

Discovery at Every Turn



Role of EUS in Peritoneal and Retroperitoneal Tuberculosis

Dr. Jimil Shah

MD, MRCP (UK), DM
FASGE, FISG

Associate Professor,
Dept of Gastroenterology
PGIMER, Chandigarh



DDW2026

Digestive Disease Week®

MAY 2-5, 2026 | CHICAGO, IL

EXHIBIT DATES: MAY 3-5, 2026

@DDWMeeting | #DDW2026

SPEAKER DISCLOSURE

Presenter	Dr. Jimil Shah
Session	ASGE–SGEI Joint Symposium • DDW 2026 • Chicago, IL
Topic	Role of EUS in Peritoneal and Retroperitoneal Tuberculosis

I have no relevant financial relationships to disclose with any commercial entity related to the content of this presentation.

All product / device images are used for educational purposes only — no endorsement is implied.

INTRODUCTION

01

Retroperitoneal lymph nodes

02

Peritoneal & omental disease

03

Pancreatic & visceral TB

04

Limitations & Conclusion

ABDOMINAL TB — THE DIAGNOSTIC PROBLEM

~10%

of extrapulmonary TB is abdominal

*EUS turns a diagnostic dilemma
into a tissue diagnosis*

20-30%

sensitivity of AFB / culture

Great mimicker

Lymphoma, peritoneal carcinomatosis, Crohn's, fungal — all overlap clinically and radiologically.

Bacteriology elusive

Ascitic-fluid AFB / culture are insensitive (<30%) and slow.

? Empirical ATT

Hepatotoxicity, delayed correct diagnosis, drug-resistance from partial treatment.

Histology: Definitive Diagnosis

Minimally-invasive tissue access becomes the clinical question.

TYPES OF ABDOMINAL TB

Esophageal

Secondary to mediastinal LN

Gastric

Rare; submucosal

Pancreatic / Visceral

Mimics malignancy

Peritoneal

Wet • dry • fibrotic

Retroperitoneal LN

Coalescent, caseating

Hepatosplenic & biliary

Miliary or focal

@DDWMeeting | #DDW2026

Sharma V, JIACM 2017

 **DDW2026**
Digestive Disease Week®
MAY 2-5, 2026 | CHICAGO, IL
EXHIBIT DATES: MAY 3-5, 2026

01

Retroperitoneal lymph nodes



DDW2026
Digestive Disease Week®

MAY 2-5, 2026 | CHICAGO, IL

EXHIBIT DATES: MAY 3-5, 2026

@DDWMeeting | #DDW2026

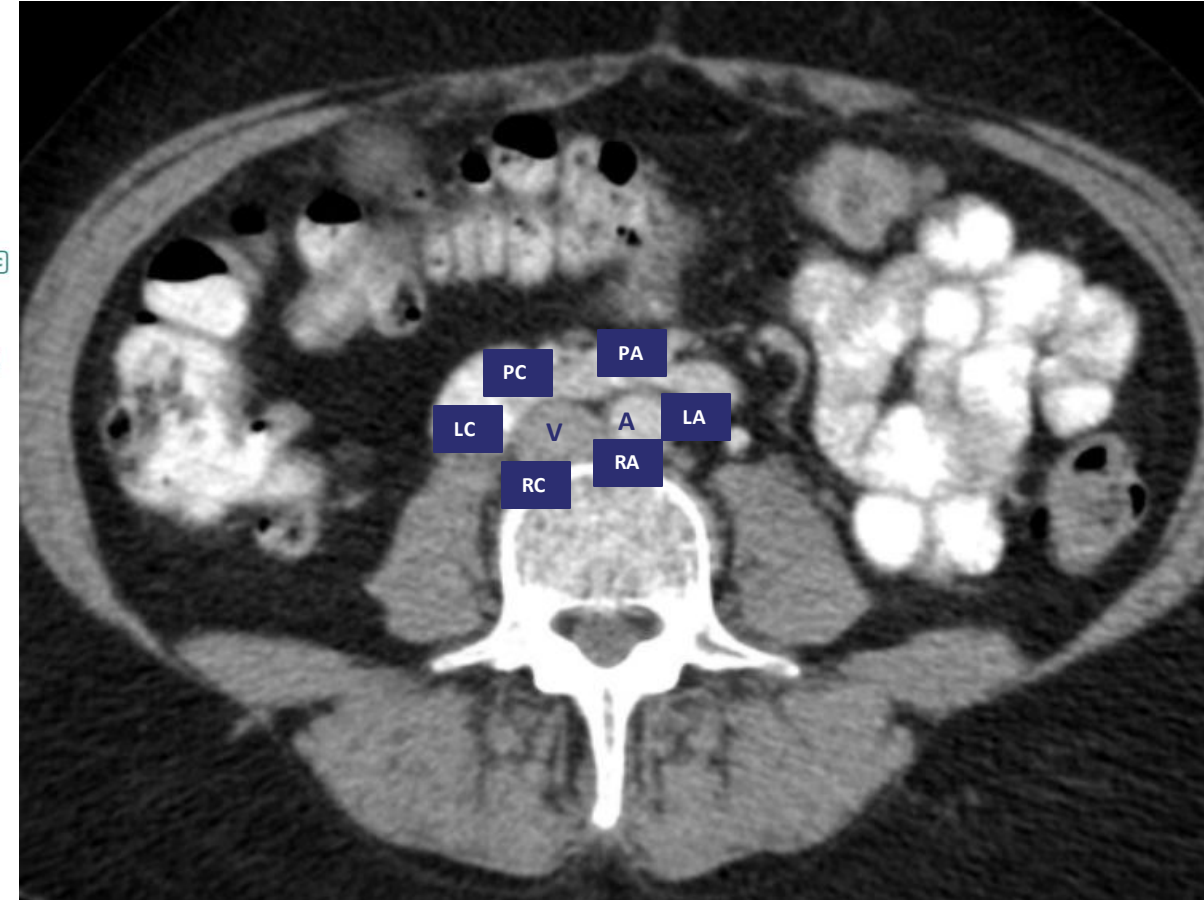
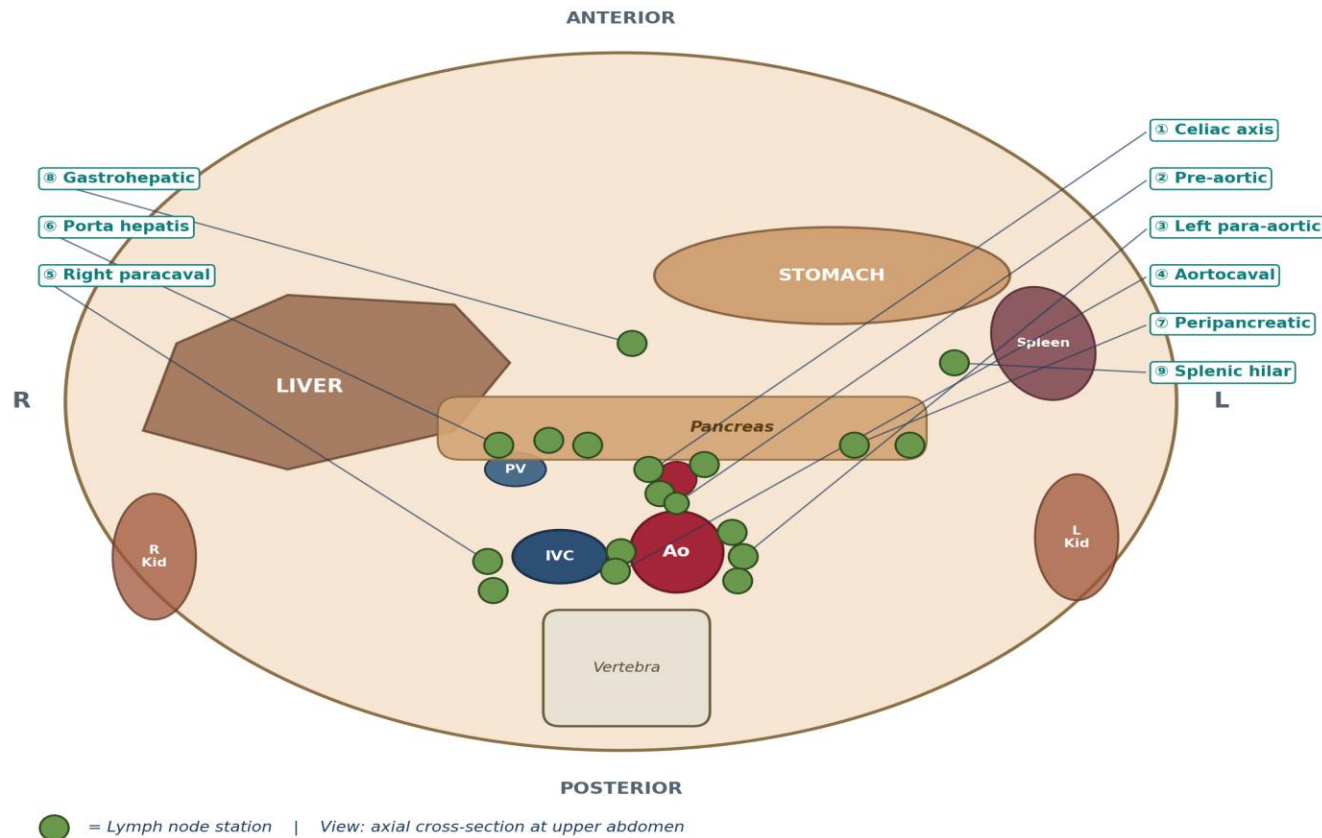
RETROPERITONEAL LYMPHADENOPATHY

- Retroperitoneal LNs:
 - Most common type of presentation of abdominal TB
 - Isolated or along with luminal, visceral or peritoneal involvement
 - Commonly involved LN stations: Celiac, peri-pancreatic, peri-portal, para-aortic, aorto-caval nodes etc.
- Role of EUS
 - Provides an excellent acoustic window for deep upper abdominal nodal stations
 - Enables detection of
 - Smaller LNs
 - Necrosis/conglomeration of LNs
 - Adjacent organ involvement
 - Allows real time tissue acquisition for cytology, Gene X-pert and culture

RETROPERITONEAL LN STATIONS

Techniques of imaging of nodal stations of gastric cancer by endoscopic ultrasound

