Can EUS replace ERCP for malignant biliary decompression?

By

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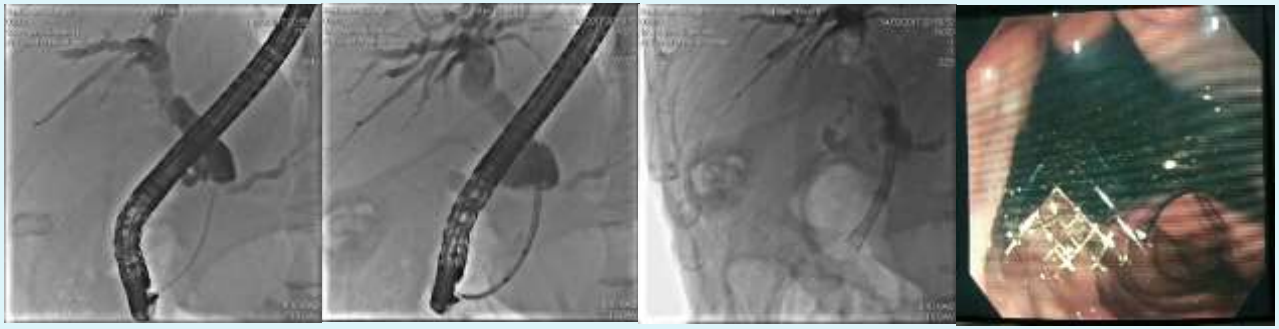
Introduction

- ERCP is the standard procedure for biliary drainage in patients with malignant biliary obstruction.

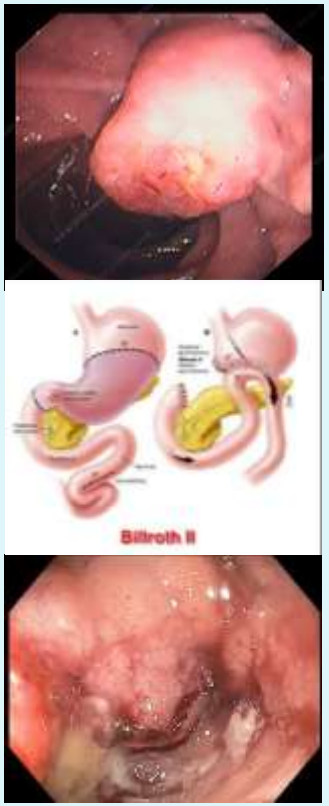
- Despite having high success rate of more than 90%, successful achievement of biliary access by ERCP is not always possible, even by skilled endoscopists.



Karagyozov PI, Tishkov I, Boeva I, Draganov K. Endoscopic ultrasound-guided biliary drainage-current status and future perspectives. World J Gastrointest Endosc 2021;13(12): 607-618.

Introduction

- Causes of failed ERCP:
  1. Malignant infiltration
  2. Altered anatomy
  3. Gastric outlet obstruction



Present status of ERCP

Present status of ERCP

- The international consensus statement for management of malignant distal biliary stricture recommends ERCP with transpapillary SEMS placement as the mainstay of treatment.

- The 3 commonly encountered challenges with this recommendation are:
  - Adverse events
  - Stent dysfunction.
  - Cannulation difficulties

Nakai Y, Isayama H, Wang H-P et al. International consensus statements for endoscopic management of distal biliary stricture. J Gastroenterol Hepatol 2020; 35: 967–79.

