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Complications in IBD

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Disclosures of potential conflicts of interest

•Consultancy honoraria:

- Takeda pharmaceutical, Pfizer pharmaceutical, Janssen pharmaceutical, Bristol- Mayers Squibb pharmaceutical, Ferring pharmaceutical, Hikma pharmaceutical.

•Speaker honoraria:

- AbbVie pharmaceutical, Janssen pharmaceutical, Takeda pharmaceutical, Hikmah pharmaceutical, Bristol- Mayers Squibb pharmaceutical, Pfizer pharmaceutical, Ferring pharmaceutical, Hikma pharmaceutical.

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Objectives

01 The importance of imaging in IBD.

02 Intestinal ultrasound (IUS) in detecting Crohn's disease complications:

- Strictures (inflammatory vs fibrosis).
- Abdominal fistulas.
- Inflammatory Masses (Abscess vs phlegmon).

03 Helpful tools for better IUS accuracy.

04 IUS in acute severe ulcerative colitis (ASUC).

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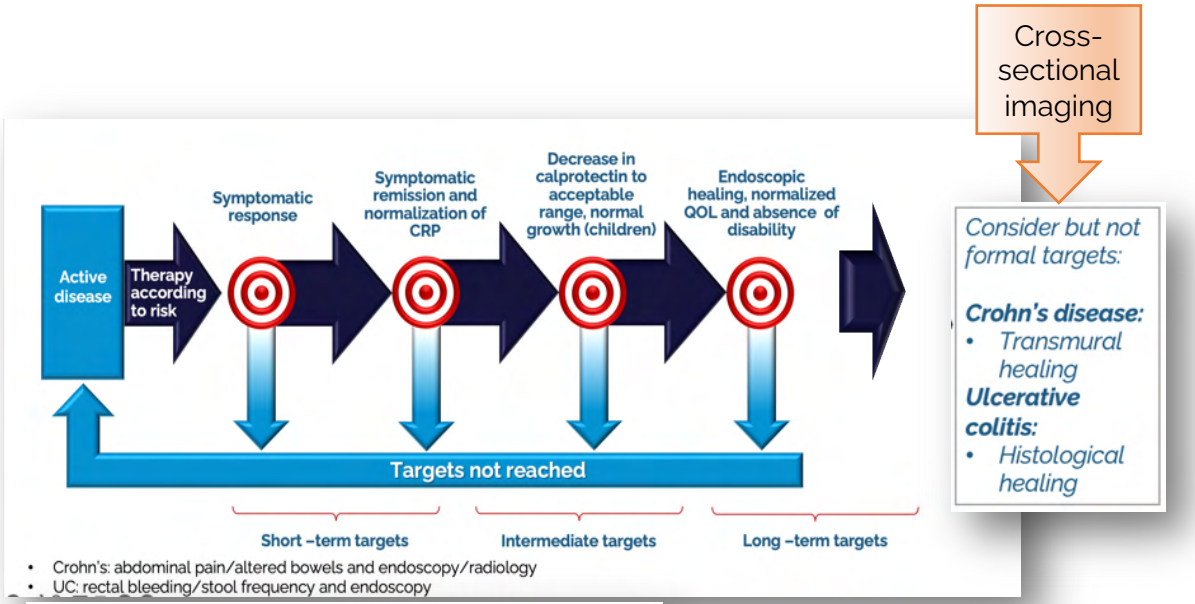
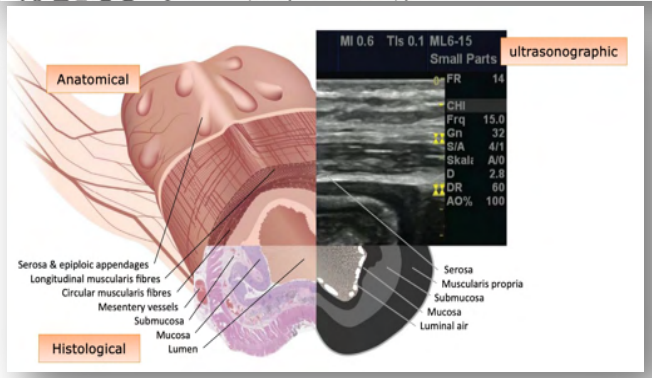
Use of IUS IN IBD

Determining therapeutic goals for T2T

STRIDE-II Stated:

- Cross-sectional imaging, using **ultrasound**, contrast-enhanced computed tomography, & magnetic resonance enterography, has been increasingly used in addition to endoscopic assessments.
- The use of bedside **bowel ultrasound** has revolutionized our ability to assess the degree of inflammation in IBD.
- It allows frequent assessments & has the advantage of assessing the entire gastrointestinal tract, including transmural healing.





- Turner D, et al. *Gastroenterology*. 2021;160:1570-1583.
- Gastroenterology-AGA STRIDE-II April 2021
- ATKINSON et al. WJG, 2017

Crohn's disease complications

- Strictures:
  - (Inflammatory vs Fibrosis)
- Abdominal Fistulas.
- Inflammatory Masses:
  - (Abscess vs Phlegmon)

Current role of IUS in IBD
Screening and diagnosis of IBD
Differential diagnosis with IBS and GI infections
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Perianal disease in CD-TPUS
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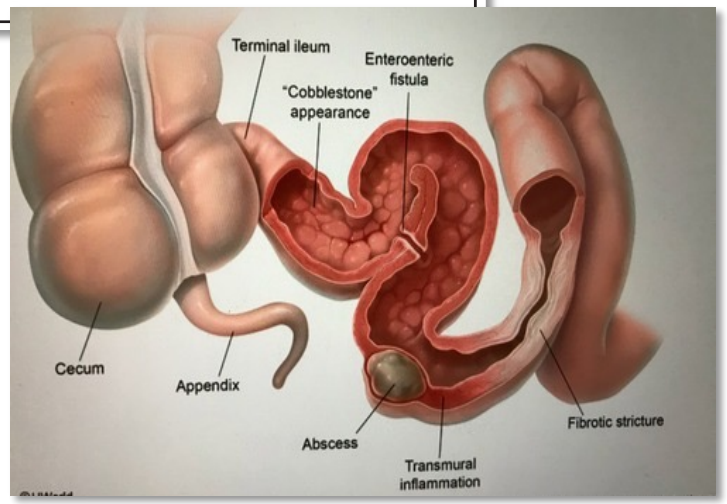
Strictures, fistula such as and inflammatory masses, such as phlegmon and abscesses
Monitoring response to therapy in IBD



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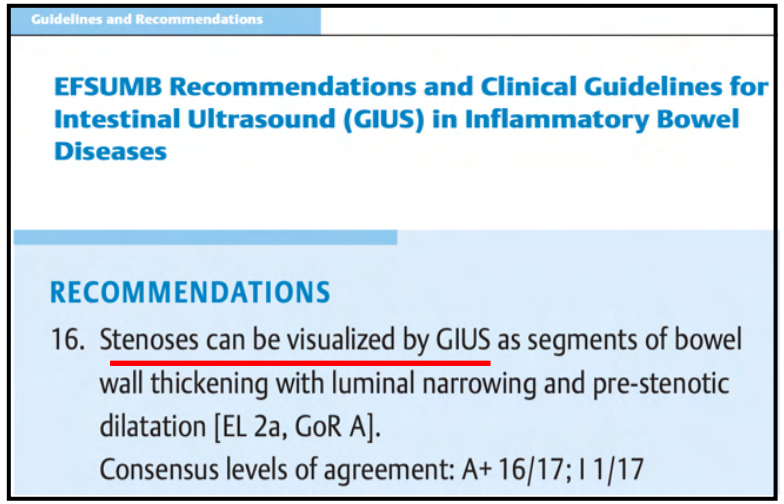
B-mode IUS can detect CD complications

- **Stricture**

Statement 3.1.1. ECCO-ESGAR Diagnostics GL [2018]

Cross-sectional imaging should be used to detect small bowel strictures [EL2]. Due to radiation exposure with CT, the preferred methods are MRI and/or intestinal ultrasound [IUS]. No imaging technique is currently able to determine the degree of fibrosis [EL3]



Guidelines and Recommendations

EFSUMB Recommendations and Clinical Guidelines for Intestinal Ultrasound (GIUS) in Inflammatory Bowel Diseases

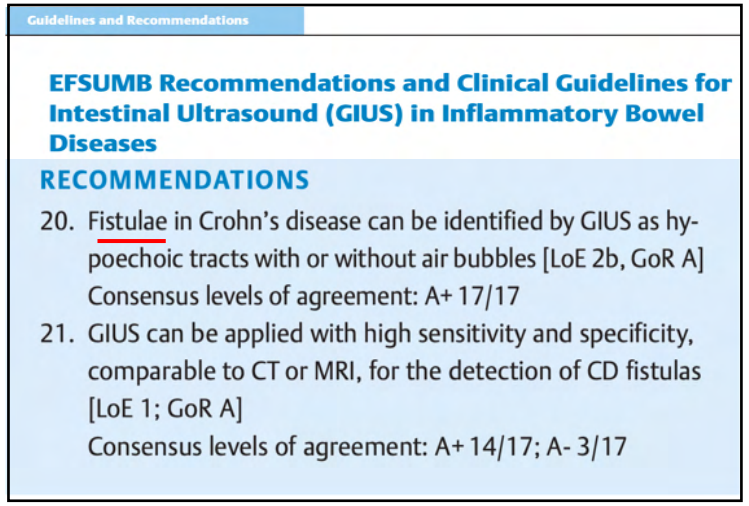
RECOMMENDATIONS

16. Stenoses can be visualized by GIUS as segments of bowel wall thickening with luminal narrowing and pre-stenotic dilatation [EL 2a, GoR A].
Consensus levels of agreement: A+ 16/17; I 1/17

- **Abdominal Fistulas.**

Statement 2.1.7. ECCO-ESGAR Diagnostics GL [2018]

Extramural complications in CD [such as fistulae and abscesses] should be monitored by cross-sectional imaging, including intestinal ultrasound [IUS] [EL2] or MRI [EL2] [or both] in combination with clinical and laboratory parameters [EL5]



Guidelines and Recommendations

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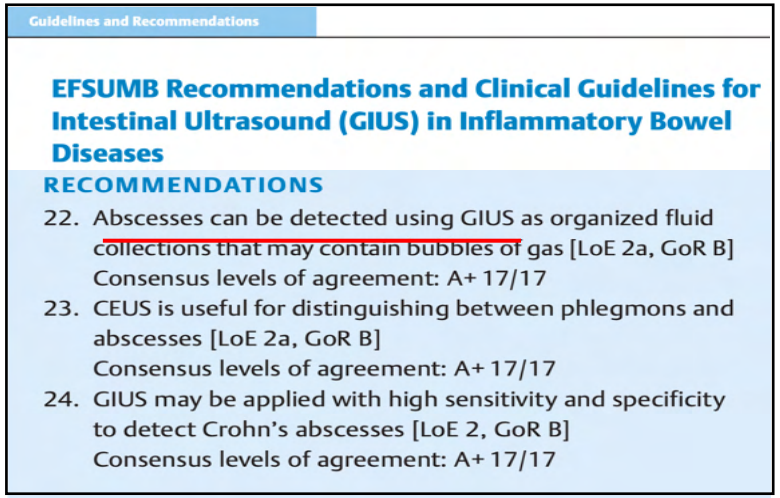
RECOMMENDATIONS

20. Fistulae in Crohn's disease can be identified by GIUS as hypoechoic tracts with or without air bubbles [LoE 2b, GoR A]
Consensus levels of agreement: A+ 17/17
21. GIUS can be applied with high sensitivity and specificity, comparable to CT or MRI, for the detection of CD fistulas [LoE 1; GoR A]
Consensus levels of agreement: A+ 14/17; A- 3/17

- **Inflammatory Masses:**

Statement 3.2.1. ECCO-ESGAR Diagnostics GL [2018]

Cross-sectional imaging [IUS, MRI, and CT] can detect internal penetrating disease and intra-abdominal abscesses with varying accuracy [EL1]. MRI is preferable to ultrasound for deep-seated fistulae or abscesses or pelvic fistulae [EL4]



Guidelines and Recommendations

EFSUMB Recommendations and Clinical Guidelines for Intestinal Ultrasound (GIUS) in Inflammatory Bowel Diseases

RECOMMENDATIONS

22. Abscesses can be detected using GIUS as organized fluid collections that may contain bubbles of gas [LoE 2a, GoR B]
Consensus levels of agreement: A+ 17/17
23. CEUS is useful for distinguishing between phlegmons and abscesses [LoE 2a, GoR B]
Consensus levels of agreement: A+ 17/17
24. GIUS may be applied with high sensitivity and specificity to detect Crohn's abscesses [LoE 2, GoR B]
Consensus levels of agreement: A+ 17/17

- C. Maaser et al. ECCO-ESGAR guideline, 2018
- Maconi G et al. EFSUMB Recommendations in Med 2018

Crohn's disease complications

- **Strictures:**
  - **(Inflammatory vs Fibrosis)**
- Abdominal Fistulas.
- Inflammatory Masses:
  - (Abscess vs Phlegmon)

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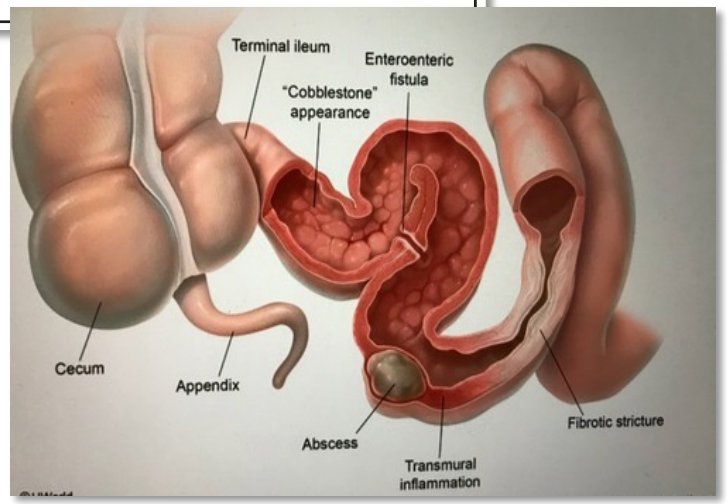
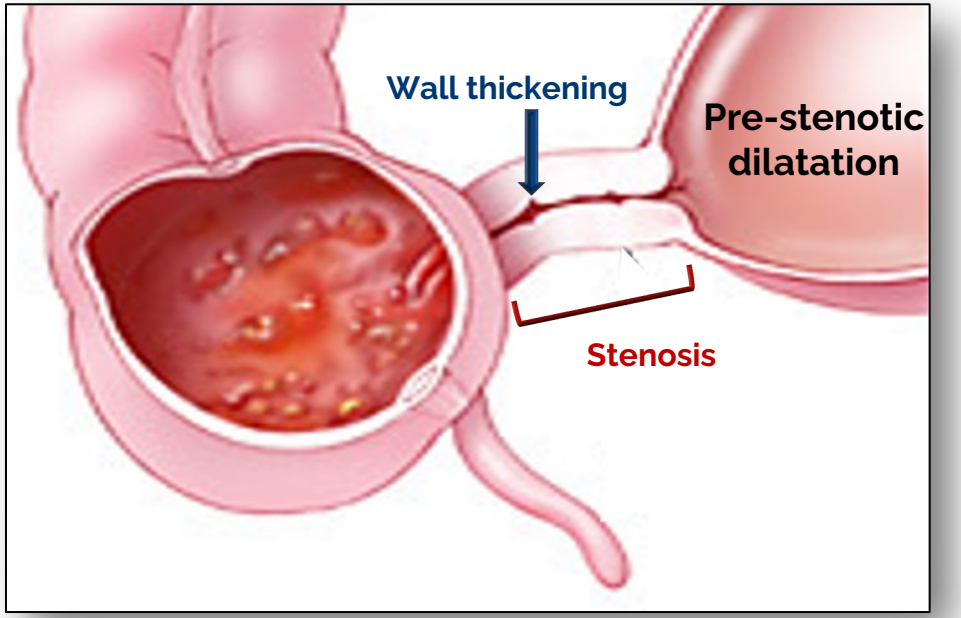


Stricture

- > 50% of patients with CD develop strictures over their lifetime. The terminal ileum is the most common stricture location.
- Strictures develop >30-35 % of patients in the first decade of a diagnosis of CD.
- Strictures are characterized by different degrees of inflammation & fibrosis.
- Identification of these two components can improve the quality of IBD management.