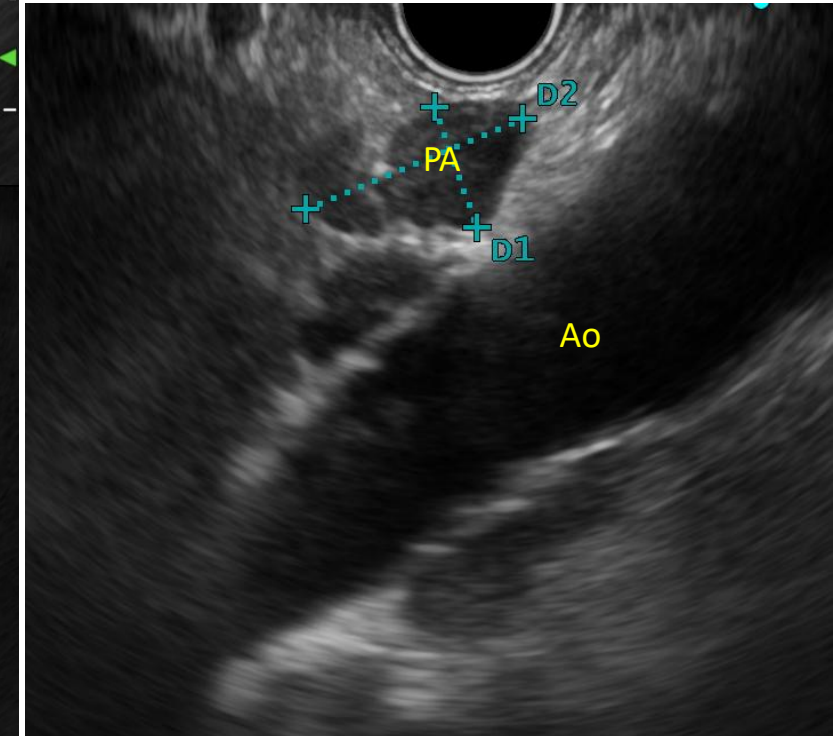
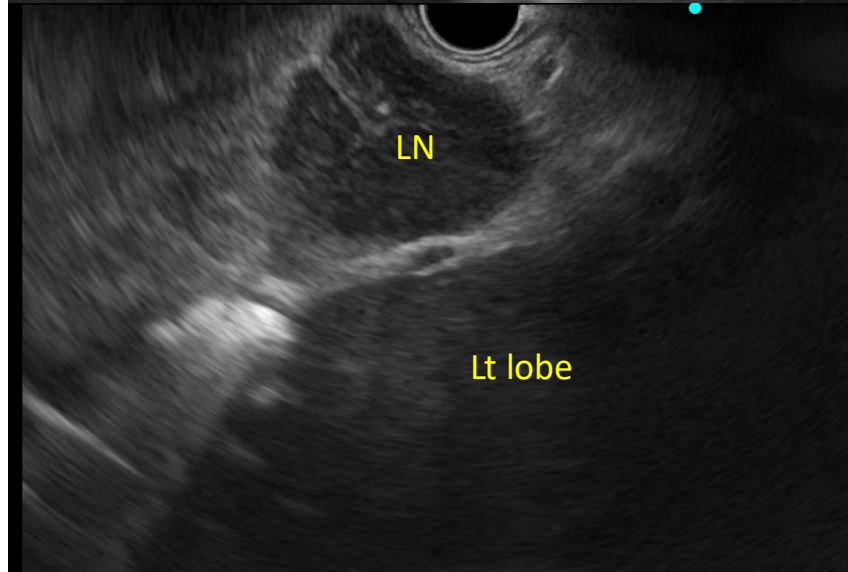
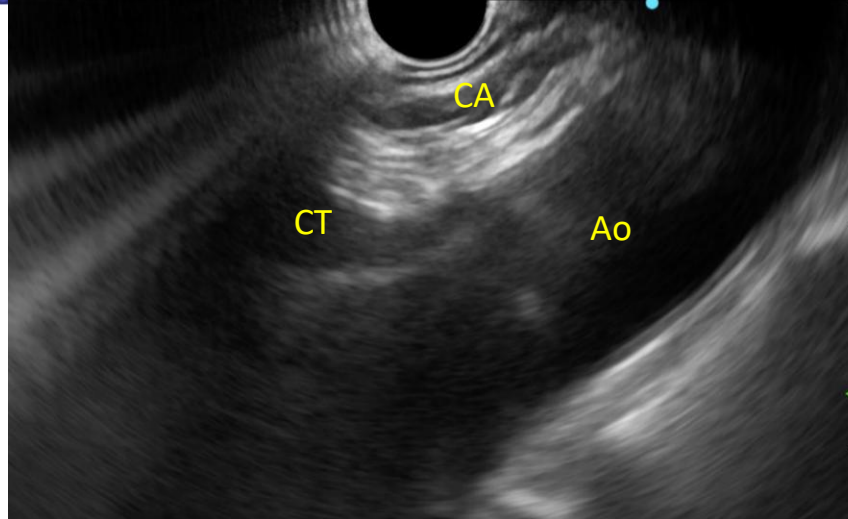
Malay Sharma, Praveer Rai¹, Chittapuram Srinivasan Rameshbabu²



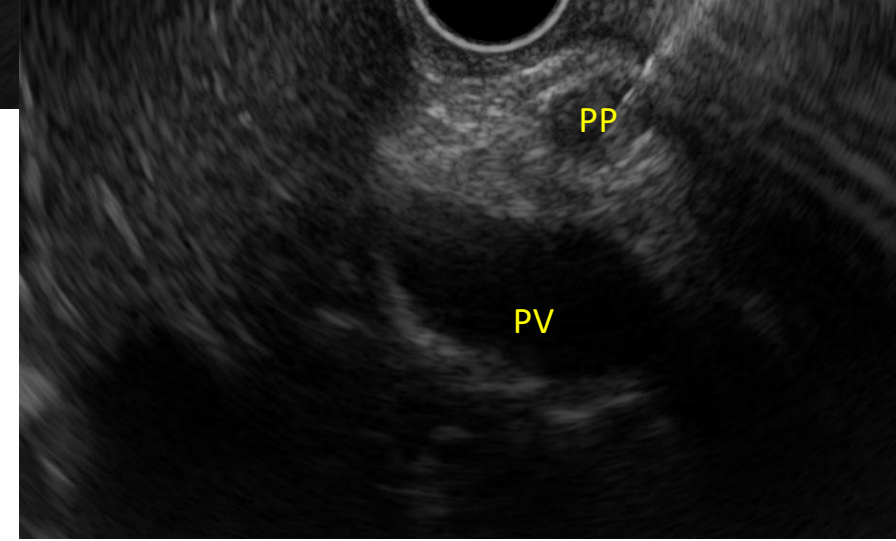
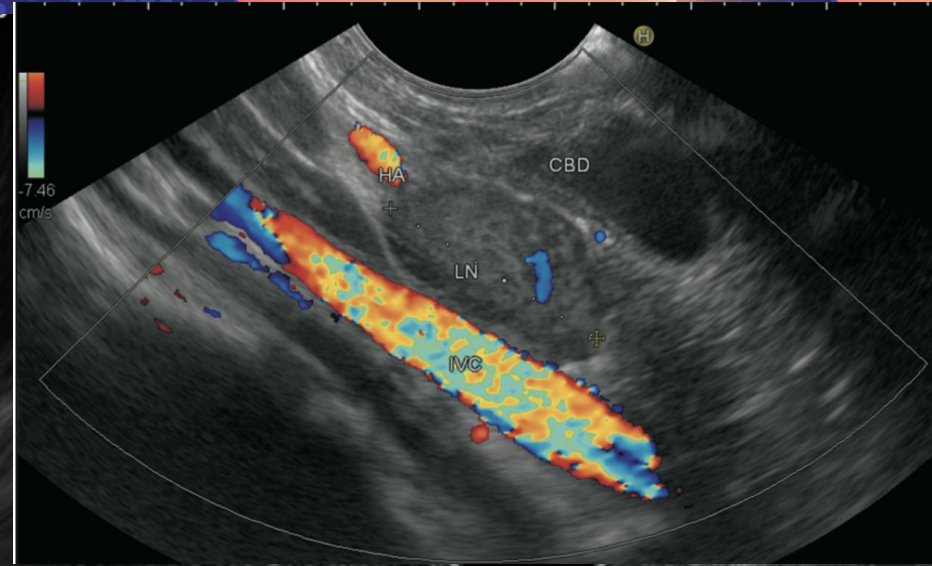
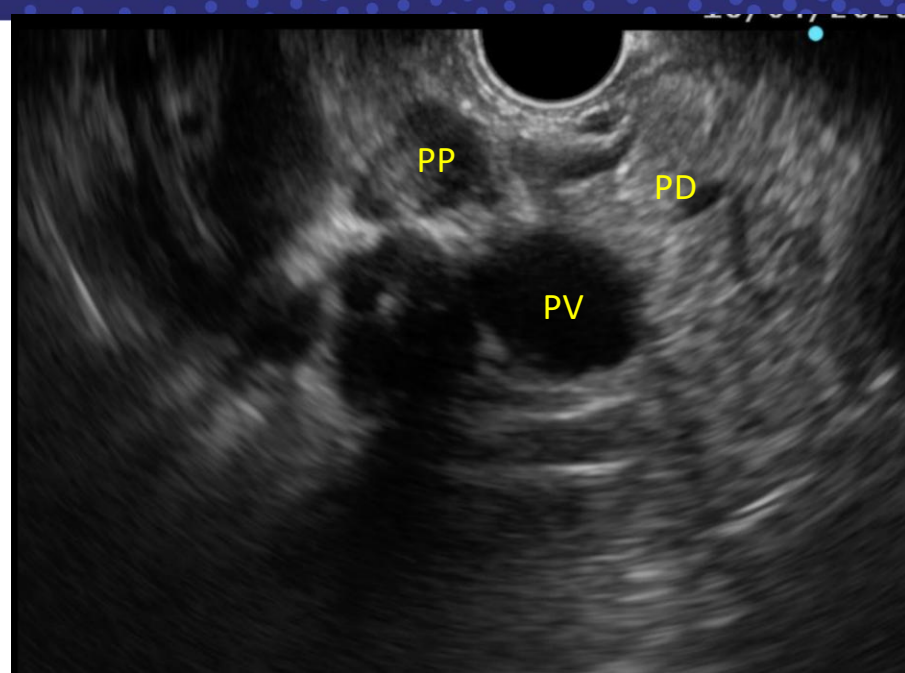
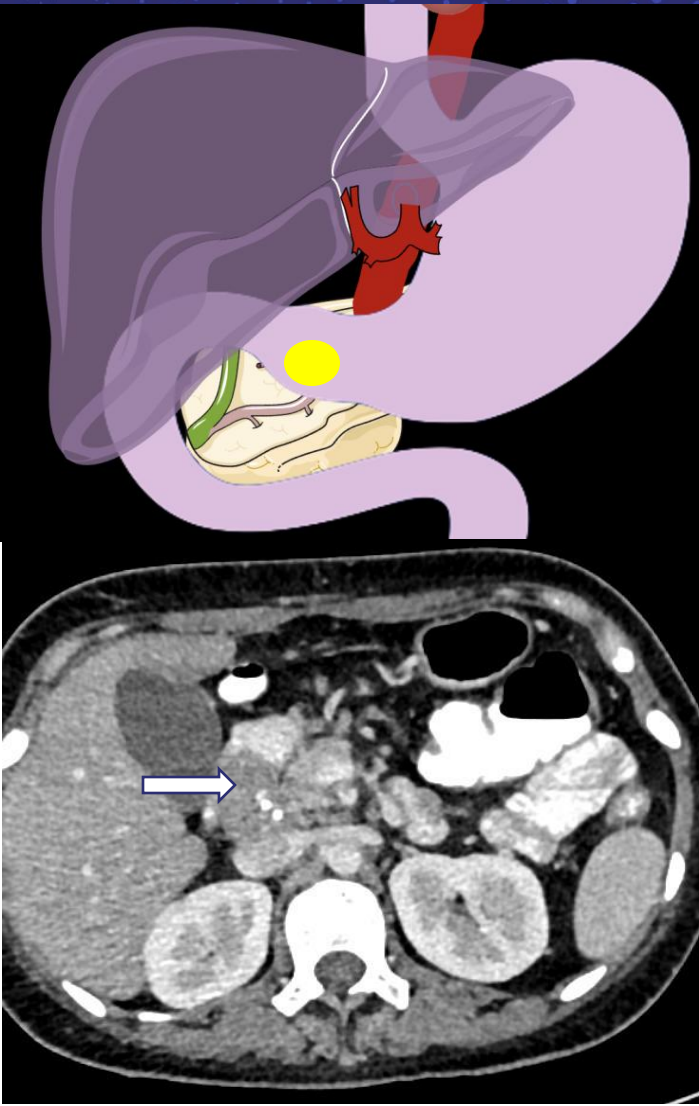
@DDWMeeting | #DDW2026

