



international bowel  
**ULTRASOUND GROUP**

# Trans-Perineal UltraSound (TPUS)

**Torsten Kucharzik**

Lüneburg, Germany

**Module 1 Workshop**

Houston, US March 20<sup>th</sup> -22<sup>nd</sup>, 2025



# Disclosures

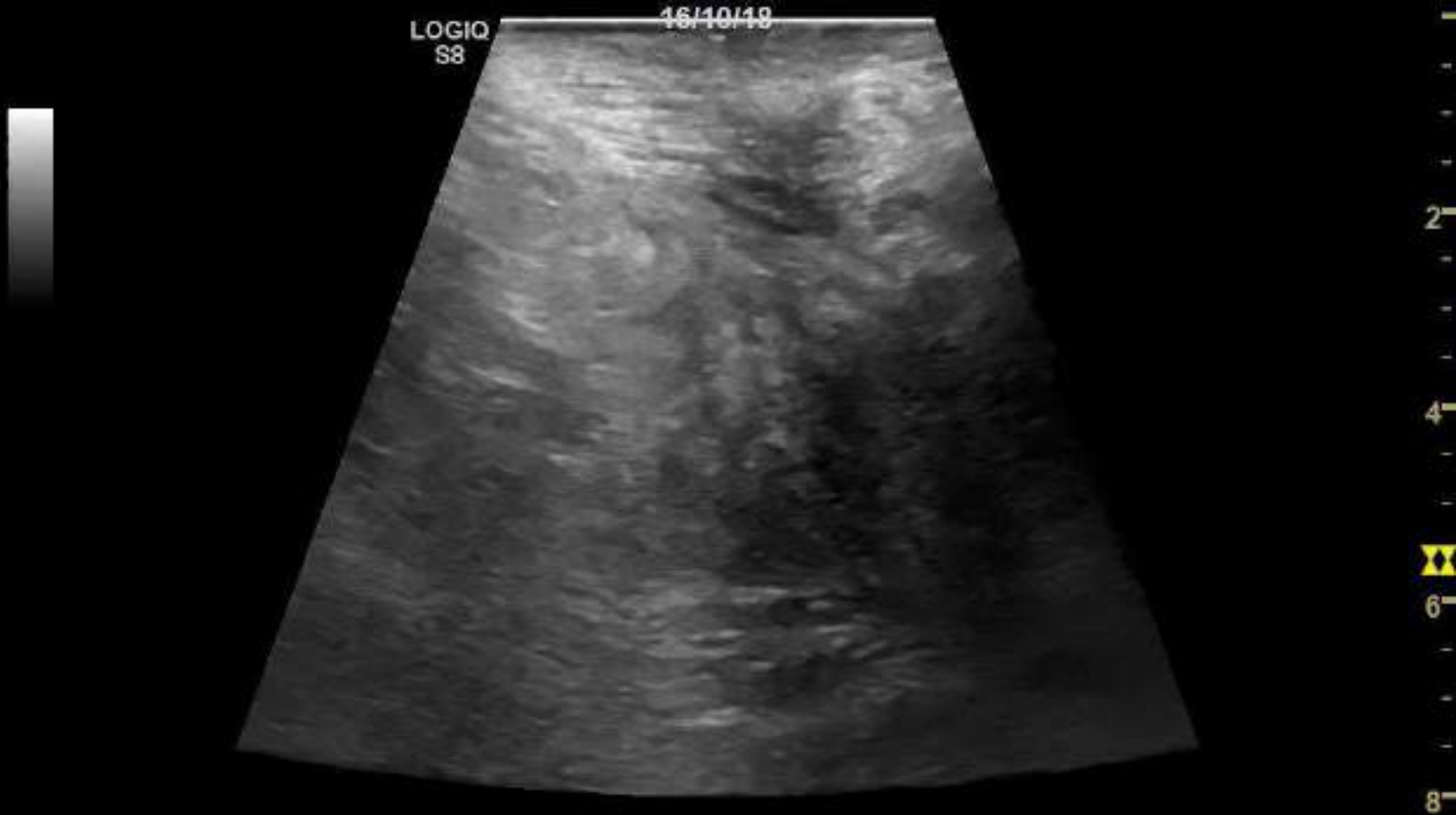
## **Consultancy**

Abbvie, Amgen, Biogen, Boehringer, Celltrion, Celgene, Hospira, MSD Sharp & Dome GmbH, Mundipharma, Dr. Falk Pharma GmbH, Galapagos, Gilead, Janssen, Lilly, MSD Sharp & Dome GmbH, Novartis, Takeda Pharma GmbH

## **Speakers honoraria**

Abbvie, Amgen, Celltrion, Celgene, Dr. Falk Pharma GmbH, Ferring Arzneimittel GmbH, Galapagos, Janssen, MSD Sharp & Dome GmbH, Pfizer, Roche, Takeda Pharma GmbH, Vifor

**Marcel 27 years old: CD L3B3p since 2017, Aza monotherapy, IFX planned; acute perianal pain**



**Marcel 27 years old: CD L3B3p since 2017  
ileal, rectal and perianal CD  
abscess drainage and seton placement**







# Transperineal Ultrasound (TPUS)



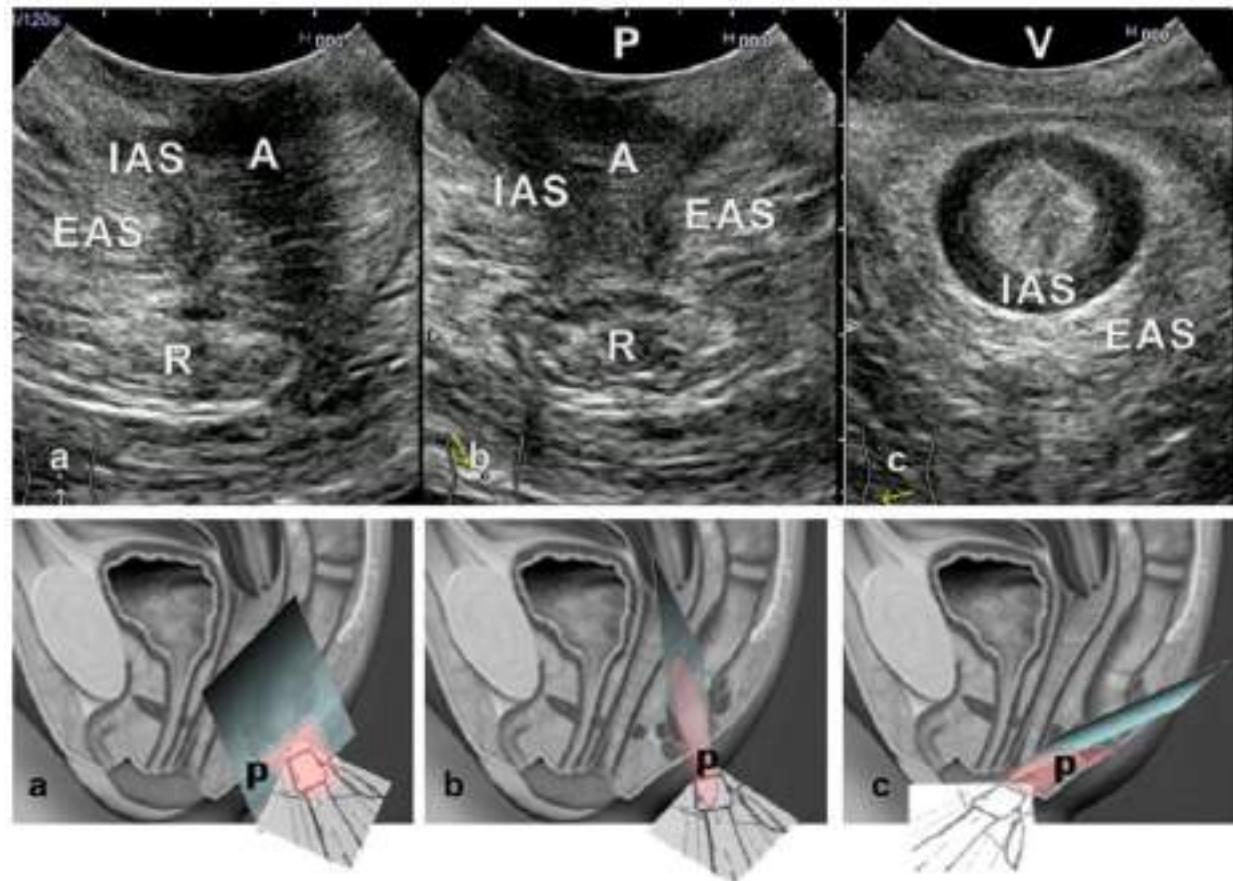
Lavazza A, Maconi G J Ultrasound 2019



Micro-convex probe  
4-8 MHz



# Transperineal Ultrasound (TPUS)



a) Saggital scan



b) Coronal scan



c) Axial scan



# Potential Indications for TPUS in IBD

## **Crohn's disease**

- Detection of perianal Crohn's disease
- Monitoring of perianal Crohn's disease
- Sphincter muscle integrity
- Detection and monitoring of proctitis