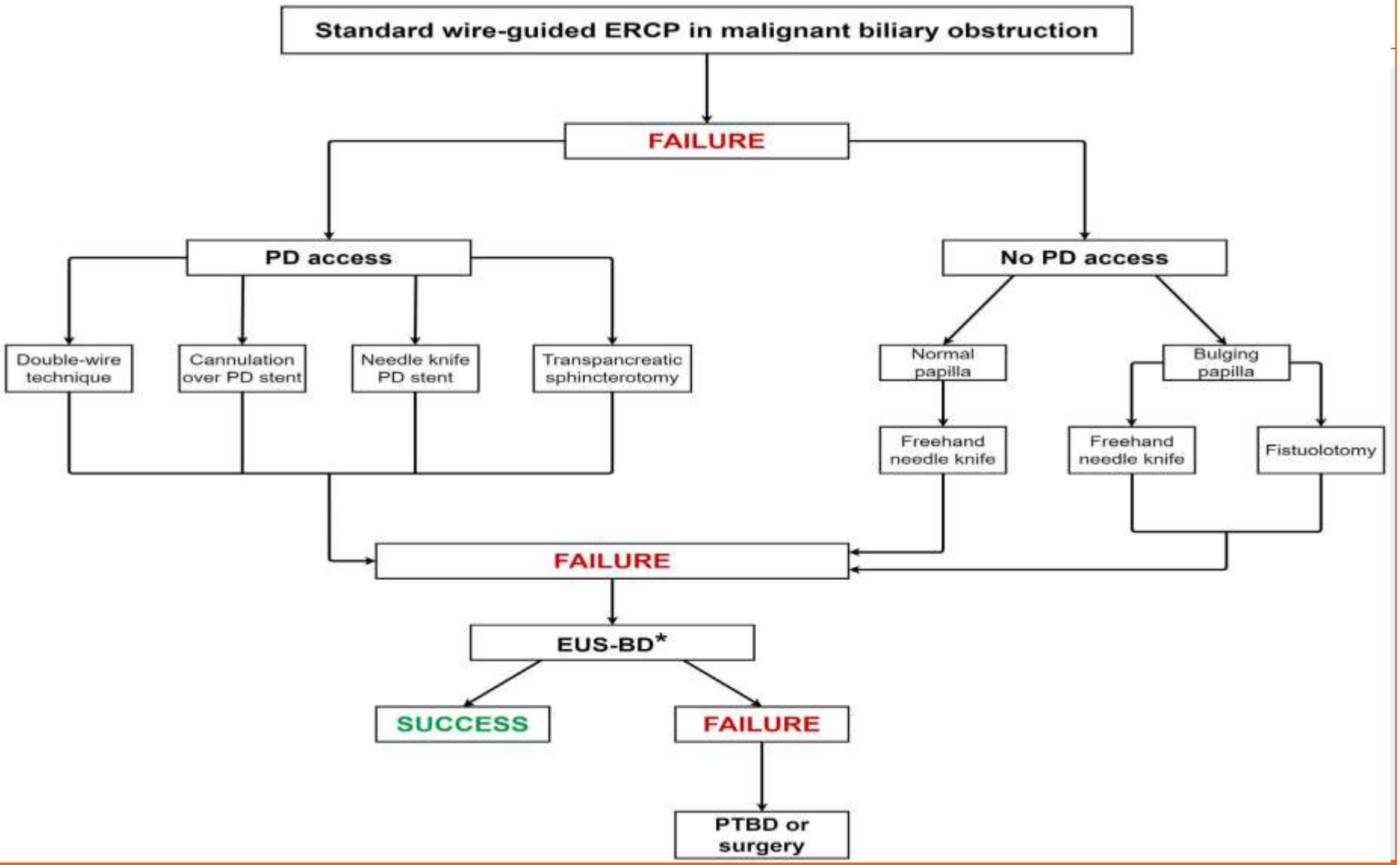
Present status of ERCP

- **For adverse events,** there is a direct correlation between procedural complexity and adverse events. Rates of post-ERCP pancreatitis are <3% if cannulation is achieved within 5 min versus >10% if it takes more than 10 min to achieve cannulation.

- **For stent dysfunction,** either occlusion by tumor or migration, is a potentially serious delayed adverse event that can result in life-threatening cholangitis.

Bang JY, Hawes R, Varadarajulu S. Endoscopic biliary drainage for malignant distal biliary obstruction: Which is better – endoscopic retrograde cholangiopancreatography or endoscopic ultrasound? Digestive Endoscopy 2022, 34: 317-324.