MAY 2-5, 2026 | CHICAGO, IL
EXHIBIT DATES: MAY 3-5, 2026

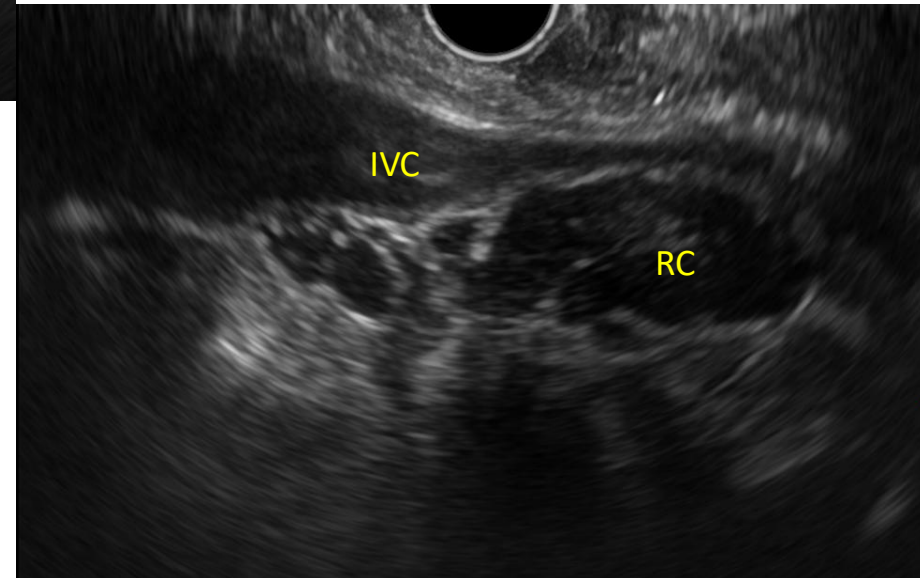
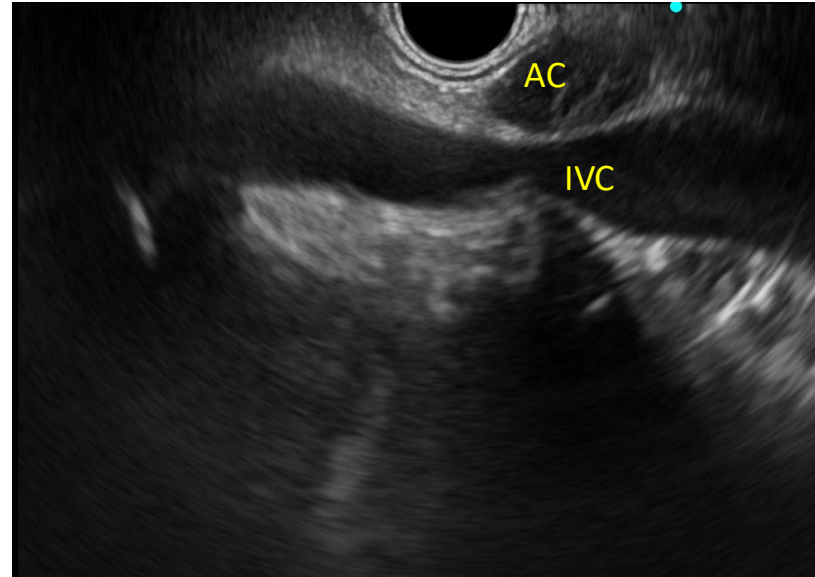
EUS EXAMINATION — FROM THE CARDIA



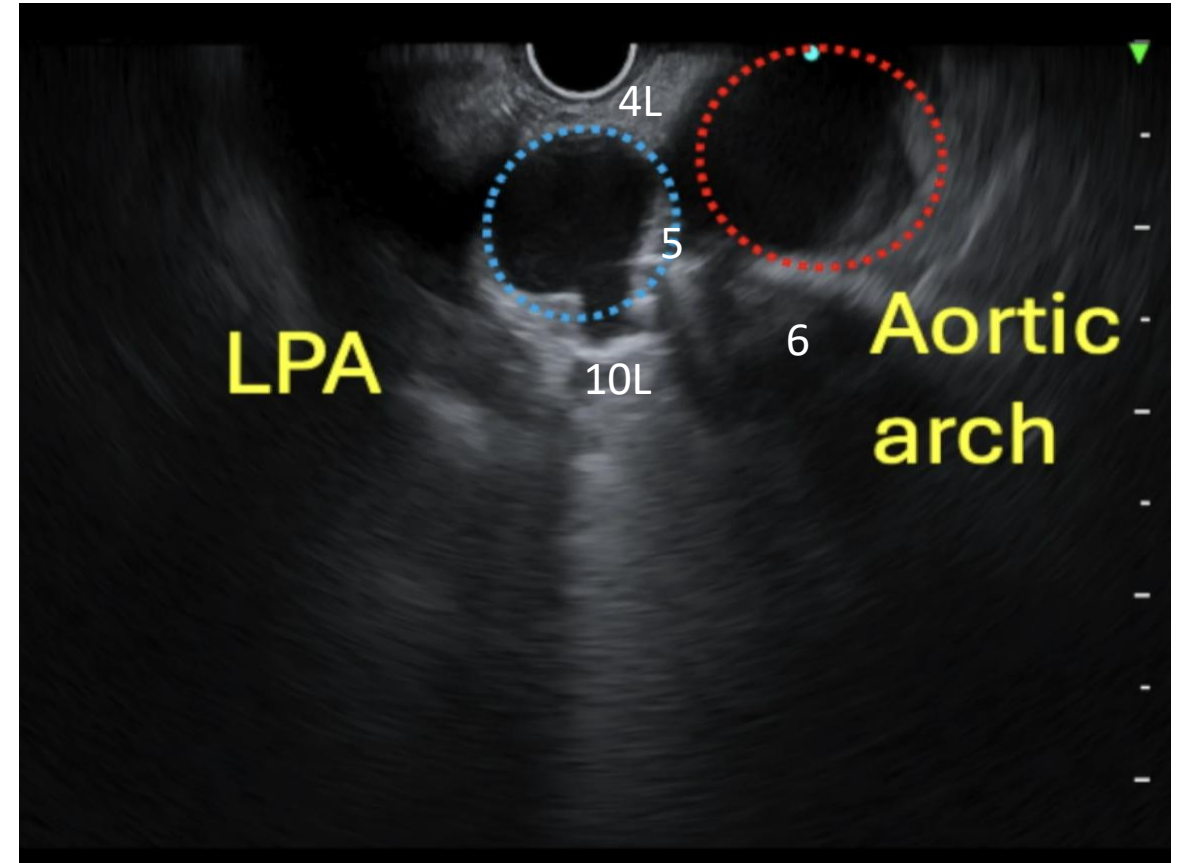
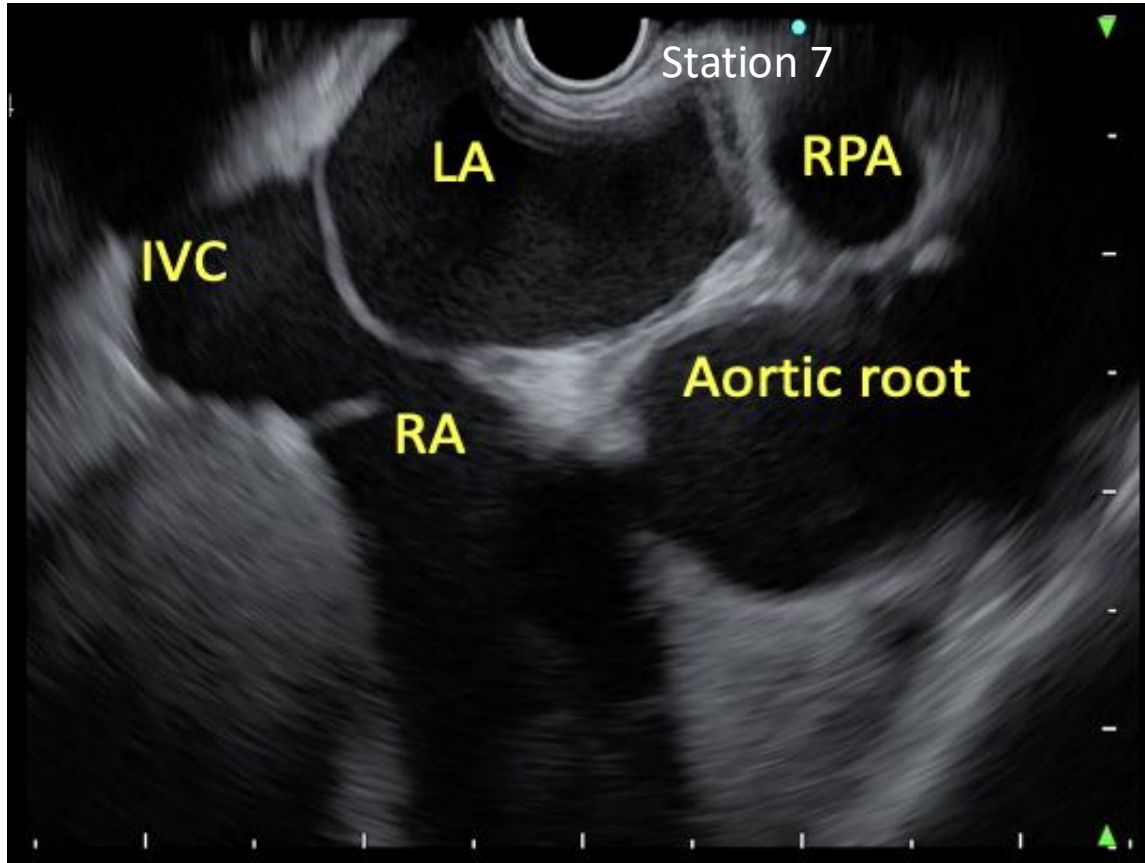
EUS EXAMINATION — FROM D1