## **Ulcerative Colitis**

- Detection of proctitis
- Monitoring of proctitis
- Detection of pouchitis
- Extramural complications in pouchitis

# Tom, CD L2B3p, acute perineal swelling



FR:25 L735 BG:18 DR:80 HdTH-P



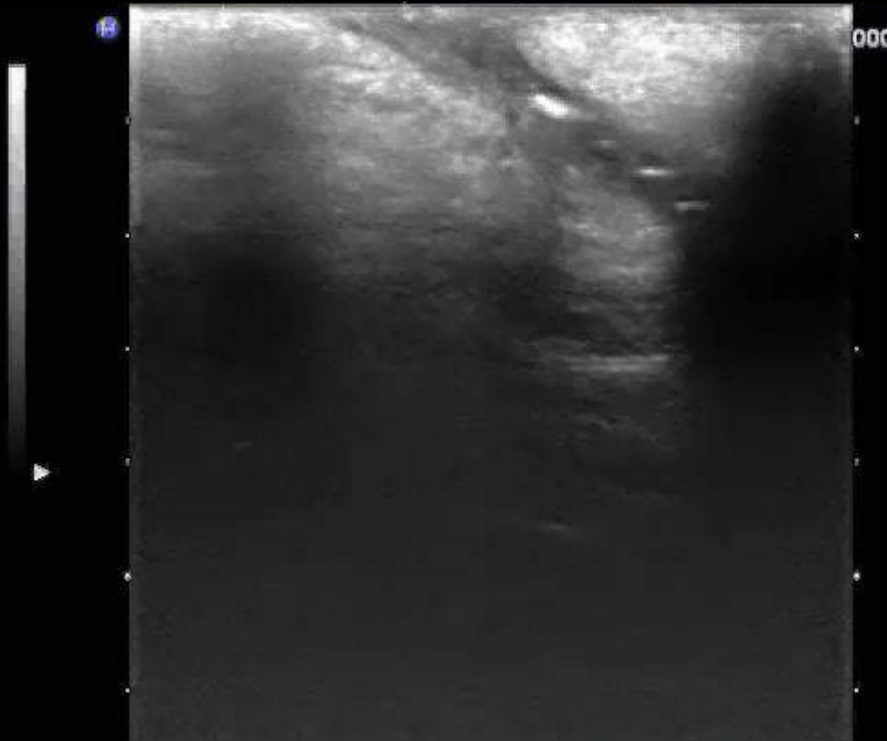
P:4% M:0.05 BG:8 DR:50 dCHI-W-P  
FR:27 C715

00:08  
P:7% M:0.04 BG:20 DR:75 FI





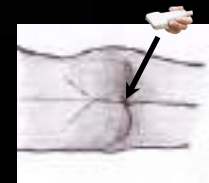
# Karla 48years old: CD L3B3p, perianal discharge



**TPUS:**  
**High transsphincteric fistula**

Contrast medium:

- $H_2O_2$
- SonoVue
- sparkling water

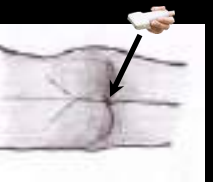


**Danny 23 years old:  
ileal and rectal CD, perianal pain, fecal vaginal  
discharge**

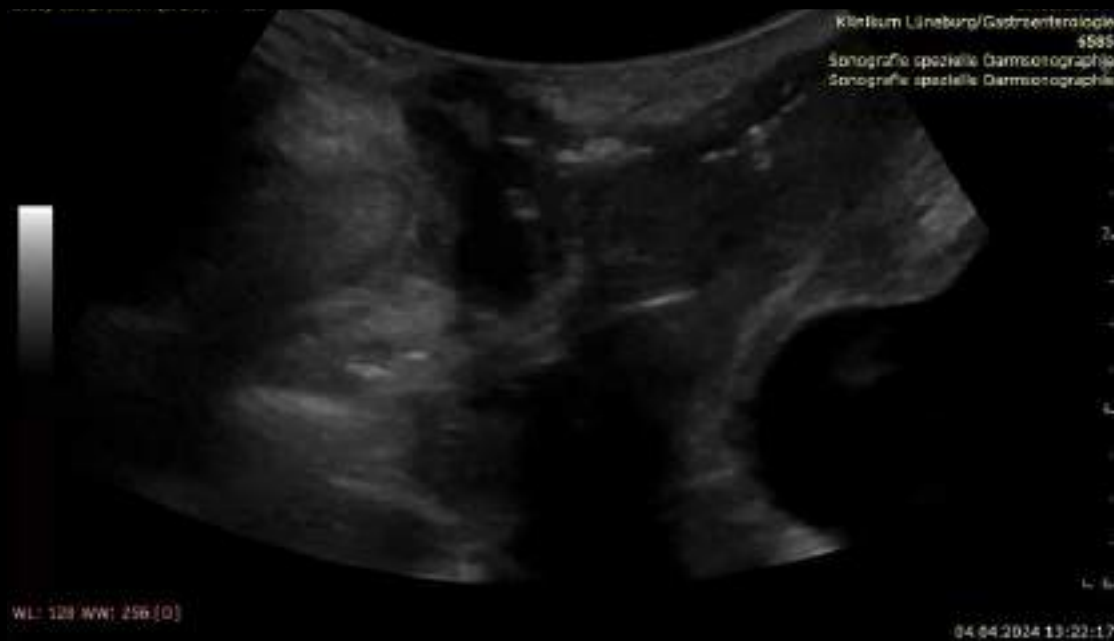


**Endoscopy: CD with moderate  
inflammation in the rectum and  
distal sigmoid.**

**Pelvic MRI: Rectal involvement  
of Crohn's disease,  
no fistula, no abscess**



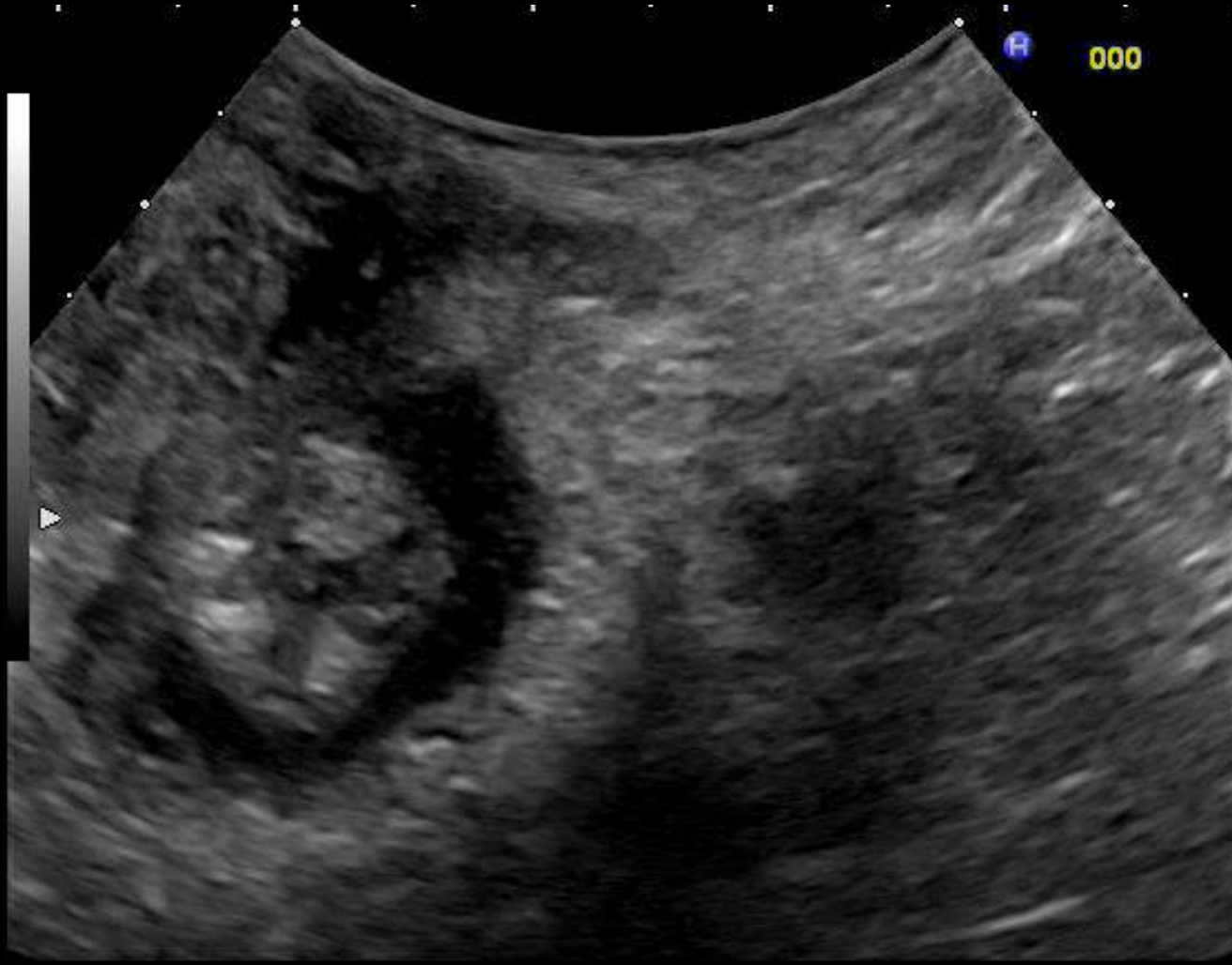
# Danny 23 years old: ileal and rectal CD, perianal pain, fecal vaginal discharge





