

EUS and ERCP: A rational categorization of a productive partnership

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Case Study

- 57yr. old female patient presents with RUQ pain, weight loss, fatigue and nausea
- Multiple consultations across varying countries

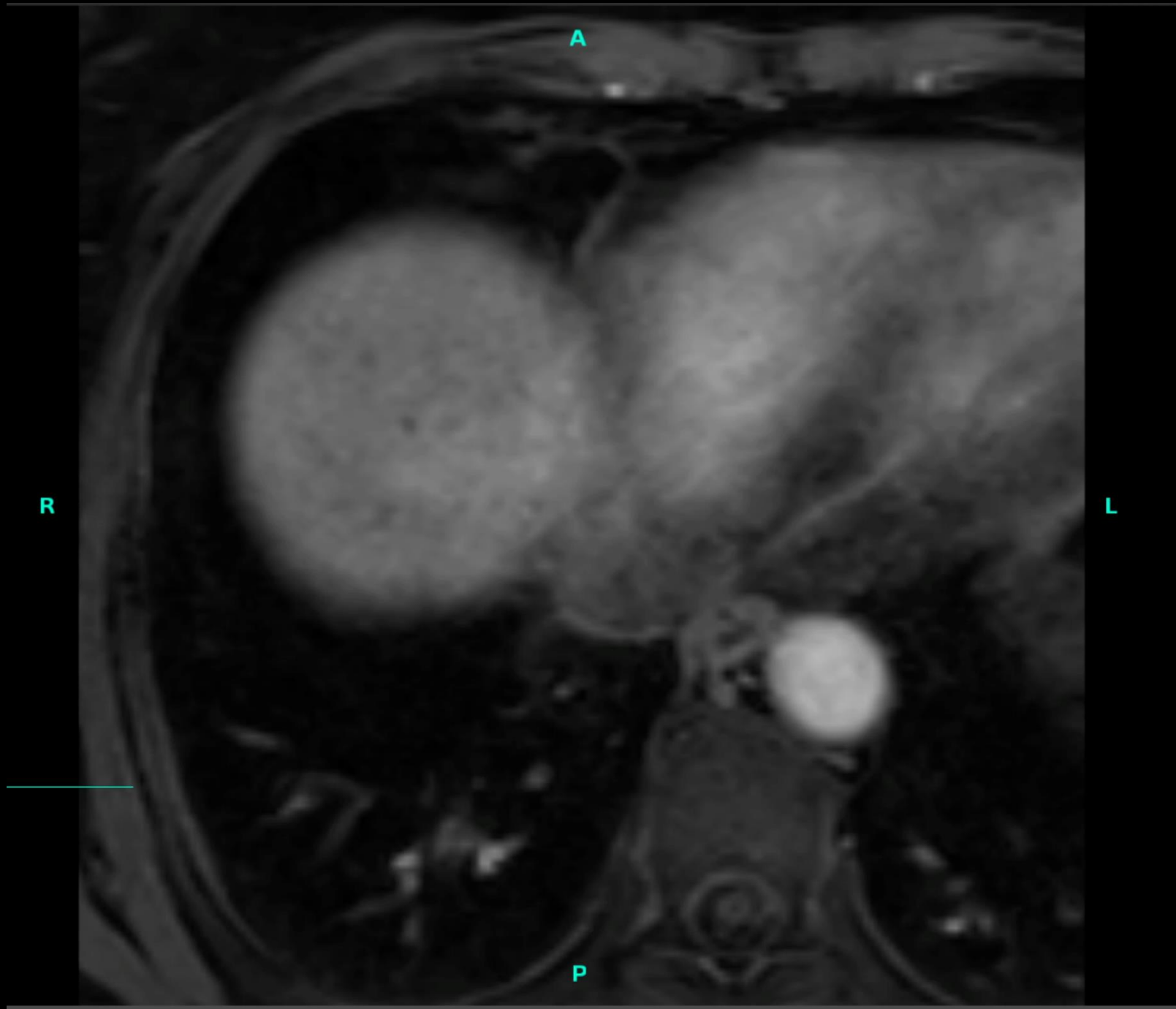
- Past Mx Hx: Hypertensive on treatment
- Past Sx Hx: Cholecystectomy 7 yrs ago.
- Allergies: none
- Habits: Non-Smoker & No alcohol consumption
- Occupation: Housewife
- Travel History: Resides in Ethiopia

Examination

- Fairly well looking female patient
- Vitals normal
- All systemic essentially normal

- Bloods:
 - FBC – 14.5g/dl, WCC – 8.17, Plts 363.
 - U&E normal
 - LFT normal
 - RVD negative
 - Trops normal
 - NT ProBNP – 105
 - Hep Studies negative

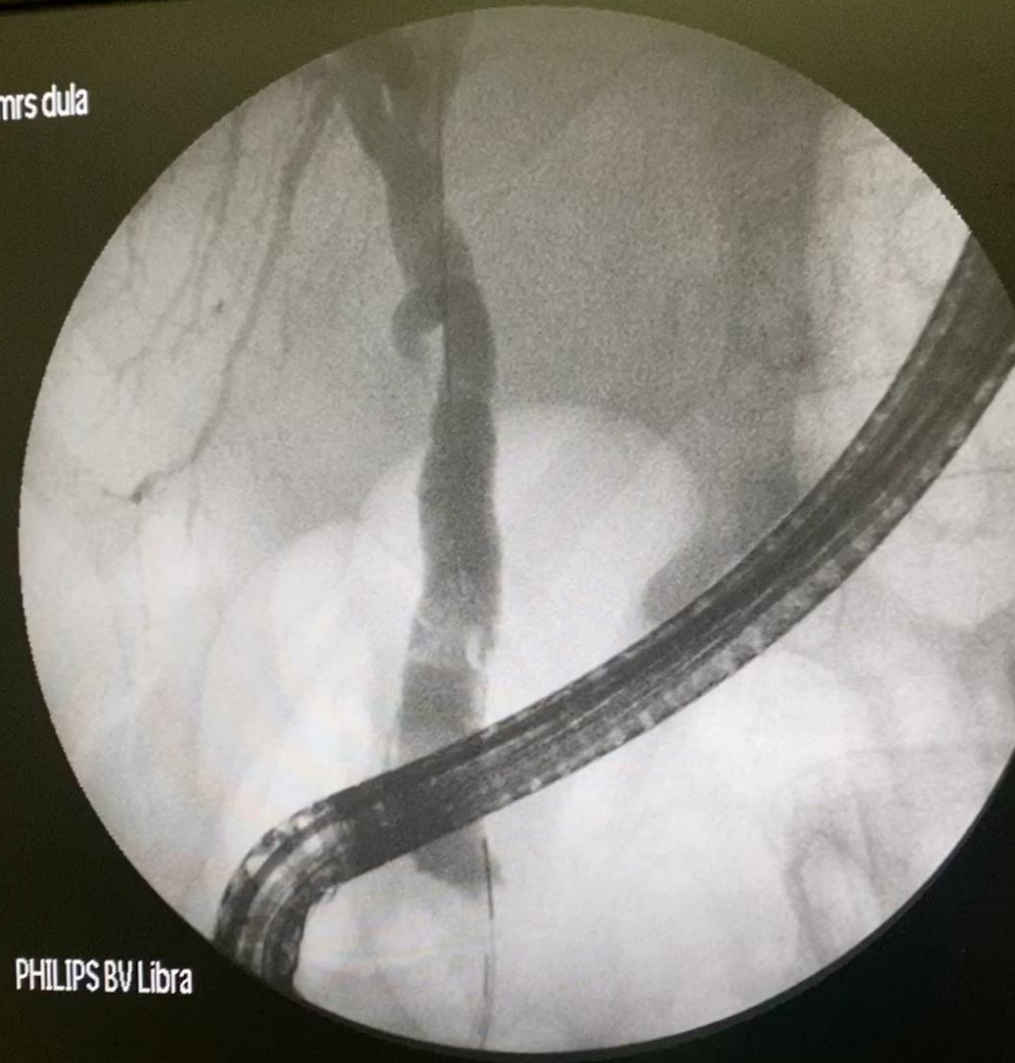
- Ultrasound – 3 small cystic lesions in the liver.