EUS EXAMINATION — FROM D2



DON'T FORGET THE MEDIASTINAL LN



Stations 4L • 5 • 6 • 7 • 10L — quick sweep

@DDWMeeting | #DDW2026

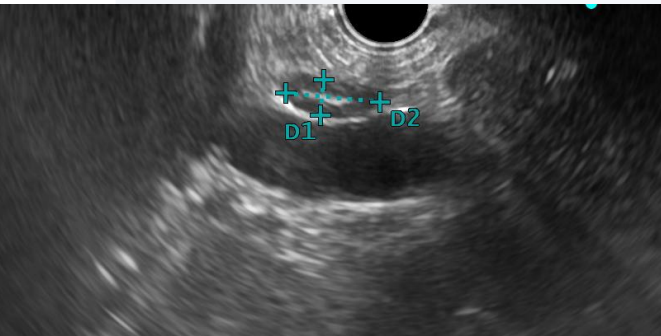
Sharma M, Lung India 2016

 Digestive Disease Week®
MAY 2-5, 2026 | CHICAGO, IL
EXHIBIT DATES: MAY 3-5, 2026

TB LYMPHADENITIS — B-MODE IMAGING

Both V, IJG 2016

✓ FAVOURING TB



nodes
of hilum
)
owing

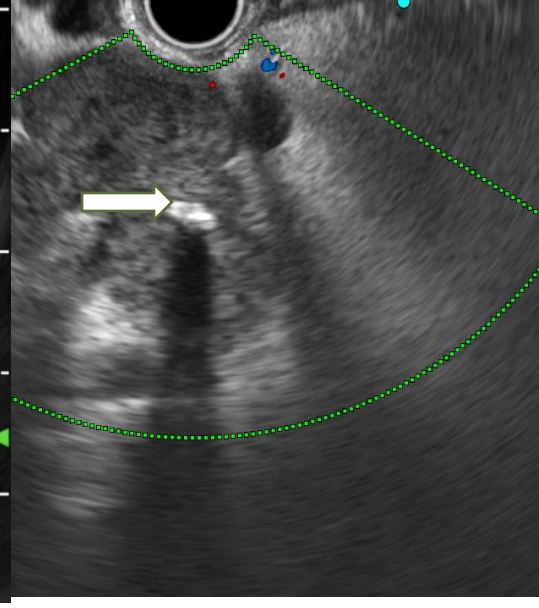
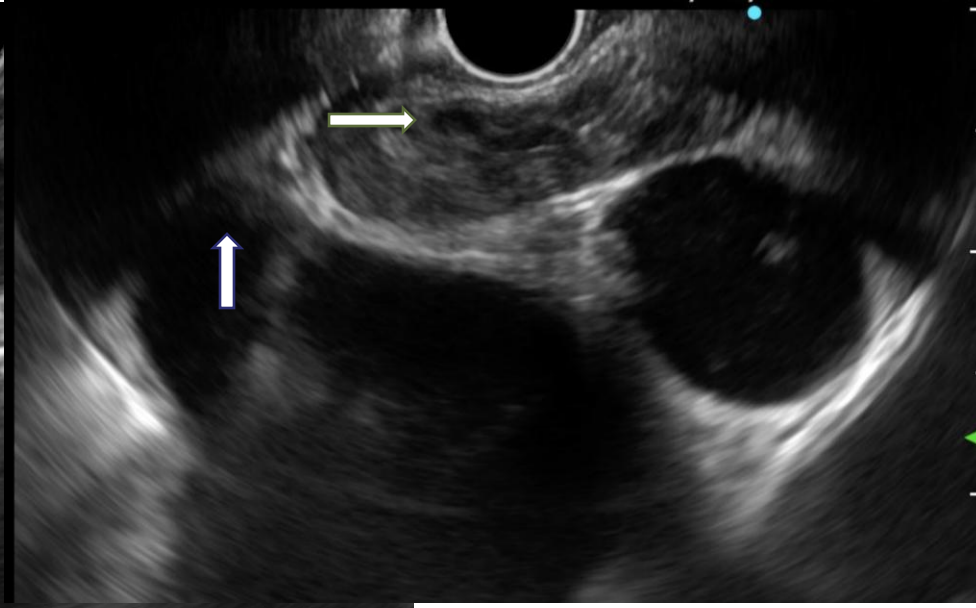
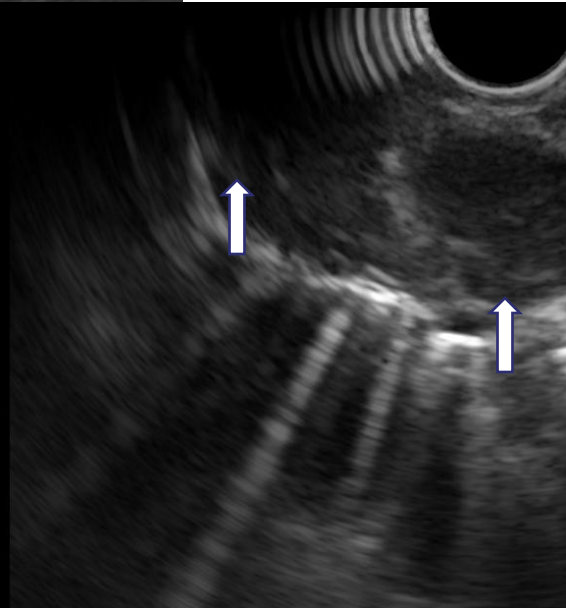
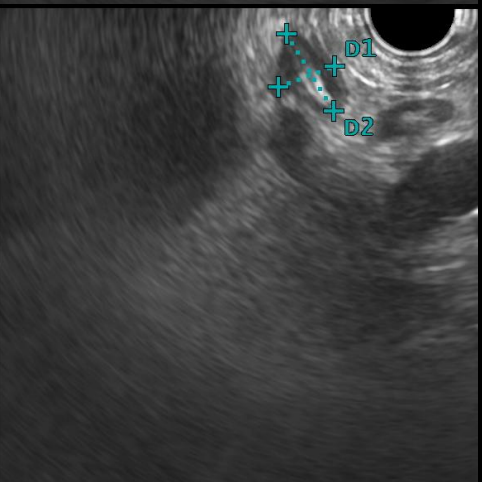
TB — matted & heterogeneous

⚠ OVERLAPPING DIFFERENTIALS

- Lymphoma — bulky, homogeneous, rarely calcified
- Metastasis — round, sharp, preserved capsule
- Sarcoidosis — identical morphology; needs context
- Histoplasmosis — indistinguishable; needs stains
- Reactive — oval, preserved hilum, no necrosis

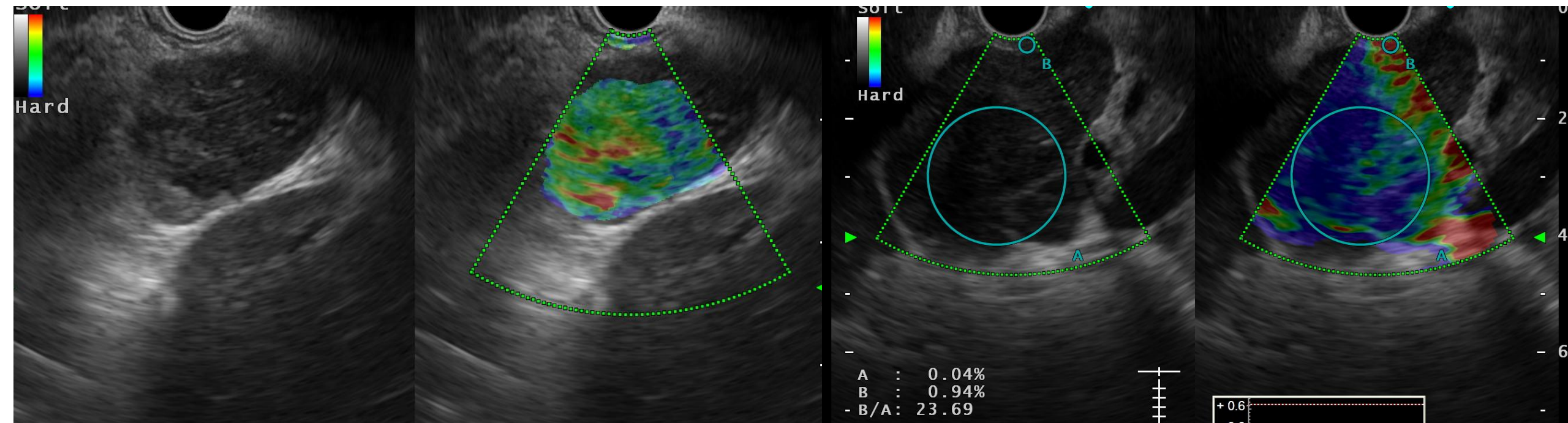
TB — central caseation

TB — calcification



BEYOND B-MODE — ELASTOGRAPHY

- TB tissue is heterogeneously soft-stiff; strain ratio 4-10
- Overlap with malignancy



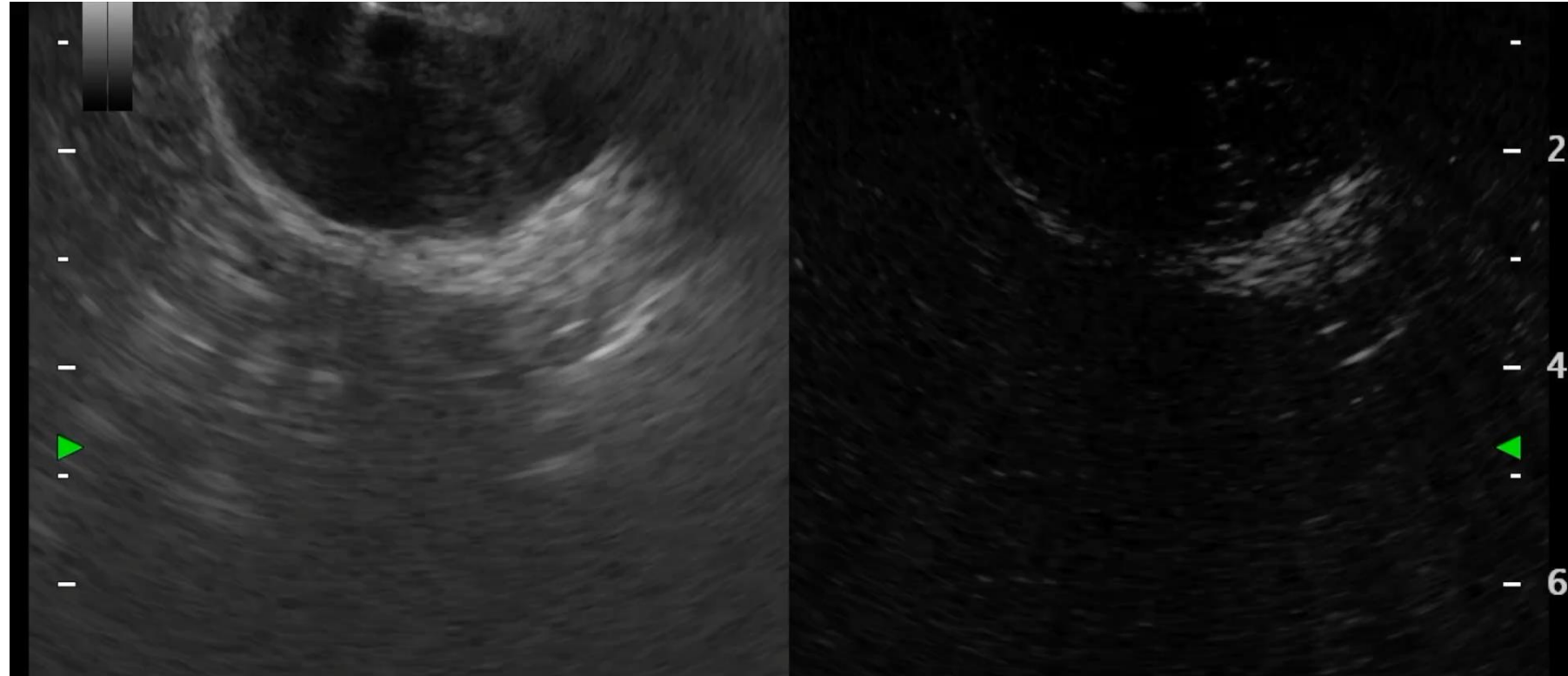
BEYOND B-MODE — CE-EUS

Contrast-enhanced endoscopic ultrasound features of tubercular lymphadenopathy

Surinder S Rana, MD, DM, AGAF, FASGE¹ , Nikhil Bush, MD, DM¹, Saurabh Dawra, MD, DM¹ , Ravi Sharma, MSc¹, Radhika Srinivasan, MD² and Rajesh Gupta, MS, MCh³

Pattern in TB Lymph-node?

