

# Interactive case presentation: IUS in CD – What is your diagnosis?

**Marios Katsaros**

Hippokration General Hospital Thessaloniki, Greece

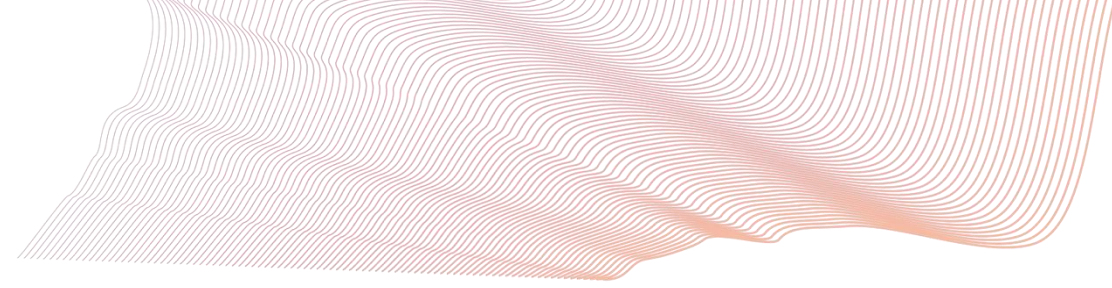
**IBUS Advanced Ultrasound Workshop – Module 3**

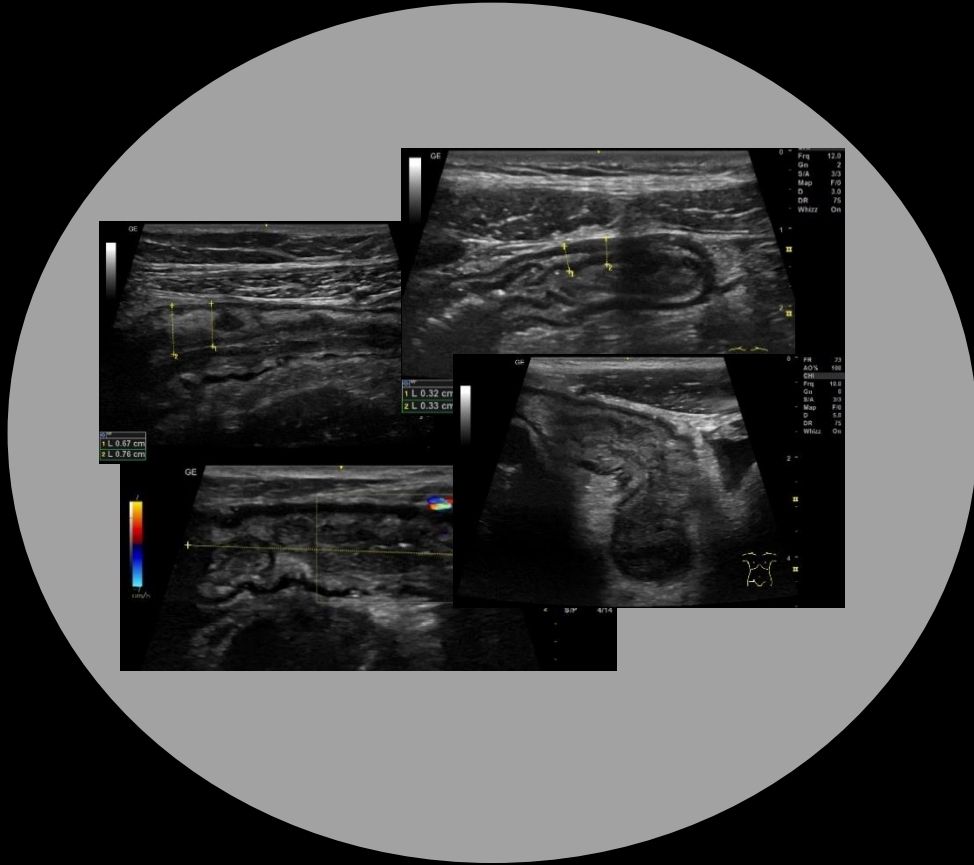
DDW, Chicago, IL, May 4<sup>th</sup>, 2026

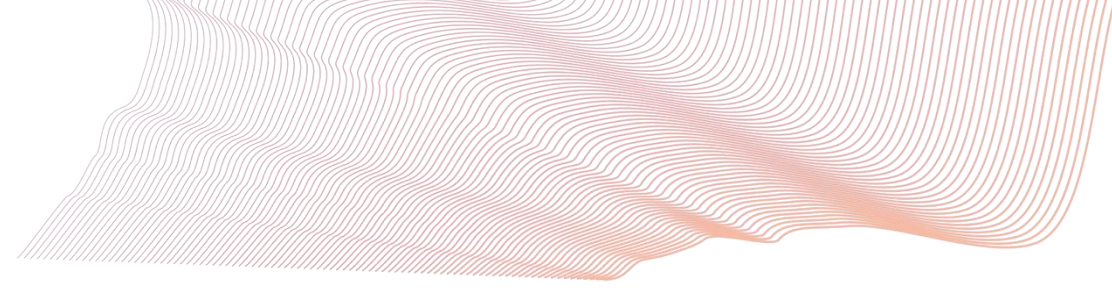
Workshop organised in collaboration with

# Disclosure

Dr. Marios Katsaros has received honoraria from Abbvie, Amgen, Ferring, Innovis, Takeda.







## HOW and WHEN to use IUS in clinical setting?

**A.** I don't care, I know everyone in the radiology department

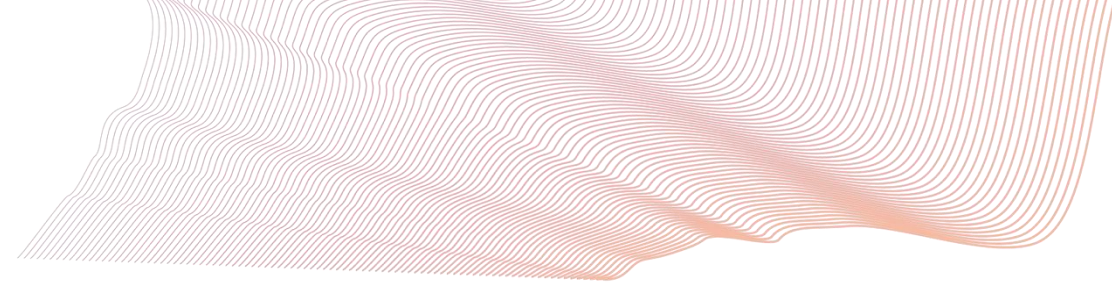
**B.** IUS can detect ONLY complications

**C.** Detection of activity, complications, monitoring, clinical decision tool

**D.** What is IUS?



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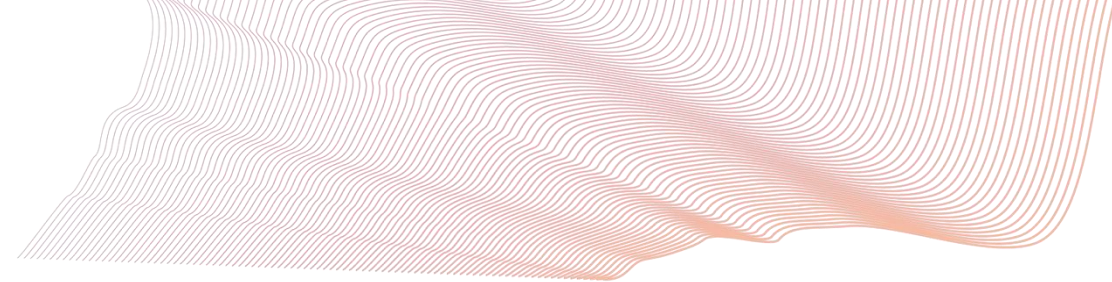
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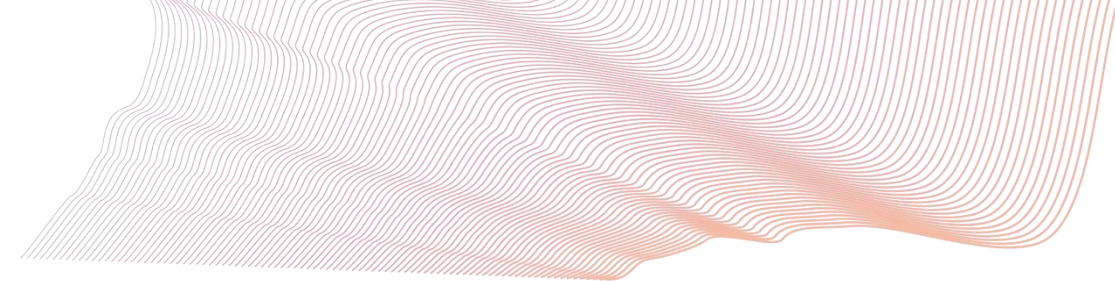
## ECCO-ESGAR-ESP-IBUS Guideline on Diagnostics and Monitoring of Patients with Inflammatory Bowel Disease: Part 1

Part 1: initial diagnosis, monitoring of known inflammatory bowel disease, detection of complications

Torsten Kucharzik<sup>1,\*</sup>, Stuart Taylor<sup>2</sup>, Mariangela Allocca<sup>3</sup>, Johan Burisch<sup>4,5,6</sup>, Pierre Ellul<sup>7</sup>, Marietta Iacucci<sup>8</sup>, Christian Maaser<sup>9</sup>, Pamela Baldin<sup>10</sup>, Gauraang Bhatnagar<sup>11</sup>, Shomron Ben-Horin<sup>12</sup>, Dominik Bettenworth<sup>13</sup>, Mallory Chavannes<sup>14</sup>, Ann Driessen<sup>15</sup>, Emma Flanagan<sup>16</sup>, Frederica Furfaro<sup>17</sup>, Giovanni Maconi<sup>18</sup>, Konstantinos Karmiris<sup>19</sup>, Amelia Kellar<sup>20,21</sup>, Isabelle De Kock<sup>22</sup>, Konstantinos Katsanos<sup>23</sup>, Uri Kopylov<sup>24</sup>, Cathy Lu<sup>25</sup>, Olga Maria Nardone<sup>26</sup>, Nurulamin M Noor<sup>27</sup>, Kerri Novak<sup>28</sup>, Paula Borralho Nunes<sup>29</sup>, Patrick van Rheenen<sup>30</sup>, Jordi Rimola<sup>31</sup>, Francesca Rosini<sup>32</sup>, David Rubin<sup>33</sup>, Martina Scharitzer<sup>34</sup>, Jaap Stoker<sup>35,36</sup>, Mathieu Uzzan<sup>37</sup>, Stephan Vavricka<sup>38</sup>, Bram Verstockt<sup>39</sup>, Rune Wilkens<sup>40</sup>, Nina Zidar<sup>41</sup>, Alessandra Zilli<sup>42</sup>, Henit Yanai<sup>43,44</sup>, Roger Feakins<sup>45,46</sup>; on behalf of the European Crohn's and Colitis Organisation (ECCO), the European Society of Gastrointestinal and Abdominal Radiology (ESGAR), the European Society of Pathology (ESP), and the International Bowel Ultrasonography Group (IBUS)

- ✓ **Initial diagnosis** of Crohn's disease (complementary to Endoscopy / MRE-CTE)
- ✓ **Detection of activity and complications**
- ✓ **Monitoring of patients** with Crohn's disease





## ✓ Clinical Decision Making tool

**49 patients with Crohn's disease** were prospectively evaluated  
**HBI, CRP** and **endoscopy** reviewed by two independent IBD-specialty physicians.  
**Clinical decisions** were **changed** after **IUS assessment** in  
**60%** and **58%** of cases, for each physician respectively [p < 0.0001 for each].  
**59% of the pts - HBI ≤ 3** however,  
**52% [n = 15]** of these had **active disease found on IUS**, resulting in  
**alterations in clinical management.**

Observational Study > J Crohns Colitis. 2015 Sep;9(9):795-801. doi: 10.1093/ecco-jcc/jjv105.

Epub 2015 Jun 16.