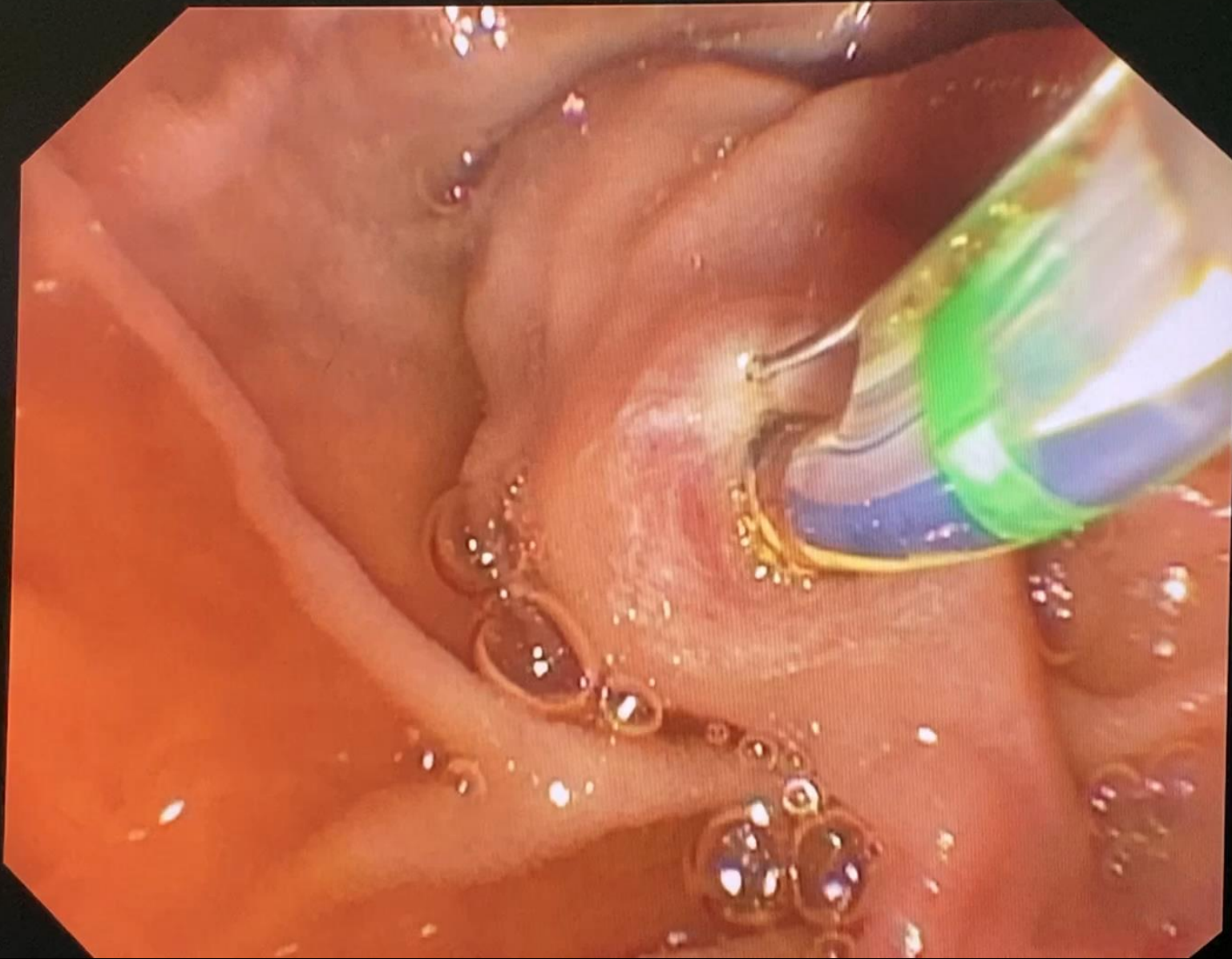
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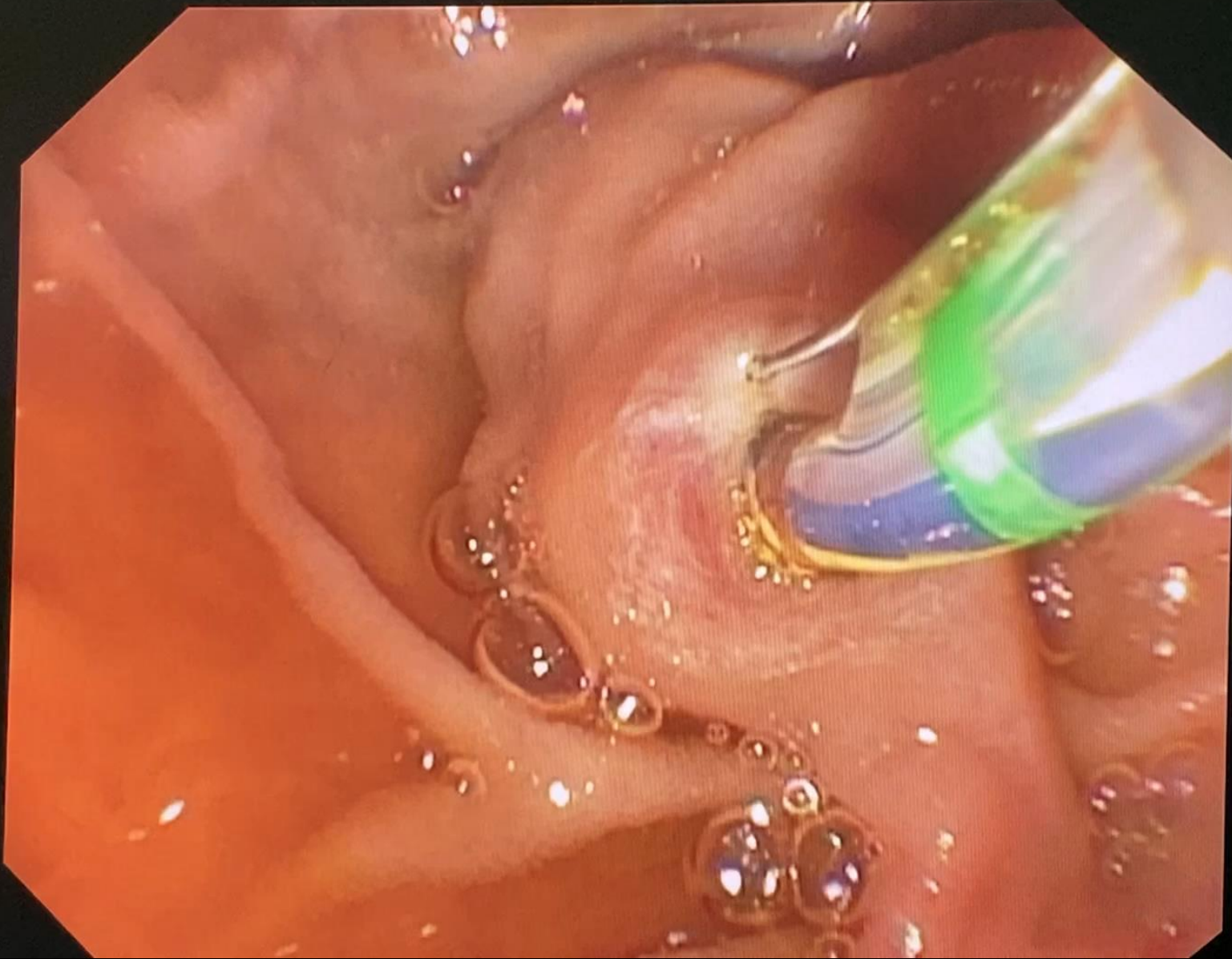
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A reality Check!