# Anal Muscle Tears

Rosa, 39y L2B3p, treated fistulotomy and seton placement



IAS Tear at 9-11  
o'clock

Adopted from IBUS workshop  
for perianal disease



# TPUS in perianal Crohn's Disease - Metaanalysis

## Detection of perianal fistula

Sensitivity **98%** (95% CI 96-100%)

PPV **95%** (95% CI 90-96%)

## Classification of perianal fistula

Sensitivity **92%** (95% CI 85-97%)

PPV **92%** (95% CI 83-98%)

## Detection of perianal abscesses

Sensitivity **86%** (95% CI 67-99%)

PPV **90%** (95% CI 76-99%)

12 studies, 565 patients

**PROBLEM: POOR STUDY QUALITY!**

Maconi G et al. *Ultraschall Med* 2017



# TPUS in perianal Crohn's Disease

## Comparison MRI vs TPUS in pediatric CD

### Detection of perianal fistula

#### Correspondence TPUS vs MRI

Sensitivity **76%**

PPV **85%**

Kappa value **0.296**

38 patients

### Detection of perianal abscesses

#### Correspondence TPUS vs MRI

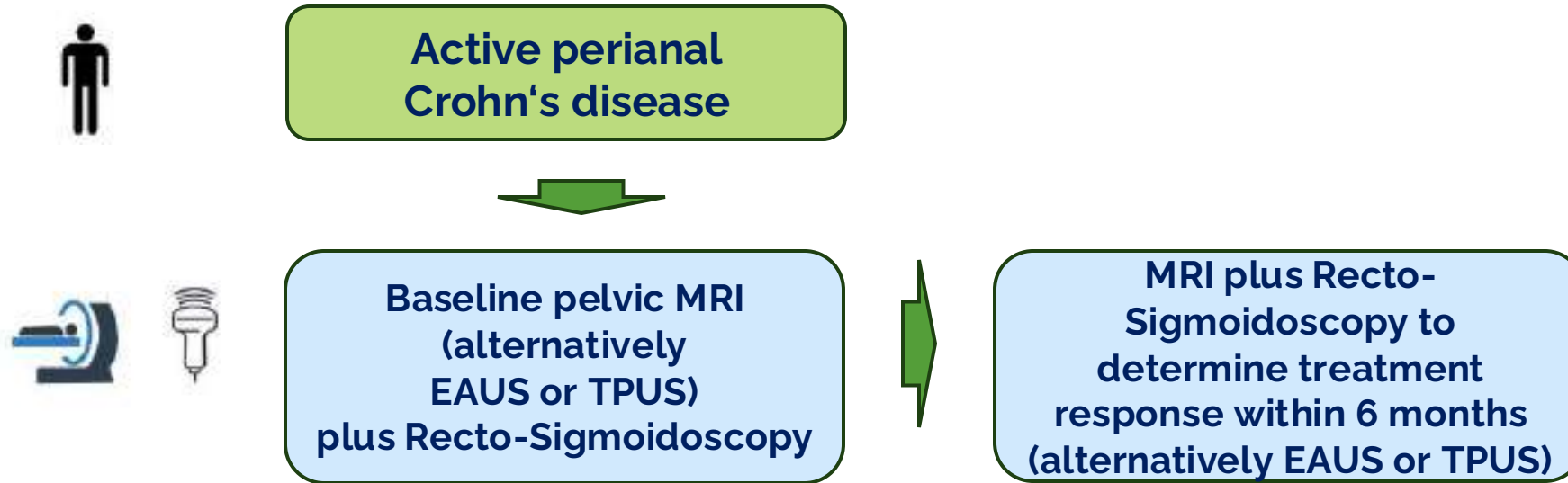
Sensitivity **56%**

PPV **90%**

Kappa value **0.624**



# Diagnostic algorithm for perianal Crohn's disease



MRI: magnetic resonance imaging  
EAUS: endo-anal ultrasonography  
TPUS: transperineal ultrasonography





ECCO Topical Review

# ECCO-ESGAR Topical Review on Optimizing Reporting for Cross-Sectional Imaging in Inflammatory Bowel Disease

Torsten Kucharzik<sup>a,\*</sup>, Jeroen Tielbeek<sup>b,\*</sup>, Dan Carter<sup>c</sup>, Stuart A. Taylor<sup>d</sup>,  
Damian Tolan<sup>e</sup>, Rune Wilkens<sup>f,g</sup>, Robert V. Bryant<sup>g</sup>, Christine Hoeffel<sup>h</sup>,  
Isabelle De Kock<sup>i</sup>, Christian Maaser<sup>j</sup>, Giovanni Maconi<sup>k</sup>, Kerri Novak<sup>l</sup>,  
Søren R. Rafaelsen<sup>m</sup>, Martina Scharitzer<sup>n</sup>, Antonino Spinelli<sup>o,t</sup>,  
Jordi Rimola<sup>p,t,u</sup>





## Perianal CD – Initial Diagnosis

### Which Key Findings should be described during TPUS?

**Number of  
fistulae/sinuses/  
abscesses**

**Parks classification  
of each fistula**

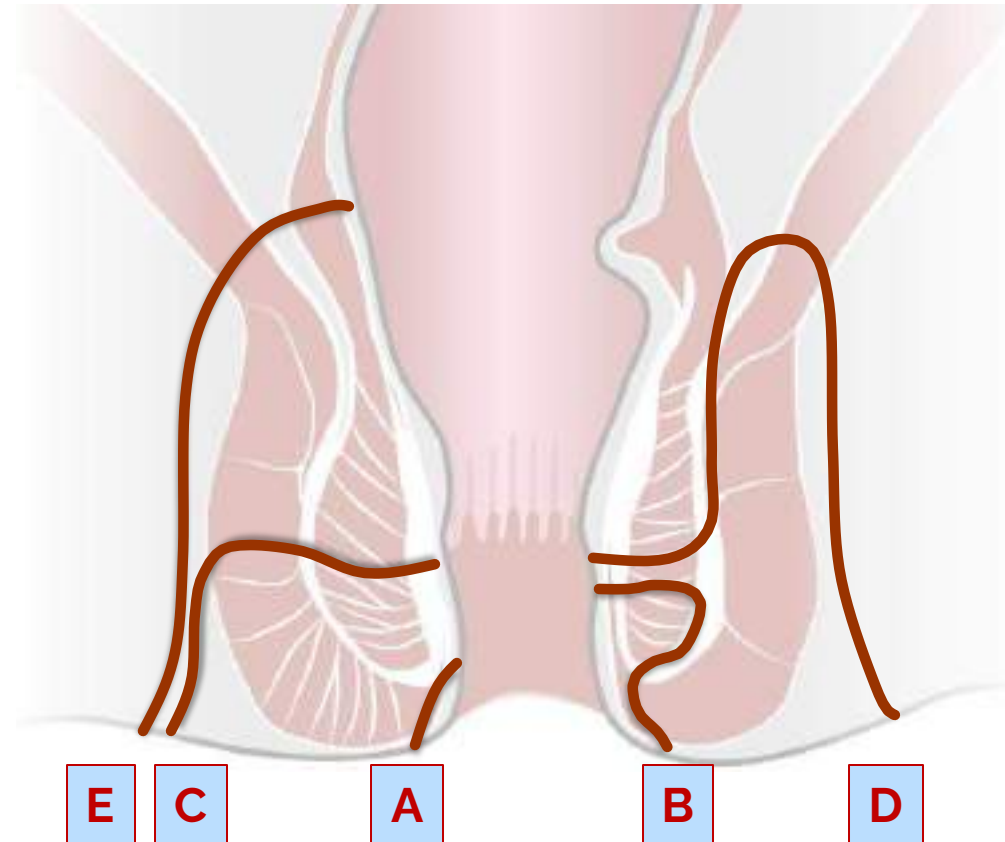
**Description of all  
complex fistula  
features**

**Assessment of  
sphincter integrity**



# Parks Classification of Perianal Fistula

- A. superficial
- B. Inter-sphincteric
- C. Trans-sphincteric
- D. Supra-sphincteric
- E. Extra-sphincteric



Im: 1/777  
Se: 1  
Lossy compression (JPEG)

LOGIQ  
E10

WL: 128 WW: 256 [D]

26.09.2024 11:12:02

**Benjamin**

**male.  
27 years old**

**Ileal and  
Perianal Crohn's  
disease (L3B3p)**

**Perianal fistula  
with secreting  
porus posterior  
gluteal left**







## Transperineal Ultrasound (TPUS-) REPORT

**NAME:** Benjamin

### INDICATIONS and DISEASE CHARACTERISTICS

27y old man. Ileal and Perianal Crohn's disease (L3B3p) since 2013.