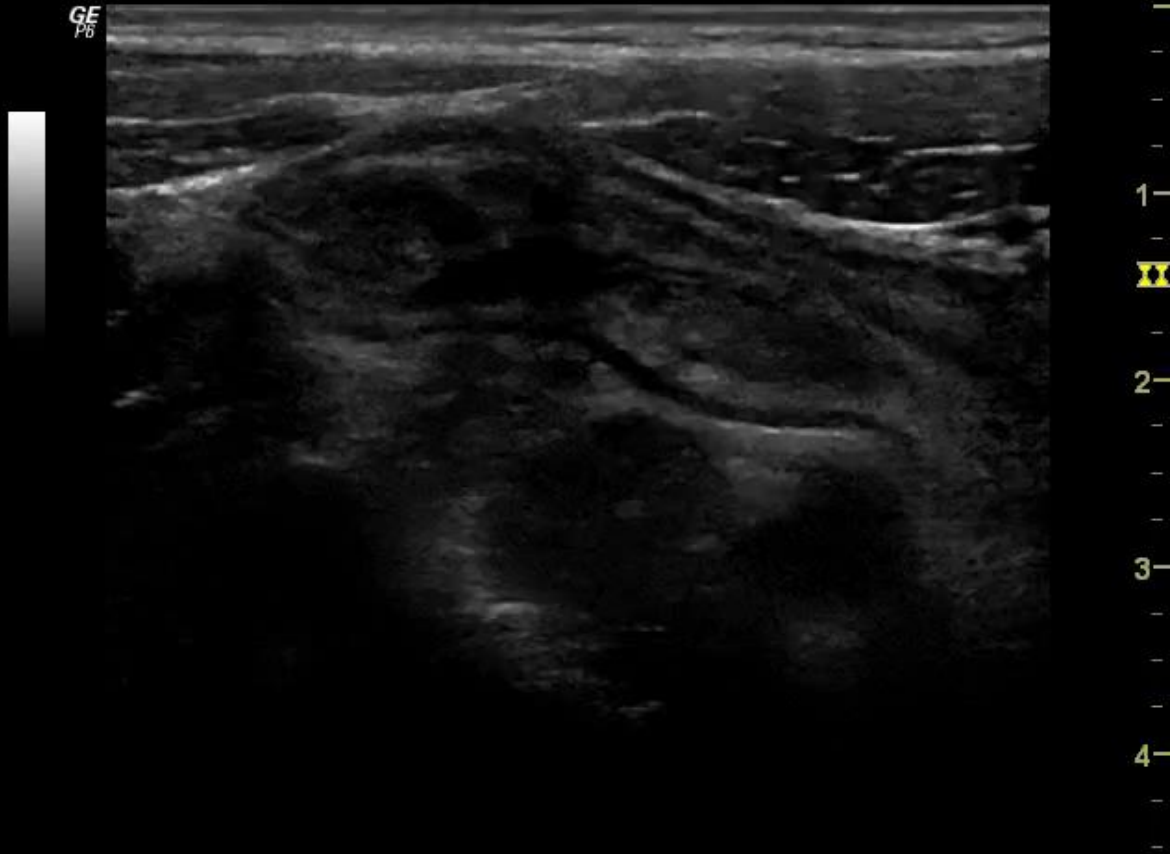
### Clinic-based Point of Care Transabdominal Ultrasound for Monitoring Crohn's Disease: Impact on Clinical Decision Making

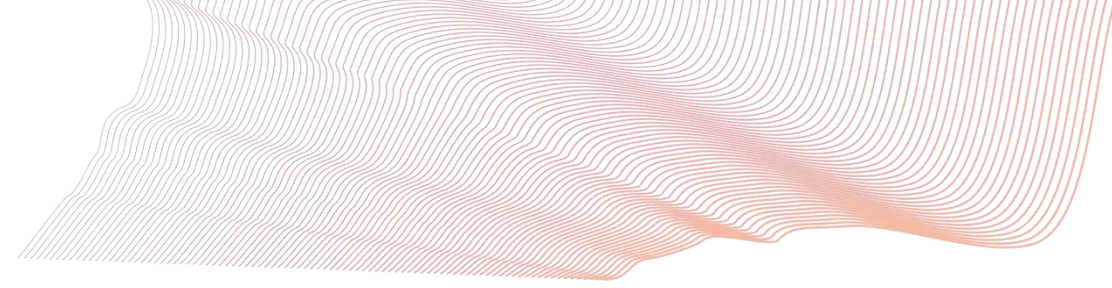
Kerri Novak<sup>1</sup>, Divine Tanyingoh<sup>2</sup>, Frauke Petersen<sup>3</sup>, Torsten Kucharzik<sup>2</sup>, Remo Panaccione<sup>2</sup>,  
Subrata Ghosh<sup>2</sup>, Gilaad G Kaplan<sup>2</sup>, Alex Wilson<sup>2</sup>, Klaus Kannengiesser<sup>2</sup>, Christian Maaser<sup>2</sup>

	Physician 1, n [%]		Physician 2, n [%]	
	Pre-US <sup>a</sup>	Post-US	Pre-US <sup>a</sup>	Post-US
Clinical decision				
No change	25 [51]	15 [31]	30 [63]	15 [31]
Further investigation	14 [28]	12 [24]	13 [27]	7 [15]
Medication change	7 [14]	22 [45]	5 [10]	23 [48]
Surgical consultation	2 [4]	7 [14]	0 [0]	4 [8]
Combination	2 [4]	6 [12]	3 [6]	1 [2]
Other	2 [4]	1 [2]	0 [0]	0 [0]
Incomplete	0	0	1	1
Effect of US on clinical decision				
No change	19 [40]		20 [42]	
Change	30 [60] <sup>b</sup>		28 [58] <sup>b</sup>	
Incomplete	0		1	



- 25-year-old male with 4 months history of recurrent aphthous ulcers in the oral cavity
- Biopsy findings may be compatible with Crohn's disease
- Referred to the outpatient IBD clinic by a Stomatologist
- 2-3 soft stools/day for the past 5 months
- CRP: 17.5 mg/L (ULN 6mg/L)
- IUS performed / A segment of the terminal ileum can be seen on the ultrasound.





What are the findings in this segment of the terminal ileum?

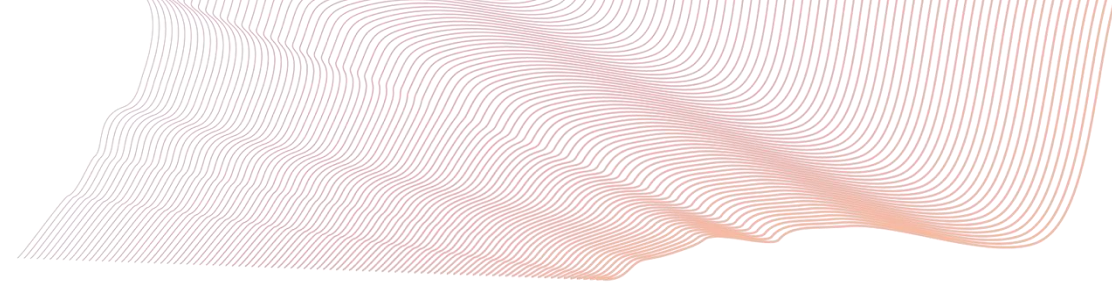
**A.** Increased BWT, free fluid, ifat, LN

**B.** Increased BWT, ifat, LN.

**C.** Increased BWT, LN, free fluid

**D.** Increased BWT, free fluid, ifat, complete loss of BWS

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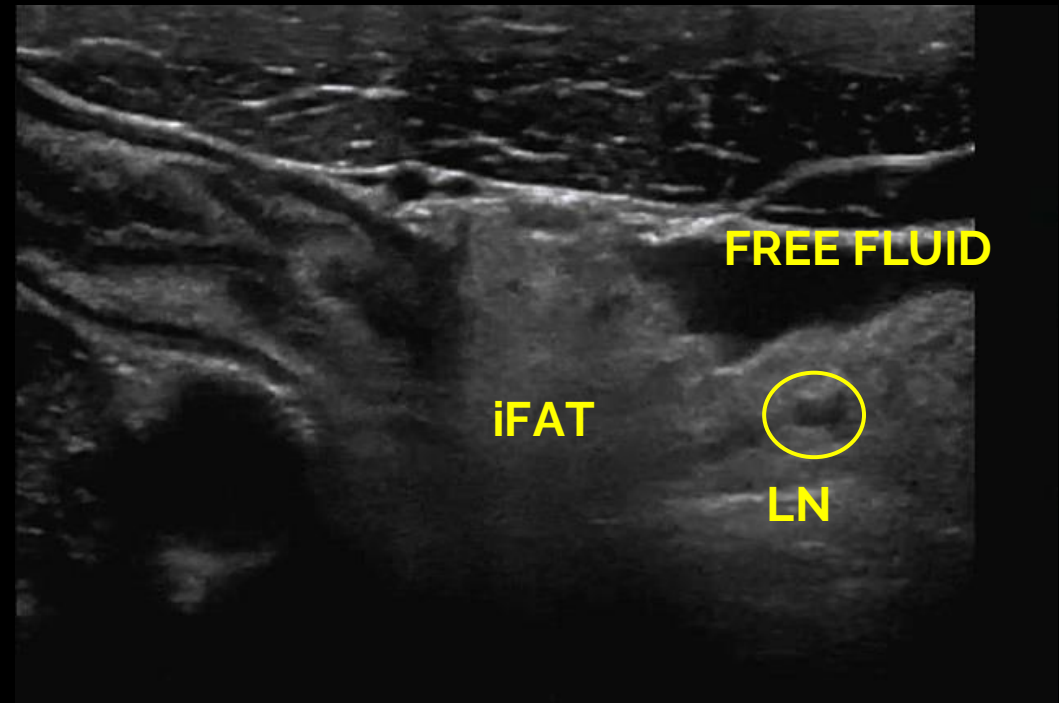
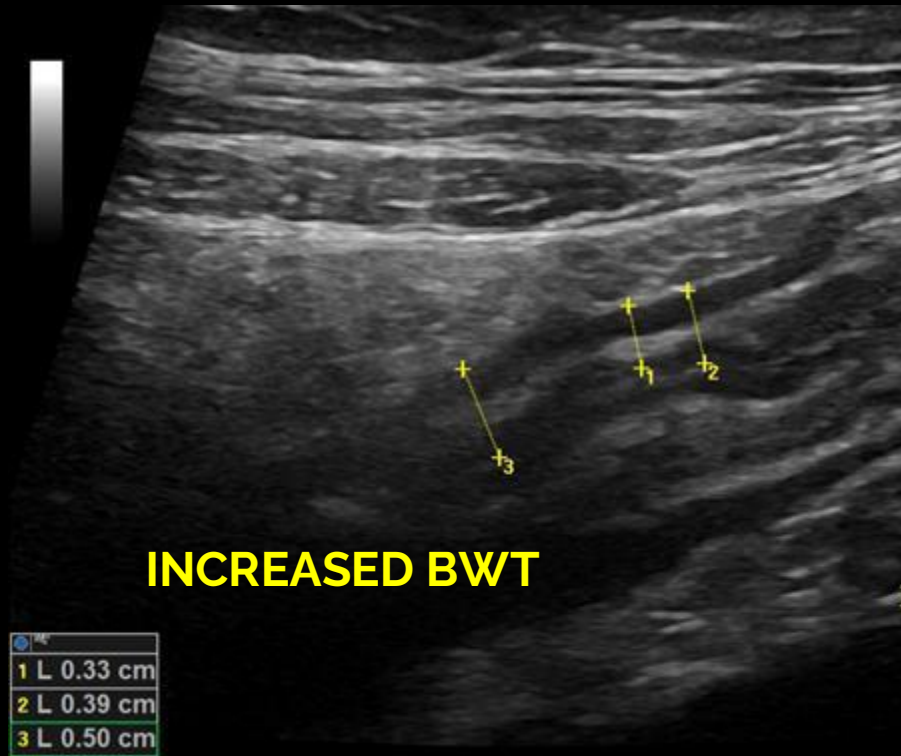
**A.** Increased BWT, free fluid, ifat, LN

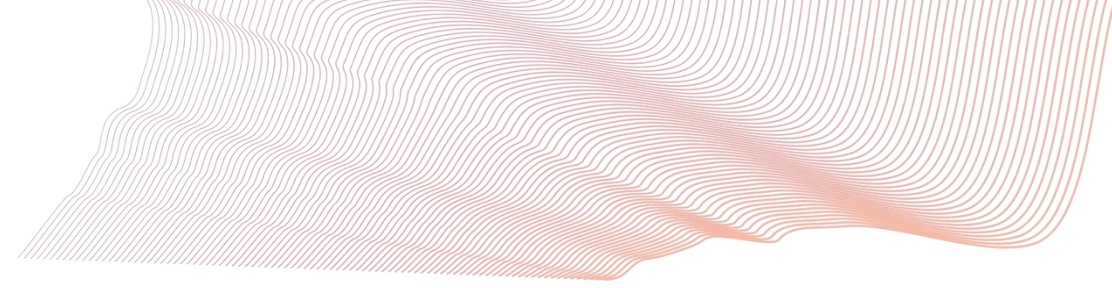
**B.** Increased BWT, ifat, LN.