- Zishan Liu et al, UEG J,ournal March 2024
- C. Lu et al, Aliment Pharmacol Ther. April 2024

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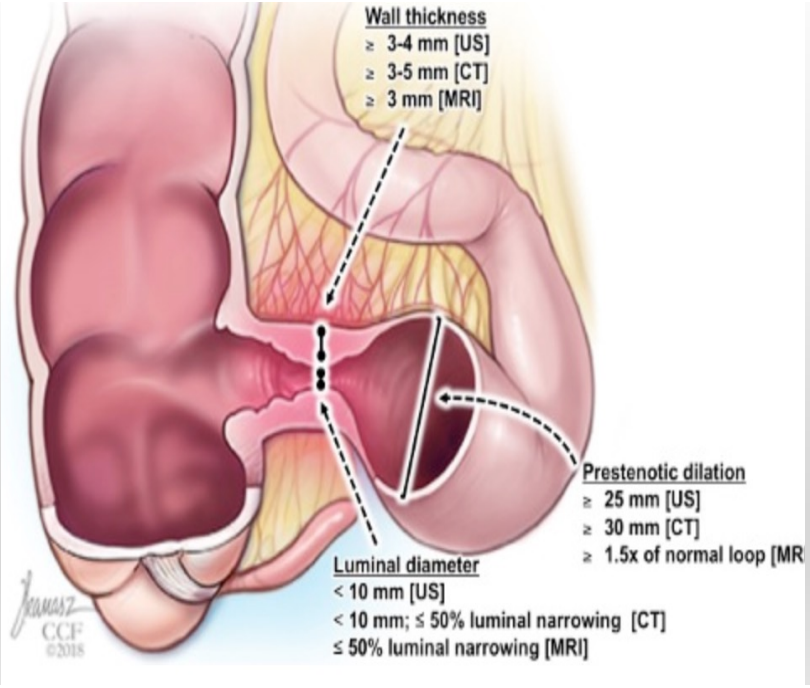
Standard IUS parameters & diagnostic criteria for stricture (B-mode)

- SYSTEMIC REVIEW by The (STAR) consortium proposed a standardized definition by ultrasound by three features :

1. Bowel wall thickness (>3 mm).
2. Luminal narrowing (Diameter < 1 cm).
3. Pre-stenotic dilation (increase in lumen diameter or absolute diameter of > 2.5 cm).



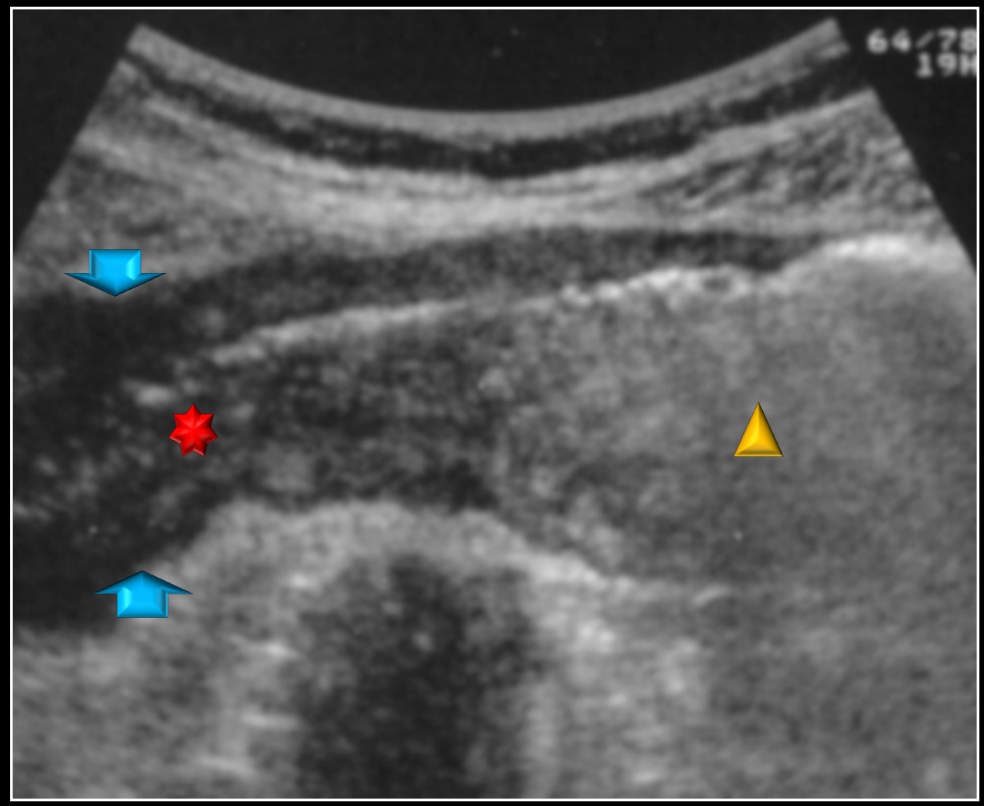
- Amezaga J. et al. Life June 2021
- C. Lu et al, Aliment Pharmacol Ther. April 2024

Standard IUS parameters & diagnostic criteria for stricture (B-mode)

Guidelines and Recommendations

EFSUMB Recommendations and Clinical Guidelines for Intestinal Ultrasound (GIUS) in Inflammatory Bowel Diseases

- Thickened & stiff bowel wall (>3 mm).
- Narrowing of the lumen (diameter < 10 mm).
- Proximal dilatation (> 25 – 30 mm).
- Hyperperistalsis of the pre-stenotic gut.



- Maconi G et al. EFSUMB Recommendations in Med 2018
- R. Coelho.et al. EFSUMB recommendation, Inflamm Bowel Dis 2017
- Rieder et al Aliment Pharmacol Ther. AUG,2018

IUS to detect CD complications (stricture)

Case 1

- Mr. E is a 31 years old gentleman, smoker, was diagnosed as a case of Terminal ileal Crohn's disease for > 3 years.
- On ustekinumab.
- Presented to clinic with recurrent symptoms of lower abdominal pain, bloating & mild abdominal distention.

- Long segment of stenosis 11 cm.
- Thickened bowel wall > 10 mm.
- Pre-stenotic dilatation.
- Abnormal Peristalsis.

IUS to detect CD complications (stricture)

- Long segment of stenosis 11 cm.
- Thickened bowel wall > 10 mm.
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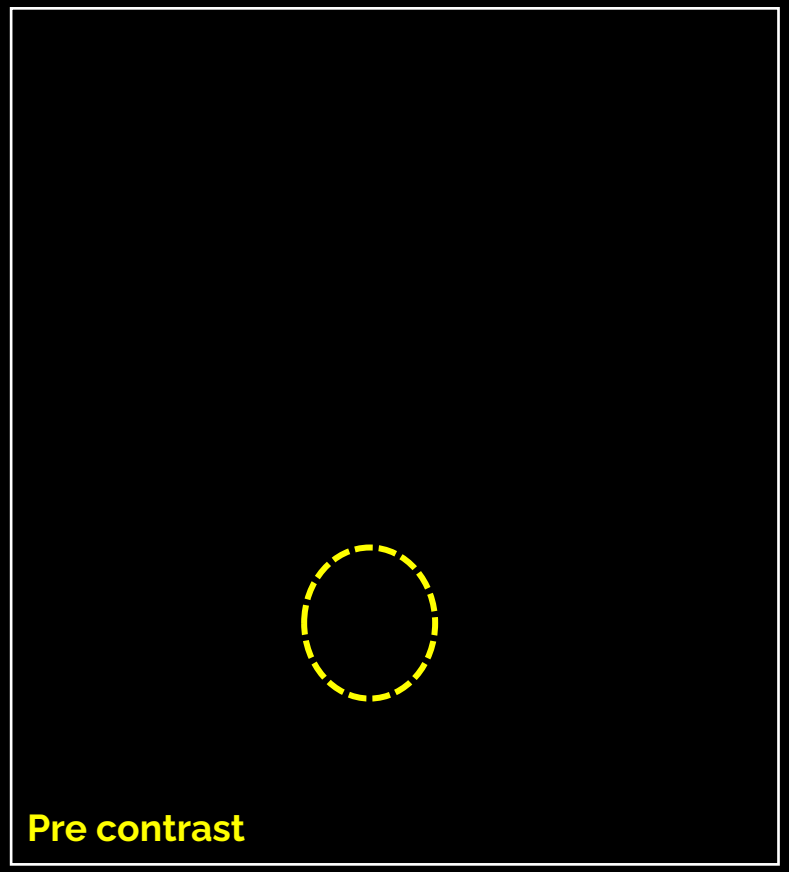
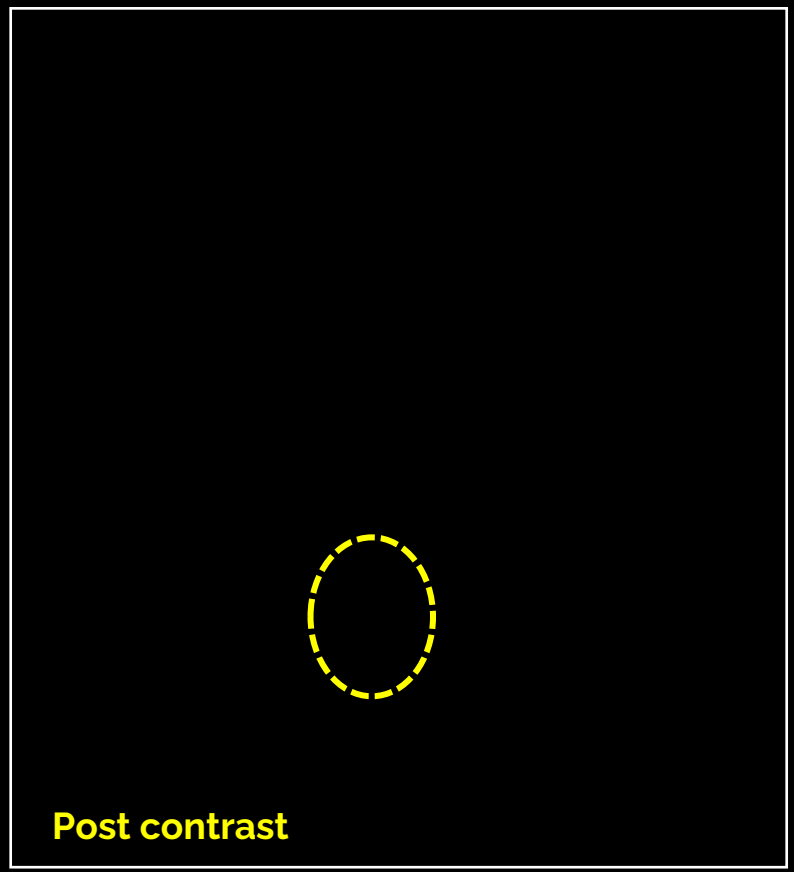




11 cm long Segment of ileal loop stricture fibrotic with localized up stream focal pouch like dilatation with retained content

Diagnostic accuracy of B-mode IUS for strictures

- Systemic review

- 45 of 56 studies reported on the diagnostic accuracy of IUS in small bowel CD based on a gold standard; *(Histopathology, endoscopy and CT/MRI images as reference)*.

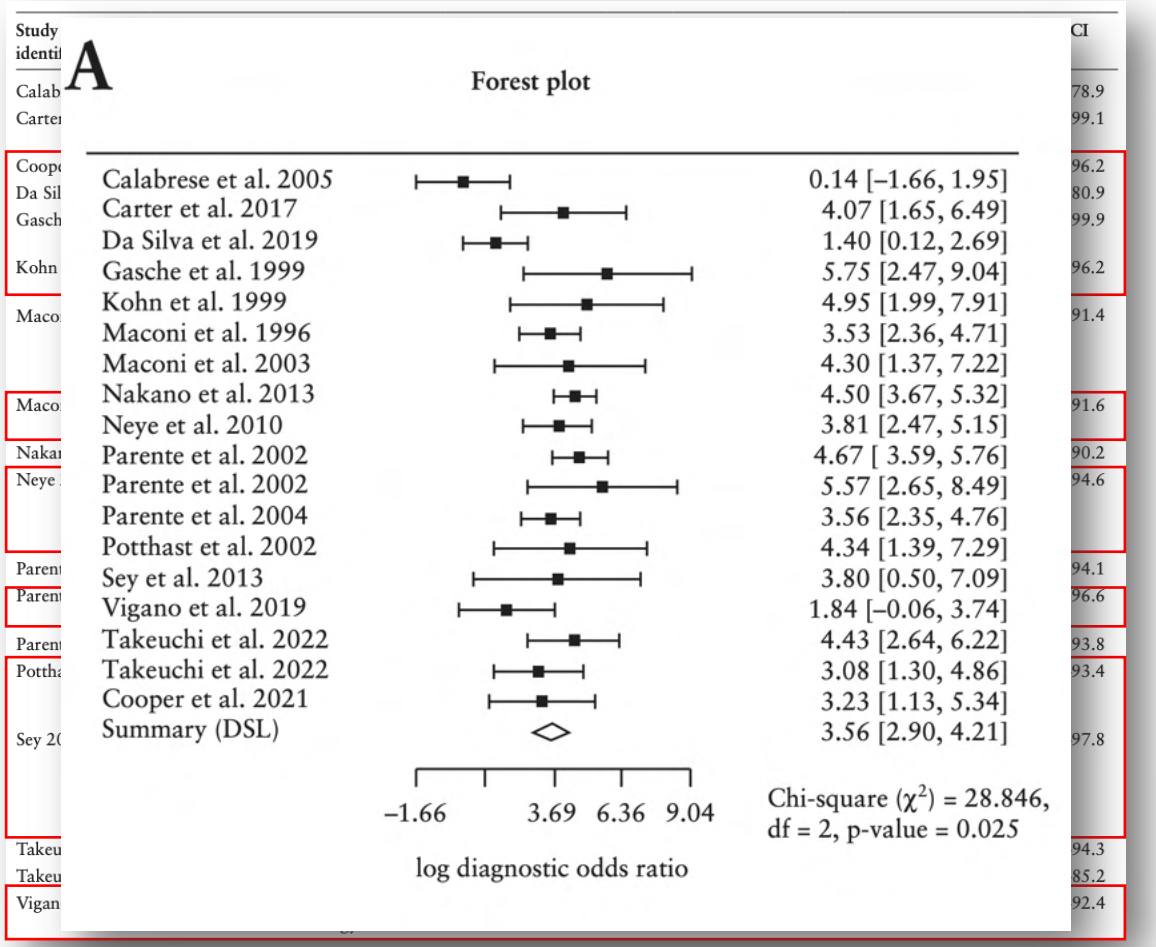
- Estimates for stricture diagnosis in IUS using the various 'gold standards:

  - The pooled sensitivity → 68% to 100%.
  - The Pooled specificity → 86% to 100%.