- Heterogenous contrast enhancement
- Peripheral rim enhancement
- Central anechoic area



EUS-FNA / FNB — SAMPLING TECHNIQUE

Endoscopic Ultrasound Fine-Needle Aspiration versus Fine-Needle Biopsy for Lymph Node Diagnosis: A Large Multicenter Comparative Analysis

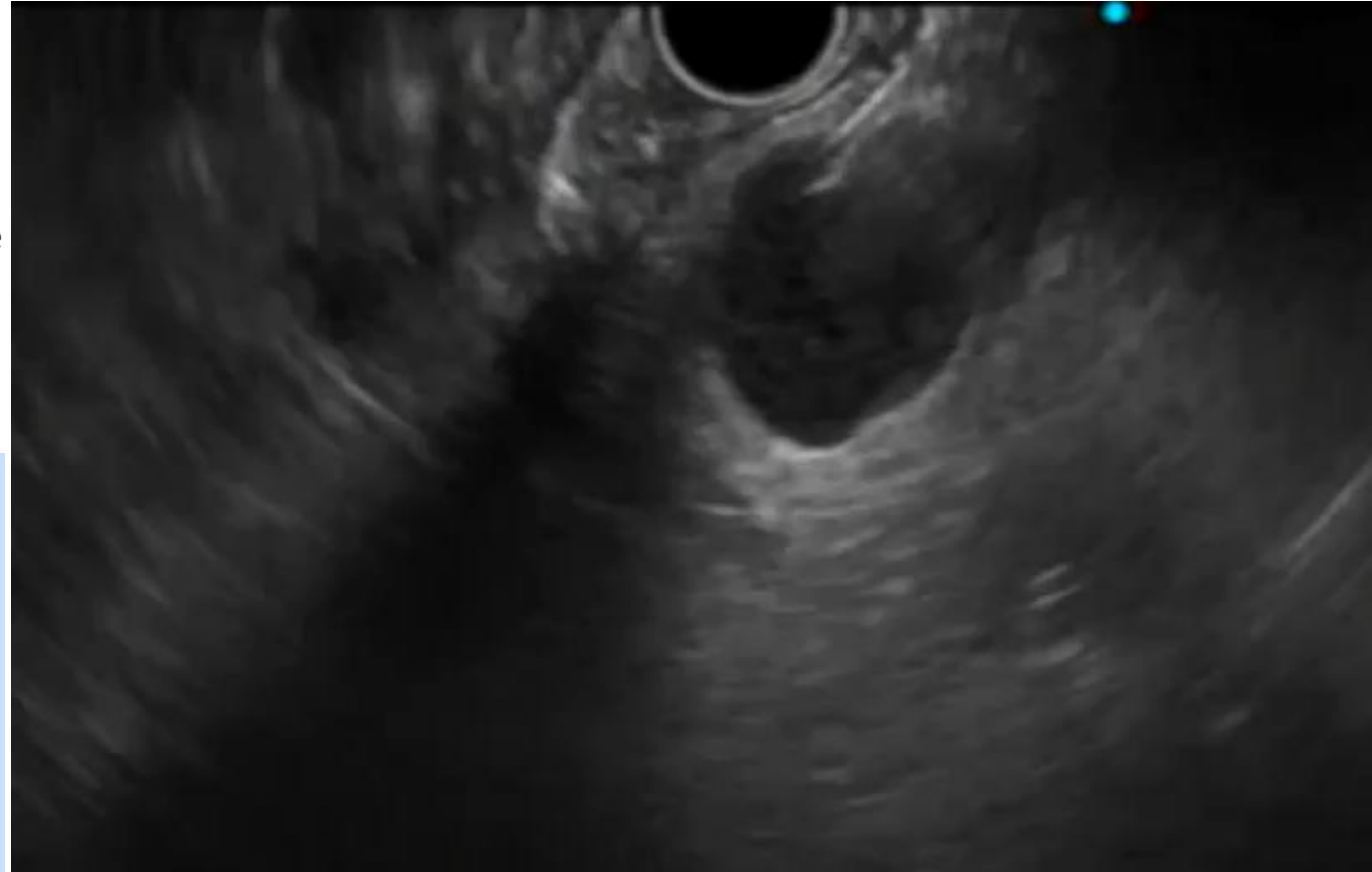
[Diogo Turiani Hourneaux de Moura](#)^{1,2,3}, [Thomas R McCarty](#)^{1,2}, [Pichamol Jirapinyo](#)^{1,2}, [Igor Braga Ribeiro](#)³,

Endoscopic Ultrasound Fine-Needle Biopsy versus Fine-Needle Aspiration for Tissue Sampling of Abdominal Lymph Nodes: A Propensity Score Matched Multicenter Comparative Study

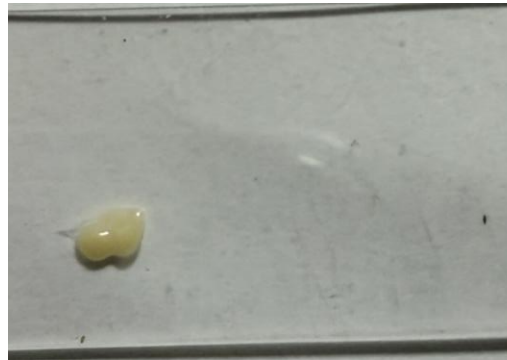
[Antonio Facciorusso](#)^{1,2}, [Stefano Francesco Crinò](#)², [Nicola Muscatiello](#)¹, [Paraskevas Gkolfakis](#)³,

FNA vs FNB?

- FNB:
 - Higher sample adequacy (96.1% vs 89.5%; p=0.06)
 - Higher diagnostic accuracy (87.6% vs 75.2%; p=0.02)
 - Higher sensitivity (81.1% vs 64.7%; p=0.03)
 - Lesser requirement of ROSE



NECROTIC MATERIAL & ASPIRATION OF PUS



Practical pearls

- Cheesy / pus-like aspirate— send 3 separate aliquots: cytology, cell-block, Gene-Xpert
- Avoid aggressive suction
- Aspirate the rim (viable cells) and centre (microbiology) separately if the node is large
- Thick pus: 19G might be useful

CYTOLOGY & ANCILLARY STAINING

CLASSIC CYTOLOGY

- **Epithelioid granulomas**
Aggregates of histiocytes — the diagnostic backbone
- **Langhans giant cells**
Multinucleated, peripheral horseshoe nuclei
- **Caseating necrosis**
Eosinophilic acellular debris — favours TB over sarcoidosis
- **Acid-fast bacilli (ZN)**
Yield 27–30% — paucibacillary disease
- **Lymphocyte-rich background**
Reactive lymphocytes around granulomas

ANCILLARY STAINS & TESTS

ZN

AFB — seen 27–30% in EUS-FNA aspirate

PAS / GMS

Exclude histoplasma — a key differential

CELL BLOCK

Architecture preserved; allows IHC on same sample

ICC

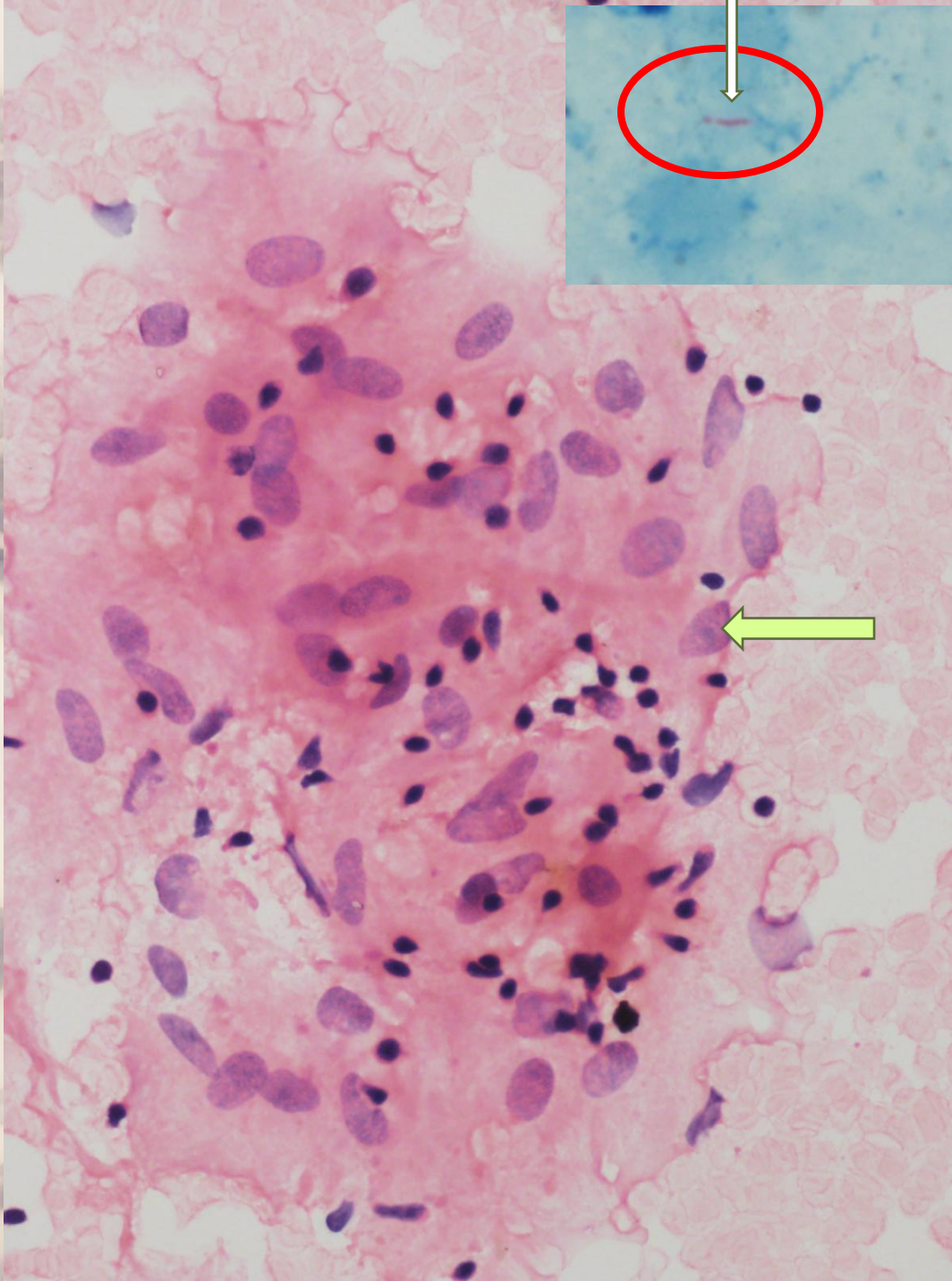
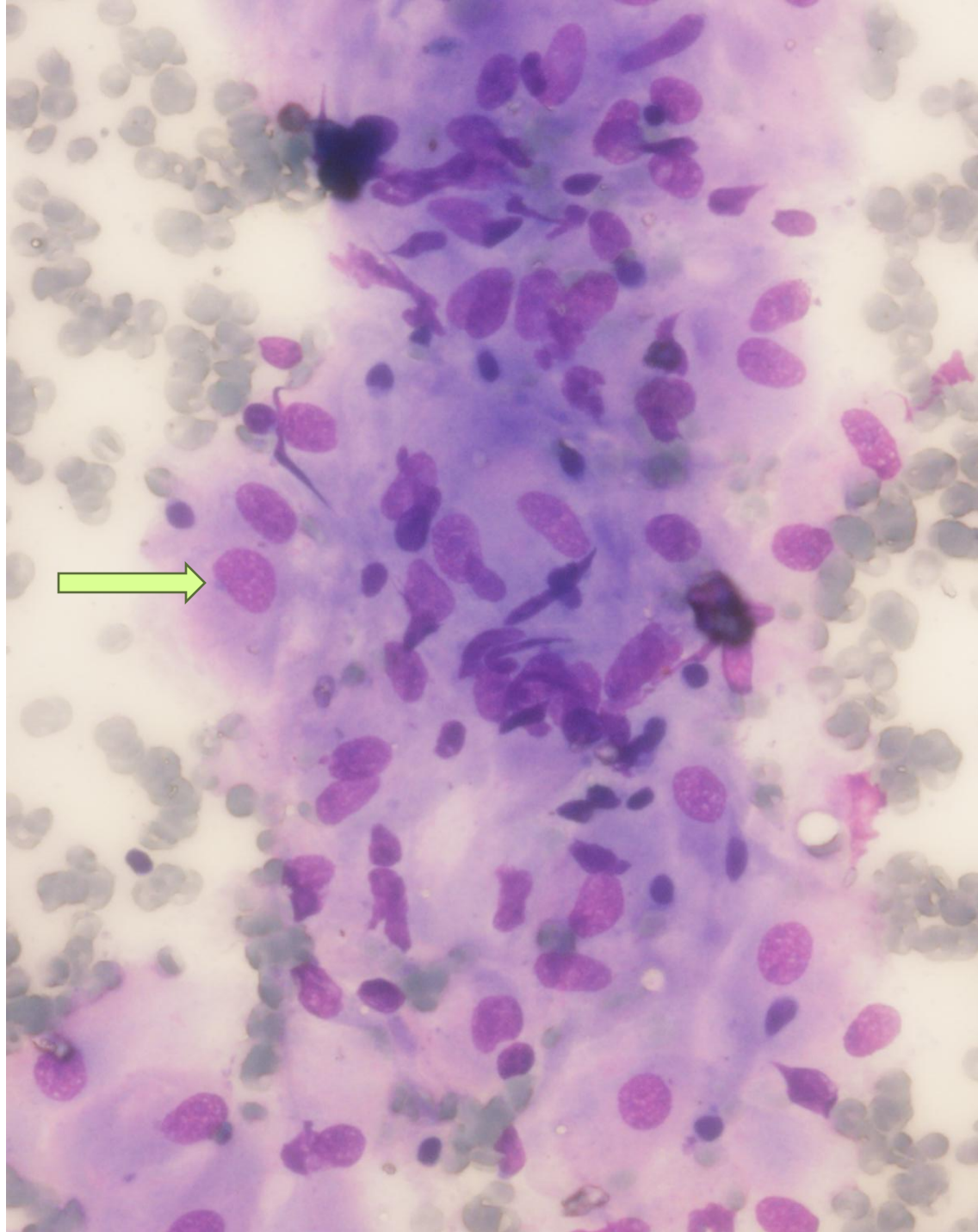
When DDx includes lymphoma / metastasis