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- |     |             |
|-----|-------------|
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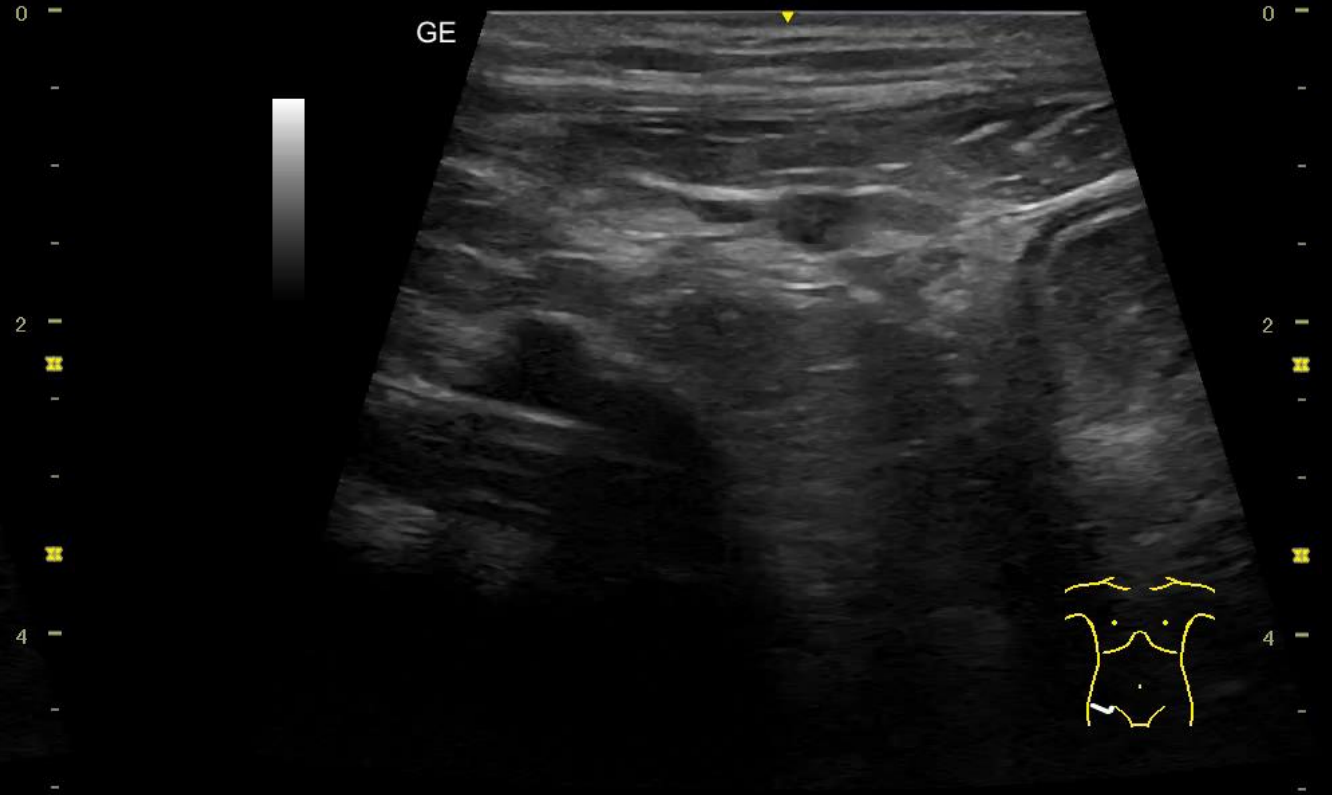
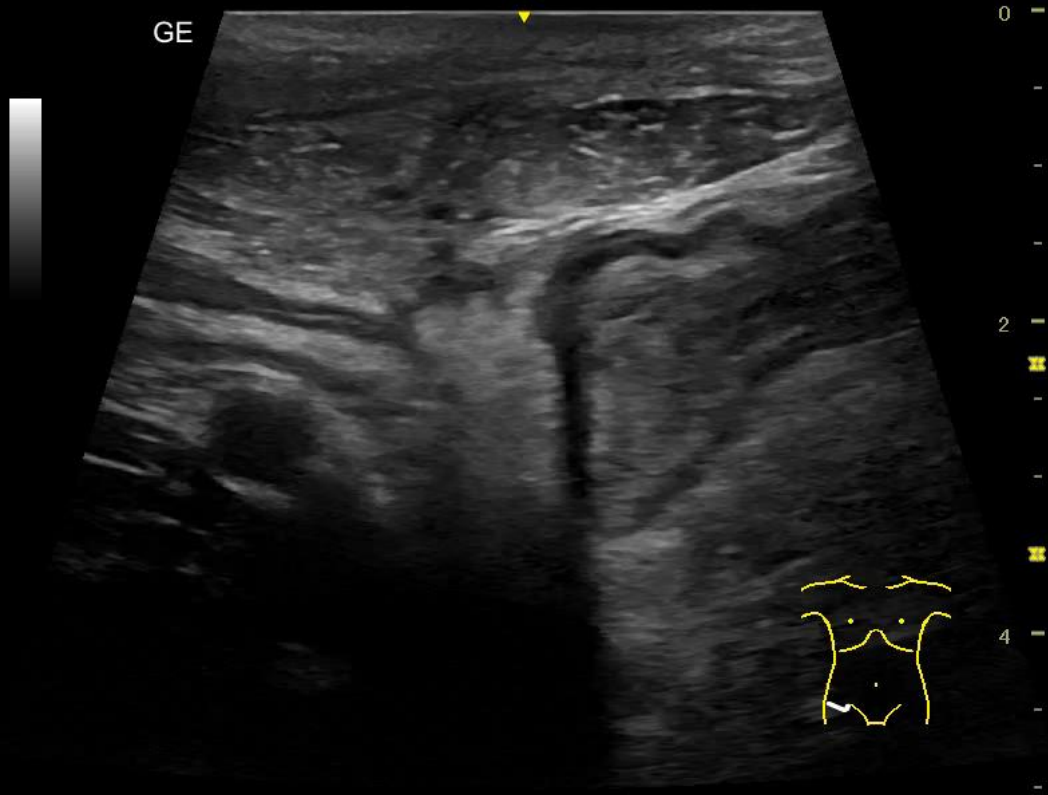
**IUS findings** prompted endoscopic evaluation, which confirmed Crohn's disease (SES-CD 8)

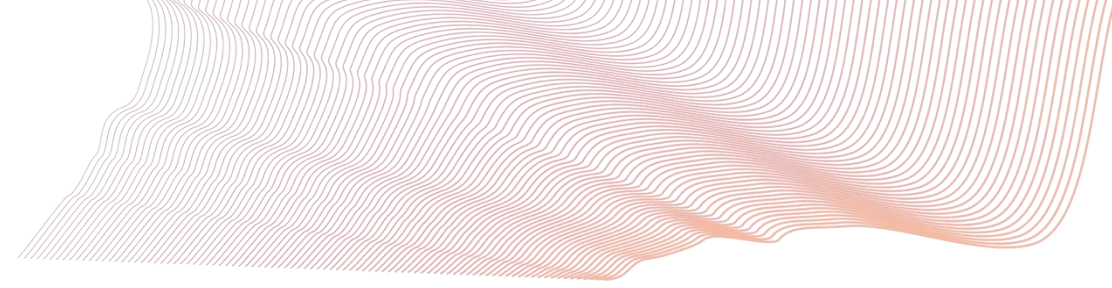
**MRE confirmed the IUS** findings, showing a total involvement of 15 cm of the terminal ileum proximal to the ICV





- 12y/o female
- Diagnosed 9 months ago
- A1L1B1
- Standard dose of IFX
- **Referred for IUS due to external abdominal drainage, elevated CRP (68mg/L) and mild abdominal pain.**





Did you notice any mistakes while I was performing the IUS?

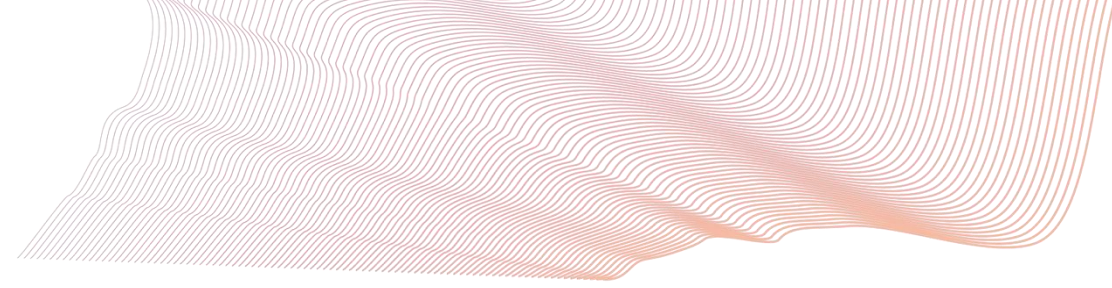
A. I did not realize the probe was damaged

B. I did not adjust the depth

C. There was an artefact

D. No, everything looked fine

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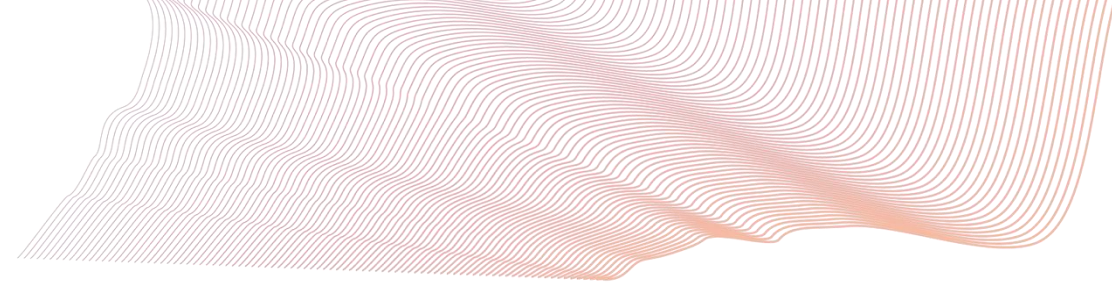
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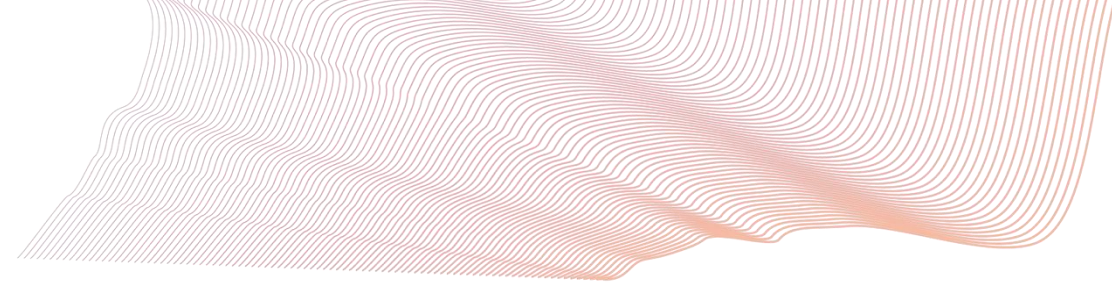
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I remove the bag attached to the stoma

Hygiene is important!!





Look beyond my mistake...what else do you see on the IUS?