Currently: Perianal fistula with secreting porus posterior gluteal

### INTRA-PROCEDURE FEATURES

No technical limitation. Normal body status

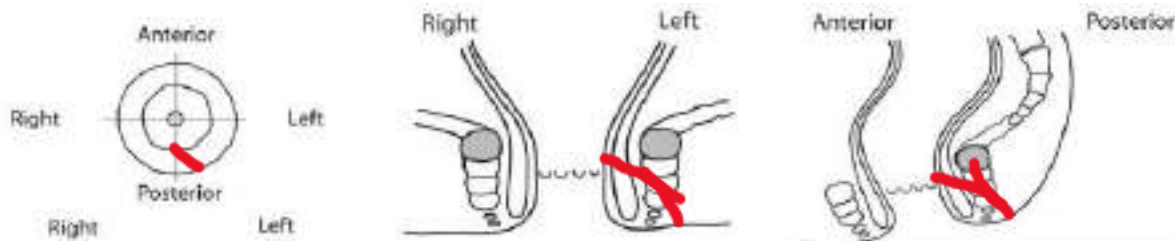
**Examination quality:** good

**Diagnostic confidence:** high confidence

**Image storage location:** cine loops and images stored in PACS

**Examiner:** Torsten Kucharzik

**IUS machine:** GE Logiq E10; Probe: Miniprobe 2-5 MHz



## RESULTS

### Fistula reporting descriptors:

- Number of separate fistulae present: 1
- Complexity: complex
- For each fistula:
- Fistula type: high transsphincteric
- Seton visible: no
- Internal opening: distance from anal verge [1.5 cm]
- External opening: [clock face position 5 o'clock relative to anal verge] 6 o'clock distance from anal verge [2 cm]
- External opening: distance from anal verge [2 cm]
- External opening position: perineum
- Extension: two
- Abscess/collection present [ $\geq 10$  mm]: no
- Other disease complications present: no
- Rectal wall/pouch wall thickening: no
- Anal sphincter integrity and scarring:
- Internal sphincter intact: yes

### DESCRIPTION/DIAGNOSIS:

Perianal Crohn's disease with high transsphincteric fistula posterior gluteal left without proctitis

**RECOMMENDATION:** Complete ileocolonoscopy. Seton drainage. Treatment with Infliximab



# TPUS in UC Proctitis?

Received: 14 January 2020 | First decision: 24 February 2020 | Accepted: 14 April 2020

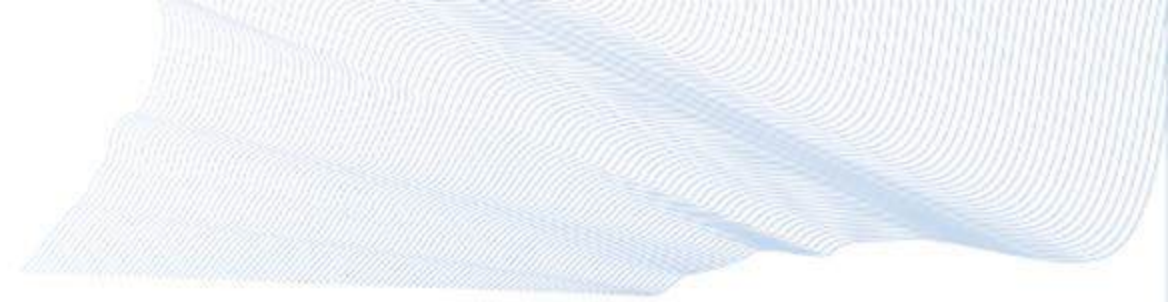
DOI: 10.1111/apt.15767

APJT Alimentary Pharmacology & Therapeutics WILEY

## Transperineal ultrasound predicts endoscopic and histological healing in ulcerative colitis

Shintaro Sagami<sup>1</sup> | Taku Kobayashi<sup>1</sup> | Kanako Aihara<sup>2</sup> | Misaki Umeda<sup>2</sup> |  
Hiromu Morikubo<sup>1,3</sup> | Mao Matsubayashi<sup>1,3</sup> | Hiroki Kiyohara<sup>1,3</sup> | Masaru Nakano<sup>1,3</sup> |  
Makoto Ohbu<sup>4</sup> | Toshifumi Hibi<sup>2</sup>

**Key message:** TPUS with **BWT ≤ 4 mm** predicted endoscopic (AUC = 0.90 and histological (AUC = 0.87-0.89) healing of the rectum.



Received: 11 November 2021 | First decision: 13 December 2021 | Accepted: 30 January 2022

DOI: 10.1111/apt.15817

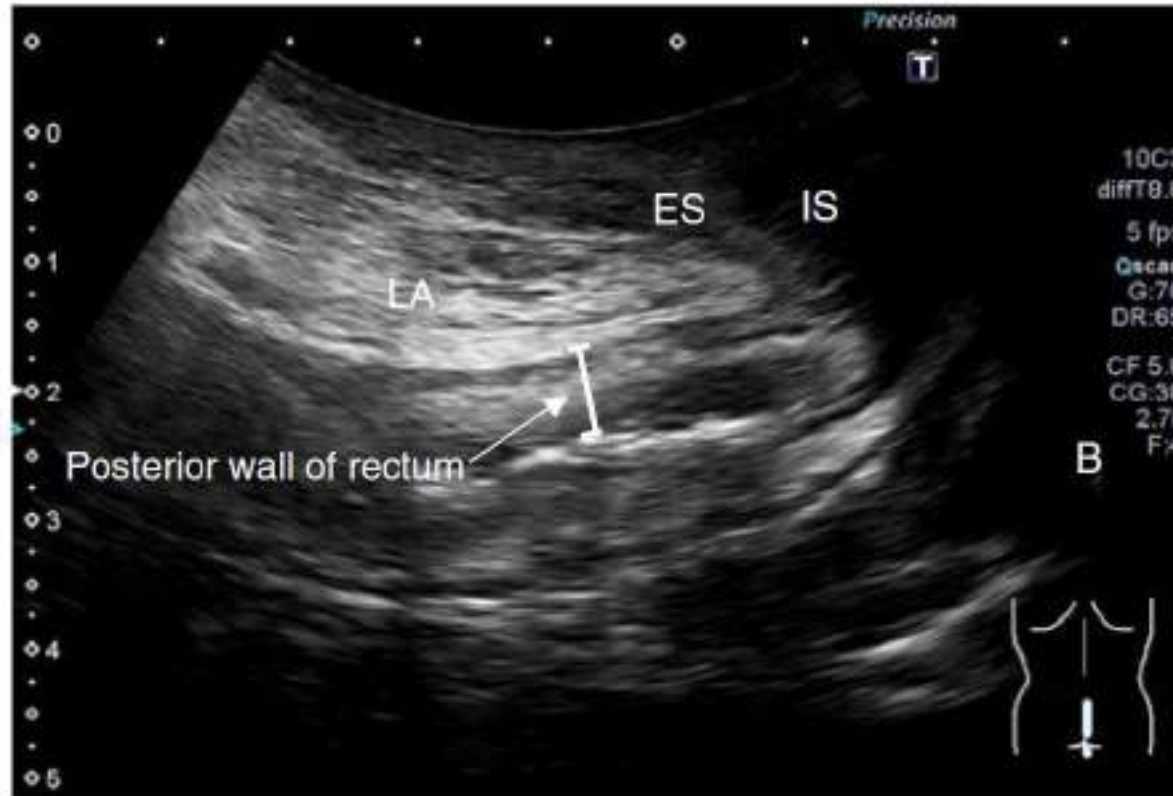
APJT Alimentary Pharmacology & Therapeutics WILEY