ROSE

On-site evaluation → 90.6% adequacy

@DDWMeeting | #DDW2026

 **DDW2026**
Digestive Disease Week®
MAY 2-5, 2026 | CHICAGO, IL
EXHIBIT DATES: MAY 3-5, 2026



MICROBIOLOGICAL EVALUATION

MICROBIOLOGICAL TESTS IN ABDOMINAL / PERITONEAL TB

Diagnostic Test	Typical Sensitivity	Typical Specificity	Turnaround Time	Key Points / Use
 AFB Smear (Ziehl-Neelsen)	Low (10–30%)	High (>90%)	1–2 days	• Rapid and inexpensive • Low sensitivity in paucibacillary extrapulmonary TB • Positive result is highly specific
 MGIT Culture (Liquid culture)	Moderate (<50%)	~100%	1–3 weeks	• Gold standard for diagnosis • Highest specificity • Detects drug resistance (with additional testing) • Longer turnaround time
 GeneXpert MTB/RIF	Moderate–High (50–80%)	High (>95%)	<2 hours	• Detects MTB DNA and rifampicin resistance • High specificity and rapid • Useful for early diagnosis and treatment decisions
 PCR (Generic)	Moderate (40–70%)	High (90–100%)	1–2 days	• Detects MTB DNA • Good specificity • Sensitivity varies with assay and sample type • Useful adjunct to histology/cytology

02

Peritoneal & omental disease



DDW2026
Digestive Disease Week®

MAY 2-5, 2026 | CHICAGO, IL
EXHIBIT DATES: MAY 3-5, 2026

@DDWMeeting | #DDW2026

PERITONEAL TB — MORPHOLOGICAL PATTERNS

WET ASCITIC

~ 90% of cases

Sonographic features

Large-volume, high-protein ascites • ADA > 37 U/L • SAAG < 1.1

DRY (PLASTIC)

adhesions, matted loops

Sonographic features

Matted bowel loops • fibrous adhesions • peritoneal thickening • omental infiltration

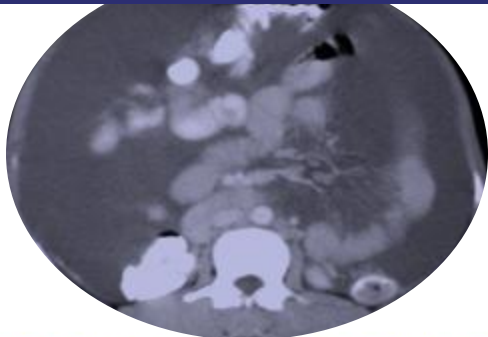
FIBROTIC FIXED

omental masses

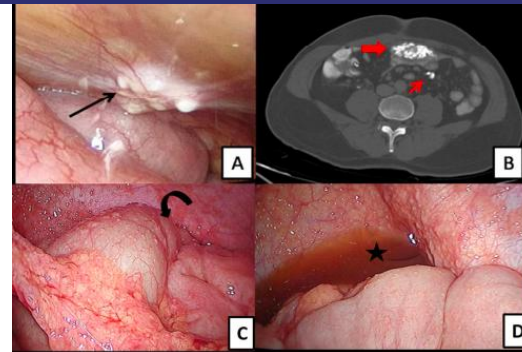
Sonographic features

Omental caking (mass-like) • loculated ascites • loops fixed to posterior wall

EUS: Minimal/loculated ascites, Omental thickening or peritoneal nodules with/without ascites



@DDWMeeting | #DDW2026

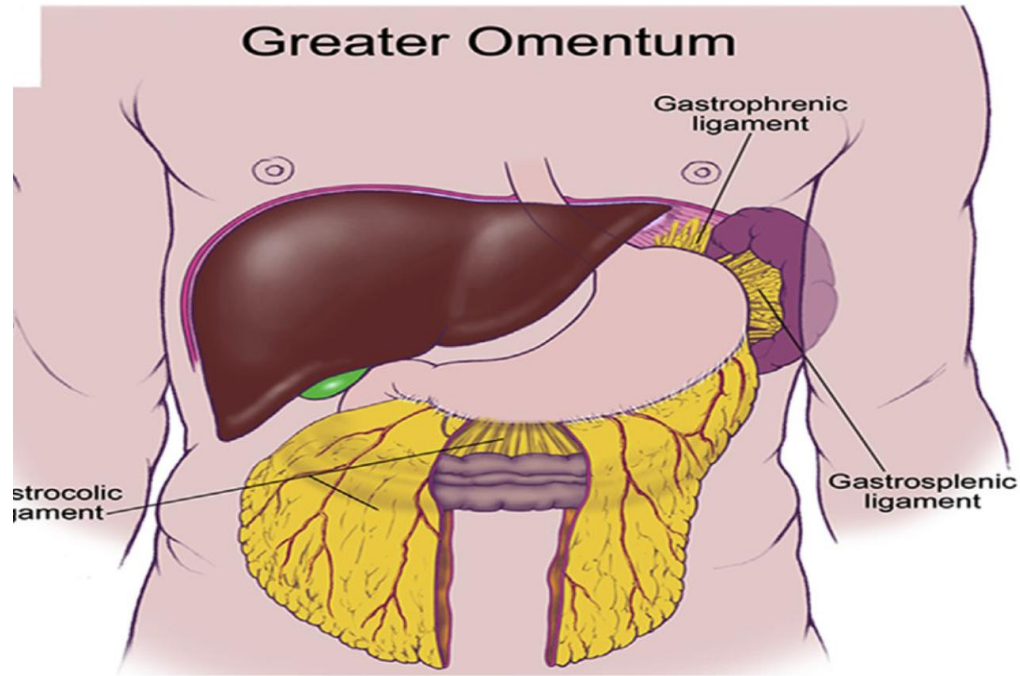


Jena A IJG 2023



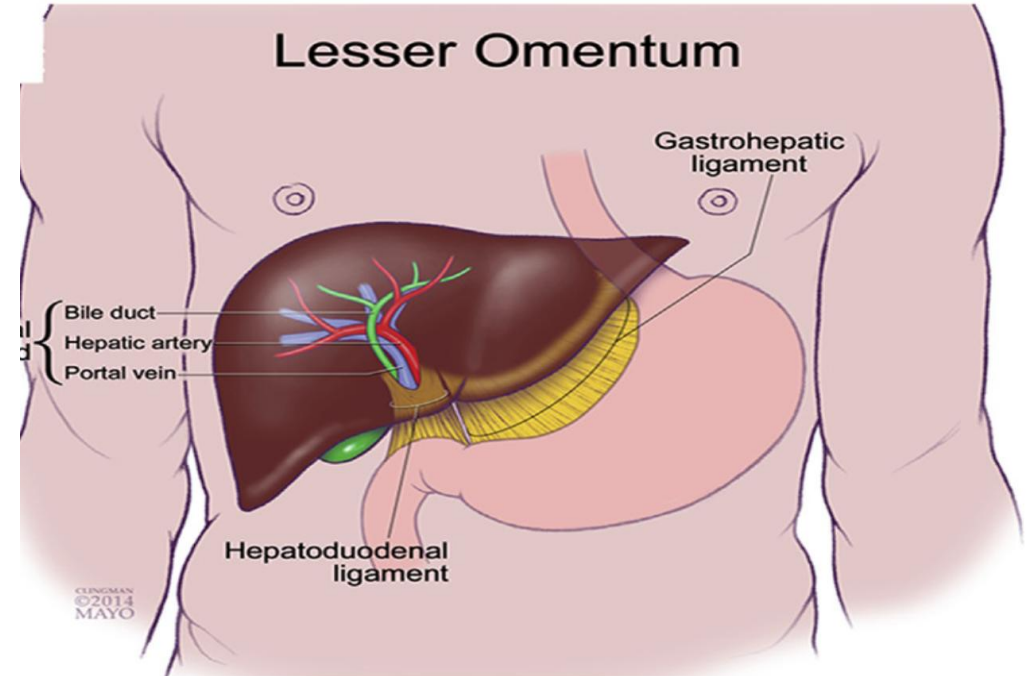
May 3-5, 2026
CHICAGO, IL
EXHIBIT DATES: MAY 3-5, 2026

GREATER & LESSER OMENTUM — EUS LANDMARKS



Greater omentum

Hangs from greater curvature; reached transgastrically through the anterior gastric wall — best contrast with ascites present.