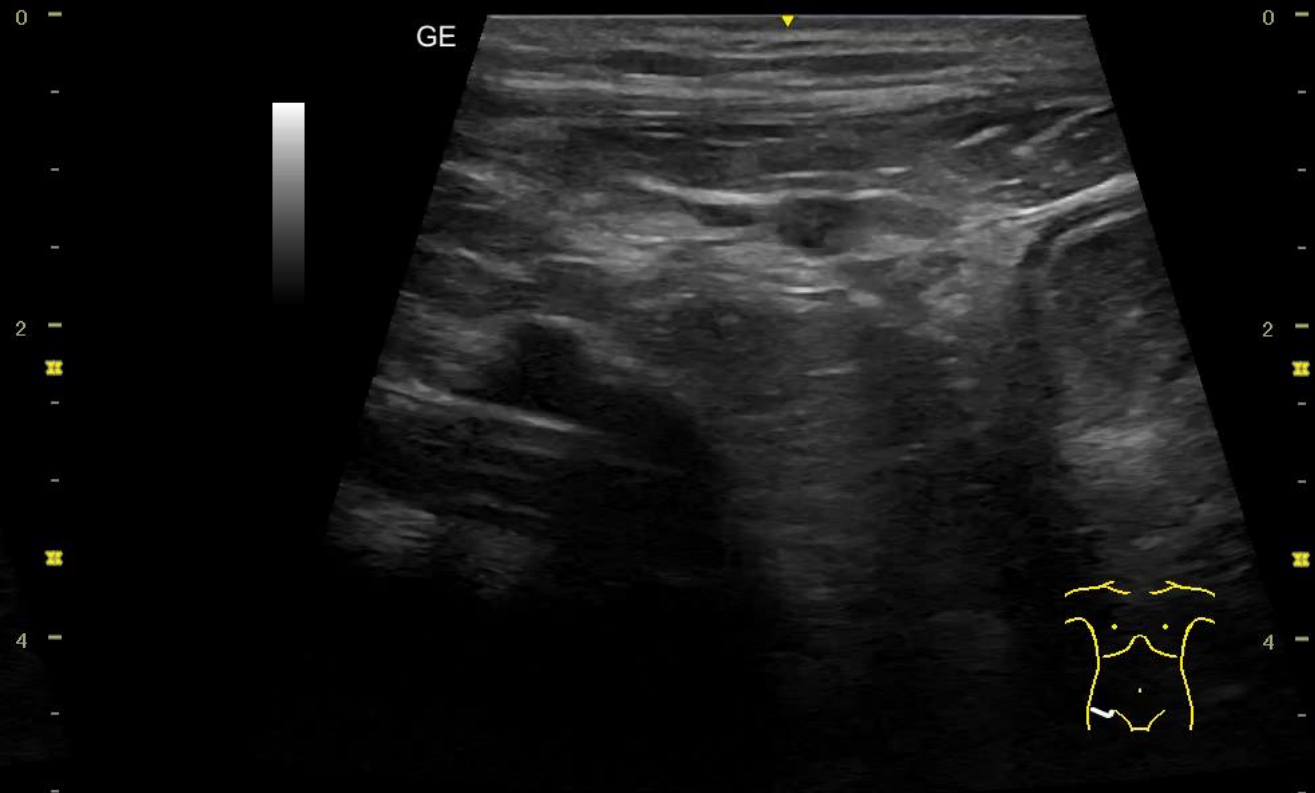
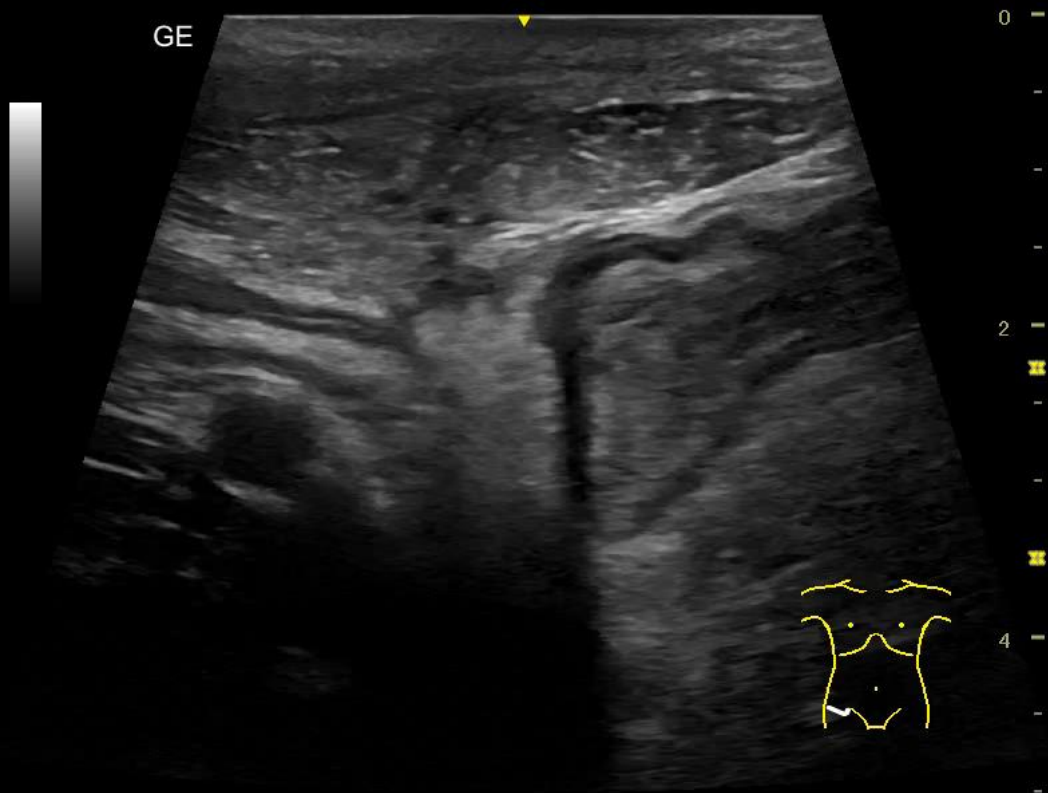
A. Abscess

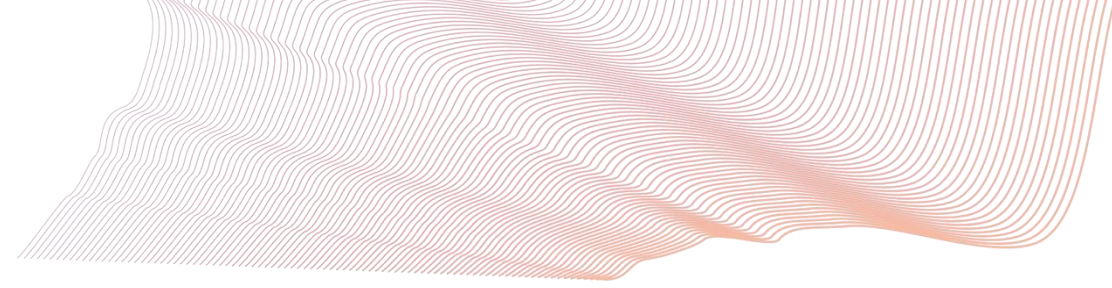
B. Plegmon

C. Only Increased BWT

D. Enterocutaneous fistula

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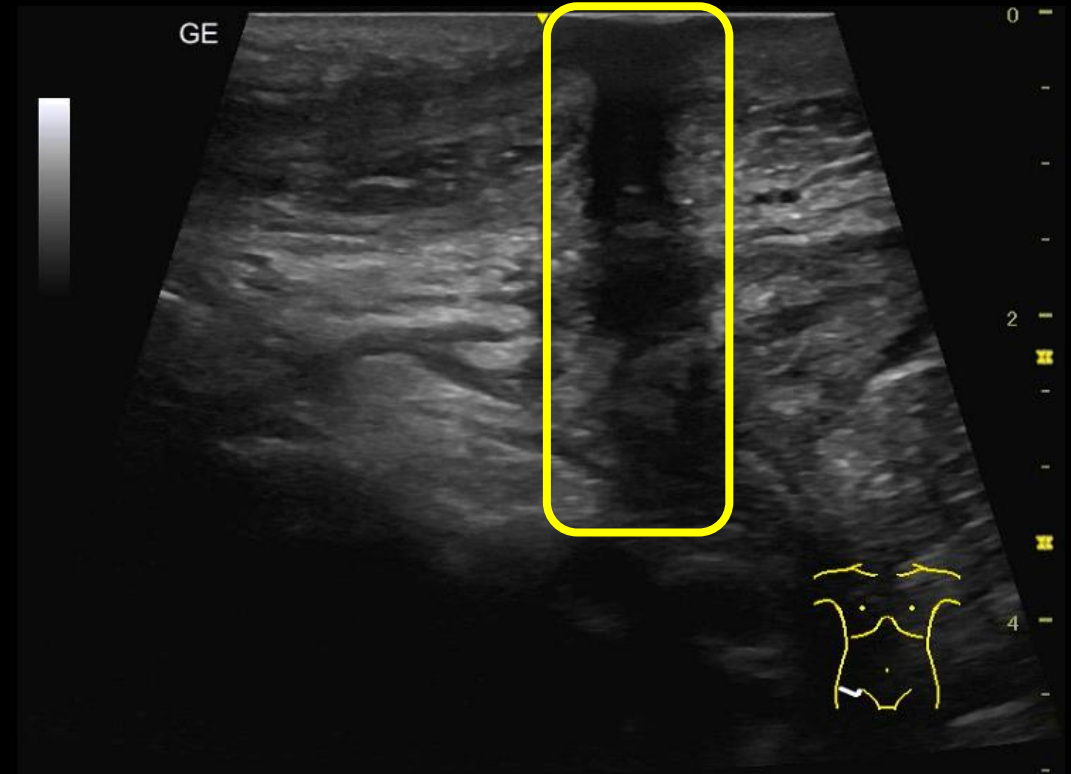
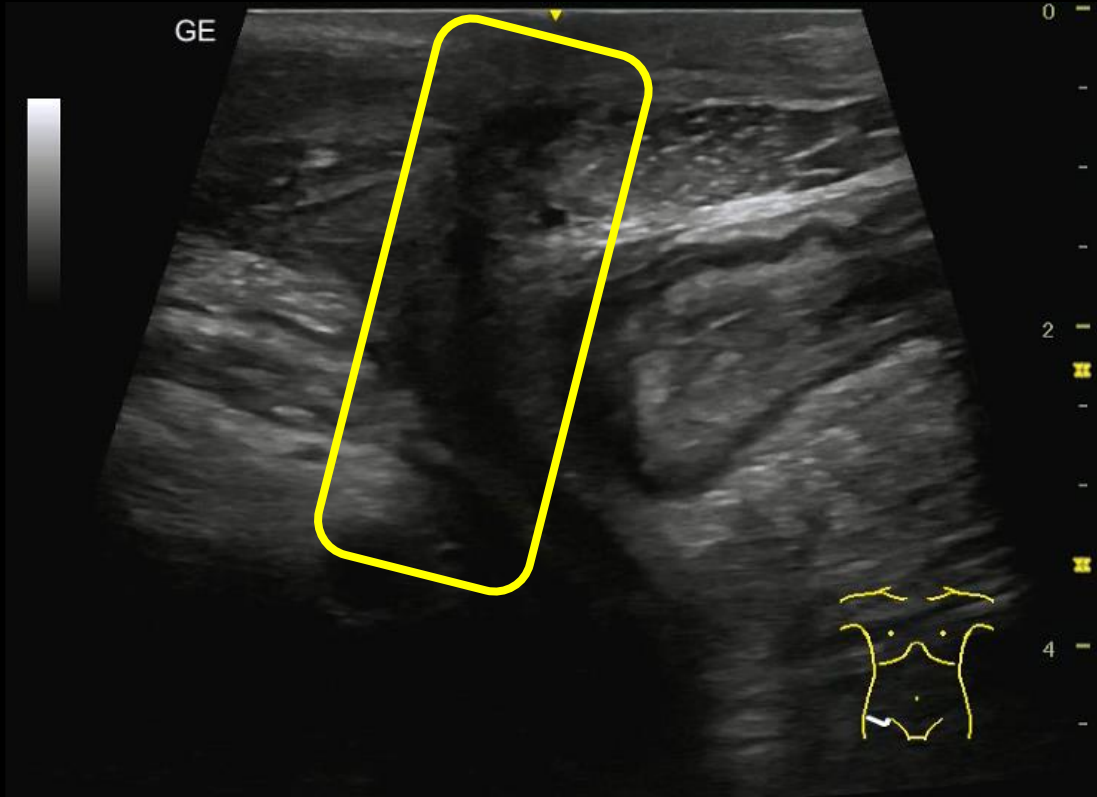
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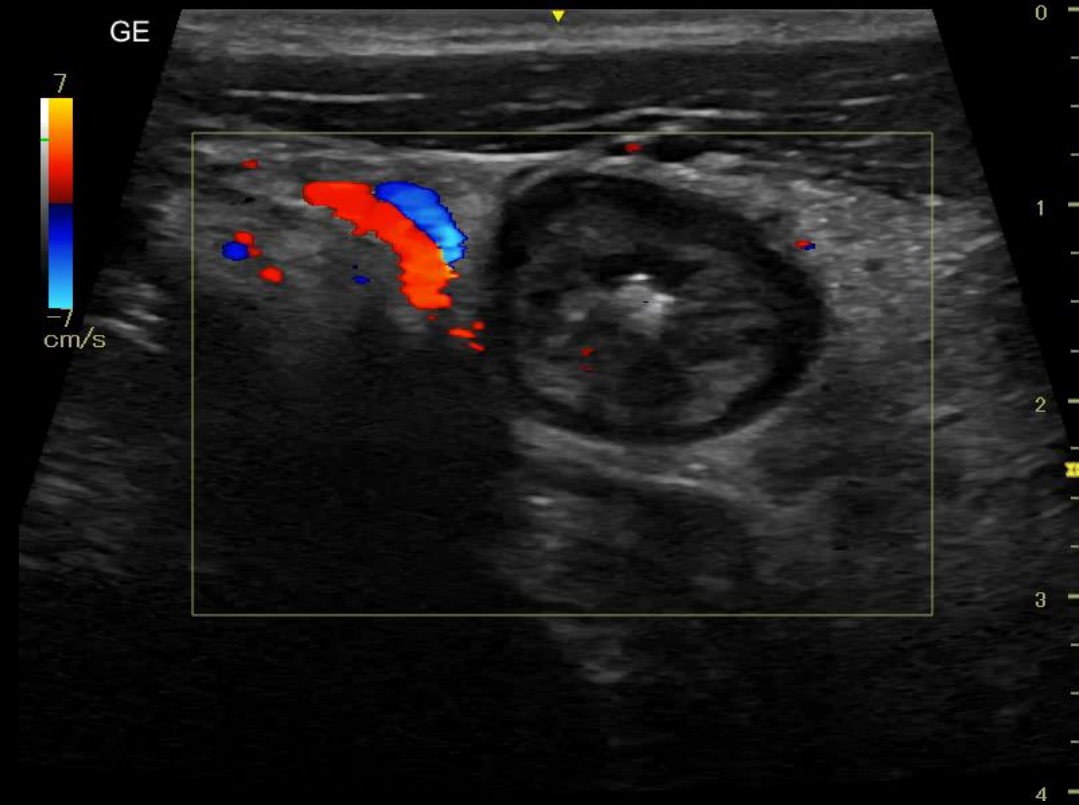