## Early improvement in bowel wall thickness on transperineal ultrasonography predicts treatment success in active ulcerative colitis

Shintaro Sagami<sup>1,2</sup> | Taku Kobayashi<sup>1</sup> | Kanako Aihara<sup>3</sup> | Misaki Umeda<sup>3</sup> |  
Kazuhiro Odajima<sup>3</sup> | Hiromu Morikubo<sup>1,2</sup> | Kunio Asonuma<sup>1</sup> | Yusuke Miyatani<sup>1</sup> |  
Tomohiro Fukuda<sup>1,2</sup> | Mao Matsubayashi<sup>1,2</sup> | Hiroki Kiyohara<sup>1,2</sup> | Masaru Nakano<sup>1,2</sup> |  
Toshifumi Hibi<sup>1</sup>

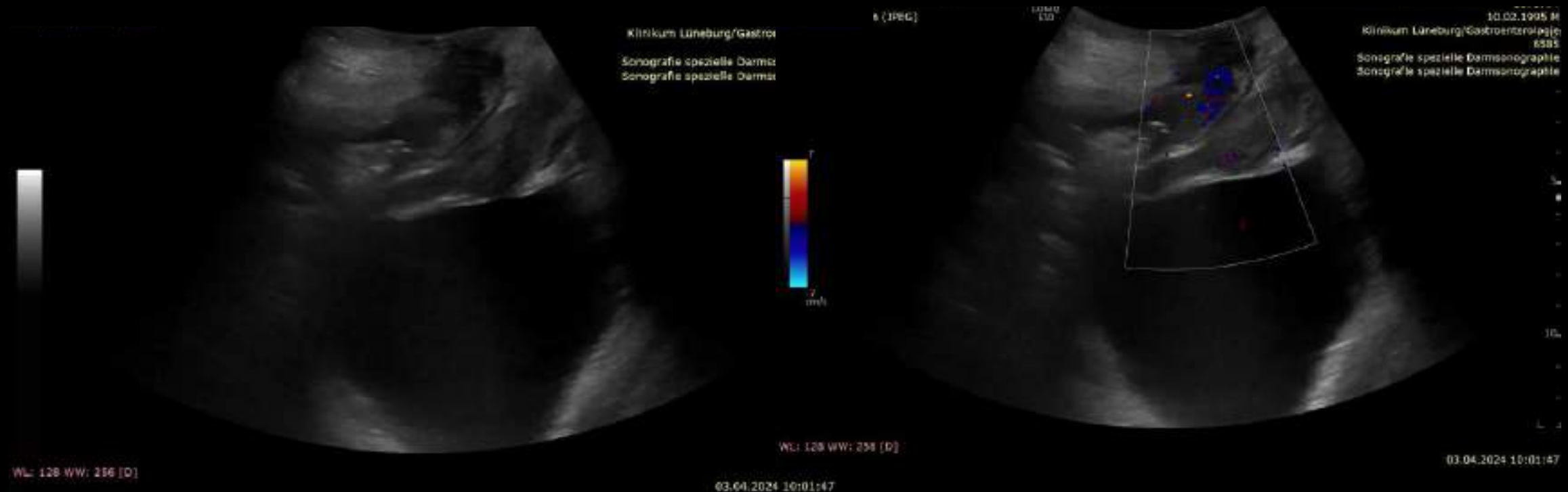
**Key message:** Improvement in rectal bowel wall thickness measured using transperineal ultrasonography at week 1 predicts treatment success at week 8 (**OR 1.90, 1 mm decrease in BWT**)

# TPUS in Ulcerative Colitis



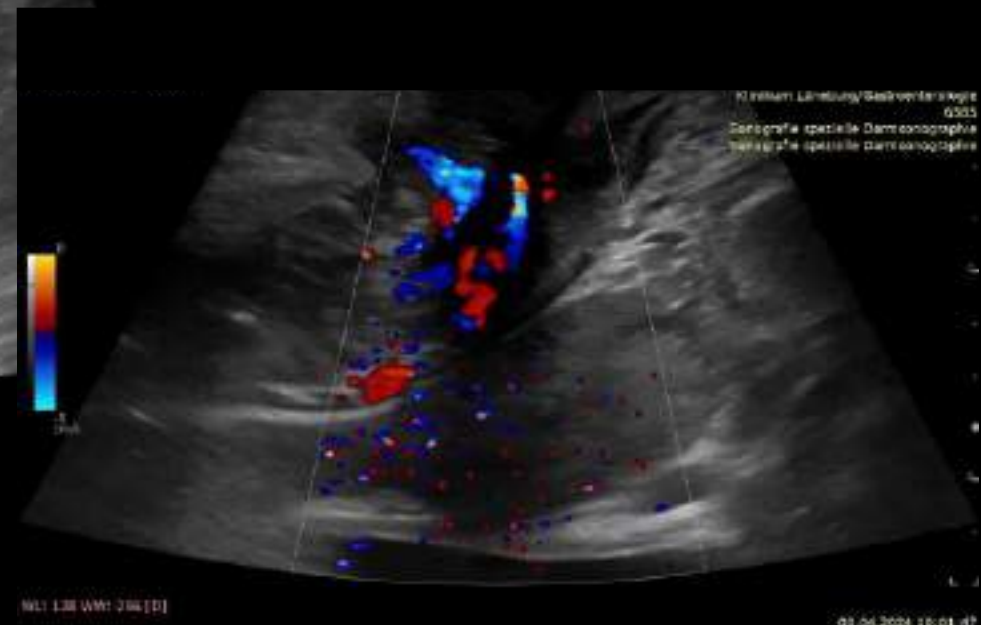
Most relevant TPUS parameters: BWT, vascularisation