Lesser omentum

Gastrohepatic + hepatoduodenal ligaments

@DDWMeeting | #DDW2026

EUS — MINIMAL ASCITES

Endoscopic ultrasound-guided fine-needle aspiration from ascites and peritoneal nodules: A scoping review

Vishal Sharma, Surinder Singh Rana, Sobur Uddin Ahmed, Sonali Guleria¹, Ravi Sharma, Rajesh Gupta²
Departments of Gastroenterology and ²Surgery, Postgraduate Institute of Medical Education and Research, ¹Department of Botany, DAV College, Chandigarh, India

EUS guided paracentesis of ascites:

- 42-55% higher yield compared CT
- 22G/25G needle
- Mean fluid aspirated around 5 ml (1-40)
- Complications: Abdominal pain, fever, peritonitis



@DDWMeeting | #DDW2026

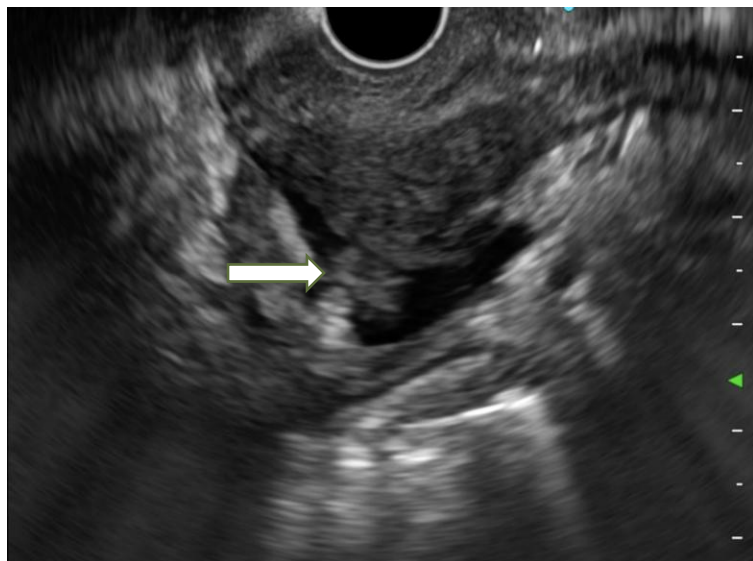
Sharma V EUS 2017

 **DDW2026**
Digestive Disease Week®
MAY 2-5, 2026 | CHICAGO, IL
EXHIBIT DATES: MAY 3-5, 2026

EUS — OMENTAL & PERITONEAL SAMPLING

In Presence of ascites

- Anechoic fluid unfolds the omentum and gives contrasting echodensity
- Thickened omentum & nodules become easily discernible
- Peritoneal deposits = hyperechoic rounded nodules against anechoic background



EUS — OMENTAL & PERITONEAL SAMPLING

In absence of Ascites

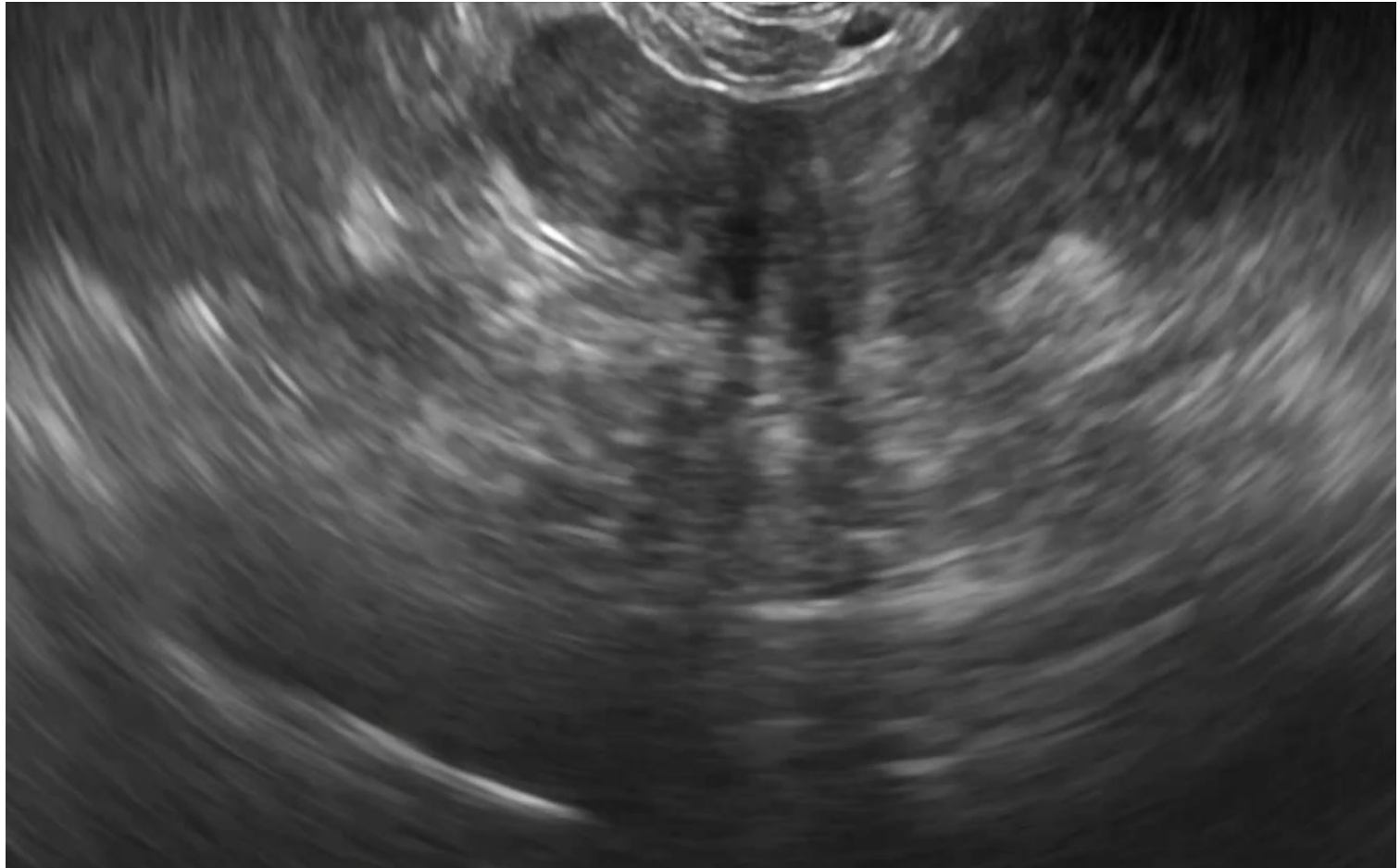
- Look for sheet-like hypoechoic / echogenic structure adjacent to the gastric wall

Role compared to CT/MRI

- Sensitivity: 91% vs 28%
- Accuracy: 94% vs 47%

D/D with malignant nodules:

- Hypoechoic and well-defined
- Larger and well-defined (5.2 vs. 2.2 mm; $p=0.002$)
- CE-EUS: Enhancing in malignant ascites vs hypoenhancing in tubercular ascites



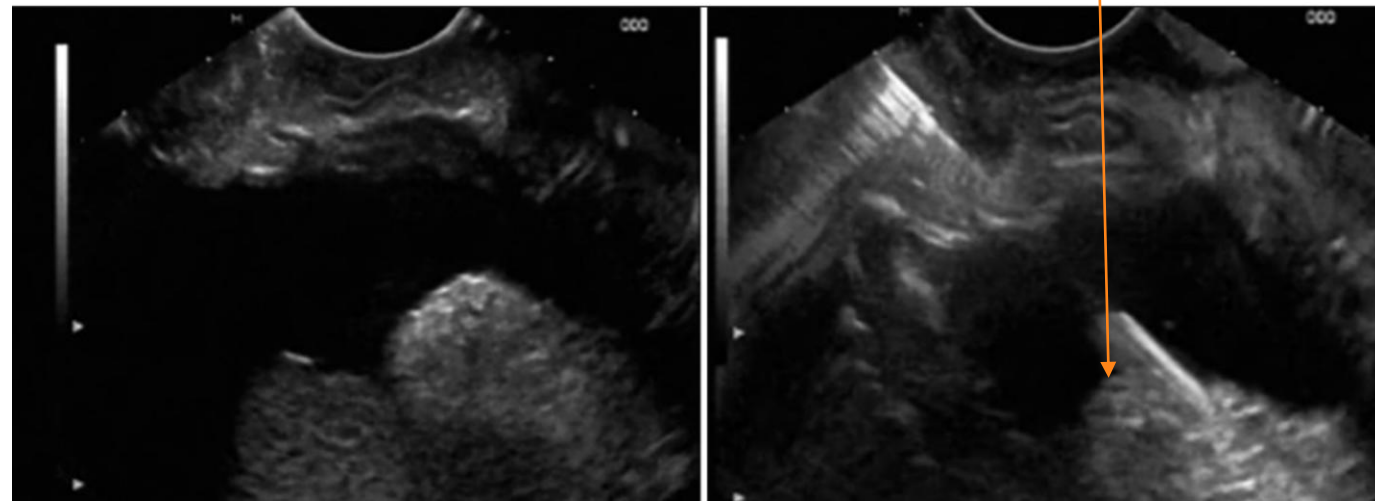
EUS — OMENTAL & PERITONEAL SAMPLING

Case scenarios

- Minimal ascites/loculated ascites
- Mixed etiologies
- Undiagnosed case after initial evaluation
- Prior risk factors



Thickened omentum
With ascites



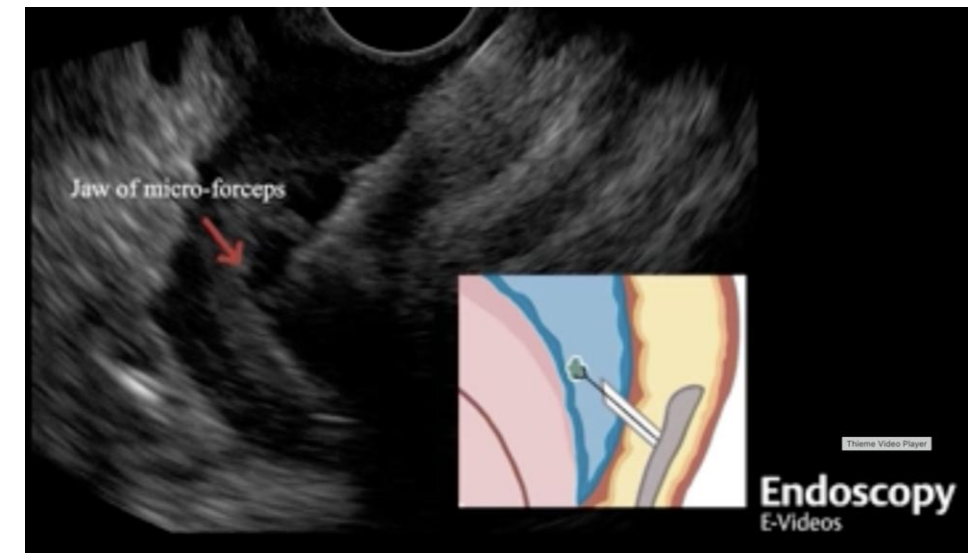
@DDWMeeting | #DDW2026

TRANSRECTAL & LOWER-GI EUS

Atypical Presentation of Tubercular Ascites as a Loculated Pelvic Collection Causing Urinary Retention

📌 When to use?