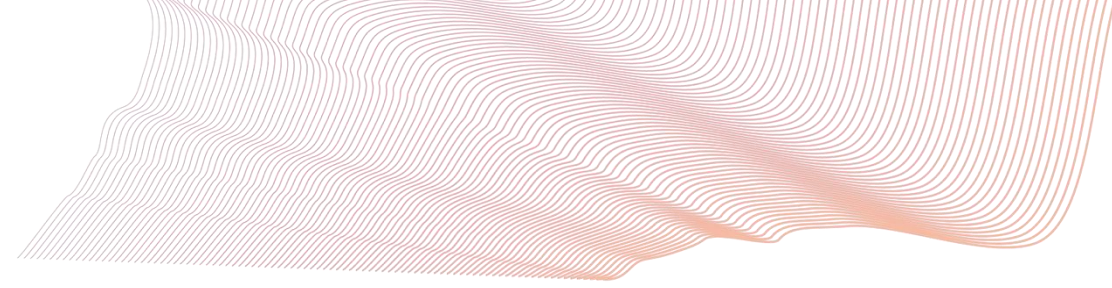
## Enterocutaneous fistula





- A 22 y/o male
- A2L1B1
- 1<sup>st</sup> diagnosis 2,5 years ago
- Failed IFX.
- Last 12 months on Ustekinumab / Escalated (every 4 weeks) for the last 4 months
- ED presentation on physician's recommendation: 5 – 6 diarrheal stools/day for the last two months and moderate to severe abdominal pain at the RLQ for 15 days.
- POCUS





What do you see on the IUS?

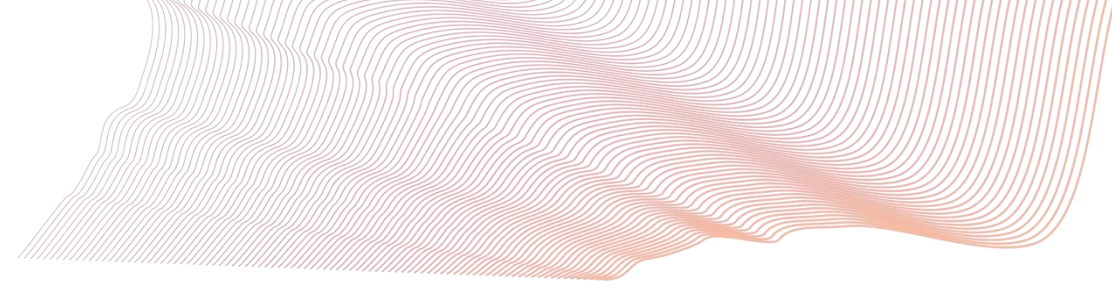
A. Increased BWT, CDS 3, iFAT

B. Increased BWT, CDS 1

C. Increased BWT, CDS 2, iFAT

D. Increased BWT, CDS 1, iFAT,

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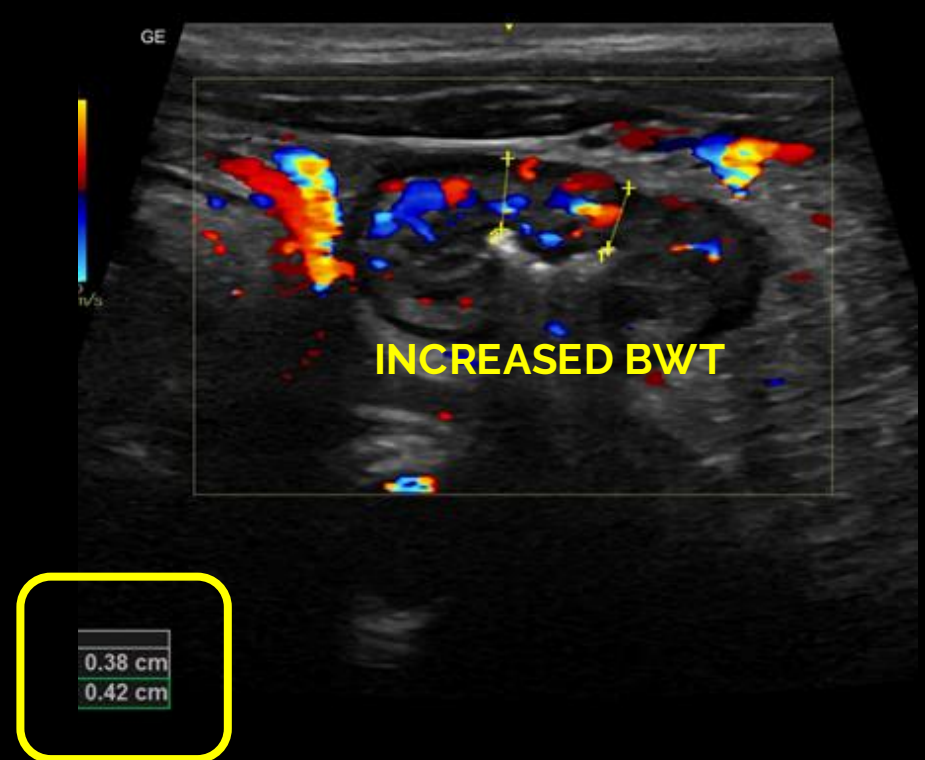
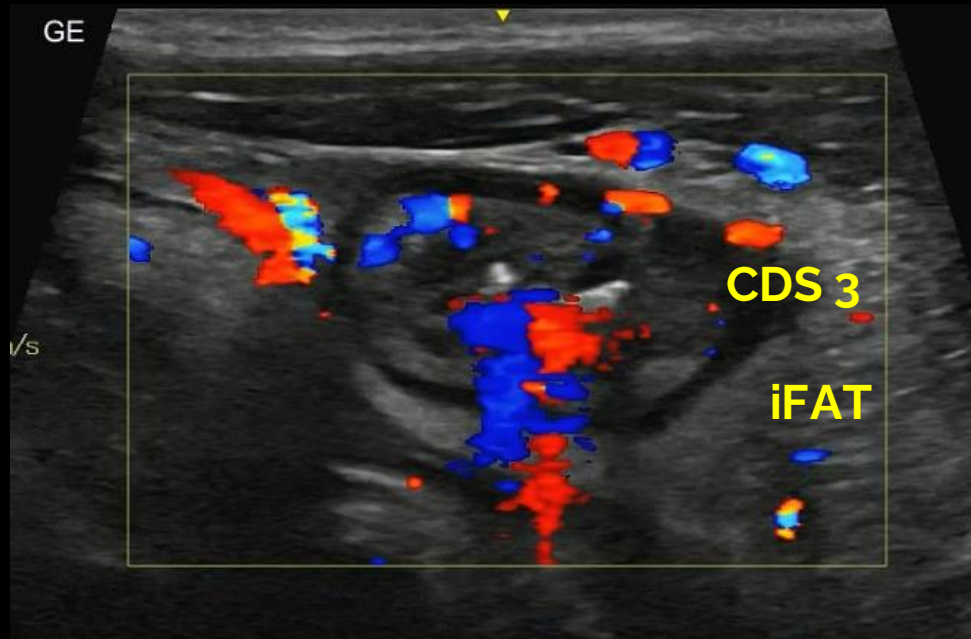
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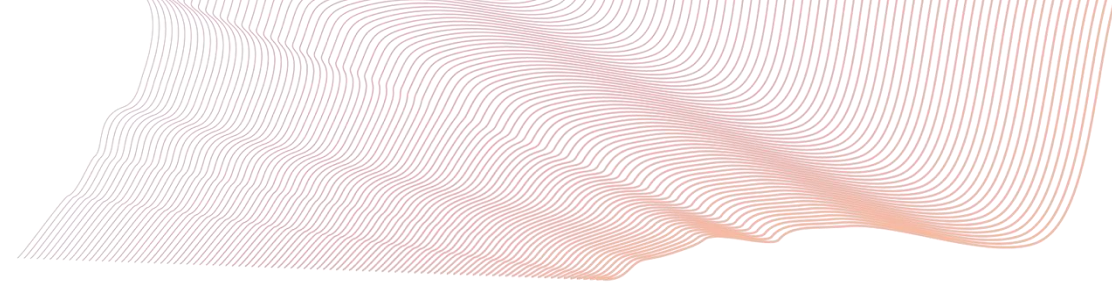
B. Increased BWT, CDS 1

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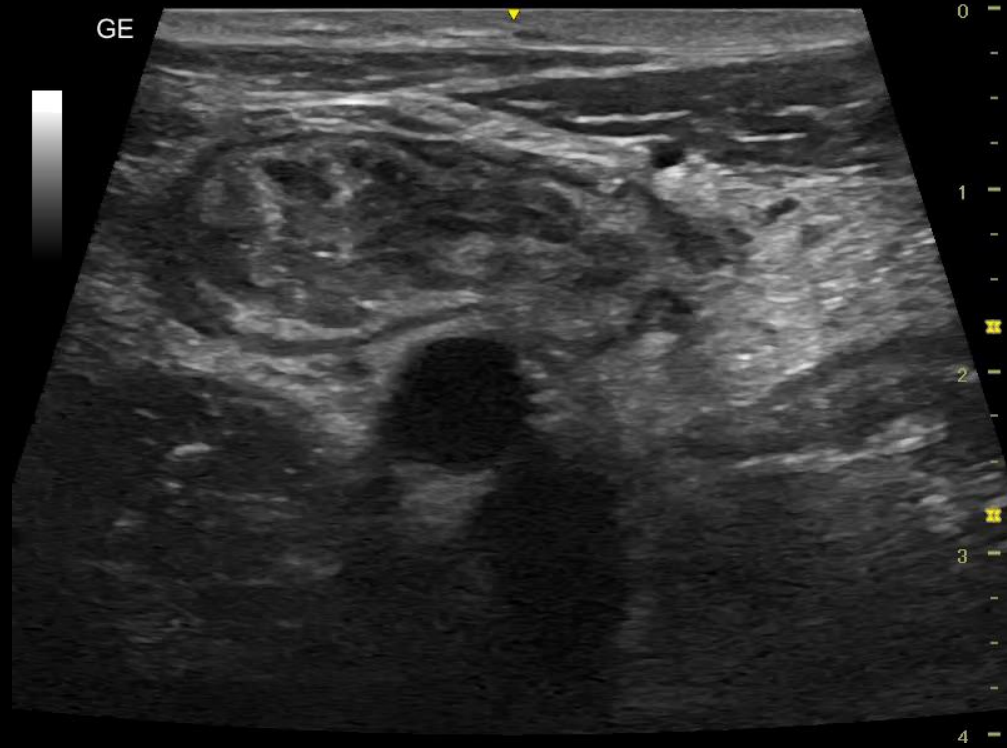
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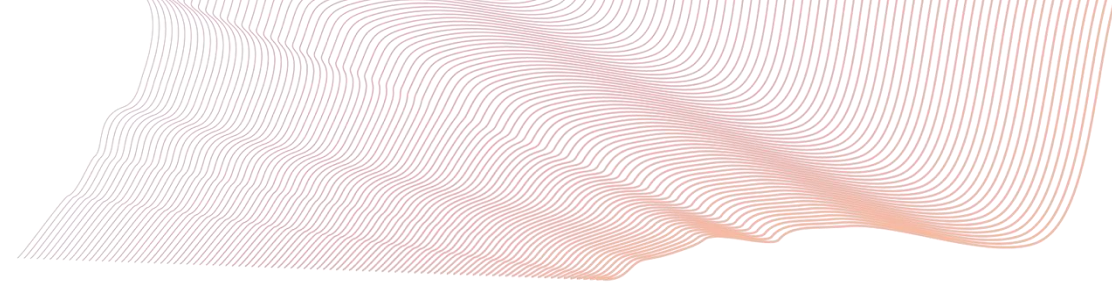




Do the IUS findings explain the clinical presentation?







What else do you see on the IUS?