# Tobias 19 years old: severe UC, E3 since 1-2024, steroid-refractory





# Tobias 19 years old: severe UC, E3 since 1-2024, steroid-refractory

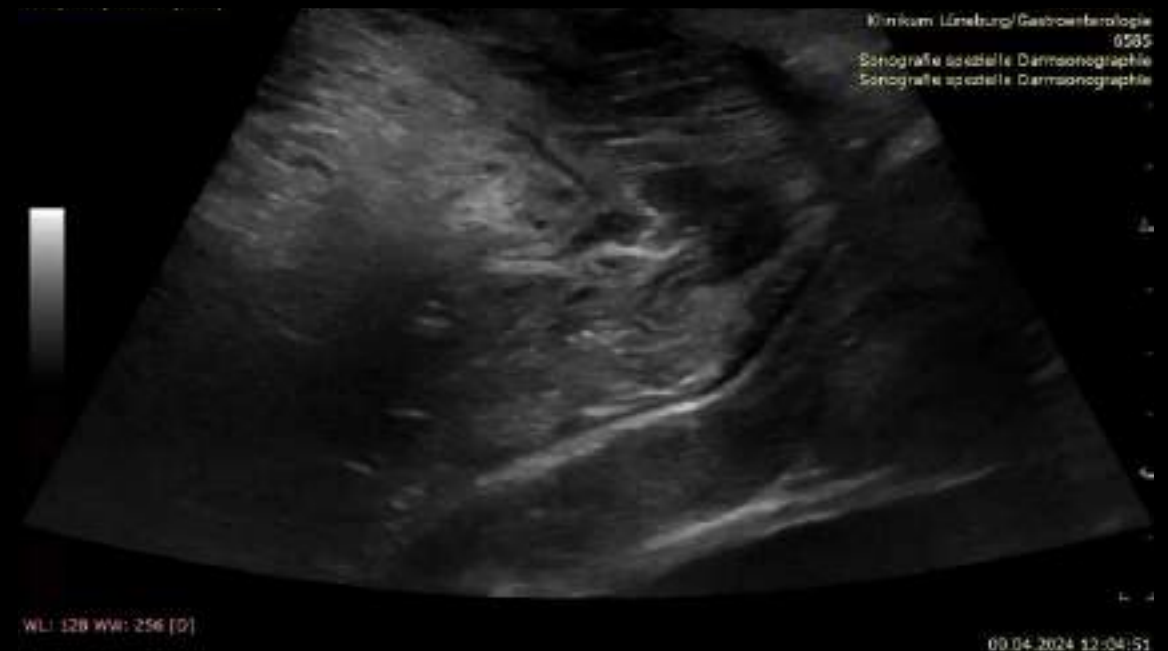


**BWT 8.7 mm, CDS Score: 3**

**Tobias 19 years old:  
severe UC, E3 since 1-2024, steroid-refractory  
6 days after induction with cyclosporine**

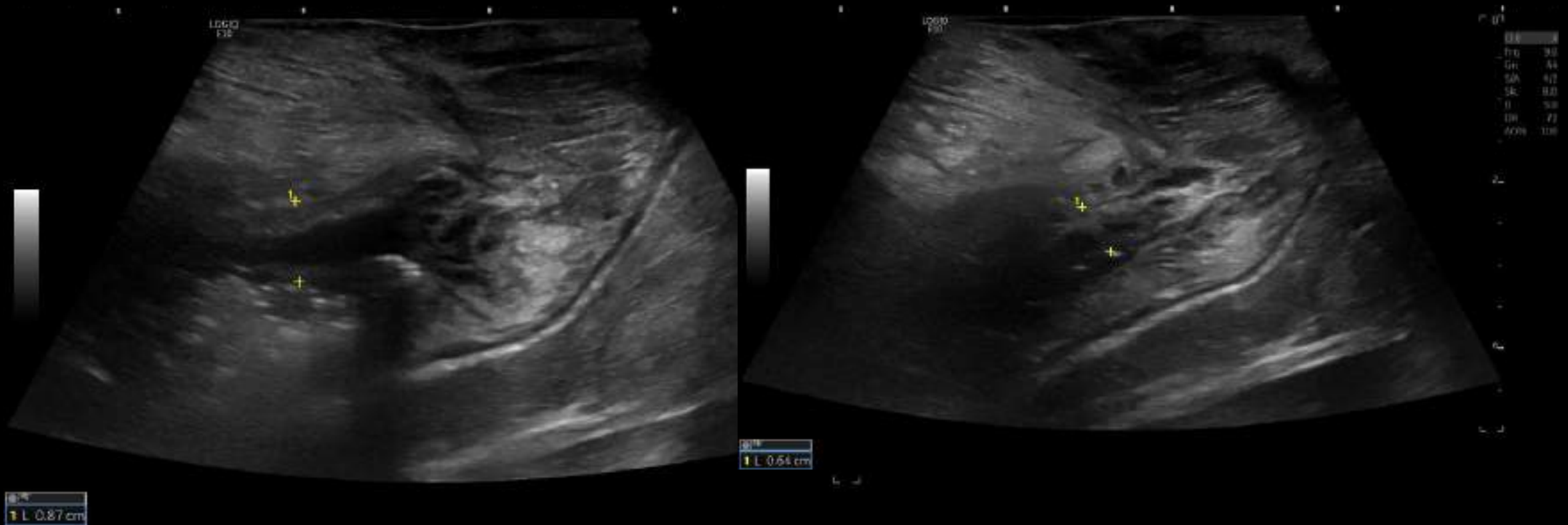


**BWT 8.7 mm, CDS Score: 3**



**6 days after induction with Cyclosporine i.v.  
BWT 6.4 mm, CDS Score: 2**

**Tobias 19 years old:  
severe UC, E3 since 1-2024, steroid-refractory  
6 days after induction with cyclosporine**



**BWT 8.7 mm, CDS Score: 3**

**6 days after induction with Cyclosporine i.v.  
BWT 6.4 mm, CDS Score: 2**



# Pouchitis after proctocolectomy with IPAA in UC

acute pouchitis ( $\leq 4$  weeks) **appr. 50%**



chronic pouchitis ( $> 4$  weeks) **10-20%**



antibiotic-sensitive



antibiotic-dependent



antibiotic-refractory



# Chronic antibiotic refractory pouchitis (CARP) - Differential diagnosis

## Differential diagnosis

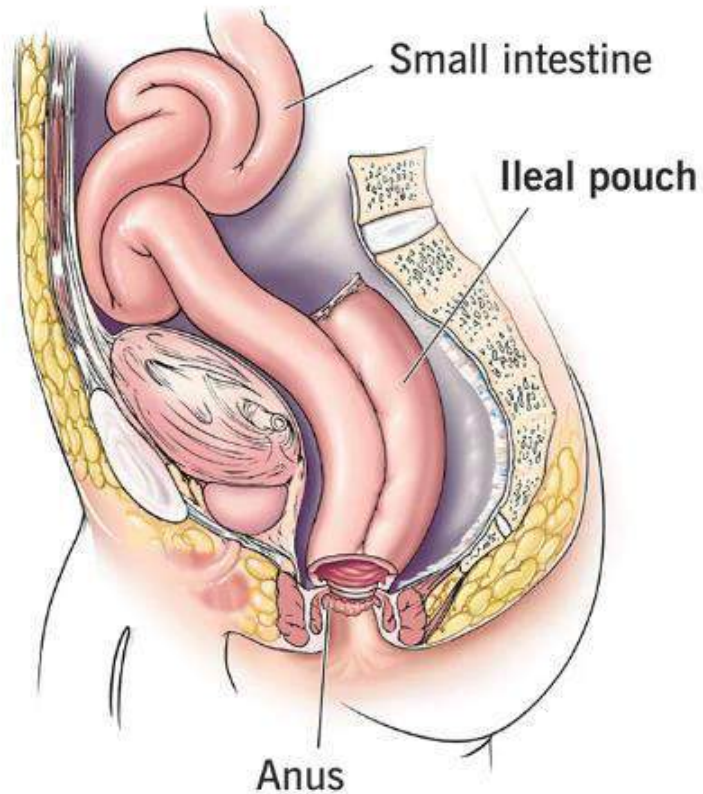
- ischemia
- mechanical/structural disturbance
- surgical complications
- Crohn's disease
- irritable pouch syndrome (IPS)
- neoplasia
- cuffitis