- C. Lu et al, Aliment Pharmacol Ther. April 2024

Diagnostic accuracy of B-mode IUS for strictures

- Meta- analysis: 16 studies reported. N= 2002 patients.
- Eight had surgery/pathology as reference standards.
- Pooled sensitivity → 0.81 *[95% CI, 0.78–0.84]*
- Pooled specificity → 0.90 *[95% CI, 0.89–0.92]*
- Heterogeneity of studies was significant for both sensitivity [I^2 = 75.3%, χ^2 = 68.74; $p < 0.0001$] and specificity [I^2 = 82.9%, χ^2 = 99.56; $p < 0.0001$].
- The pooled overall log diagnostic odds ratio 3.56



- Maarten Pruijrt et al, J. crohns colitis , Jan 2024

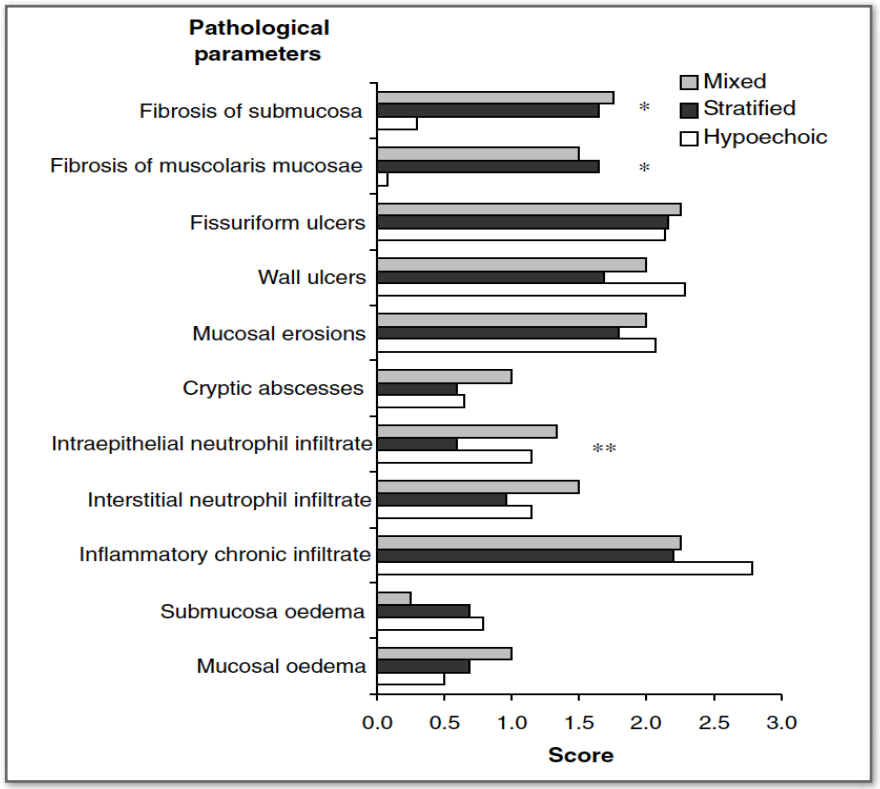
IUS to determine the degree of inflammation & fibrosis in CD strictures

ECCO- ESGAR stated:

- Strictures in CD are transmural & contain variable proportions of inflammatory & fibrotic tissue.
- Quantification of active inflammation versus fibrosis is challenging.

Prospective single center trial:

- Cohort: 43 patients with strictures.
- Echo pattern identified:
  - Components of strictures.
  - Degree of fibrosis→ moderate to sever or intermediate fibrosis.
- Sensitivity 100% & Specificity 63%.



Histological characteristics of bowel wall at level of stenosis according to US echo pattern (**P <0.001**).

- G. Maconi et al, AP&T , June 2003
- C. Maaser et al. ECCO-ESGAR , 2018

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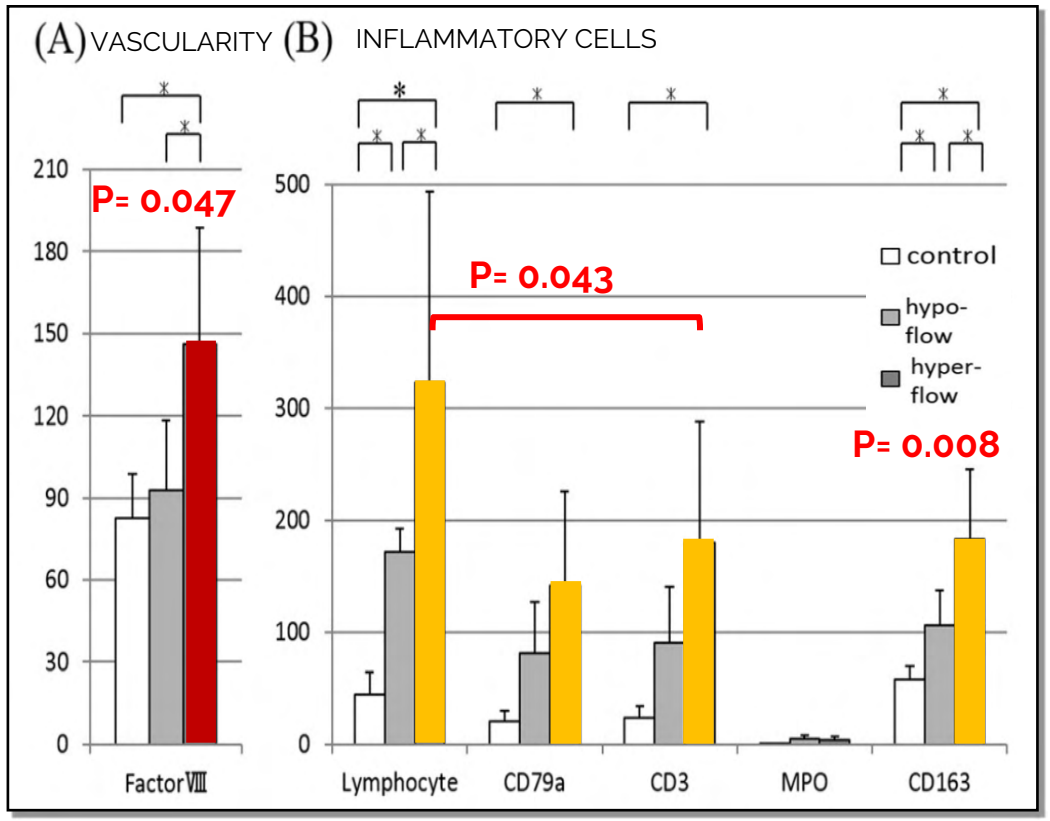
IUS to determine the degree of inflammation & fibrosis in CD strictures- Color doppler images (CDI)

Inflammatory vs Fibrotic stricture

- Inflammatory → Loss of stratification, hypoechoic & **highly vascularized**.
- Fibrotic → preserved stratification with **no or poor signal** at color Doppler.

Prospective trial:

- Cohort: 12 patients had small intestinal CD lesions prior to elective resection.
- Histopathological findings:
  - Hyper-flow lesions had significantly greater bowel wall vascularity & inflammatory cell infiltration - *CD163 macrophages (p = 0.008), CD3 T cells, & CD79a B cells (p = 0.043)*- than did hypo-flow lesions.



Hyper-flow lesions showed significant greater vascularity & inflammatory cell infiltration.

- G. Maconi et al, AP&T , June 2003
- Sasaki et al. BMC Research Notes 2014
- Adamina M et al. *J. Crohn's Colitis.* 2020
- Ludovico Alfarone et al, j. Clin. Med, Jan 2022

Crohn's disease complications

- Strictures:
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- **Abdominal Fistulas.**
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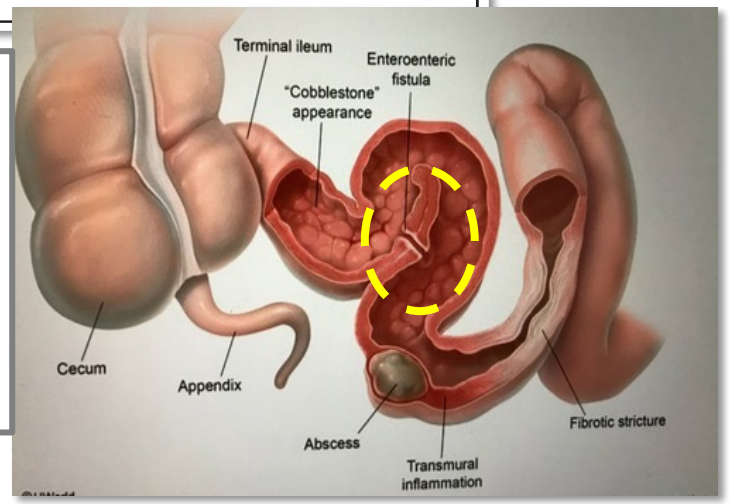
Internal Fistulae
Entero-enteric
Entero-mesenteric
Entero-vesical

External Fistulae
Entero-cutaneous

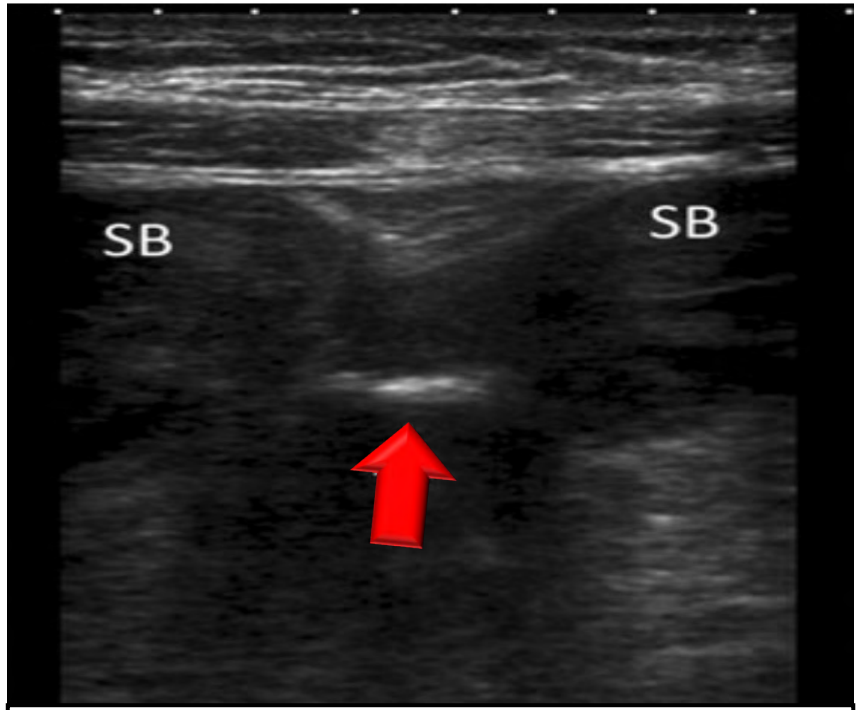


- C.Gomes et al, GE Port J Gastroenterol, Nov 2021

Standard IUS parameters for fistula (B-mode)

- **The US diagnostic criteria of sinus tracts & fistulae are similar:**

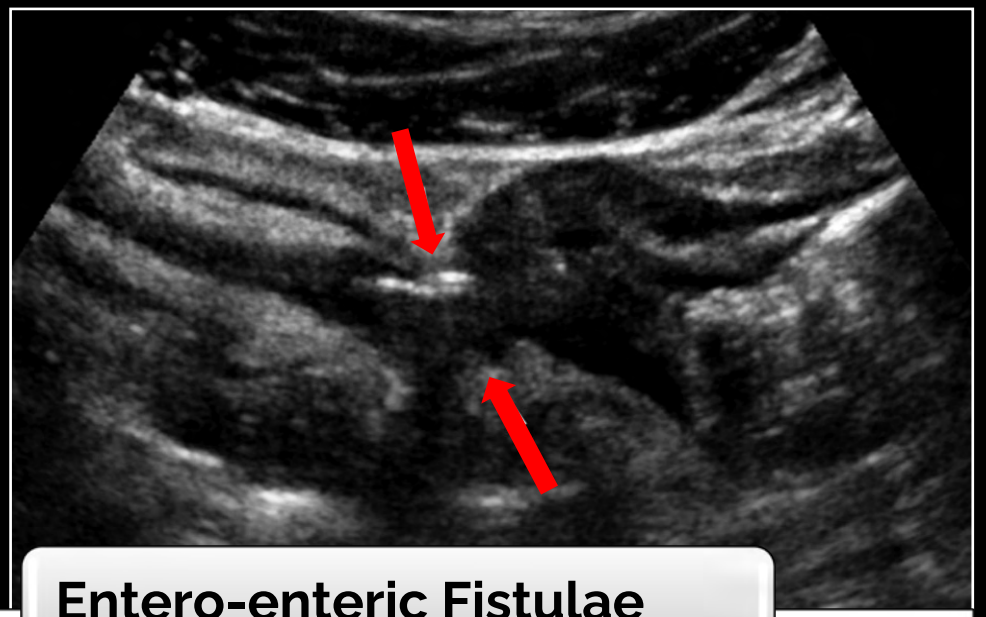
1. Hypoechoic areas or tracts between **ileal loops** with or without internal gaseous artifacts.
2. Hypoechoic **peri-intestinal** tracts with or without gas within.
3. Hypoechoic peri-intestinal areas with a **diameter < 2 cm**.



IUS shows an entero-enteric fistulae. Linear communication between two thickened small bowel loops which contains air (arrow)

- Maconi G et al. EFSUMB Recommendations 2018
- Pan.s J, et al. Systematic review. AP & T 2011 Jul
- C. Maaser et al. ECCO-ESGAR guideline, 2018

IUS to detect CD complications (Fistula)



Entero-enteric Fistulae

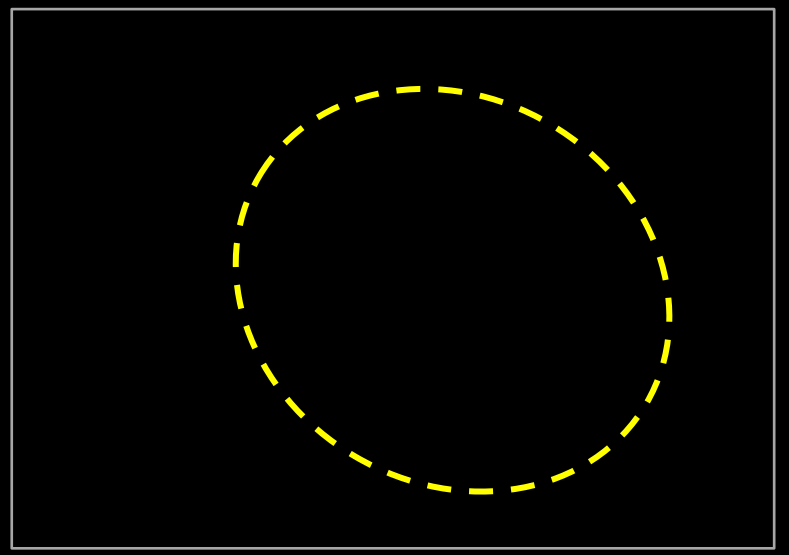
- Between two loops of small bowel. *Arrows indicate area of fistulae.*
- White streak, consistent with air presence.