- Failed trans-gastric attempt — retro-pancreatic / deep nodes inaccessible from above
- Loculated ascites in pouch of Douglas
- Pelvic peritoneal deposits — female genital TB extension
- Isolated LNs below aorto-iliac bifurcation



03

Pancreatic & Visceral TB



DDW2026
Digestive Disease Week®

MAY 2-5, 2026 | CHICAGO, IL

EXHIBIT DATES: MAY 3-5, 2026

@DDWMeeting | #DDW2026

PANCREATIC TB — CLINICAL & EUS FINDINGS

CLINICAL PRESENTATION

79.5%

present as a pancreatic mass

Head 59.0% • Body 18.2% • Tail 13.4%

- Mimic PDAC
- EUS <30%
- Laparotomy: 55%

EUS FINDINGS

- **Solid or mixed solid-cystic**
Hypoechoic / anechoic; no vascular invasion
- **Less sharply demarcated**
Compared with PDAC
- **Peripancreatic pseudocysts/LNs**
Common in TB — uncommon in PDAC
- **CEUS**
Iso/hyper-enhancement arterial; non-enhancing necrotic zones

@DDWMeeting | #DDW2026

 **DDW2026**
Digestive Disease Week®
MAY 2-5, 2026 | CHICAGO, IL
EXHIBIT DATES: MAY 3-5, 2026

SPLENIC SOL



Advantages

- Bowel free approach
- Lesion near hilum
- Lesion in central spleen
- Be careful of vessels



Meta-analysis

- Six studies (62 patients)
- 22G or 25G needle
- Accuracy: 88.2%
- Complications: 4.7%



@DDWMeeting | #DDW2026

Lisotti A Gastro Report 2022 • Rana S Ann of Gastro 2017

 **DDW2026**
Digestive Disease Week®
MAY 2-5, 2026 | CHICAGO, IL
EXHIBIT DATES: MAY 3-5, 2026

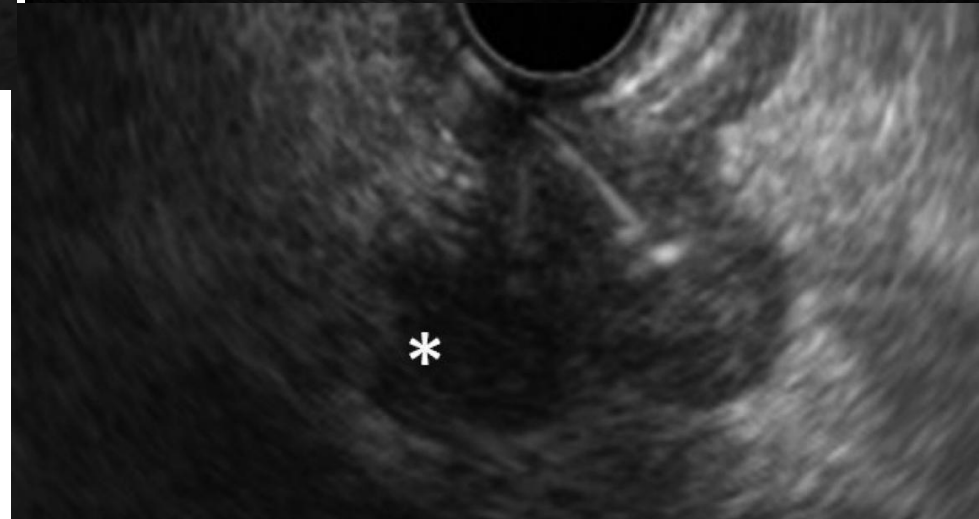
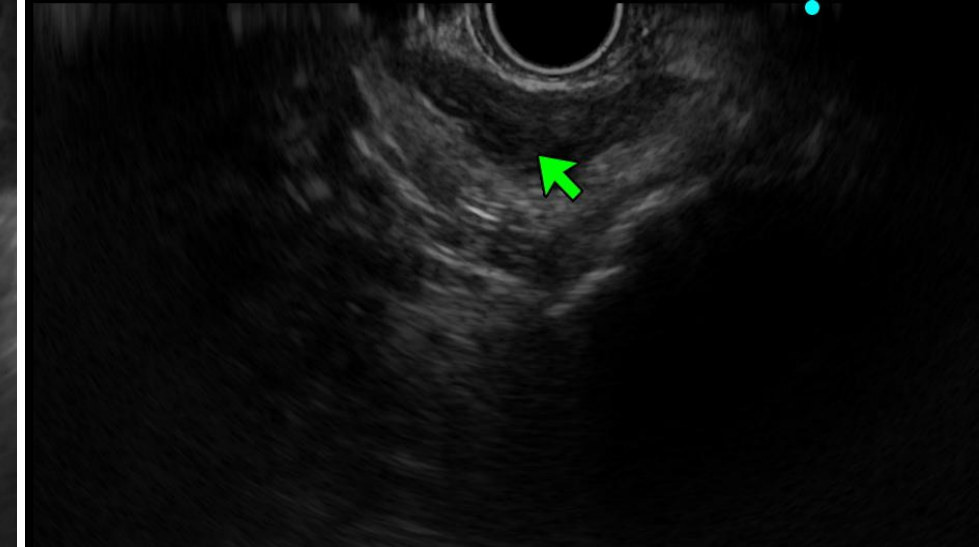
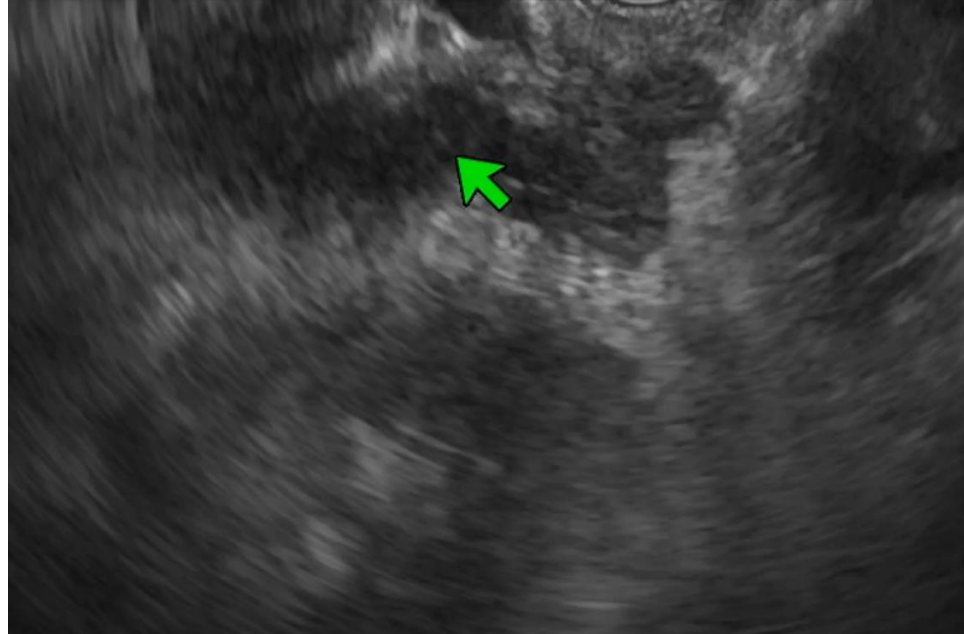
ADRENAL INVOLVEMENT

✚ Adrenal TB

- Common cause of adrenal insufficiency in endemic area
- U/L vs B/L
- May be with necrosis
- Chronic cases: Calcifications

✚ Access route?

- L adrenal → transgastric
- R adrenal → transduodenal
- FNA yields TB cytology with very low complication rate vs percutaneous (2.8–8.4%)



THERAPEUTIC ROLE — EUS-GUIDED DRAINAGE IN ABDOMINAL TB

Endoscopic ultrasonography-guided drainage for tuberculous liver abscess drainage

Takao Itoi ¹, Tiing Leong Ang, Stefan Seewald, Shujiro Tsuji, Toshio Kurihara, Reina Tanaka, Fumihide Itokawa

Endoscopic Ultrasound (EUS)-guided Drainage of Caudate Lobe Abscess: A Single Center Experience

Jimil Shah ¹, Anuraag Jena, Anupam K Singh, Vaneet Jearth, Usha Dutta

EUS-guided drainage of an isolated primary tubercular prostatic abscess

[Rajesh Puri, MD](#)  · [Parvesh Jain, MD](#) · [Randhir Sud, MD](#) · ... · [Sabir Hussain, MD](#) · [Amit Basnotra, MD](#) · [Mohamad A. Eloubeidi, MD, MHS, FASGE](#) ... [Show more](#)

Data?

- Limited data: Case report/series
- Selected cases of well loculate abscess: Liver/peritoneal/pelvic

04

Limitations & Conclusion



DDW2026

Digestive Disease Week®

MAY 2-5, 2026 | CHICAGO, IL

EXHIBIT DATES: MAY 3-5, 2026

@DDWMeeting | #DDW2026

LIMITATIONS OF EUS IN PERITONEAL & RETROPERITONEAL TB

Anatomical blind spots

Right retroperitoneum, right adrenal, peripheral mesenteric nodes and nodes below D3 are difficult

Operator dependency

Yield for small peritoneal deposits and omental caking is operator-dependent

No pathognomonic feature

Matted, heterogeneous, calcified nodes overlap with sarcoidosis, histoplasmosis and lymphoma

Conclusion

1

EUS : most granular imaging window onto the retroperitoneum

2

EUS provides better insights and tissue samples in abdominal LNs

3

Cytology + Gene-Xpert : Increased yield

4

Role of EUS: Minimal ascites, Omental thickening or nodules

5

Visceral TB: Rare but EUS plays a crucial role

6

Role of therapeutic EUS : Selected but definite role



MAY 2-5, 2026 | CHICAGO, IL
EXHIBIT DATES: MAY 3-5, 2026

@DDWMeeting | #DDW2026

Listen to your patient — he is telling you the diagnosis.

— Sir William Osler

In abdominal TB, the patient speaks through tissue — EUS is how we listen.



DDW2026

Digestive Disease Week®

MAY 2-5, 2026 | CHICAGO, IL

EXHIBIT DATES: MAY 3-5, 2026

@DDWMeeting | #DDW2026

Thank you

ASGE-SGEI Joint Symposium • DDW 2026 • Chicago, IL



DDW2026
Digestive Disease Week®

MAY 2-5, 2026 | CHICAGO, IL
EXHIBIT DATES: MAY 3-5, 2026

@DDWMeeting | #DDW2026