## Diagnostic procedures

- pouchoscopy
- MRI
- TRUS
- **TPUS?**



# TPUS in patients with IPAA - anatomy

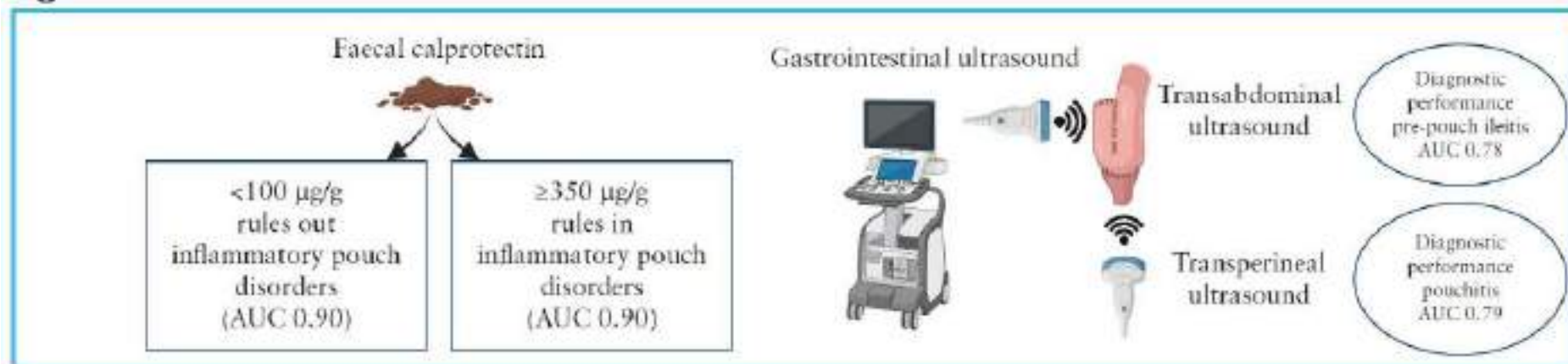




# TPUS to determine pouch disorders in UC

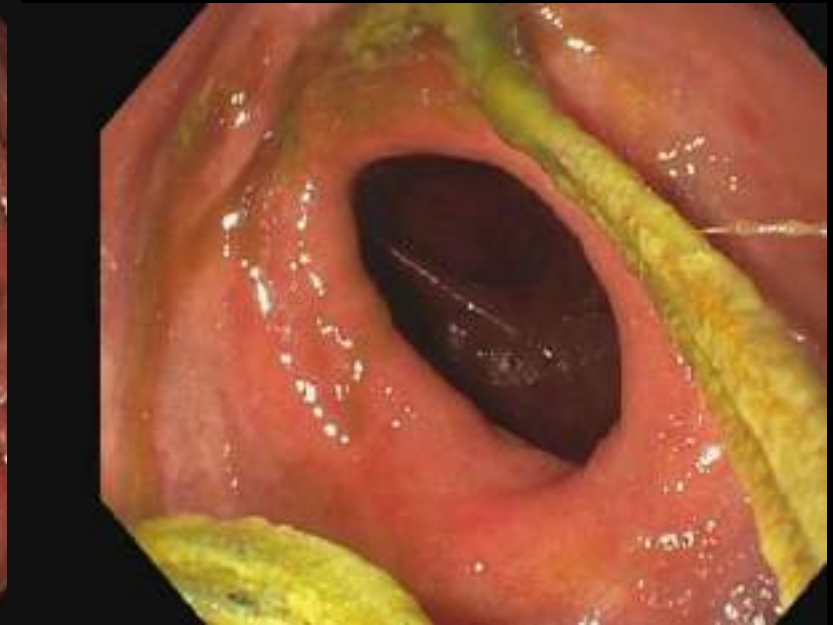
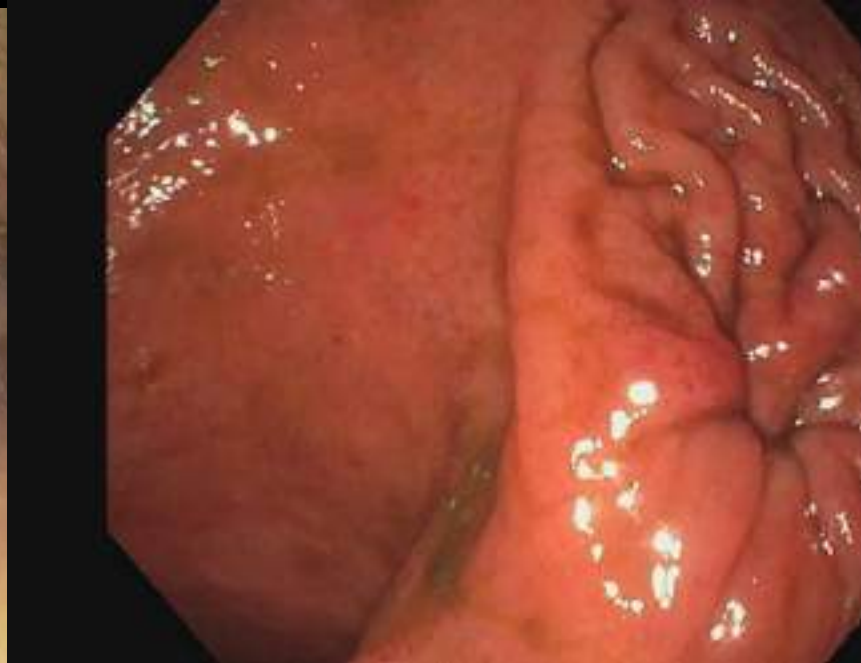


Cut-off BWT (pouch wall) < 3 mm: 88% sensitivity to rule out pouchitis  
Cut-off BWT (pouch wall) > 4 mm: 87% specificity to diagnose pouchitis



## TPUS for pouchitis and extramural complications

**Nicole, 28y; Crohn's Colitis since 2008  
proctocolectomy 2017 due to refractory disease, developed perianal disease,  
seton placement, currently: perianal pain and discharge**



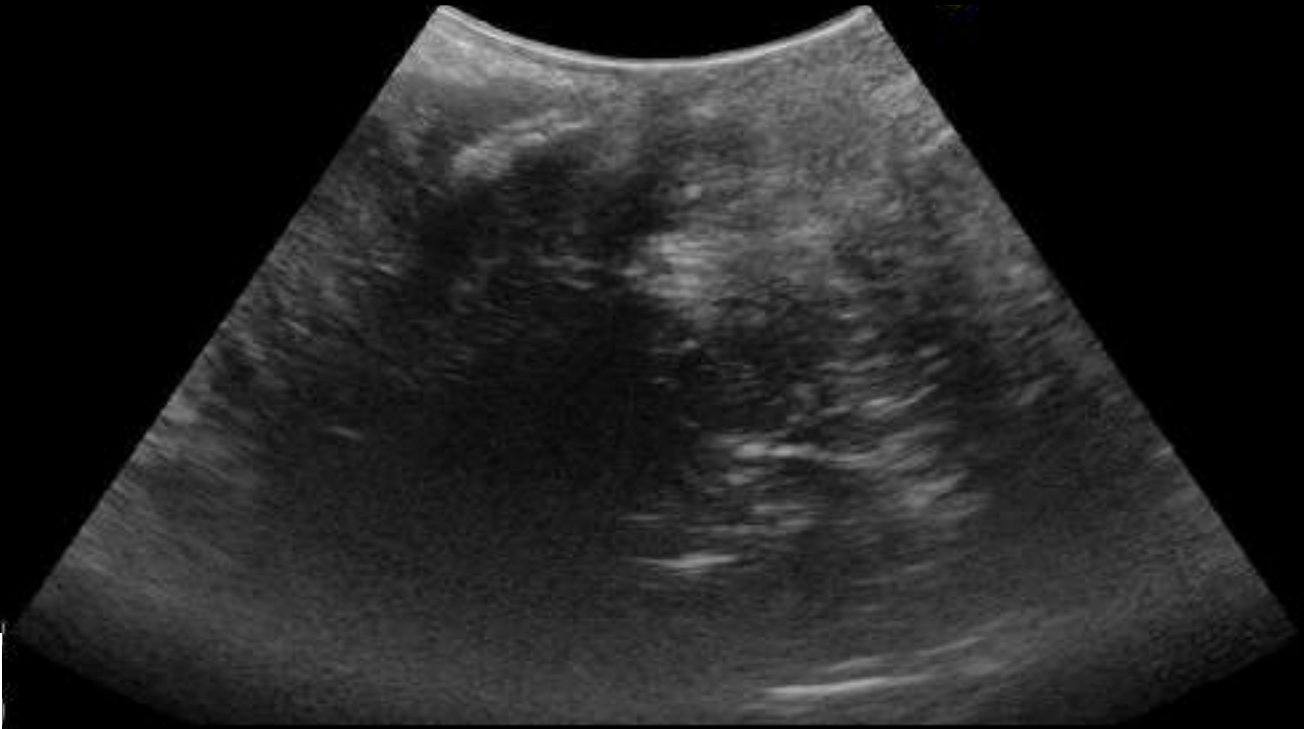


**Nicole, 28y**  
**Crohn's Colitis since 2008**  
**proctocolectomy 2017 due to refractory disease**





**Nicole, 28y**  
**Crohn's Colitis since 2008**  
**proctocolectomy 2017 due to refractory disease**



**Nicole, 28y**  
**Crohn's Colitis since 2008**  
**proctocolectomy 2017 due to refractory disease**



TPUS diagnosis: Complex fistula, only partially drained. No pouchitis.  
Additional seton placement required

**Katrin, 33y** Crohn's Colitis since 2008  
proctocolectomy with IPAA 2019 due to lateral spreading  
adenoma with HIEN in the distal rectum



Insufficiency of the ileoanal anastomosis,  
endo vac treatment with closure of the  
anastomotic insufficiency 2019. Since 2  
months recurrent moderate perianal  
discomfort