- C. Lu et al. J Ultrasound Med 2019

IUS to detect CD complications (Fistula)

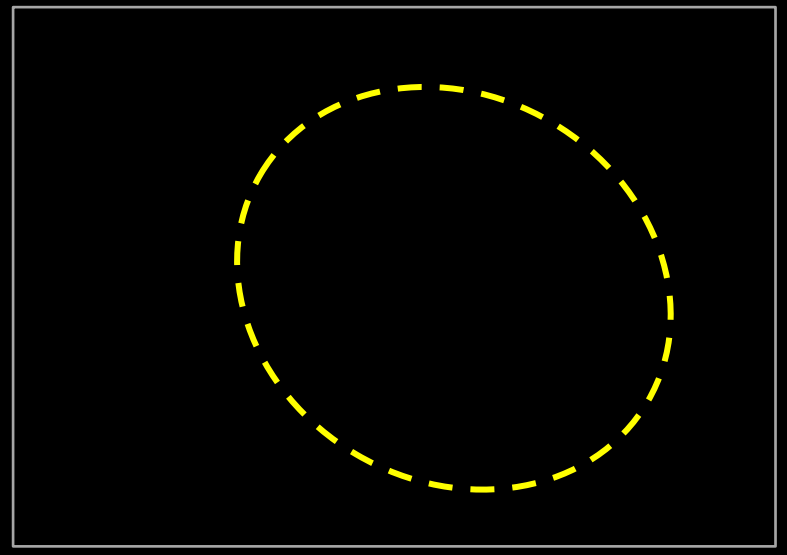
Case 2

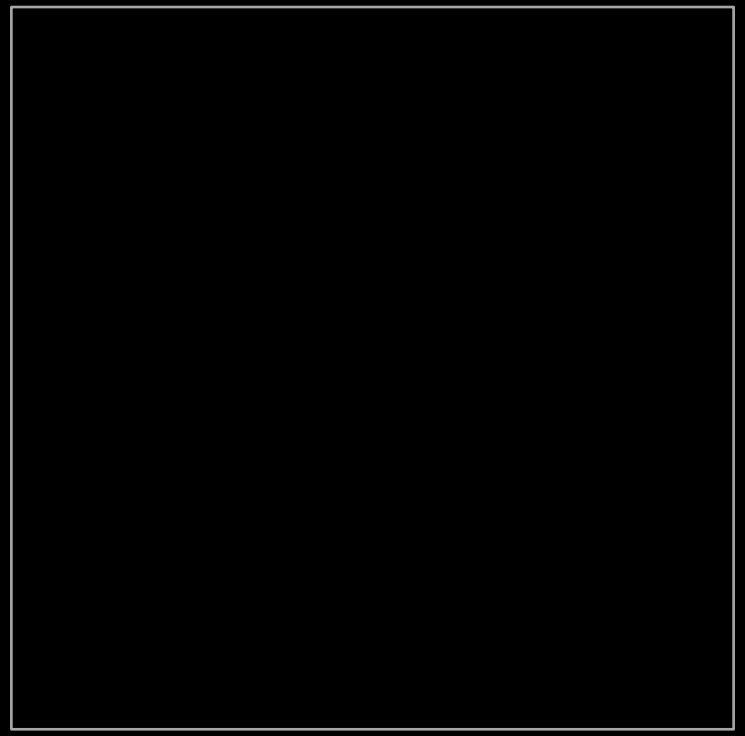
- Mrs. M is a 43 years old lady, was diagnosed on 2018 as a case of inflammatory terminal ileal CD, was on infliximab then she decided to stop it and start herbal medications.
- Missed follow up for 4 years. Presented with severe abdominal pain.

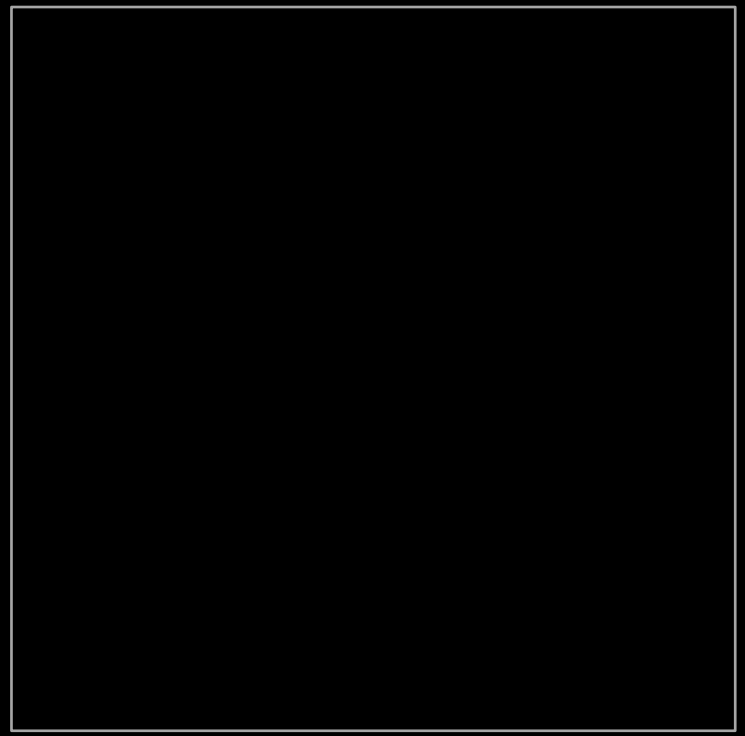


IUS to detect CD complications (Fistula)

- MR- Enterography:







Diagnostic accuracy of B-mode IUS for fistula

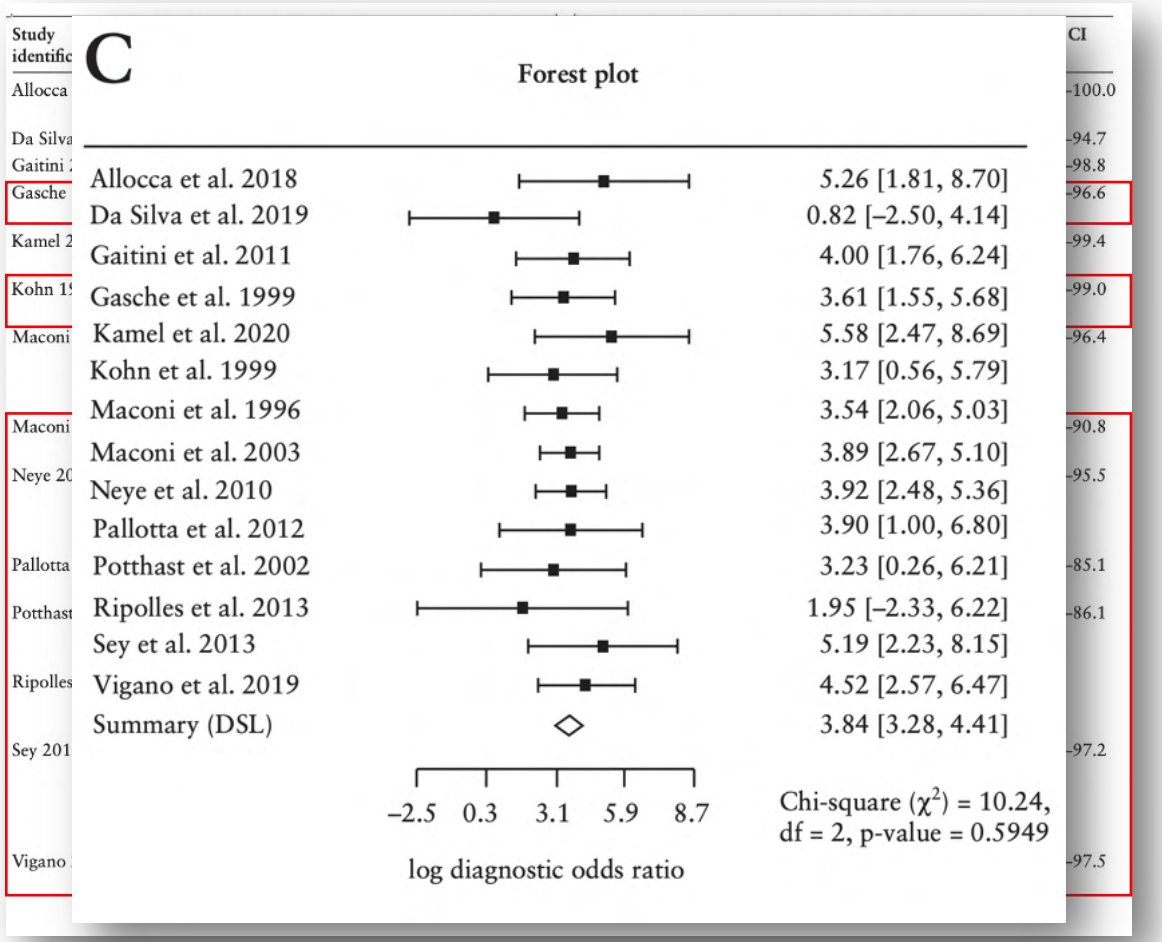
- Fourteen studies reported data on the accuracy of B-mode IUS in detecting fistula. N= 828 patients.

- Eight of these studies had surgery or pathology as reference standards.

- Pooled sensitivity → 0.67 [95% CI, 0.60–0.73]
- Pooled specificity → 0.97 [95% CI, 0.96–0.99]

- Significant heterogeneity among studies for sensitivity [I^2 = 65.6%, χ^2 = 34.91; p < 0.0001], but not for specificity [I^2 = 11.0%, χ^2 = 13.48; p = 0.335]

- The pooled overall log diagnostic odds ratio for fistulas was 3.84 [95% CI, 3.28–4.41].



- Maarten Pruijrt et al, J. crohns colitis , Jan 2024

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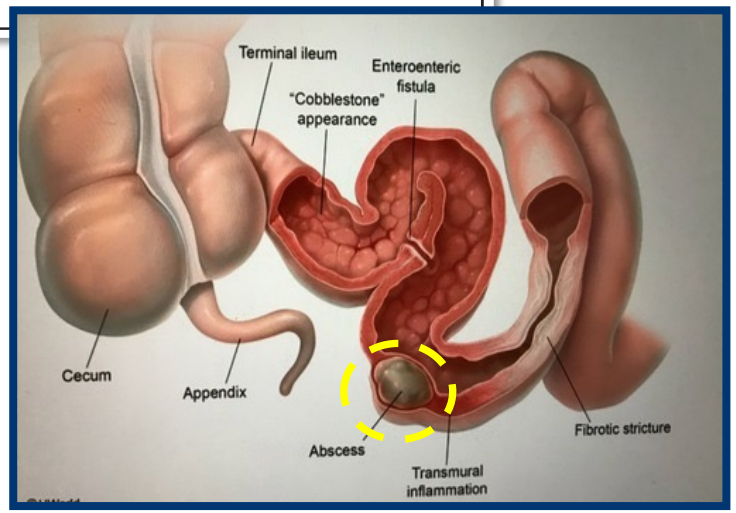


- C.Gomes et al, GE Port J Gastroenterol, Nov 2021

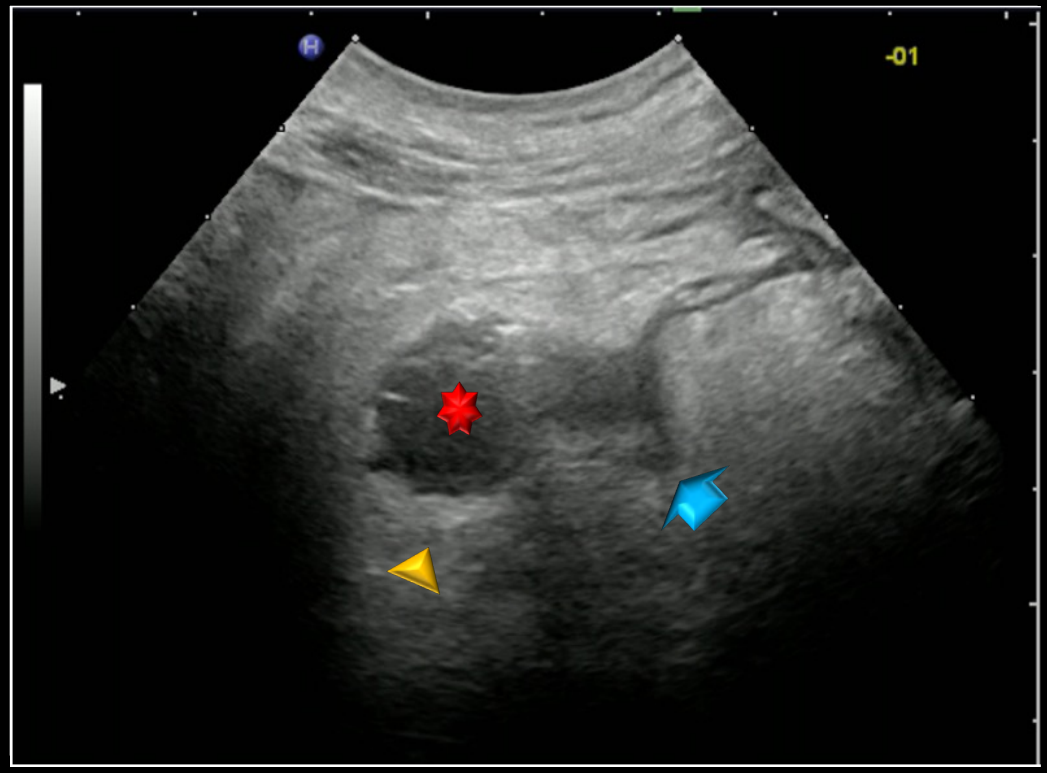
Standard IUS parameters for Inflammatory Masses (B-mode)

- **The US diagnostic criteria:**

Hypo-anechoic lesions containing fluid & gaseous artifacts.

Posterior wall echo enhancement.

Surrounded by hypertrophic mesenteric fat.