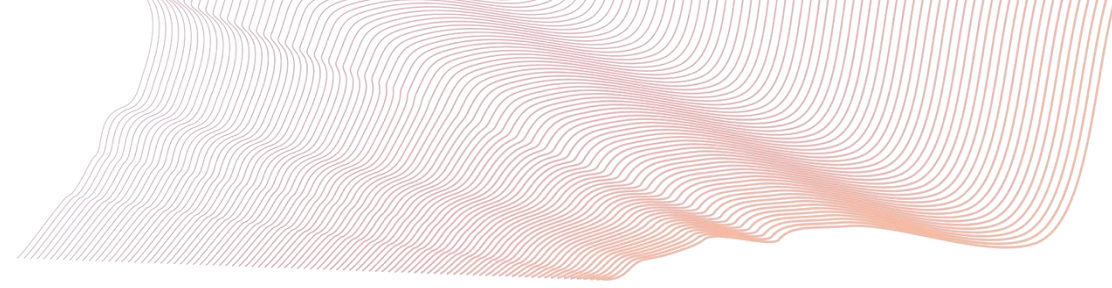
A. Large Abscess

B. Stricture with prestenotic dilation

C. Increased BWT, iFAT

D. Enteroenteric fistula

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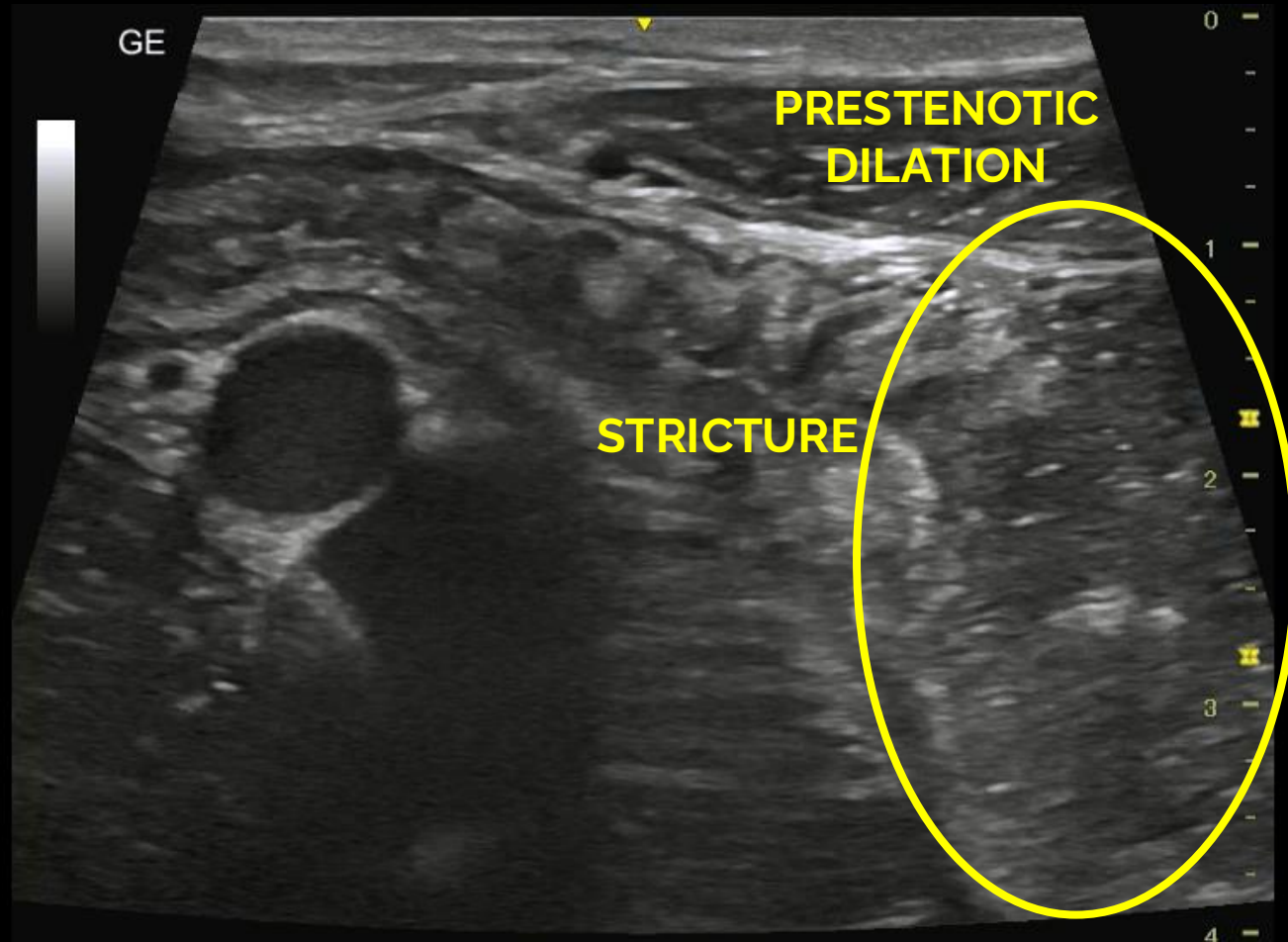
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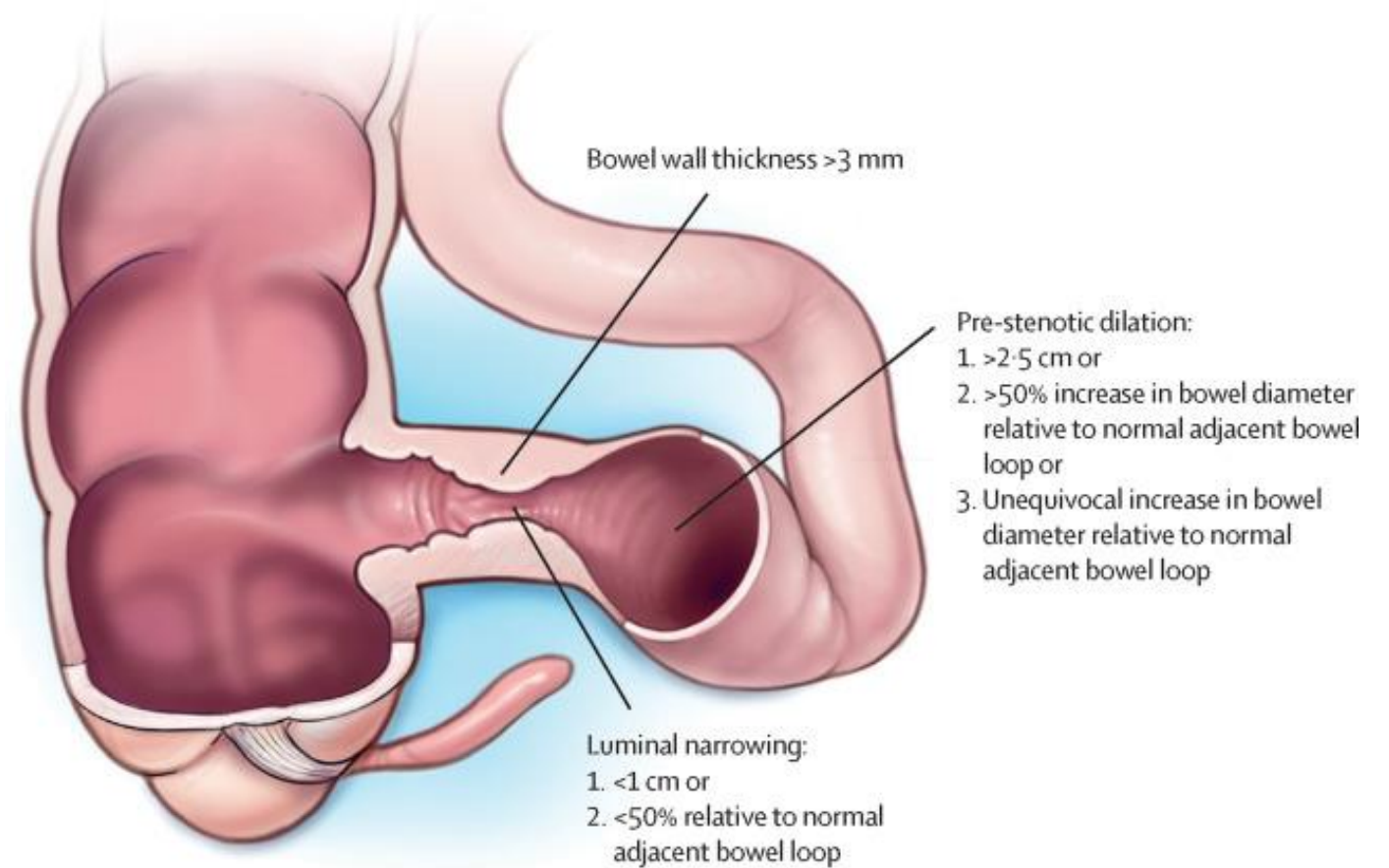
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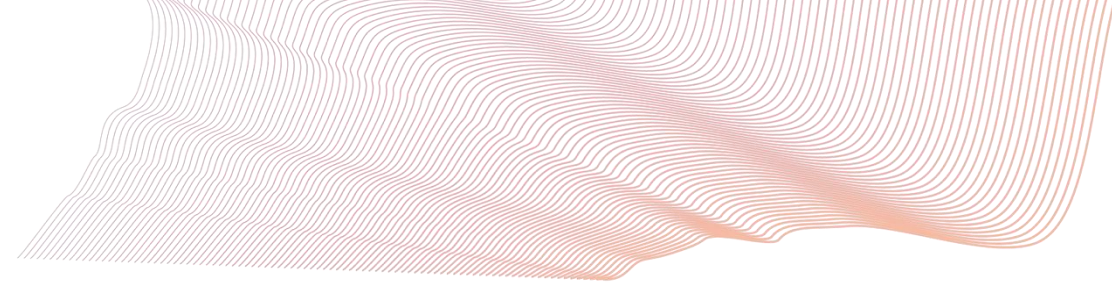


> *Lancet Gastroenterol Hepatol.* 2024 Dec;9(12):1101-1110. doi: 10.1016/S2468-1253(24)00265-6.  
Epub 2024 Oct 22.

## International expert guidance for defining and monitoring small bowel strictures in Crohn's disease on intestinal ultrasound: a consensus statement

Cathy Lu<sup>1</sup>, Ryan Rosentreter<sup>2</sup>, Claire E Parker<sup>3</sup>, Julie Remillard<sup>3</sup>, Stephanie R Wilson<sup>4</sup>, Mark E Baker<sup>5</sup>, Gauraang Bhatnagar<sup>6</sup>, Jakob Begun<sup>7</sup>, David H Bruining<sup>8</sup>, Robert V Bryant<sup>7</sup>, Britt Christensen<sup>9</sup>, Brian G Feagan<sup>10</sup>, Joel G Fletcher<sup>11</sup>, Ilyssa Gordon<sup>12</sup>, Gaylyn Henderson<sup>13</sup>, Vipul Jairath<sup>14</sup>, John Knudsen<sup>11</sup>, Torsten Kucharzik<sup>15</sup>, Kyle Lesack<sup>2</sup>, Christian Maaser<sup>16</sup>, Giovanni Maconi<sup>17</sup>, Kerri Novak<sup>2</sup>, Jordi Rimola<sup>18</sup>, Stuart A Taylor<sup>19</sup>, Rune Wilkens<sup>20</sup>, Florian Rieder<sup>21</sup>; Stenosis Therapy and Anti-Fibrotic Research (STAR) consortium





ECCO Topical Review

## ECCO Topical Review: Refractory Inflammatory Bowel Disease

Tim Raine,<sup>a</sup> Bram Verstockt,<sup>b,e</sup> Uri Kopylov,<sup>c</sup> Konstantinos Karmiris,<sup>d</sup>  
Rimma Goldberg,<sup>e</sup> Raja Atreya,<sup>f</sup> Johan Burisch,<sup>g,e</sup> John Burke,<sup>h</sup>  
Pierre Ellul,<sup>i</sup> Charlotte Hedin,<sup>j,k,e</sup> Stefan D. Holubar,<sup>l,e</sup>  
Konstantinos Katsanos,<sup>m</sup> Triana Lobaton,<sup>n</sup> Carsten Schmidt,<sup>o</sup>  
Garret Cullen<sup>p</sup>

**Refractory IBD** should be defined as **disease not responding to or losing response to all classes of licensed immunosuppressive and biologic agents.**

Refractory CD should additionally not be considered amenable to surgery.