- Few people in SSA with endoscopy skills
- Ghana – 1 trained ERCP endoscopist
- Kenya - 7 people trained for ERCP and 2 training in EUS
- Zambia - 1 HPB surgeon doing ERCP
- Globally more ERCP skills than EUS skills
- SA few people with advanced EUS skills to perform EUS-BD
- Who does ERCP here?
- Who does EUS here?
- Who does both with more than 100 cases/annum in each arm?

Distal Malignant lesions

- Resectable and Borderline disease
- Advanced disease
- Recommendations





ERCP

Preferred First-Line for Distal Resectable Lesions

- **Effectiveness:**
 - 90% technical success rates for Biliary drainage
- **Benefits:**
 - ERCP is **minimally invasive**
 - provides a direct route
 - allows for simultaneous **tissue biopsy** or **brush cytology**
- **Limitations:**
 - Failure due to tumor location or altered anatomy.
 - **Post-ERCP pancreatitis** & other procedure-related complications.

EUS-Guided Biliary Drainage in Resectable Distal Obstruction



- **EUS as a Rescue Technique:**
- EUS-BD is generally considered when **ERCP fails** or is not feasible
- **Effectiveness:**
 - Highly effective for **malignant biliary obstruction**
 - Demonstrates the same technical success rate as ERCP
- **Benefits:**
 - EUS-BD has a **lower risk of pancreatitis** compared to ERCP
 - Allows drainage in **complex cases** where ERCP is not an option
- **Limitations:**
 - EUS-BD is technically more challenging and requires advanced endoscopic expertise.
 - The risk of complications, **bile leaks** or **peritonitis**, may be higher
 - The cost of the stents and tissue acquisition is significant

Recommendation for resectable distal lesions



- **ERCP** remains the **first-line modality** for biliary drainage
- **EUS-BD**
 - ERCP failure
 - Altered anatomy and it is
 - Shows promise in centers with expertise in advanced endoscopic techniques.

ESGE Guidelines 2022

- Distal Malignant Obstruction:
 - **Failed ERCP:**
*EUS-biliary drainage preferred over PTBD after failed ERCP .
Strong recommendation, moderate quality evidence*
 - **Altered Surgical Anatomy:**
*EUS-BD is ideal for patients with altered surgical anatomy
Transgastric & transduodenal approach achieve over 90% success.*

Wang, K., Zhu, J., Xing, L., et al. (2016). EUS-guided biliary drainage for malignant biliary obstruction after failed ERCP: A systematic review and meta-analysis."

Gastrointestinal Endoscopy

EUS vs ERCP in distal lesions for Palliation



- Jin et al.
 - 4 comparative trials and over
 - 300 patients
 - EUS-BD similar efficacy to ERCP
 - similar rates of adverse events in expert hands.
- EUS-BD
 - Reduced risk of pancreatitis, tumor ingrowth, or stent dysfunction
- Metanalysis 10 studies (3 randomized and 7 retrospective)
 - Comparable efficacy of EUS-BD to ERCP
 - Similar rates of adverse events.