- Pan.s J, et al. Systematic review. AP & T Jul 2011
- C. Maaser et al. UEG J, Feb 2022

Diagnostic accuracy of B-mode IUS for masses

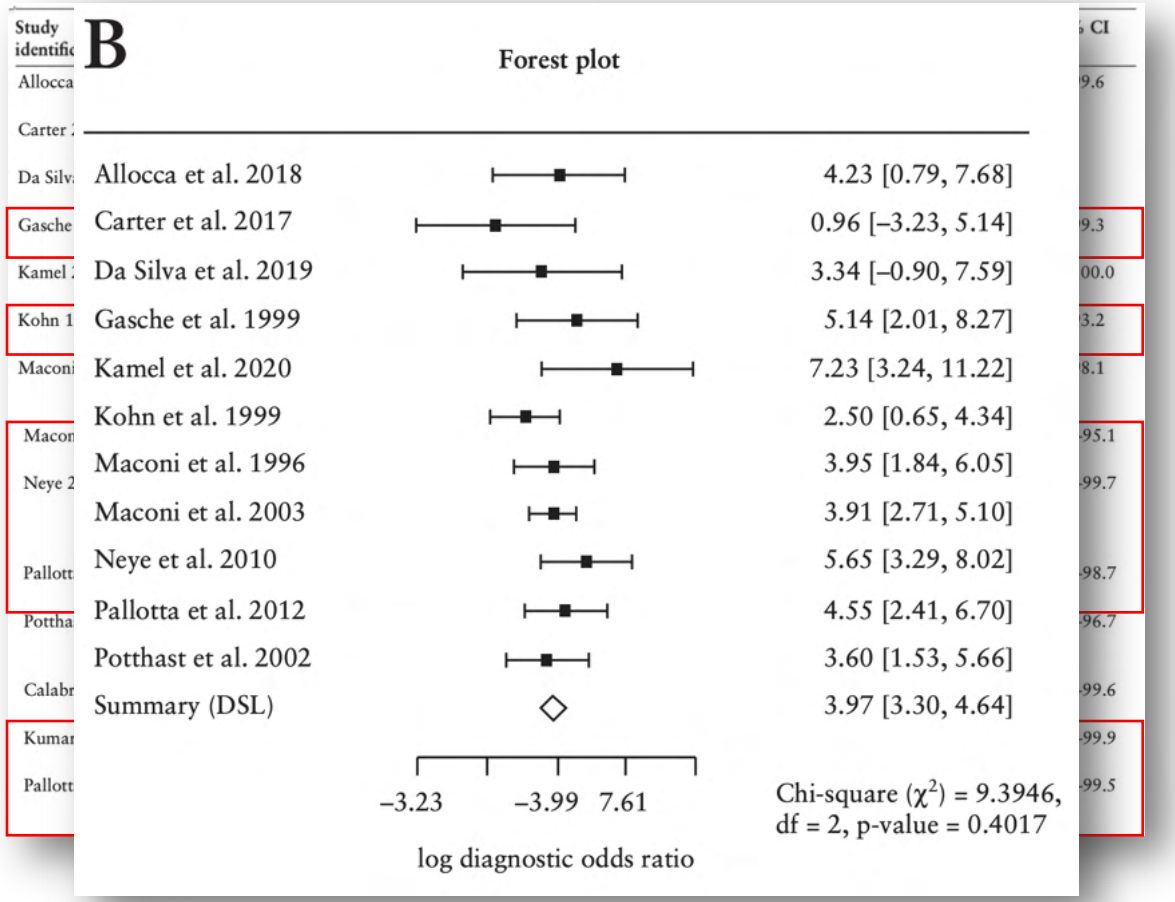
- Eleven studies reported data on accuracy of B-mode IUS in detecting masses. N= 697 patients.

- Five of these studies had surgery or pathology as reference standards.

- Pooled sensitivity → 0.87 [95% CI, 0.78–0.93]]
- Pooled specificity → 0.95 [95% CI, 0.92–0.97],

- There was no significant heterogeneity among studies for both sensitivity *[I^2 = 0.0%, χ^2 = 7.65; p = 0.469]* and specificity *[I^2 = 31.6%, χ^2 = 11.69; p = 0.166].*

- Pooled overall log diagnostic odds ratio for inflammatory masses by B-mode IUS was 3.97 [95% CI, 3.30–4.64]

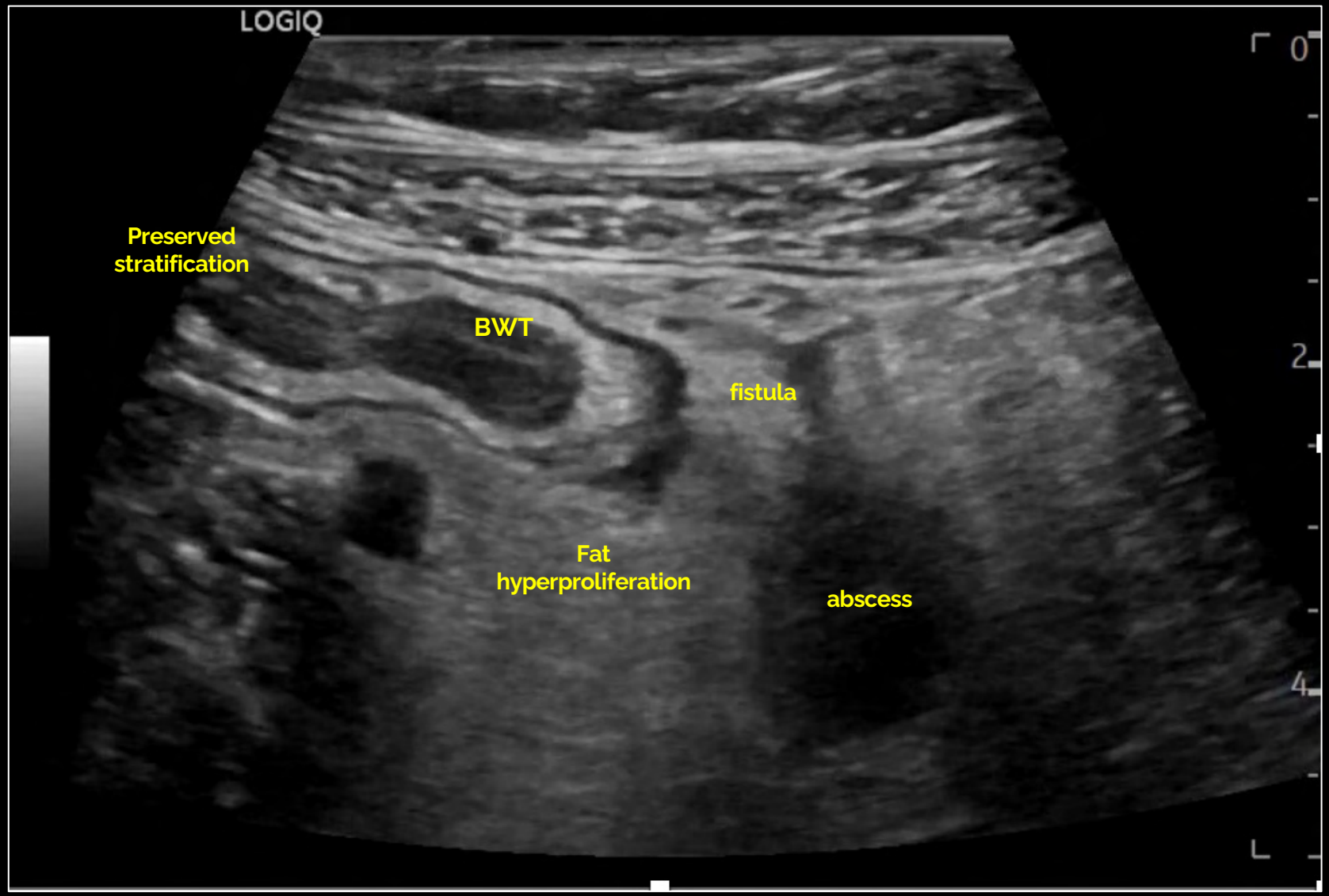


IUS to detect CD complications (Masses)

Case 3:

- Ms A is a 28 years old lady, was diagnosed on 2015 as a case of inflammatory terminal ileal CD. Non responder to Infliximab and Adalimumab.
- Started on Ustikenumab.
- No improvement in her symptoms.

IUS to detect CD complications (Masses)



Three Crohn's disease complications in one case

IUS vs MRE for CD complications

- Prospective study.
- N= 65 CD patients who were scheduled for an ileal and/or colonic resection.
  - Intestinal obstruction (n = 31 patients).
  - Inflammatory mass (n = 21).
  - Fistula (n = 10).
  - Abdominal pain/ sepsis (n = 3).
- Prior to the surgery, all patients underwent B-mode IUS and MRE examinations, and the findings were compared to the final pathology result.

Table 2 Comparison of performances of perc-US, e-MR and IOUS, per-lesion analysis

	Perc-US (%)	E-MR (%)	IOUS (%)
Identification of CD sites			
Sensitivity	84.2	86.1	100
Positive predictive value	93.4	93.5	100
Accuracy	79.4	81.3	100
Identification of stenoses			
Sensitivity	86.8	86.8	100
Specificity	50.0	50.0	–
Positive predictive value	95.2	95.2	100
Negative predictive value	25.0	25.0	–
Accuracy	83.8	83.8	100
Identification of fistulas			
Sensitivity	75.0	81.3	93.8
Specificity	98.0	95.9	100
Positive predictive value	92.3	86.7	100
Negative predictive value	92.3	94.0	98.0
Accuracy	92.3	92.3	98.5

- Luca Viganò et al, Updates in Surgery, June 2019

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Tools for better IUS accuracy!

Advanced IUS Techniques

- Other types of IUS examinations may increase the accuracy of the technique.

1-Small intestine contrast ultrasonography (SICUS)

2- Contrast enhanced ultrasonography (CEUS)

3- Sonoelastography

1- Small intestine contrast ultrasonography (SICUS)

- Performing US before & after the administration of an oral contrast agent such as polyethylene glycol (PEG) solution (500–800 mL).

Table 2. Pooled sensitivity, specificity, and accuracy for all reference standards.

Complication	Exam type	Included studies [*n*]	Patients [*n*]	Sens	95% CI	I^2 [%]	χ^2	Spec	95% CI	I^2 [%]	χ^2	Acc
Stricture	B-mode	18†	2002	0.808	0.775–0.838	83.1	100.89*	0.902	0.885–0.917	83.4	102.21*	0.855
Stricture	SICUS	4	202	0.935	0.865–0.976	0.0	2.42	0.945	0.884–0.980	55.2	6.7	0.940
Inflammatory mass	B-mode	9	513	0.867	0.779–0.929	0.0	7.65	0.948	0.922–0.967	31.6	11.69	0.908
Inflammatory mass	SICUS	3	133	0.913	0.720–0.989	50.7	4.06	0.973	0.922–0.994	46.1	3.71	0.943
Fistula	B-mode	13	817	0.665	0.598–0.727	65.6	34.91*	0.973	0.957–0.985	11.0	13.48	0.819
Fistula	SICUS	3	134	0.900	0.782–0.967	39.5	3.3	0.940	0.867–0.980	0.0	0.61	0.920

Diagnostic accuracy of SICUS for CD-related strictures

- Pooled sensitivity → 0.94 *[95% CI, 0.87– 0.98]*
- Pooled specificity → 0.95 *[95% CI, 0.88–0.98]*.
- There was no significant heterogeneity of studies for either sensitivity [I2 = 0.0%, χ2 = 2.42; p = 0.490] or specificity [I2 = 55.2%, χ2 = 6.70; p = 0.082].

Diagnostic accuracy of SICUS for CD-related fistulas

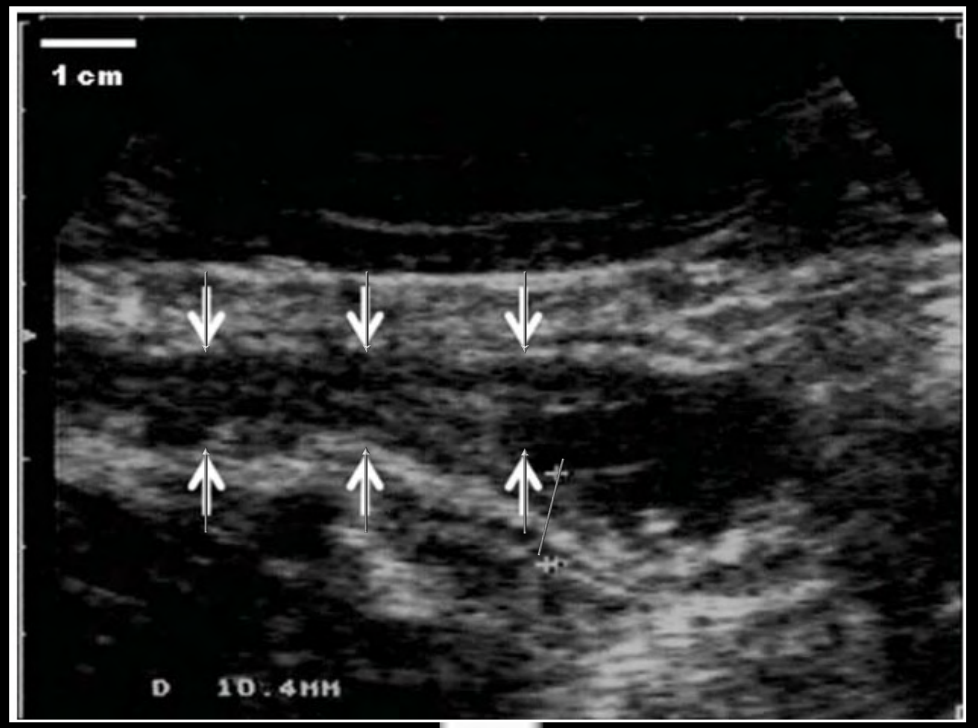
- Pooled sensitivity → 0.90 *[95% CI, 0.78–0.97]*
- Pooled specificity → 0.94 *[95% CI, 0.87–0.98],*
- There was no significant heterogeneity between studies for either sensitivity [I2 = 39.5%, χ2 = 3.30; p = 0.192] or specificity [I2 = 0.0%, χ2 = 0.61; p = 0.736].

Diagnostic accuracy of SICUS for CD-related masses

- Pooled sensitivity → 0.91 [95% CI, 0.72–0.99
- Pooled specificity → 0.97 [95% CI, 0.92–0.99], respectively.
- There was no significant heterogeneity between studies for either sensitivity [I^2 = 50.7%, χ^2 = 4.06; p = 0.132] or specificity [I^2 = 46.1%, χ^2 = 3.71; p = 0.156].

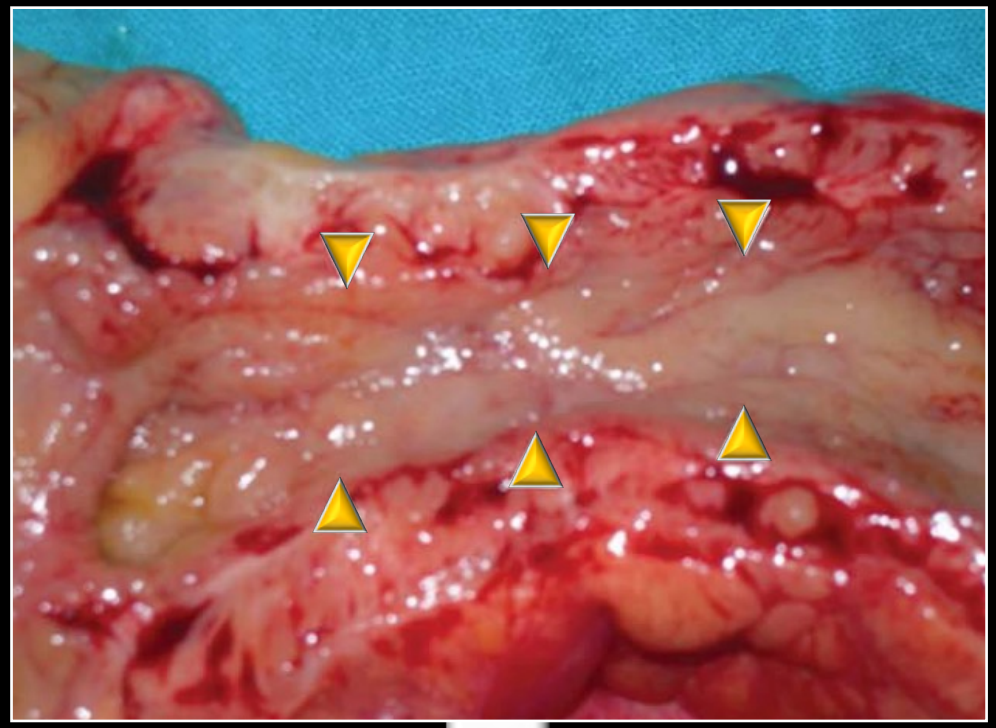
- Maarten Pruijrt et al, J. crohns colitis , Jan 2024

1- Small intestine contrast ultrasonography (SICUS)



SICUS of ileal stricture at the level of terminal ileum.