**Refractory perianal fistulising CD** should be defined as **failure of at least one surgical intervention and anti-tumour necrosis factor therapy**



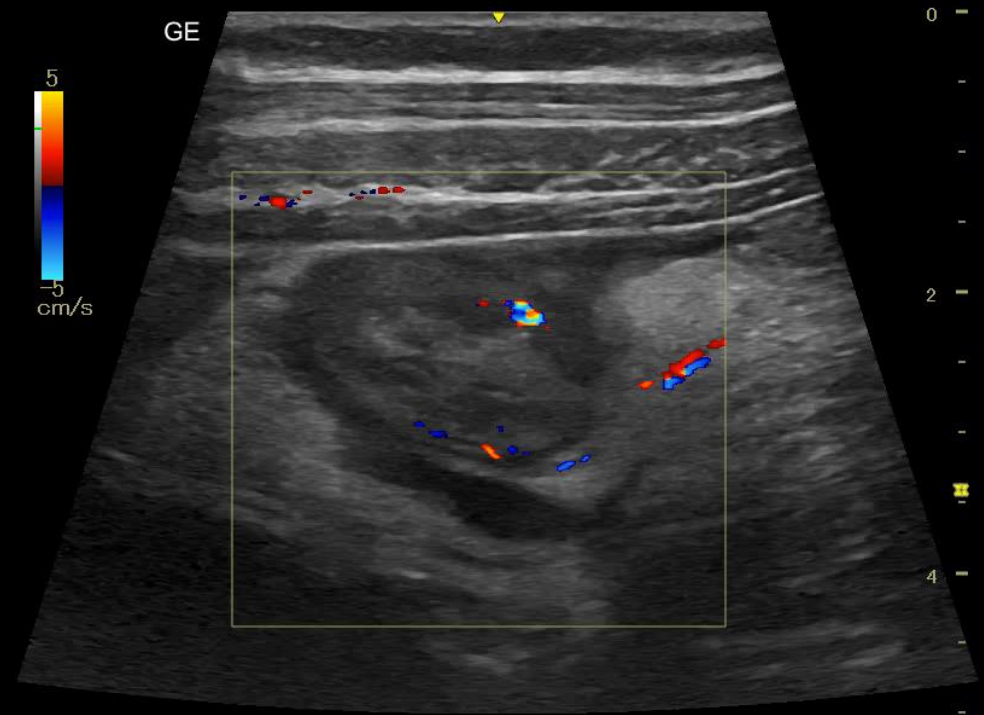
**Difficult-to-treat IBD** is defined by the **failure of biologics and advanced small molecules with at least two different mechanisms of action,**

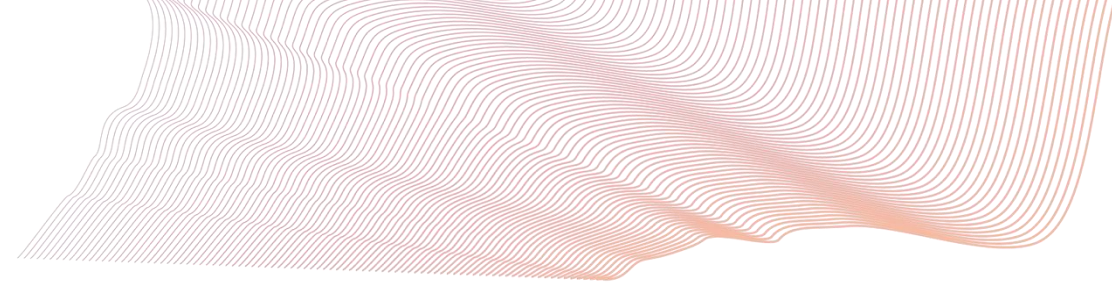
**OR**

**postoperative recurrence of Crohn's disease after two surgical resections** in adults, or one in children



- A 25 y/o female
- 1<sup>st</sup> diagnosis at the age of 11
- A1L3B2/3p
- Failed IFX,ADA,VEDO,USTE,UPA
- 4 times Operated – last operation 5 months ago (T.I and TC) – ileodescending anastomosis
- Currently on UPA / 2 active perianal fistulae / CRP 93 mg/dl / 6–7 diarrheal stools per day / BMI:14.5
- Referred to the outpatient IBD clinic / IUS shows the loop of the T.I proximal to the anastomosis





What are your findings?

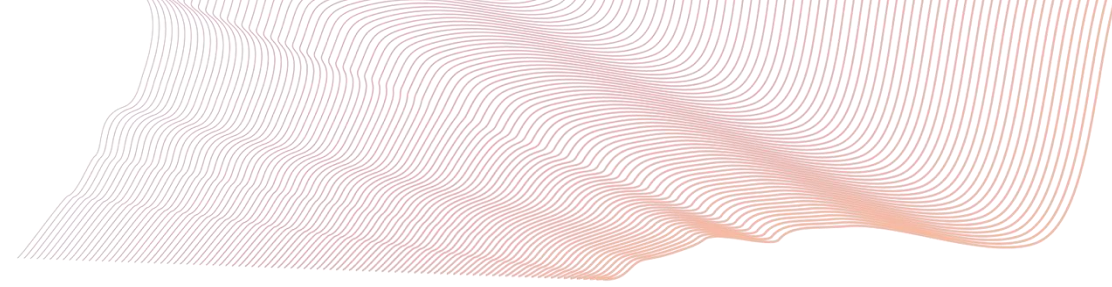
A. BWT, CDS 3, ifat,  
Extensive loss of BWS

B. BWT, CDS 3, ifat,  
partial loss of BWS

C. BWT, CDS 3, partial loss of BWS

D. BWT, CDS 2, ifat,  
Complete loss of BWS

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What are your findings?

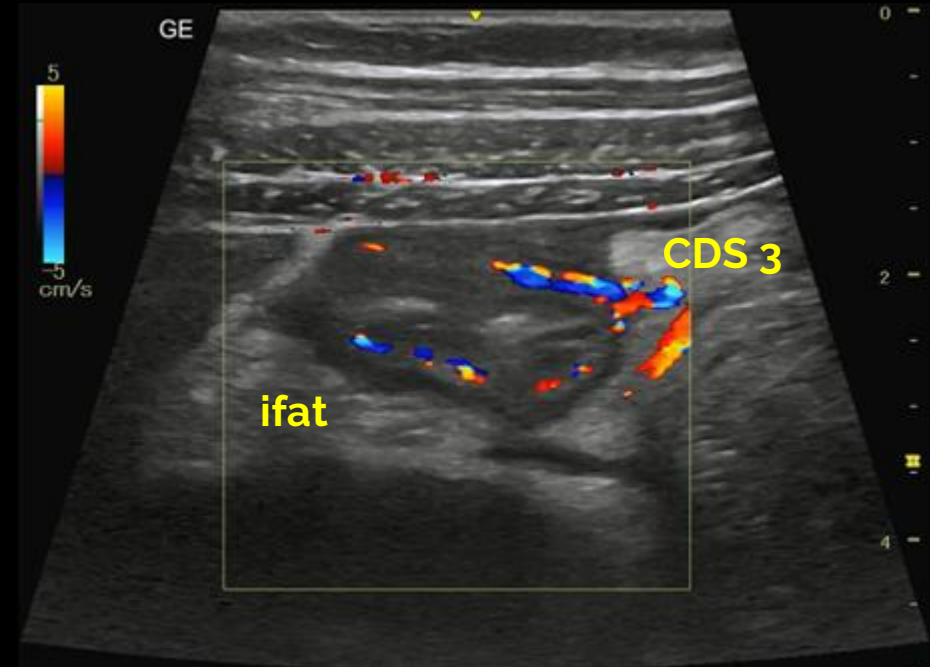
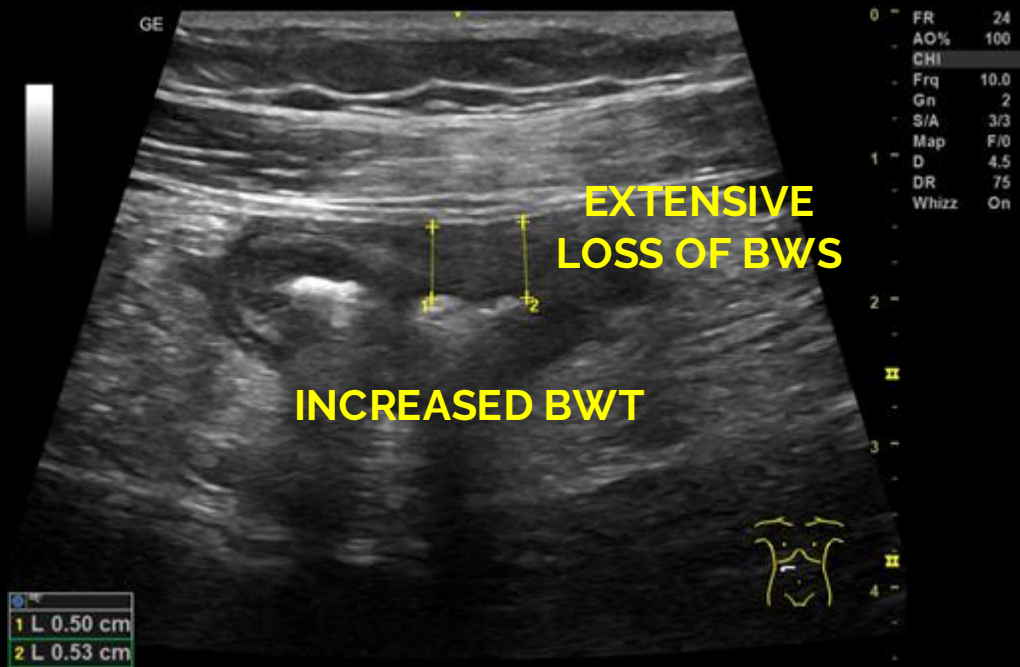
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Extensive loss of BWS

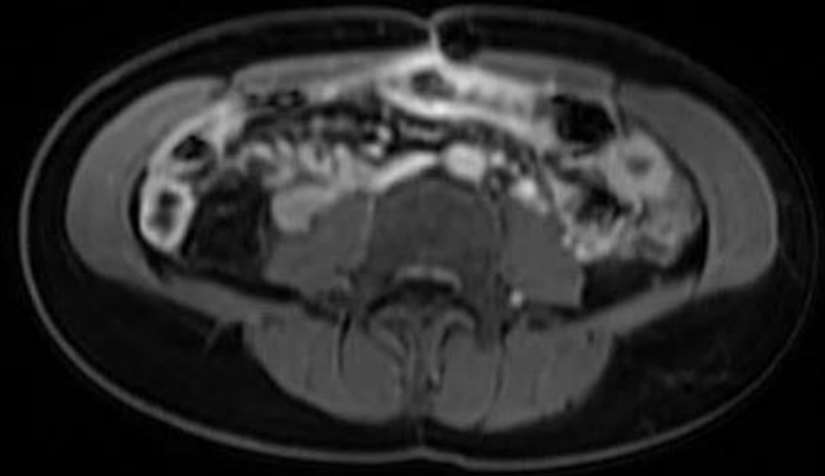
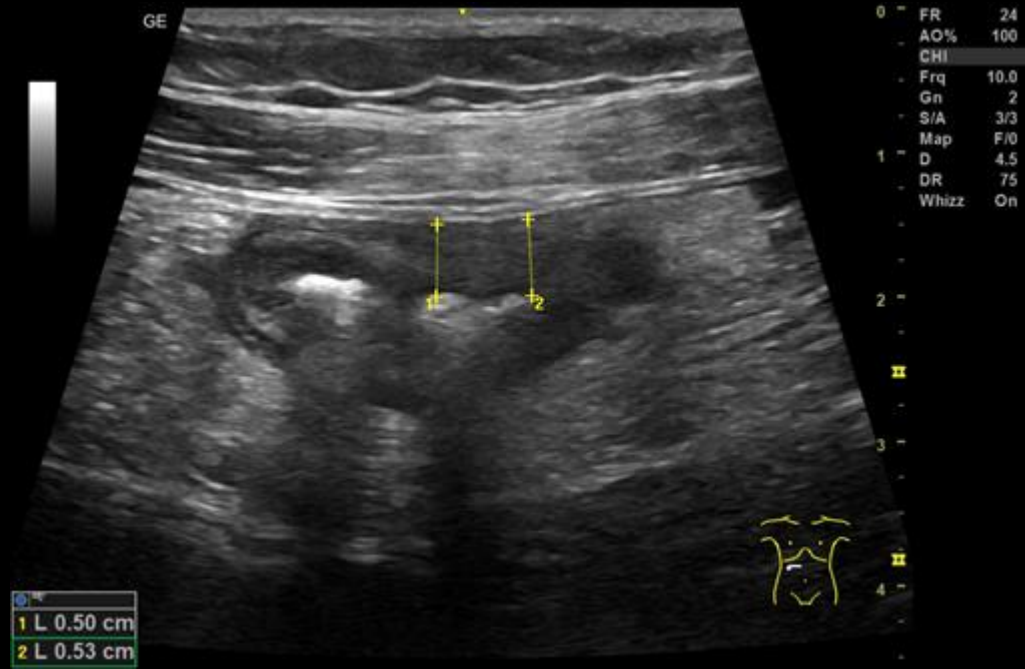
B. BWT, CDS 3, ifat,  
partial loss of BWS

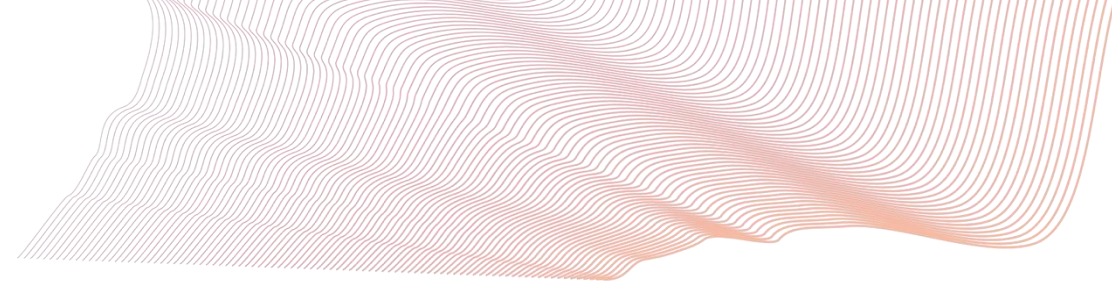
C. BWT, CDS 3, partial loss of BWS

D. BWT, CDS 2, ifat,  
Complete loss of BWS

◆ 8	\$1,000,000
◆ 7	\$500,000
◆ 6	\$250,000
◆ 5	\$125,000
◆ 4	\$64,000
◆ 3	\$32,000
◆ 2	\$16,000
◆ 1	\$8,000







Can you calculate the IBUS-SAS?