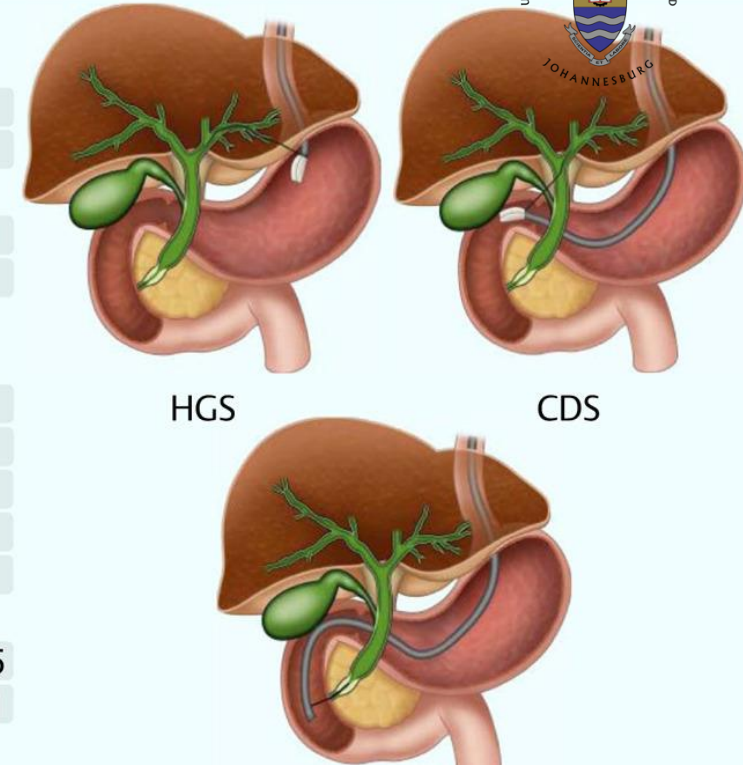
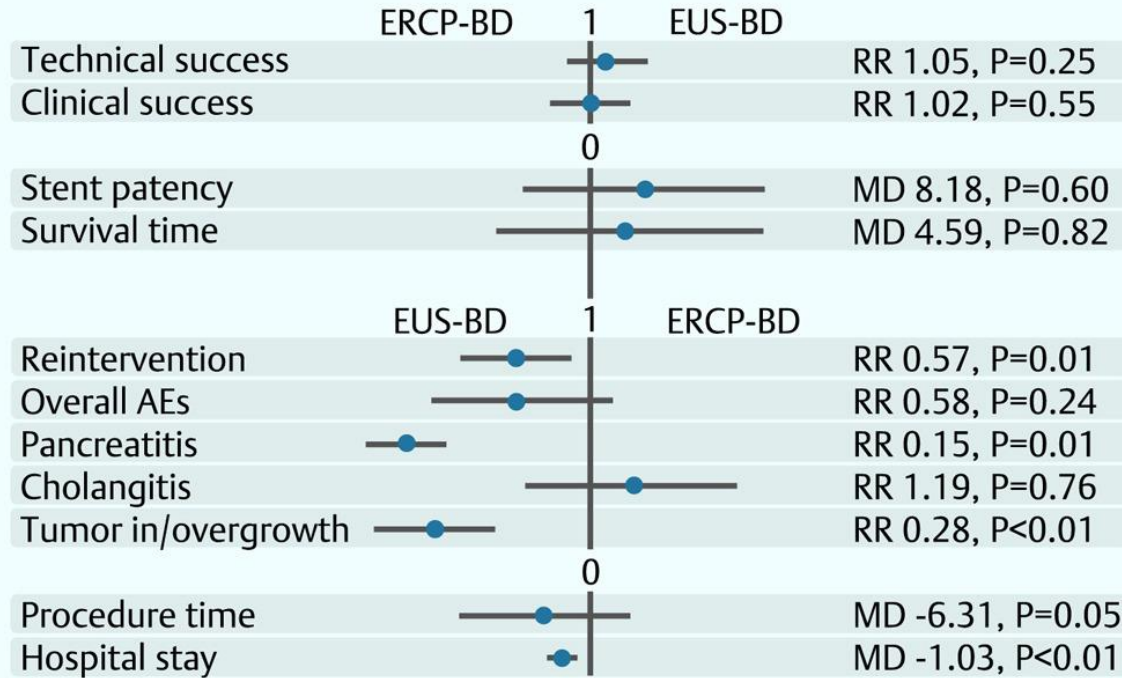
EUS-BD versus ERCP-BD for Malignant Biliary Obstruction



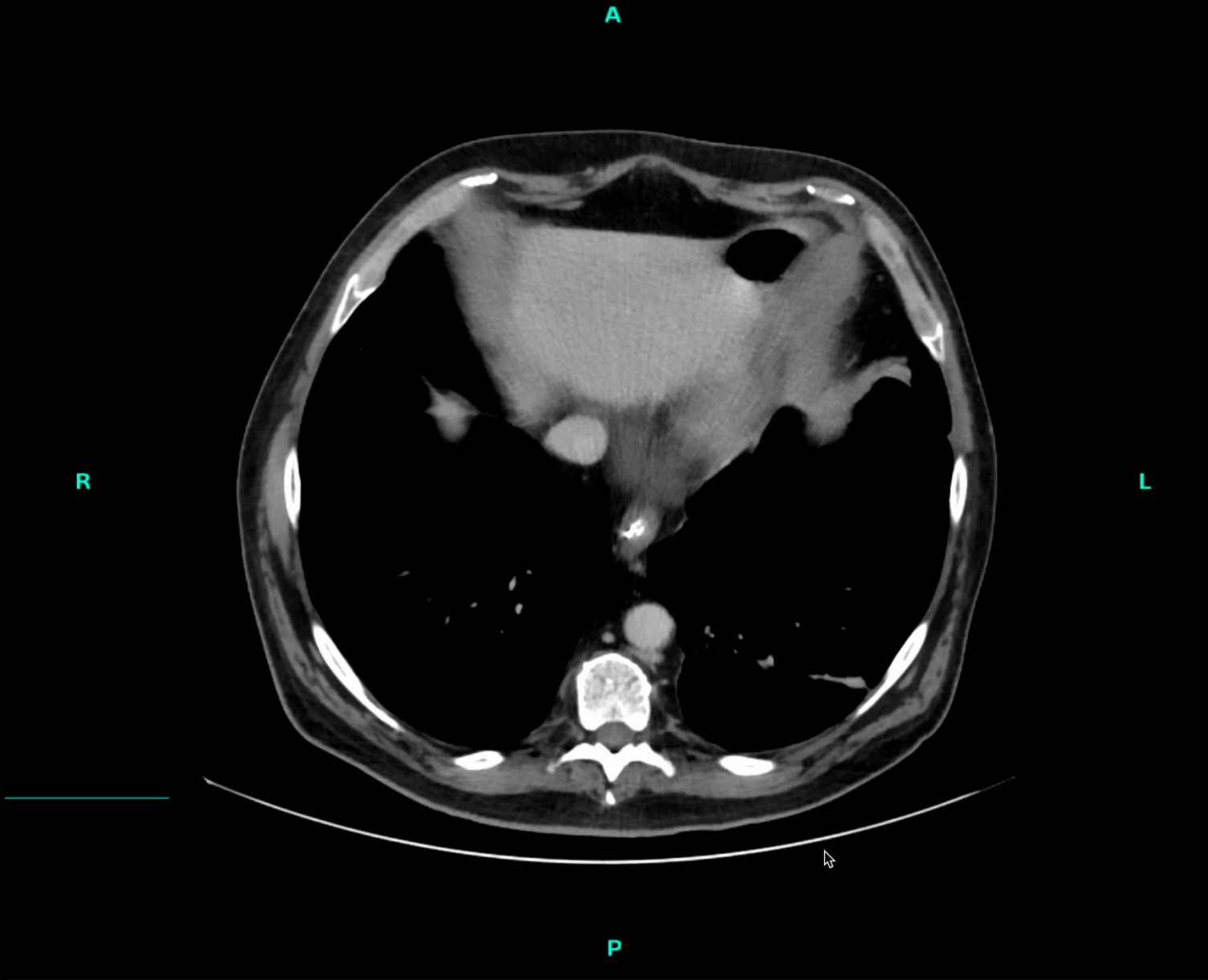
Systematic Review
and Meta-Analysis

6 Randomized
Controlled Trials

577 Patients



• *Barbosa et al. EUS- versus ERCP-guided biliary drainage for malignant biliary obstruction: a systematic review and meta-analysis of randomized controlled trials. GIE September 2024*