- Calipers → Thickness of ileal wall.
- Arrows → Extension of luminal narrowing



Corresponding surgical finding of the same patient

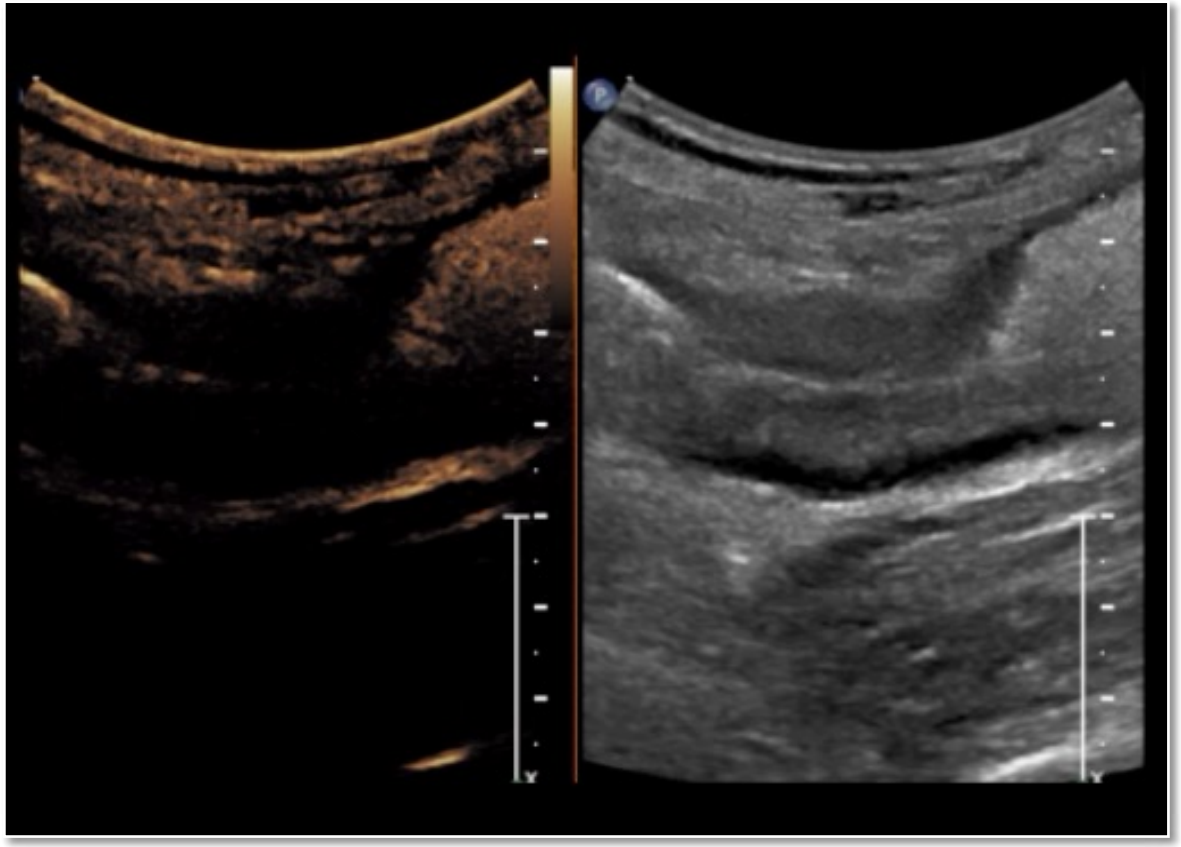
- Arrow → The extension of luminal narrowing

- Pallotta et al, Inflamm Bowel Dis. January 2012

2- Contrast-enhanced ultrasound (CEUS)

Usage in CD complications:

- Provide bowel wall & mesentery enhancement parameters that reflect inflammation & assess disease activity.
- Help in differentiation between of inflammatory vs fibrotic intestinal strictures.
- Rule in the differentiation of inflammatory masses as either phlegmon or abscess



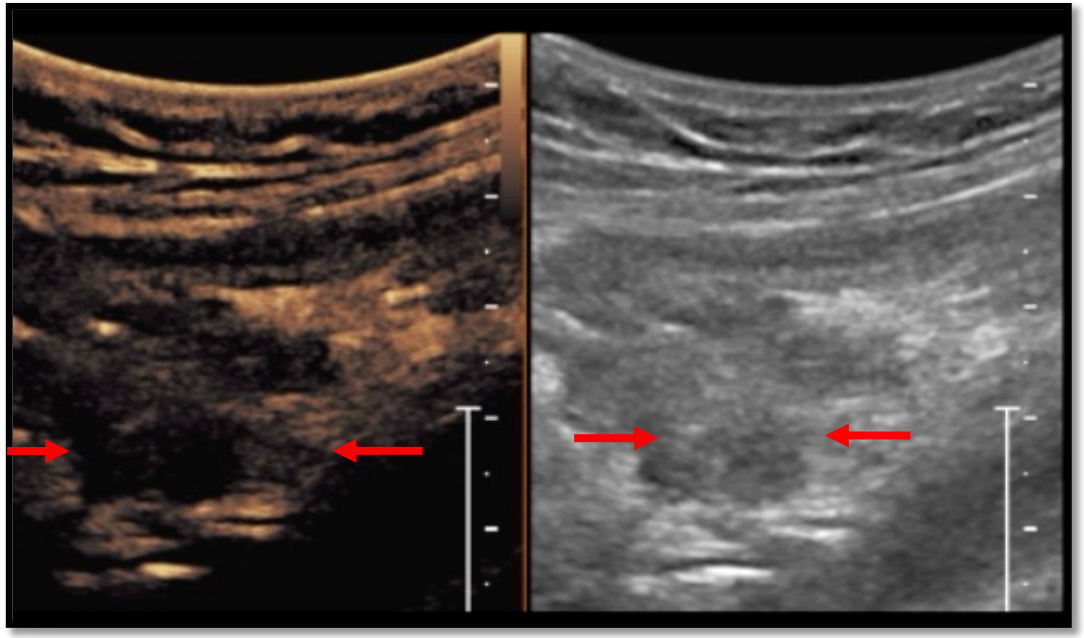
- **How is CEUS Performed?**
  - Gas-filled microbubbles with a phospholipid shell.
  - Microbubbles remain within capillaries & oscillate in the bloodstream in response to application of an ultrasound field, producing non-linear harmonic frequencies that are detected at CEUS.
  - 2 Minutes video file. Followed by Quantification with raw linearized data

- Maconi G et al. EFSUMB Recommendations 2018
- Nylund K et al. EFSUMB Recommendations 2017
- Medellin et al. Abdom Radiol 2018.
- C. Maaser et al. UEG J, Feb 2022

Use of CEUS with inflammatory masses

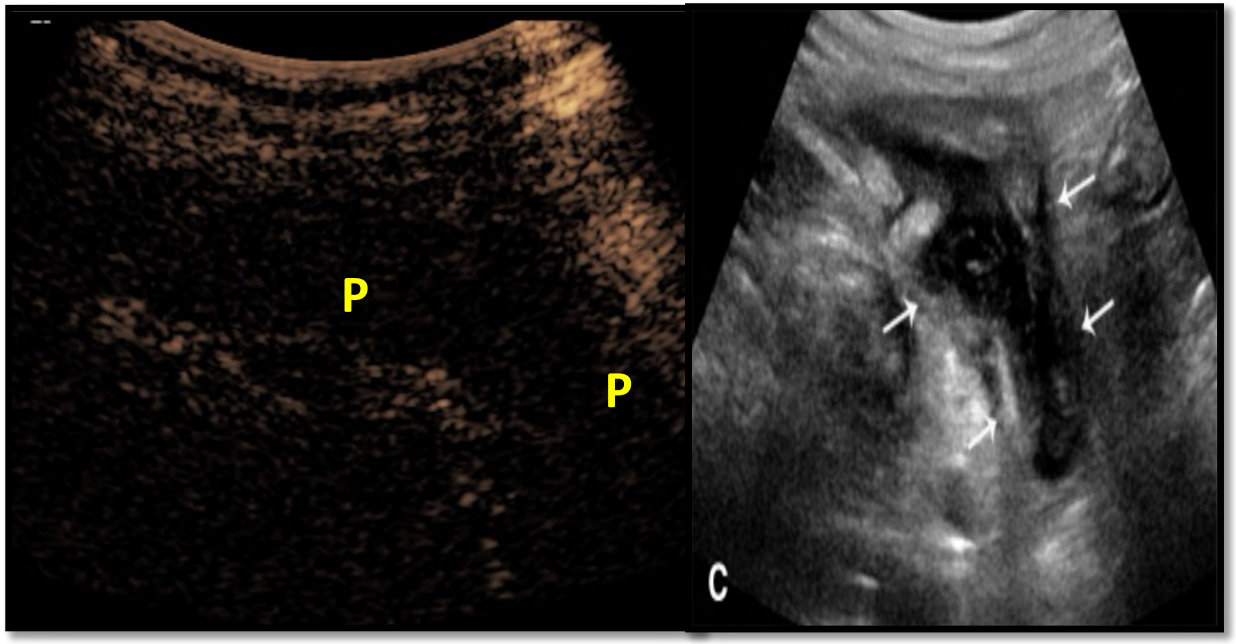
Phlegmonous masses:

- Diffuse hyperenhancement reflecting acute inflammatory changes.



Abscess:

- Regions of avascularity corresponding to pockets of pus with peripheral areas of enhancement.
- Reflective of reactive inflammation & the abscess wall.

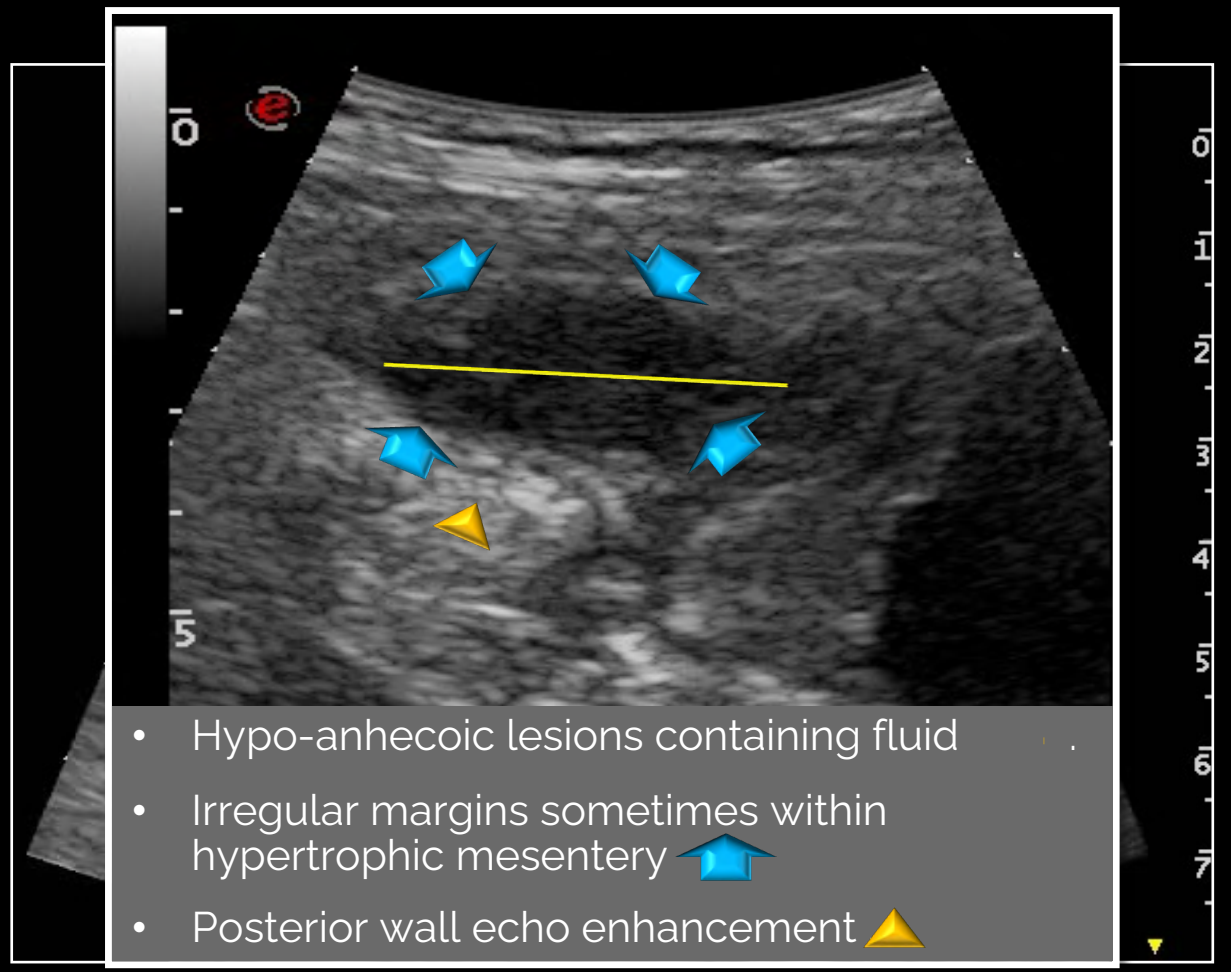


- Medellin et al. Abdom Radiol 2018.
- C. Lu et al. J Ultrasound Med 2019
- C. Maaser et al. UEG J, Feb 2022

Use of CEUS with masses

Case 4

- Mrs. K is a 26 years old was diagnosed as a case of Terminal ileal Crohn's disease for > 5 years.
- She was refusing to start biological agent & non complaint to her immunomodulator therapy (Azathioprine).
- She received many steroid doses during the disease flares.
- Presented to hospital complaining of lower abdominal pain & fever.

