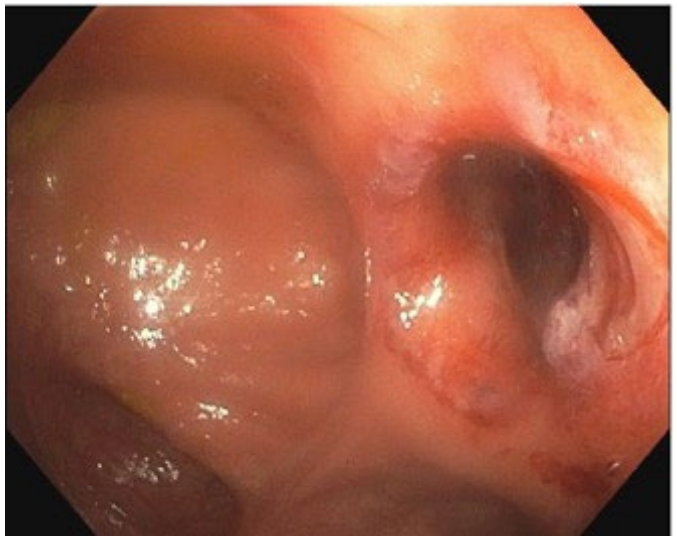


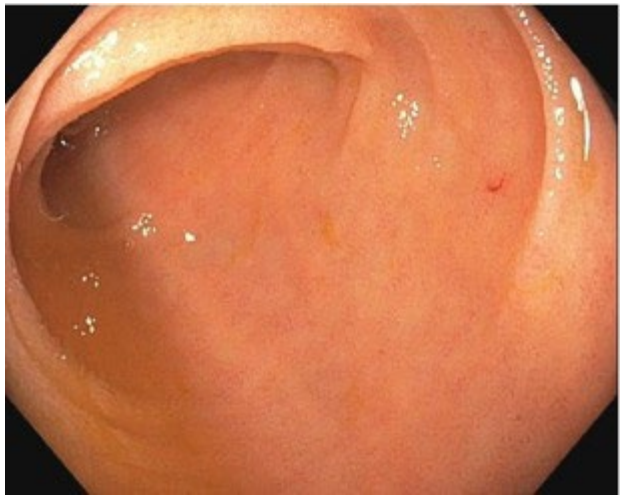
TTS balloon dilation was performed at 8-9-10 mm with dilation effect. The stricture was NOT traversed after dilation

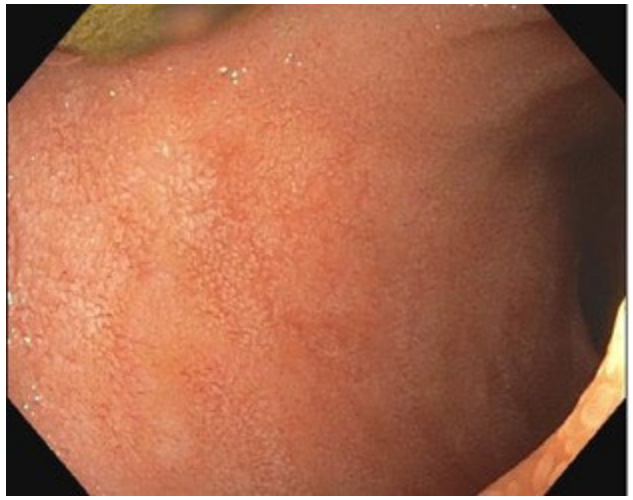
Colonoscopy 8/11/2025











TTS balloon dilation to 15 mm with dilation effect. Stricture was traversed after dilation

Fcal 7/17/2025 – 25.9

- Is this related to CD in any way?
- Any surgery-related factors that may contribute to this?
- Are there any other potential intervention to help with this?