ALOKA

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MI = 0.47 TIS < 0.4 70%

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13:Endo Echo

Prot



EUS

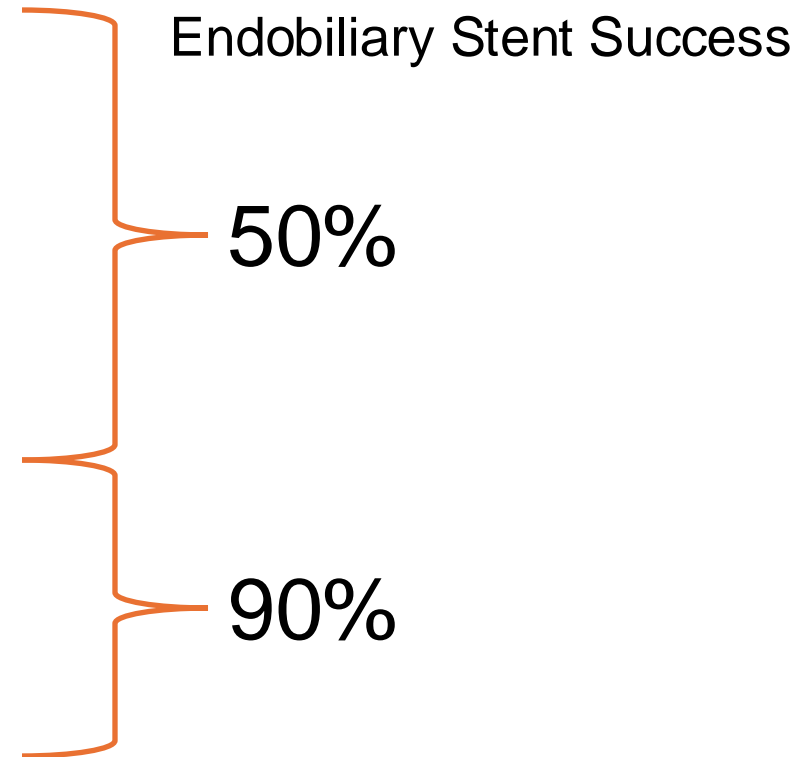
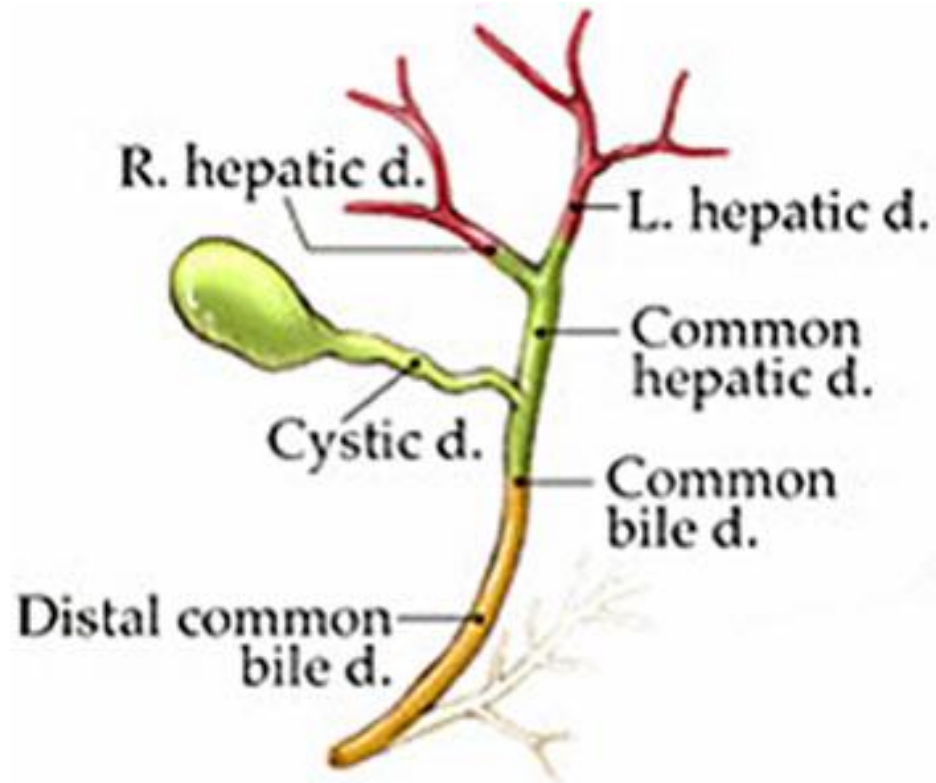
DIAGNOSIS AND TREATMENT



Precision Medicine

- We can now extract tissue and conduct multi-omic studies on all these malignancies upfront
- Although expensive helps us understand the biology of these lethal tumours
- Will change the the way we see tumours and the timing of surgery.