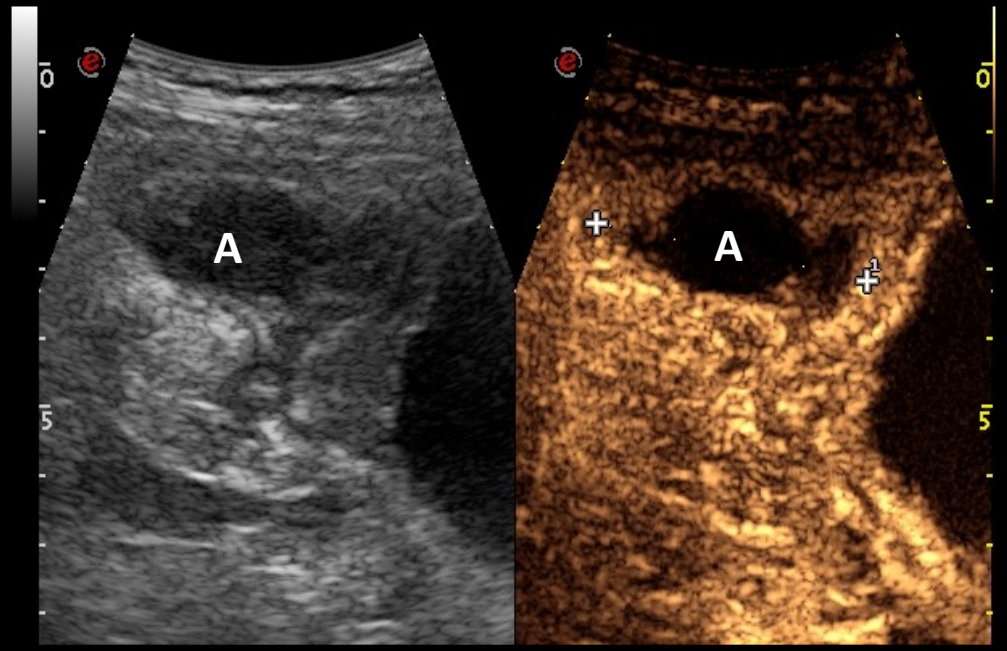


- Hypo-anhecoic lesions containing fluid
- Irregular margins sometimes within hypertrophic mesentery
- Posterior wall echo enhancement

Use of CEUS with masses

Case 4

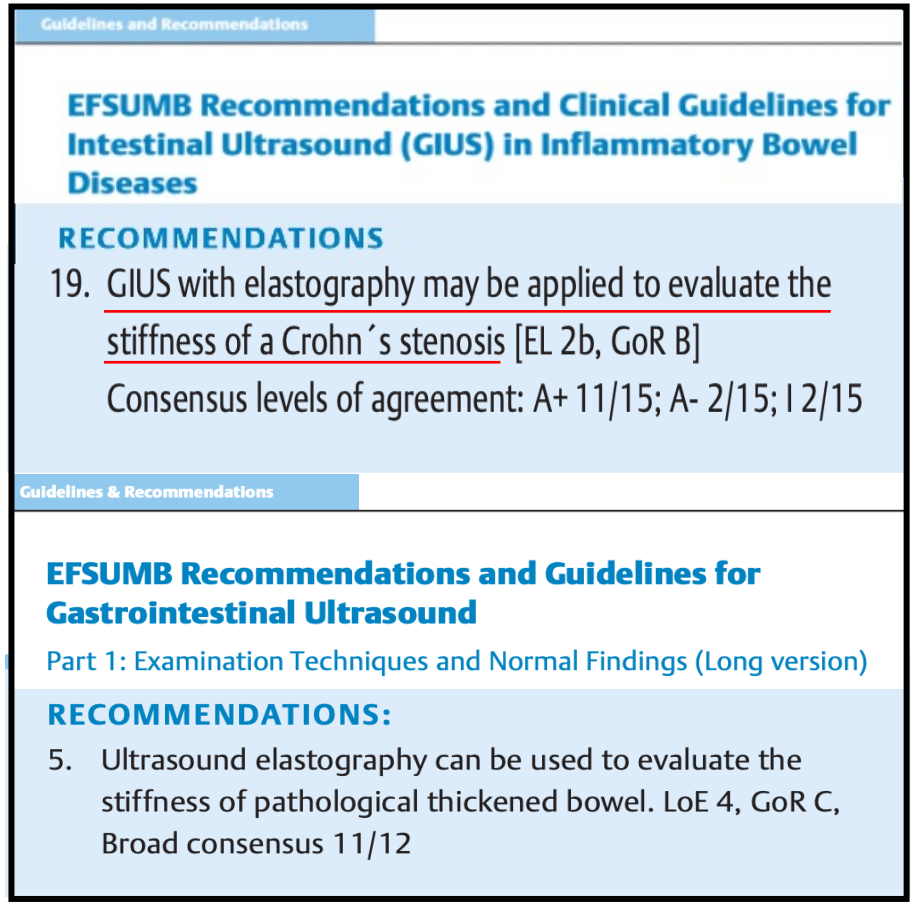
- **Abscess**:
  - Avascular mass with peripheral areas of enhancement.



3- Sonoelastography

Advantage

- Estimate tissue elasticity & asses stiffness by:
  - US force propagation wave into the tissue.
  - Wave velocity depends on tissue mechanical properties. (mainly tissue elasticity).
  - Provide information on histological features & the presence of wall fibrosis.



Guidelines and Recommendations

EFSUMB Recommendations and Clinical Guidelines for Intestinal Ultrasound (GIUS) in Inflammatory Bowel Diseases

RECOMMENDATIONS

19. GIUS with elastography may be applied to evaluate the stiffness of a Crohn´s stenosis [EL 2b, GoR B]

Consensus levels of agreement: A+ 11/15; A- 2/15; I 2/15

Guidelines & Recommendations

EFSUMB Recommendations and Guidelines for Gastrointestinal Ultrasound

Part 1: Examination Techniques and Normal Findings (Long version)

RECOMMENDATIONS:

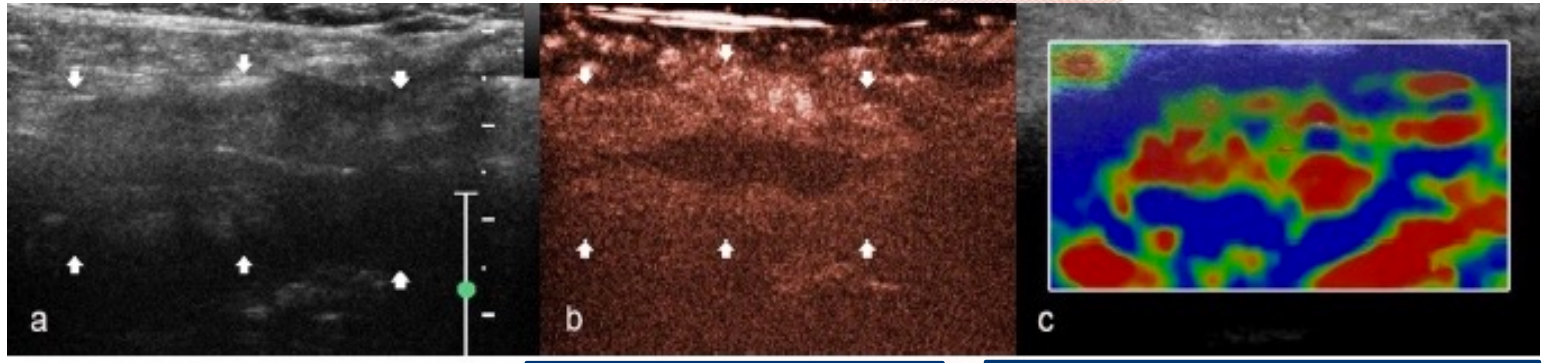
5. Ultrasound elastography can be used to evaluate the stiffness of pathological thickened bowel. LoE 4, GoR C, Broad consensus 11/12

- Ferretti et al. Front. Pharmacol. 2021
- Nylund K et al. EFSUMB Recommendations 2017
- Maconi G et al. EFSUMB Recommendations 2018

Strain elastography

A. Strain Elastography

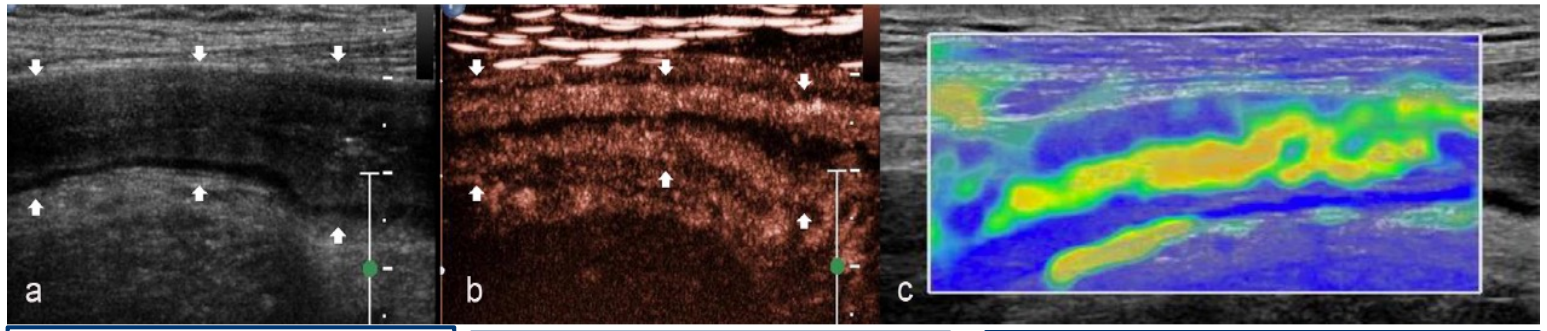
- **Compressive** force applied to tissues with repeated pulses to measure stiffness.
- Qualitative assessment:
  - Color scale
    - **Red** → Soft
    - **Blue** → Hard
- Quantitative assessment:
  - Wall-to-mesenteric fat strain ratio.



B-mode: thickened bowel wall with loss of bowel layers.

CEUS: Transmural contrast enhancement

SE: stiff stratified mural fibrosis with inflammatory component



B-mode: thickened bowel wall with intact of bowel layers.

CEUS: Submucosal contrast enhancement

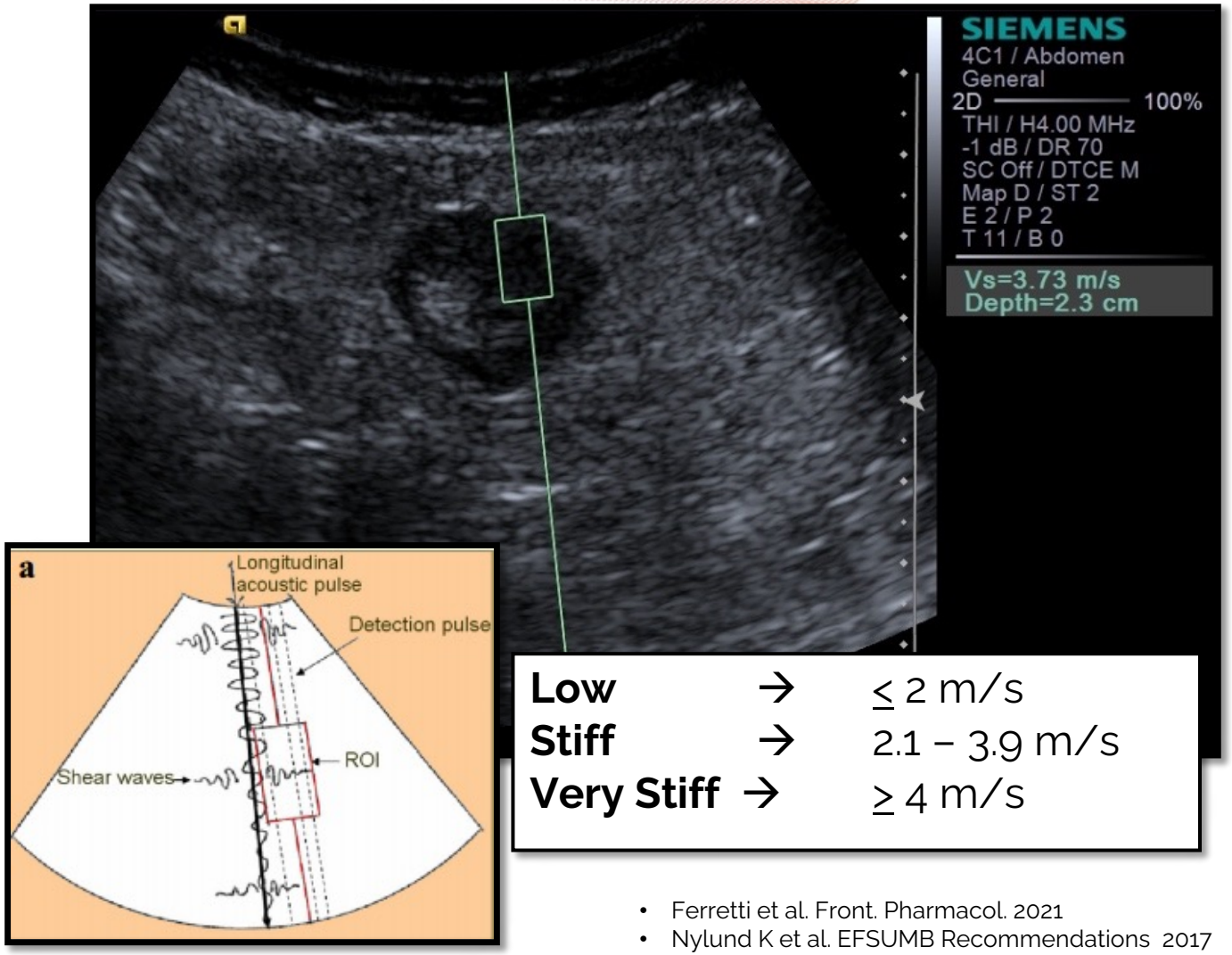
SE: stiff pattern with transmural blue color

- Ferretti et al. Front. Pharmacol. 2021
- Nylund K et al. EFSUMB Recommendations 2017
- Maconi G et al. EFSUMB Recommendations 2018
- E. Quaia et al. Ultrasound in Medicine & Biology.2018

Shear wave elastography (SWE)

B. Shear wave Elastography

- **Acoustic radiation** force impulse (ARFI)
  - Measure SW propagation speed within the tissue.
  - SW propagate faster in hard than soft tissue. (Qualify stiffness)
    - Less fibrosis: **LOW SWE**
    - More fibrosis: **HIGH SWE**
- Qualitative assessment:
  - Color-scaled image.
- Quantitative assessment:
  - Determine maximum elasticity value in kPa or m/s.



Low	→	≤ 2 m/s
Stiff	→	2.1 – 3.9 m/s
Very Stiff	→	≥ 4 m/s

- Ferretti et al. Front. Pharmacol. 2021
- Nylund K et al. EFSUMB Recommendations 2017
- Maconi G et al. EFSUMB Recommendations 2018
- Dillman JR, Stidham RW, et al. Radiology. 2013.
- Frulio et al. BMC. 2014

Accuracy of Intestinal CEUS & Elastography

Conflicting evidences & studies supporting the ACCURACY these advanced tools.

Waiting for further scientific evidences a& trials for the use of CEUS & sonoelastography in detecting & characterizing CD strictures in clinical practice.

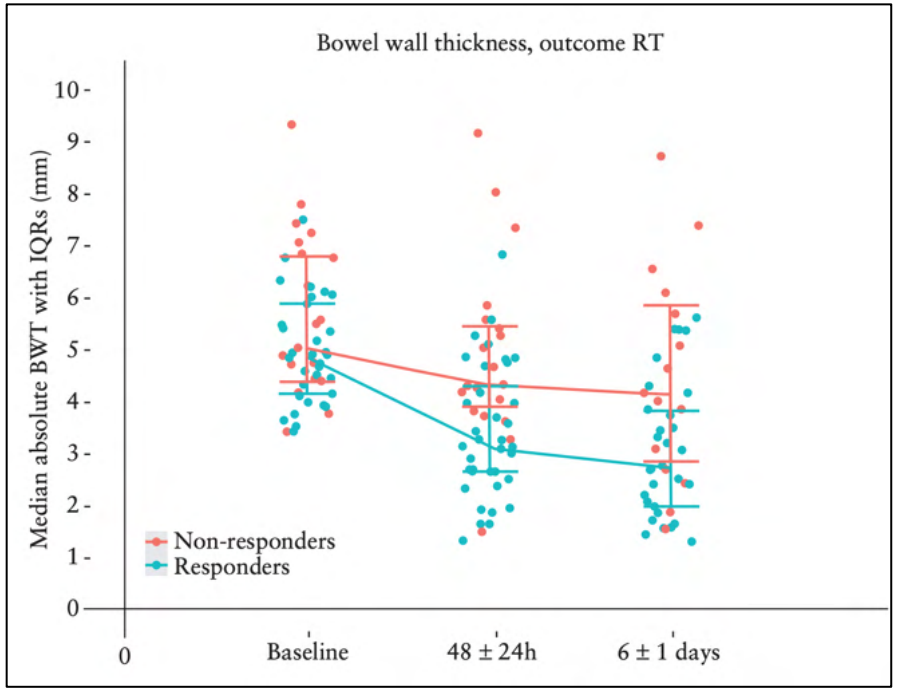
IUS in acute severe ulcerative colitis (ASUC)

Early changes on IUS in patients with (ASUC) can predict response to **therapy**.