**Jörg 53y**

UC (E3) since 2019

proctocolectomy 2020 for refractory ASUC

stool frequency: 5-7, no cramps



FR:19  
C532

BG:14 DR:70  
T:9-4MHz HdTHI-R



fCalpro: 43 mg/kg  
PDAI: 3



**Jörg 53y**

UC (E3) since 2019

proctocolectomy 2020 for refractory ASUC

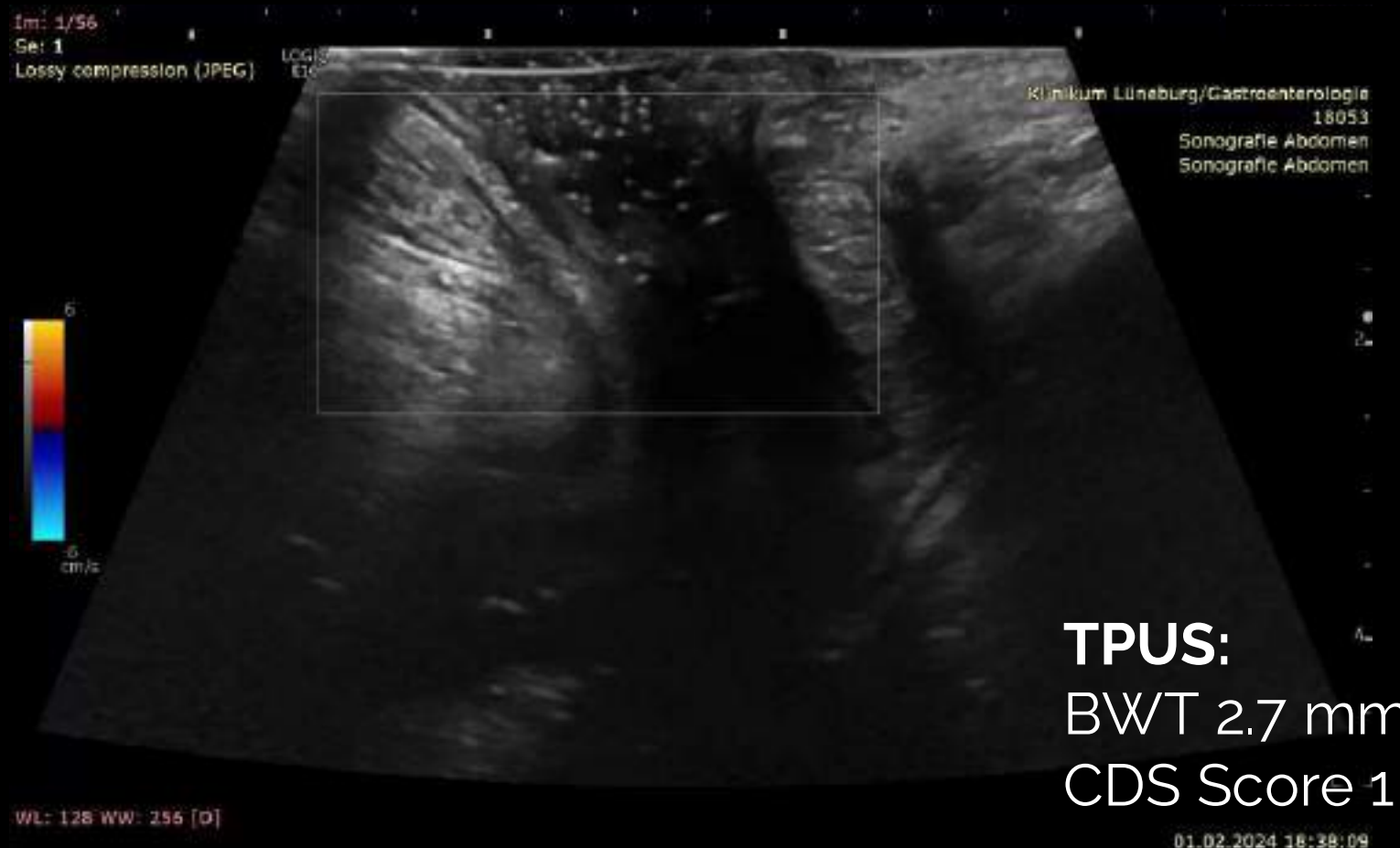


fCalpro: 43 mg/kg  
PDAI: 3

**Jörg 53y**

UC (E3) since 2019

proctocolectomy 2020 for refractory ASUC



fCalpro: 43 mg/kg  
PDAI: 3

**TPUS:**  
BWT 2.7 mm  
CDS Score 1

## Björn 41y

UC (E3) since 2007

proctocolectomy 2017 for refractory UC

15-20 bowel movements, urgency for > 2 months

no treatment



FR:17 BG:6 DR:70  
C532 T:9-4MHz HdTHI-R

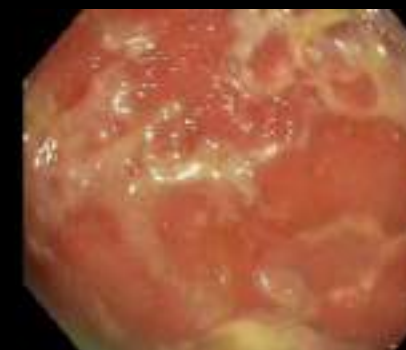
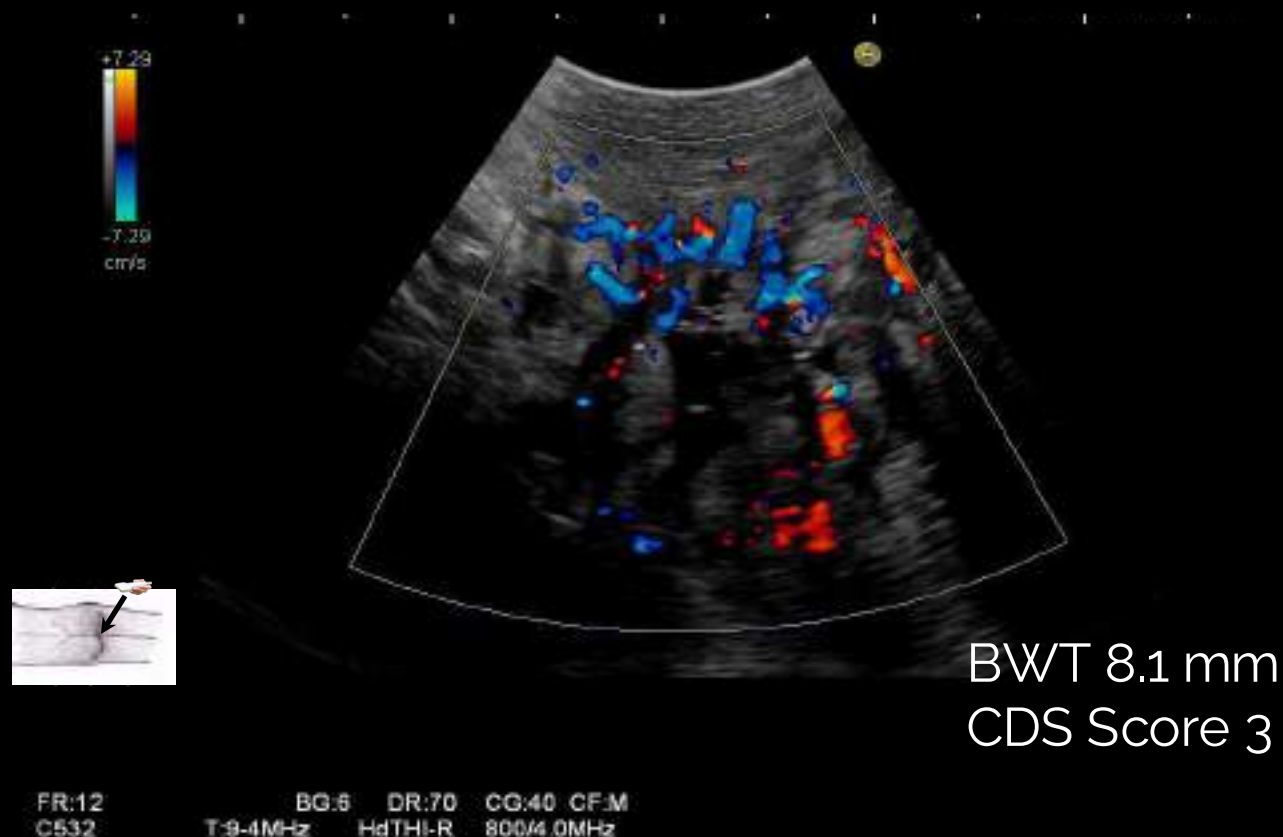
## Björn 41y

UC (E3) since 2007

proctocolectomy 2017 for refractory UC

15-20 bowel movements, urgency for > 2 months

no treatment



fCalpro: 480 mg/kg  
PDAI: 13

TPUS diagnosis: severe chronic pouchitis



# TPUS for pouch disorders

- Transperineal US (TPUS) is useful to assess the pouch (diagnosis and follow up of acute/chronic pouchitis) and the surrounding tissue (abscess, anastomotic insufficiency, fistula)
- Pouch disorders and in particular extramural complications can be determined and monitored by TPUS
- More studies and more expertise required!

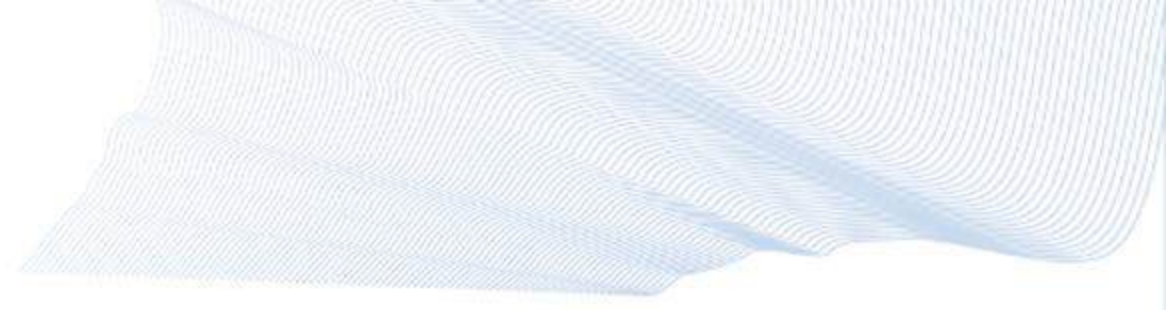


## Perineal Ultrasound When to use?

- CD and UC with perianal pain
- Suspected perianal abscess
- Suspected perianal fistula
- Perianal skin lesion in IBD patients
- UC flare (diagnosis and monitoring)
- Suspected pouch complication after IPAA



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**Thank you for your attention!**