Endobiliary Drainage



Hilar Biliary Obstruction

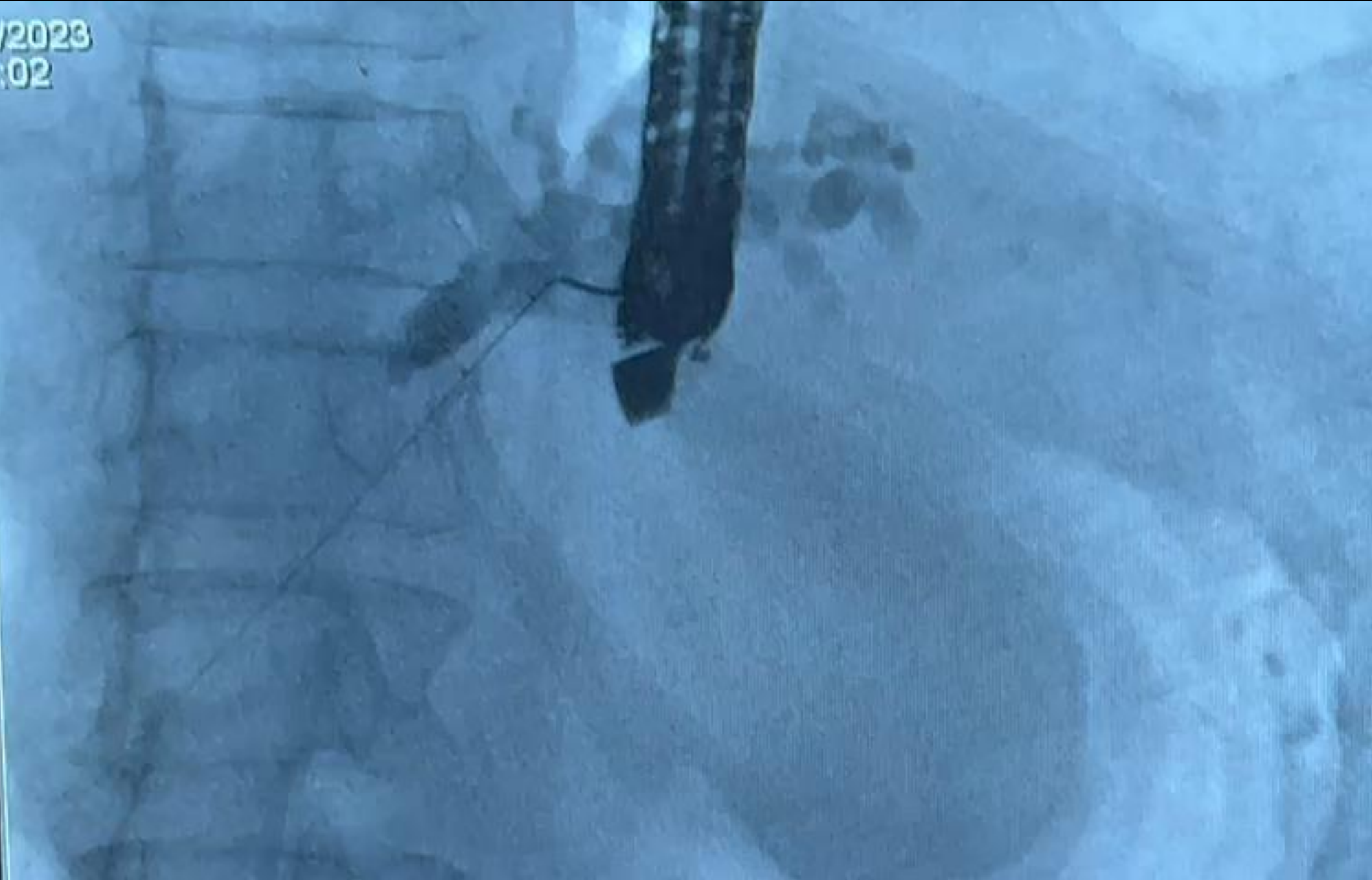
- This far more complex
- Depends on Biliary Hilum
- Resectability of the Lesion

- Resectable lesions
 - Despite the complication rate being high we prefer PTBD of the future liver remnant

- For unresectable disease with disconnected ducts our preference is to avoid ERCP.

	EUS-HGS	ERCP	PTBD
Success Rate	90% - clinical	90%	95%
Indication	Failed PTBD/ERCP	BISMUTH I&II	Bismuth III & IV
Adverse Events	14.9% - Bile leak, bleeding and pneumoperitoneum	Pancreatitis Cholangitis	Bleeding, Biloma, Bile peritonitis, Haemobilia
Drainage	Internal-enteric	Internal	External component
Comfort	Good	Good	Poor
Technical difficulty	Requires advanced expertise	Extremely difficult at the hilum with complex strictures	Requires another discipline
Mortality Risk	0.1%	Depends on pancreatitis/Cholangitis	Higher Than ERCP 5%

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mGy
mGy/min

kV
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Measure Field
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Σ A+B
kV
mA
ms
Cu mm
p/s
Heat Unit %

Examination

Artis Workplace

Artis Workplace

Examination

PostProc

Quant

HLATSHWAYO,
NOKUTHULA
F 09/07/1944

mGy A 523
mGy/min A 41

ERCPI

DR Fixed

Single CARE

KV 98.1
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Measure Field

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Focus

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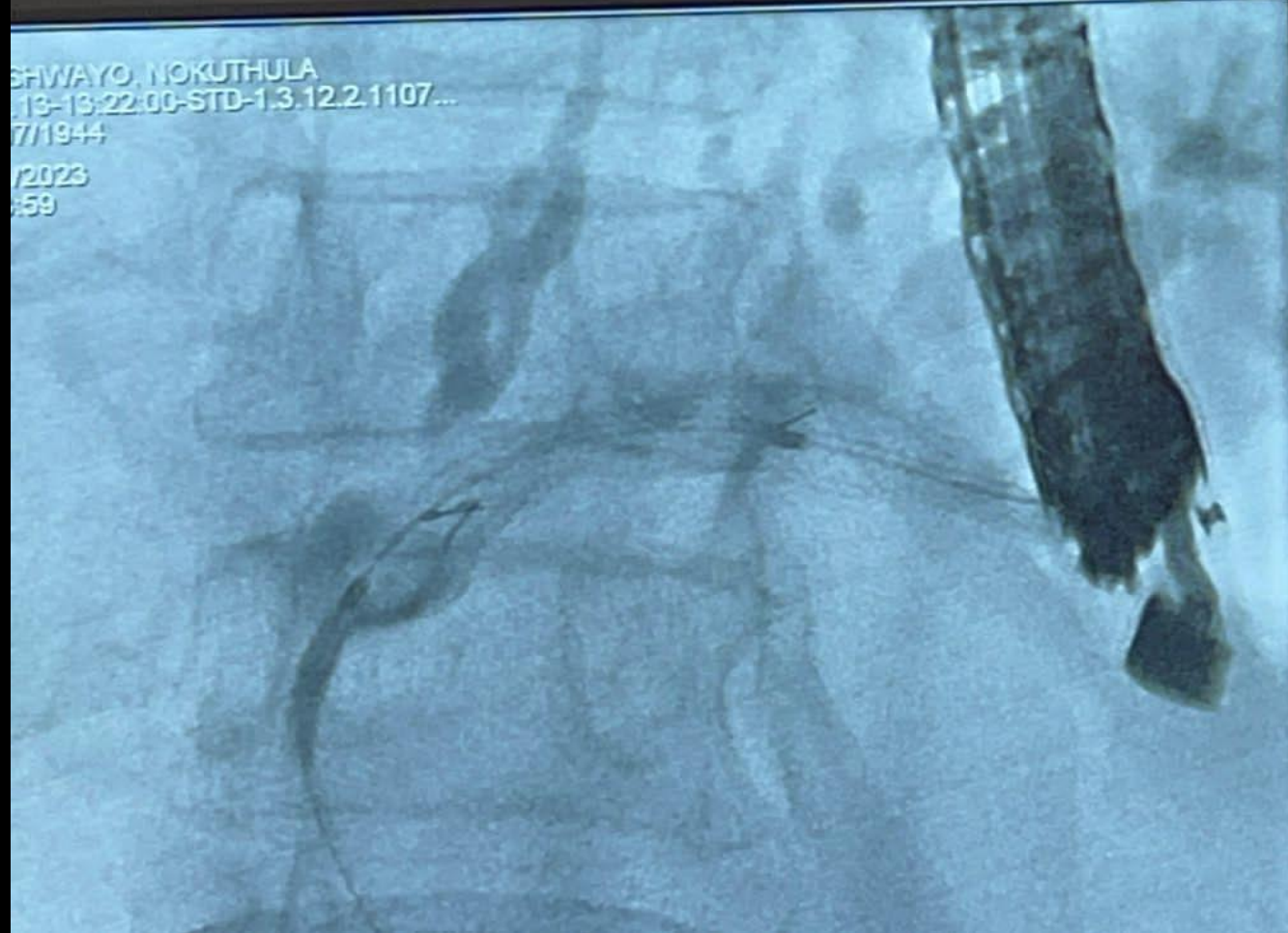
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FL Angio