- In a single-center study. N = 56 patients hospitalized with ASUC, (37 responders).

- Baseline:
  - No differences between responders & non-responders.
  - Sigmoid colon segment was analyzed.

- Change and > 20% reduction in BWT in the first 48 hrs predicted response to IV steroids with an OR of 22.6 (95% CI, 4.2-201.2; P=001).



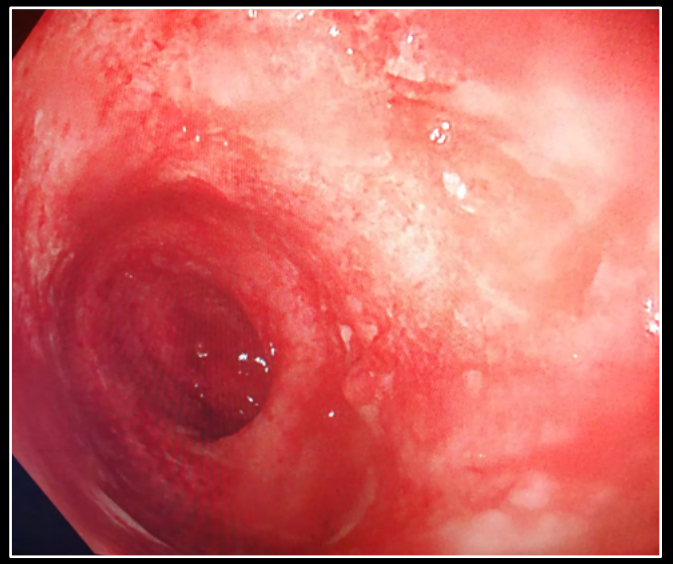
IUS can identify responders with high accuracy and can be used as an early marker to guide a faster decision for accelerated rescue therapy and prevent surgery.

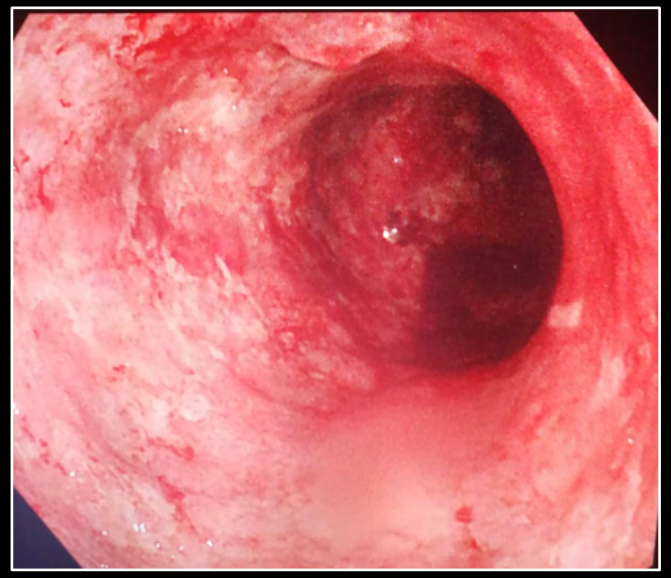
Ilvemark J, *et al.* Journal of Crohn's and Colitis, 2022, 16, 1725–1734

IUS in acute severe ulcerative colitis (ASUC)

CASE 5

- Mr. R is a 39 years old gentleman known case of UC, presented to ER with 8 weeks duration of bloody diarrhea (8 times/day), abdominal pain, fever and weight loss.
- Blood investigations showed elevated fecal calprotectin (>5000 ug/g), CRP 31 mg/dL and anemia. Stool C/S: -ve
- Sigmoidoscopy done:

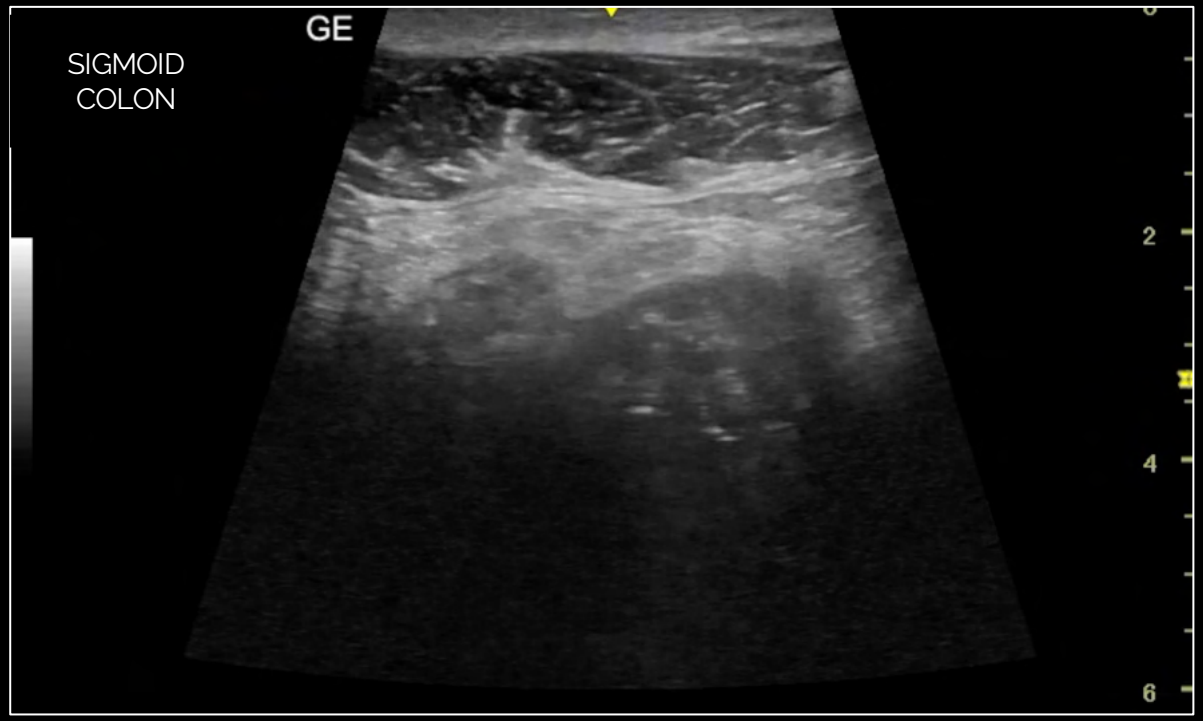




IUS in acute severe ulcerative colitis (ASUC)

CASE 5

- Started on steroids but no response. Shifted for Infliximab. Day 0



IUS in acute severe ulcerative colitis (ASUC)

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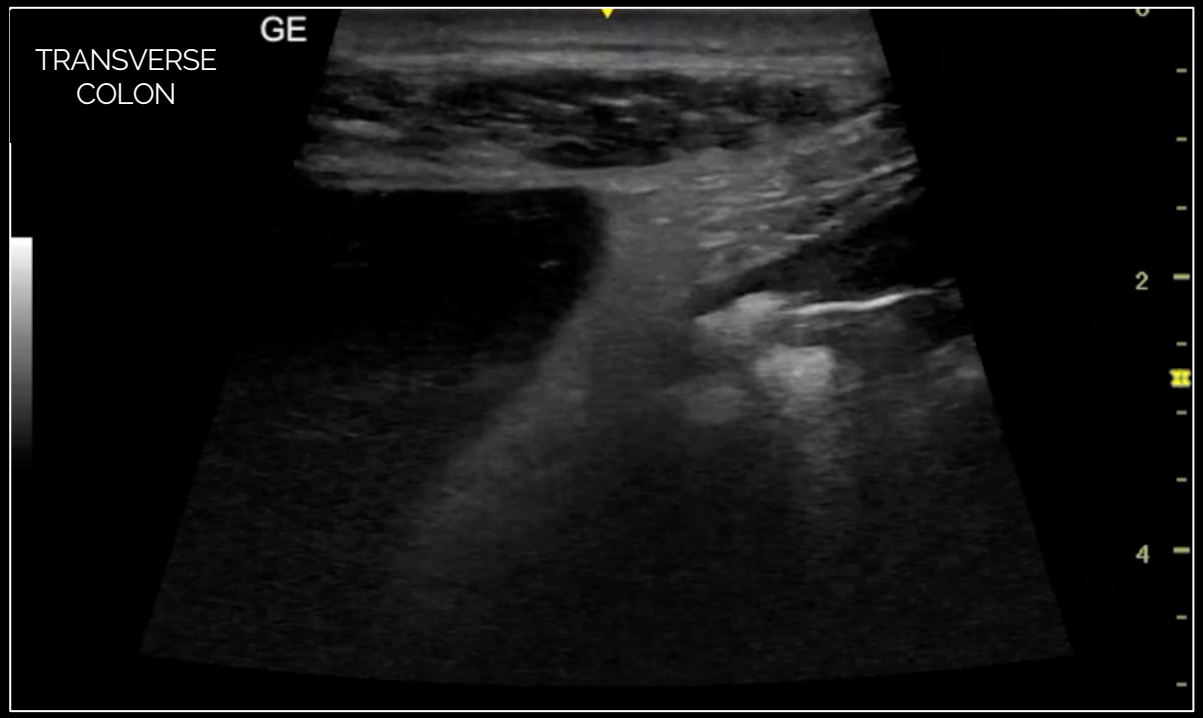
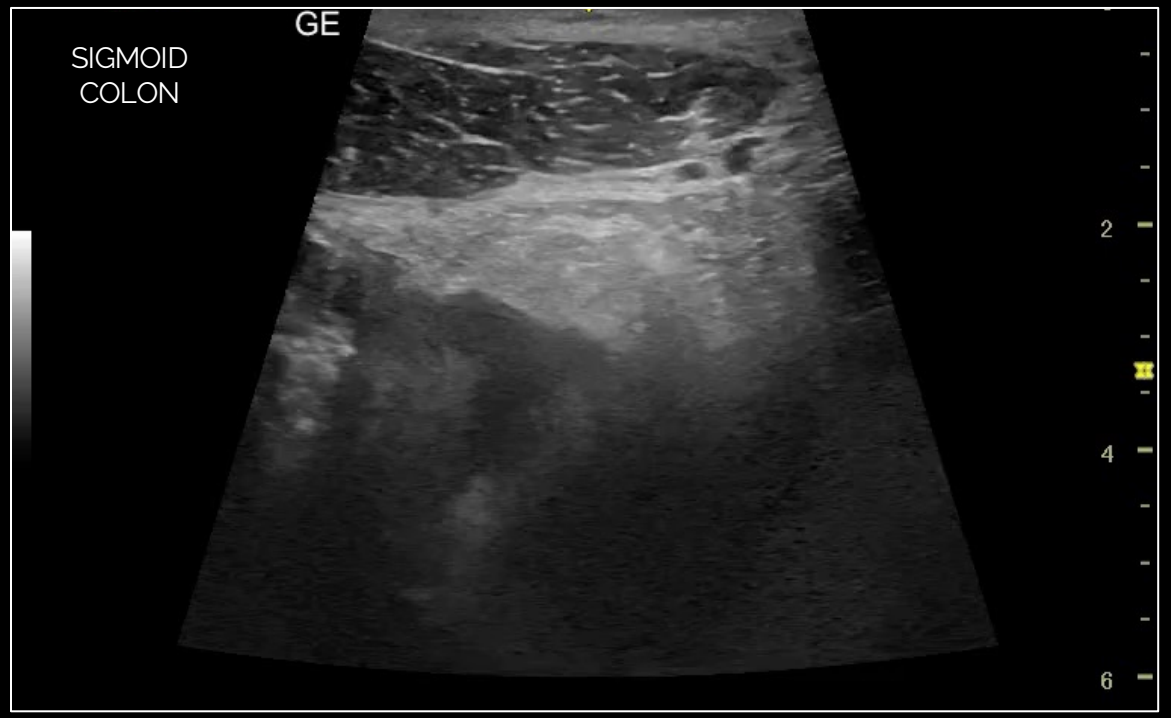


IUS in acute severe ulcerative colitis (ASUC)

CASE 5

- Started on Infliximab. Day 5.
- Still symptomatic and started to vomit.



IUS in acute severe ulcerative colitis (ASUC)

CASE 5

- Started on Infliximab. Day 5.
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IUS in acute severe ulcerative colitis (ASUC)

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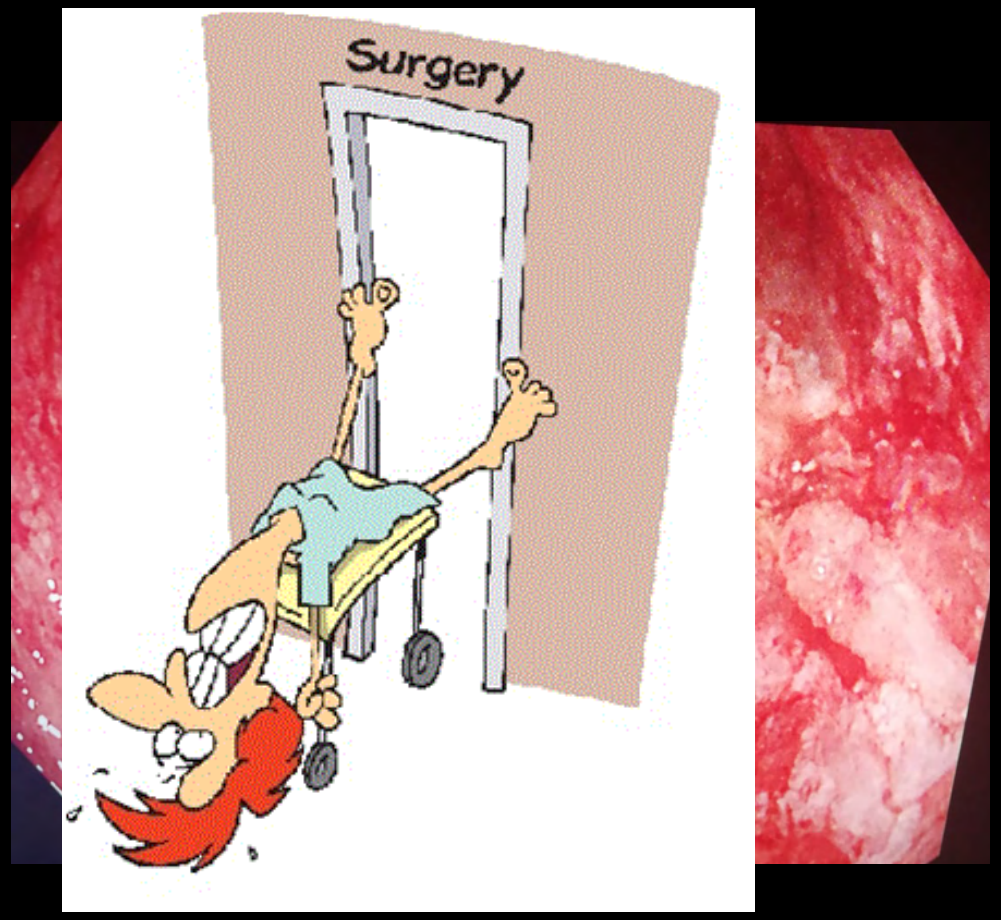

international bowel ULTRASOUND GROUP

AL-AMIRI HOSPITAL

IN CONCLUSION

- As a non-invasive, IUS is recommended as the first-line imaging tool if there is suspicion of a IBD -related intra-abdominal complication.

- There is a requirement for a unified approach in routine clinical care with incorporation of more future prospective studies for better patients care and outcome.

- The additional IUS advanced modalities, can increase the detection of IBD complications.

THANK YOU VERY MUCH!