Which of the following parameters are included in the IBUS-SAS?

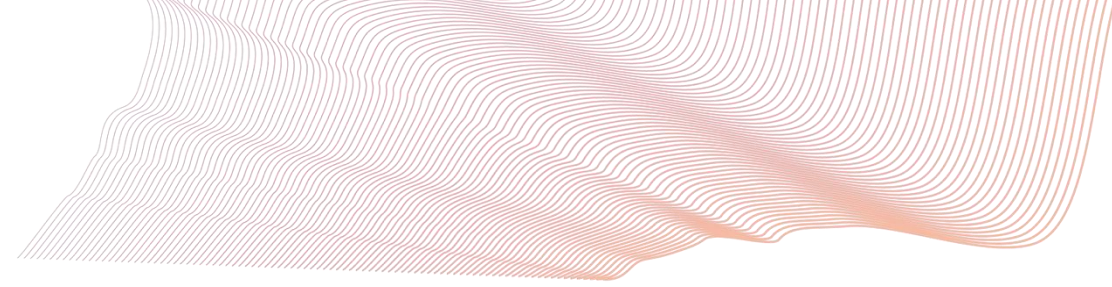
A. BWT, CDS, ifat, LN

B. BWT, BWS, ifat, LN

C. BWT, CDS, BWS, free fluid

D. BWT, CDS, ifat, BWS

◆ 8	\$1,000,000
◆ 7	\$500,000
◆ 6	\$250,000
◆ 5	\$125,000
◆ 4	\$64,000
◆ 3	\$32,000
◆ 2	\$16,000
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Which of the following parameters are included in the IBUS-SAS?

A. BWT, CDS, ifat, LN

B. BWT, BWS, ifat, LN

C. BWT, CDS, BWS, free fluid

D. BWT, CDS, ifat, BWS

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3	\$32,000
2	\$16,000
1	\$8,000

> J Crohns Colitis. 2021 Apr 6;15(4):609-616. doi: 10.1093/ecco-jcc/jjaa216.

## Expert Consensus on Optimal Acquisition and Development of the International Bowel Ultrasound Segmental Activity Score [IBUS-SAS]: A Reliability and Inter-rater Variability Study on Intestinal Ultrasonography in Crohn's Disease

Kerri L Novak <sup>1</sup>, Kim Nylund <sup>2 3</sup>, Christian Maaser <sup>4</sup>, Frauke Petersen <sup>5</sup>, Torsten Kucharzik <sup>5</sup>, Cathy Lu <sup>1</sup>, Mariangela Allocca <sup>6 7</sup>, Giovanni Maconi <sup>8</sup>, Floris de Voogd <sup>9</sup>, Britt Christensen <sup>10</sup>, Rose Vaughan <sup>10</sup>, Carolina Palmela <sup>11</sup>, Dan Carter <sup>12</sup>, Rune Wilkens <sup>13 14</sup>

	Normal	Uncertain	Activity
BWT	≤3 mm	NA	>3 mm
i-fat	0 = Absent	1 = Uncertain	2 = Present
CDS	0 = Absent [none]	1 = Short signals	2 = Long signals inside bowel    3 = Long signals inside & outside bowel
BWS	0 = Normal	1 = Uncertain	2 = Focal [≤ 3 cm]                      3 = Extensive [>3 cm]

BWT, bowel wall thickness; i-fat, inflammatory fat; CDS, colour Doppler signal; BWS, bowel wall stratification; NA, not applicable.

$$\text{IBUS - SAS (0 - 100)} = 4 \cdot \text{BWT} + 15 \cdot \text{i-fat} + 7 \cdot \text{CDS} + 4 \cdot \text{BWS}$$

*Core activity parameters, Delphi grading consensus*

## JOURNAL ARTICLE

## Correlation of Ultrasound Scores with Endoscopic Activity in Crohn's Disease: A Prospective Exploratory Study <sup>FREE</sup>

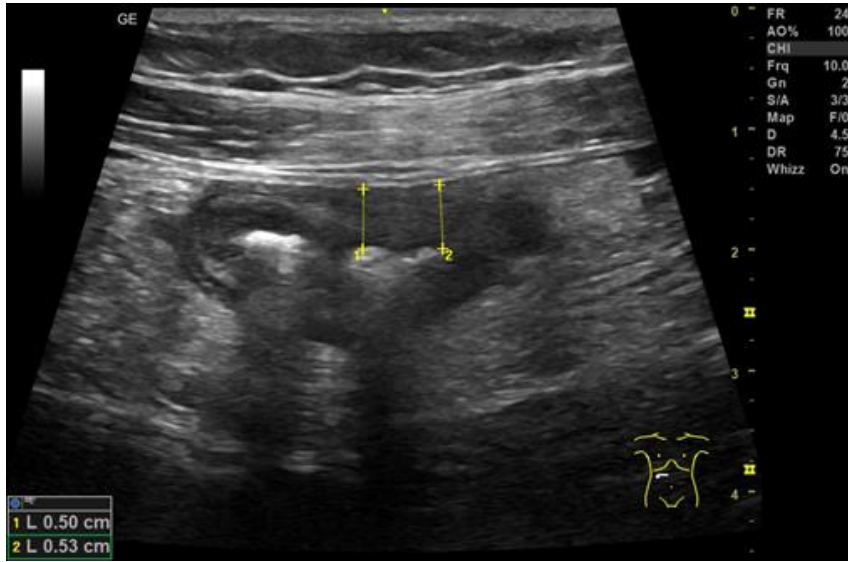
Gabriele Dragoni ✉, Matteo Gottin, Tommaso Innocenti, Erica Nicola Lynch, Siro Bagnoli, Giuseppe Macrì, Andrea Giovanni Bonanomi, Beatrice Orlandini, Francesca Rogai, Stefano Milani, Andrea Galli, Monica Milla, Maria Rosa Biagini

*Journal of Crohn's and Colitis*, Volume 17, Issue 9, September 2023, Pages 1387–1394,  
<https://doi.org/10.1093/ecco-jcc/jjad068>

**Endoscopic activity** was defined as SES-CD  $\geq 3$  or **Rutgeerts score  $\geq$  i2b** for operated patients  
**Severe endoscopic activity** was defined as SES-CD  $\geq 9$  or **Rutgeerts i4**

ROC analysis of **IBUS-SAS for any endoscopic activity** showed the **highest area under the curve** (0.95 [95% confidence interval 0.87–0.99]), with **sensitivity of 82.2% and specificity of 100% for a cut-off value of 25.2**

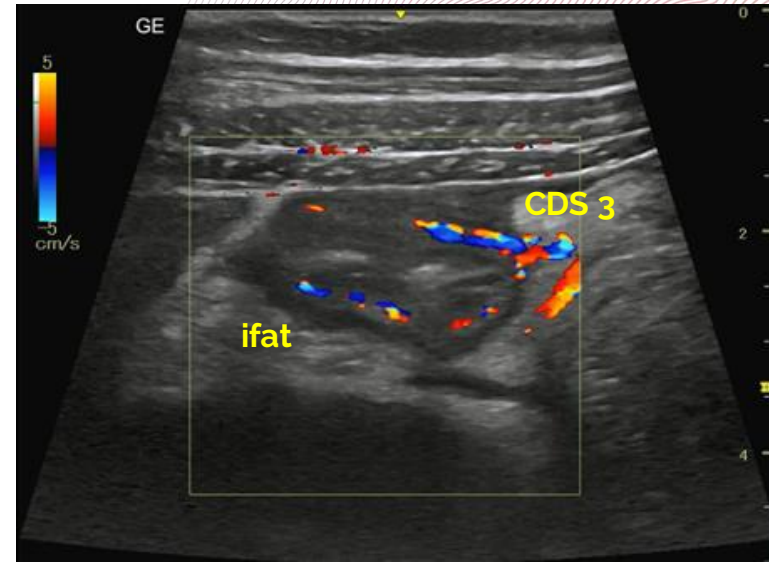
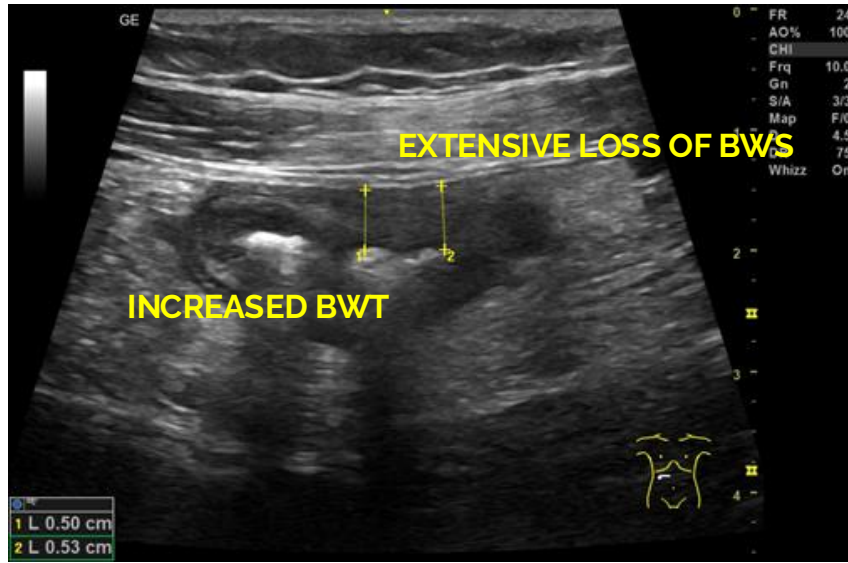
**IBUS-SAS threshold of 34.0** defined the presence of **severe endoscopic activity** with **sensitivity of 100% and specificity of 84.3%**, with an AUC of 0.96 [95% CI 0.89–0.99]



	Normal	Uncertain	Activity
BWT	≤3 mm	NA	>3 mm
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BWT, bowel wall thickness; i-fat, inflammatory fat; CDS, colour Doppler signal; BWS, bowel wall stratification; NA, not applicable.

$$\text{IBUS} - \text{SAS} (0 - 100) = 4 \cdot \text{BWT} + 15 \cdot \text{i-fat} + 7 \cdot \text{CDS} + 4 \cdot \text{BWS}$$



	Normal	Uncertain	Activity
BWT	≤3 mm	NA	>3 mm
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$$\text{IBUS} - \text{SAS} (0 - 100) = 4 \cdot \text{BWT} + 15 \cdot \text{i-fat} + 7 \cdot \text{CDS} + 4 \cdot \text{BWS}$$

$$\text{IBUS} - \text{SAS} (0-100) = 4 \cdot 5.3 + 15 \cdot 2 + 7 \cdot 3 + 4 \cdot 3 = 84.2$$



international bowel  
ULTRASOUND GROUP

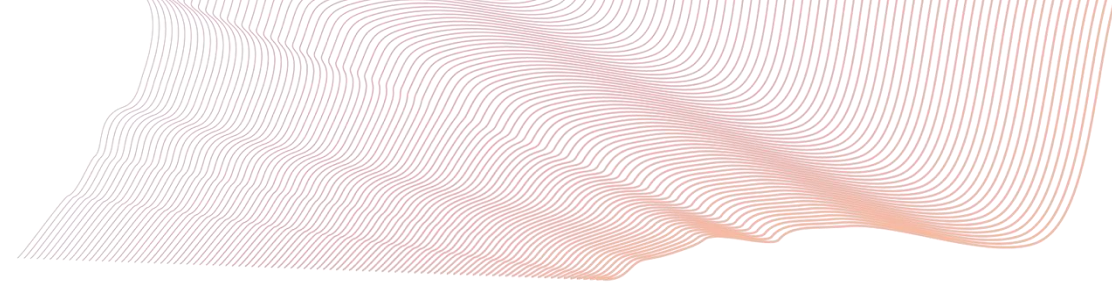


<https://imgflip.com/gif/a7gn8>



Prefer knowledge to wealth, for  
the one is transitory, the other  
perpetual.

~ Socrates



*Transform IBD care globally  
using intestinal ultrasound*