KV 77.4
mA 241.7
ms 11.6

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Cholecystitis

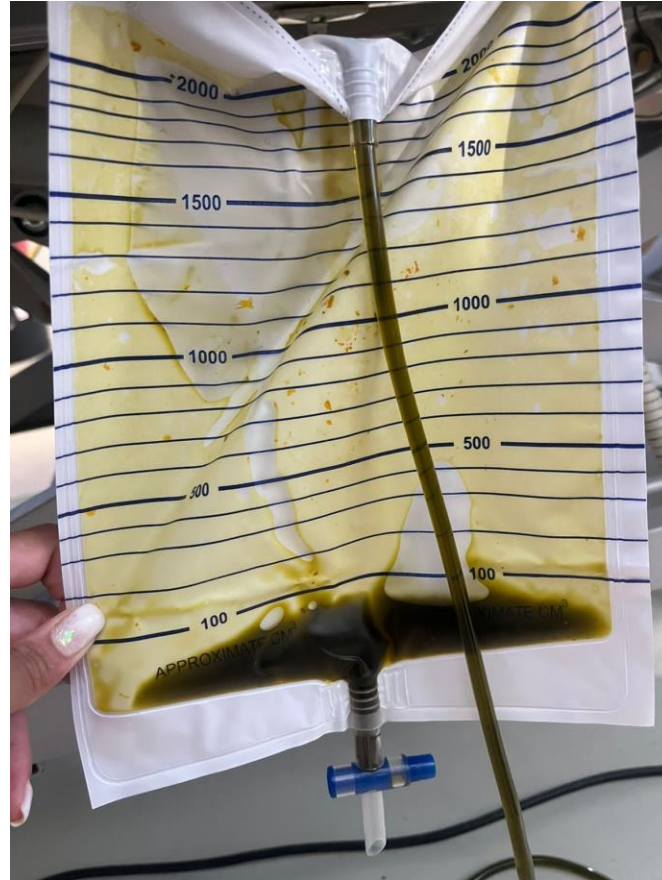
- Laparoscopic Cholecystectomy is the gold standard for treatment
- 600 000 LC's annually for calculous cholecystitis
- Poor surgical candidates:
 - High-risk comorbidities
 - Marked intra-abdominal inflammation
 - Haemodynamic instability
- Approaches to these patients include percutaneous and endoscopic techniques

Percutaneous Transhepatic Biliary drainage (PT-GBD)



- Percutaneous transhepatic gallbladder drainage (PT-GBD)
- Technical success rates are good – 95-100%
- Complication rate -12%
 - puncture- induced haemorrhage
 - pneumothorax
 - bile peritonitis
 - drain site pain or infection
- Contraindications - perihepatic ascites, intervening loops of bowel, coagulopathy

PT-GBD



Endoscopic Transpapillary Gallbladder Drainage ET-GBD



- Technically challenging
- Requires a C-arm and Fluoroscopy
- Patient needs to be moved out of the ICU.
- Technical success rate 84% :
 - Difficulty in getting the wire into the cystic duct
 - Difficulty in navigating past the obstruction
- Temporary placement of a plastic stent requires repeated intervention

EUS- Guided Gallbladder Drainage

- 2007 Barron and Topazian attempted the first drainage
- 2012 Itoi et al used the first LAMS
- Systematic review & meta-analysis by Mcarty et al. EUS-GBD with LAMS:
 - Technical success – 94.7%
 - Clinical success – 92.1%,
 - Adverse events - 11.7%

McCarty, T.R.; Hathorn, K.E. et al. Endoscopic gallbladder drainage for symptomatic gallbladder disease: A cumulative systematic review meta-analysis.

Surg. Endosc. **2021**, *35*, 4964–4985.

CLINICAL INDICATIONS

- (I) Lifesaving procedure in the acute setting – particularly in ICU
- (II) Elective nonsurgical candidates with & without stone extraction
- (II) Bridging therapy to cholecystectomy
- (III) Conversion from PT-GBD to EUS- GBD
- (IV) alternative to failed EUS-guided biliary drainage.

ESGE Guidelines



- EUS-guided gallbladder drainage (GBD) should be favoured over PT-GBD
- Due to lower rates of adverse events
- Less need for re-interventions in EUS-GBD
- Strong recommendation, high quality of evidence

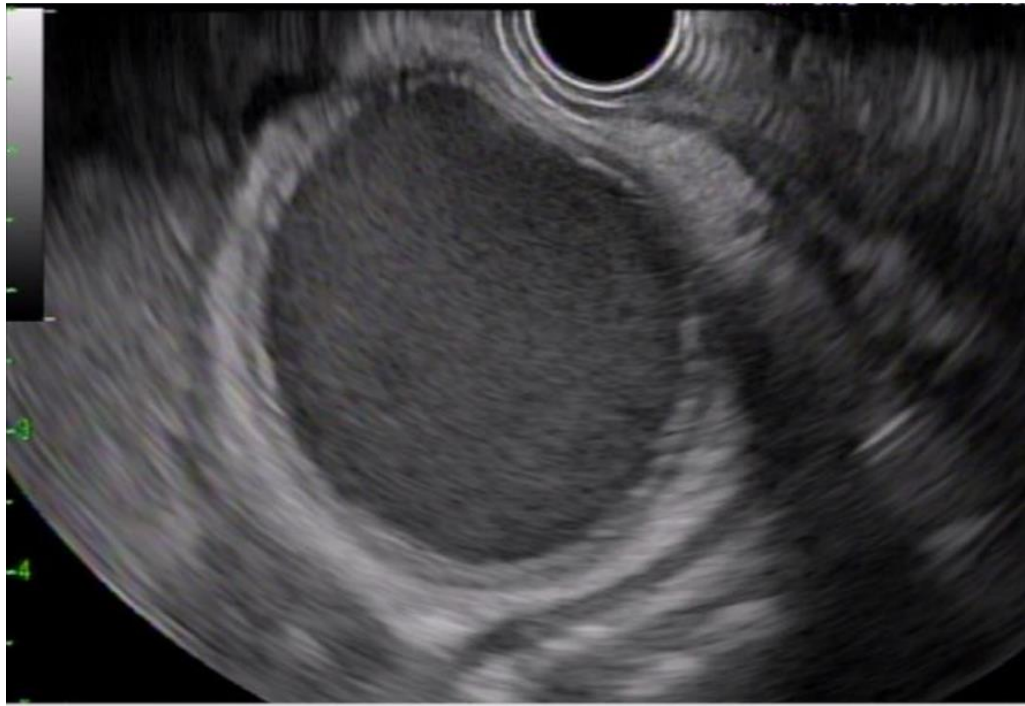
NICE National Institute for
Health and Care Excellence



Endoscopic ultrasound-guided gallbladder drainage for acute cholecystitis when surgery is not an option

Interventional procedures guidance

Published: 22 June 2023



Follow up:

- Limited life Expectancy – leave in situ
- 7% will achieve stent migration or relapse of the cholecystitis
- As a bridge to Surgery should be removed prior to LC
- If they remain poor surgical candidates, the metal stent can be replaced with a double pigtail.

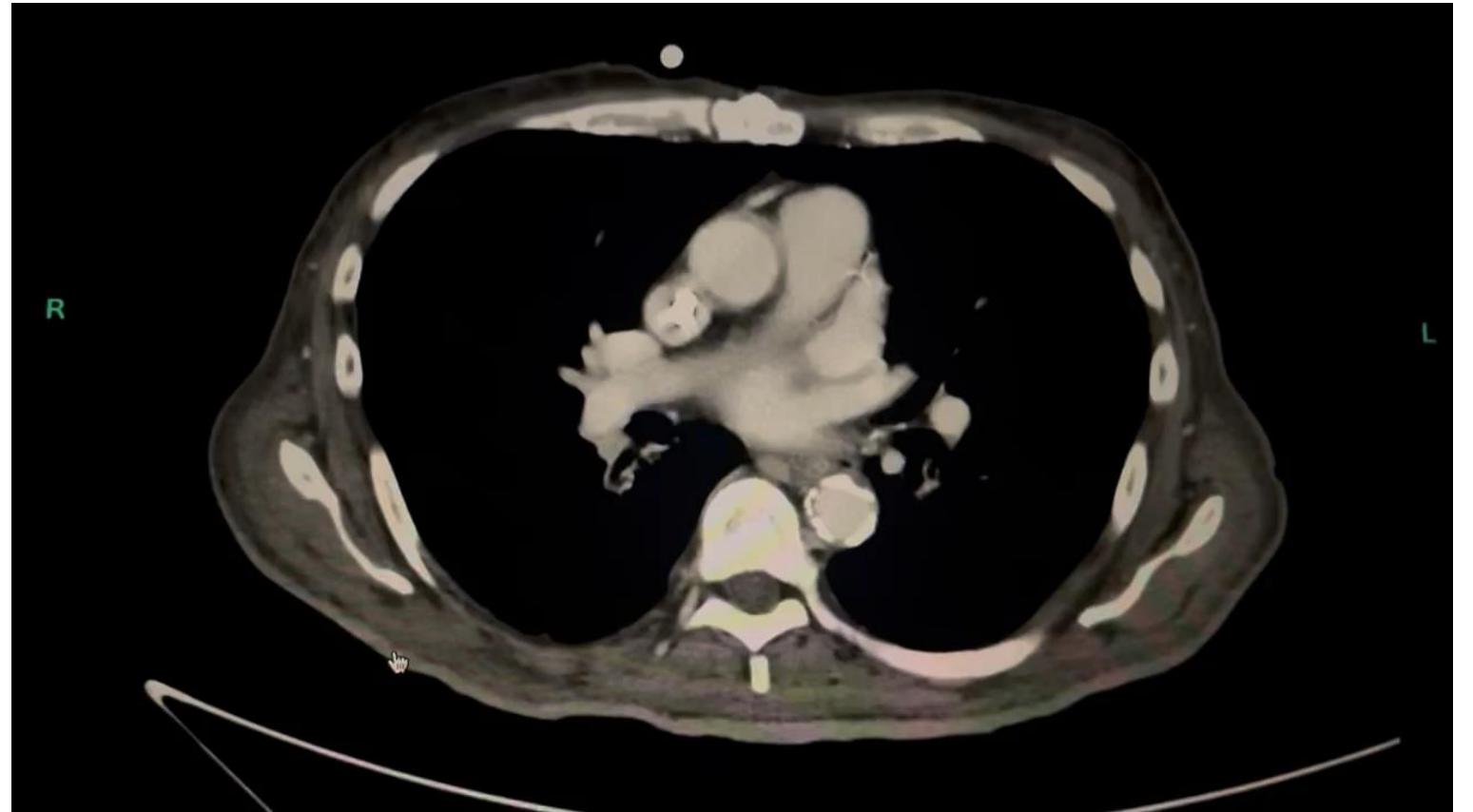
Adverse Events

- Bile leak
- Peritonitis
- Pneumoperitoneum
- Bleeding
- Recurrent cholecystitis
- Stent Migration
- Stent blockage
- Bouveret syndrome

Case Study

- 78 yr old male with end stage renal failure on dialysis
- Diabetic hypertensive with ischemic heart disease & hyperlipidemia
- Presents with new MI and severe RUQ pain was admitted to ICU
- 3 hours of admission:
 - hypotensive
 - Temp spikes to 38 deg
 - Tachycardic with a pulse of 120b/min
- Bloods on admission:
 - FBC – 11.1/ WCC – 21.73/PLTS – 324
 - UREA 9.3 & Cr 290
 - LFT: 12/9/76/32/ 29/96/
- Confirmed MI but also CT abdomen revealed distended GB with early signs of rupture

CT SCAN



Procedure at the bedside in ICU



Emerging Indications:

- Malignant Biliary obstruction below the cystic duct insertion when conventional methods fail
- Non-surgical candidates with Biliary pancreatitis
- Case reports of Mirrizzi Syndrome

Training

- 1-year advanced endoscopy fellowship 300 EUS and 350 ERCP
 - Technical Competence - 82% for EUS
 - Technical Competence - 60% for ERCP
- More difficult to teach trainees advanced ERCP maneuvers
- EUS-guided maneuvers - real-time” puncture of the bile duct - easier
- Single-step devices are being used for performing biliary drainage
- Fluoroscopy is eliminated decreasing radiation exposure



Conclusion

- Patient centered outcomes
- Malignant distal lesions – ERCP remains the current gold standard
- Malignant resectable proximal lesions – PTBD
- Malignant Complex lesions – EUS guided HGS if PTBD not available

- Severe cholecystitis – evidence starting to emerge

- ERCP and EUS are here to be used arrows in the Endoscopists quiver and not as competitors!