Present status of ERCP



Present status of EUS-BD

Present status of EUS-BD

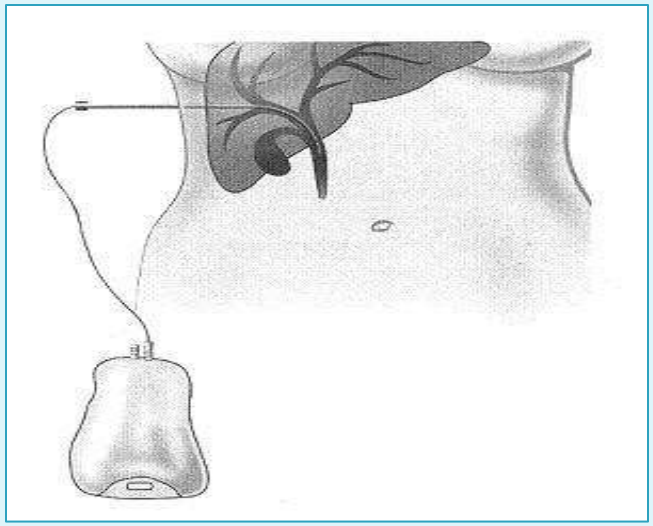
- The international consensus statement for management of malignant distal biliary stricture recommends that when expertise is available, EUS-BD may bean effective option in three situations:
  - Failed ERCP (GOO)
  - Difficult biliary cannulation
  - Postsurgical anatomy

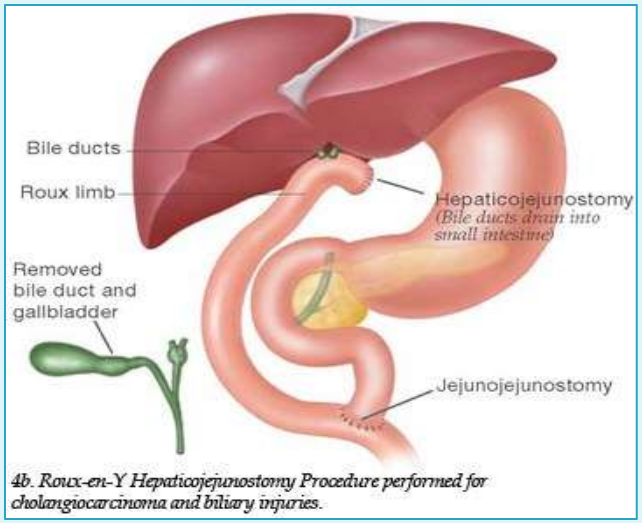
Nakai Y, Isayama H, Wang H-P et al. International consensus statements for endoscopic management of distal biliary stricture. J Gastroenterol Hepatol 2020; 35: 967–79.

Present status of EUS-BD

- Alternative biliary accesses have been utilized for many years

(PTD & Surgical bypass)



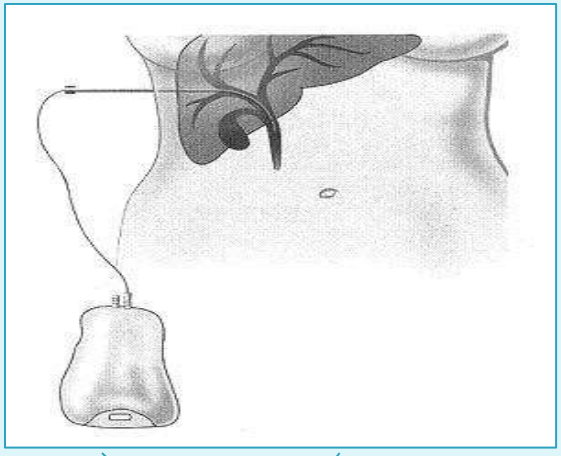


4b. Roux-en-Y Hepaticojejunostomy Procedure performed for cholangiocarcinoma and biliary injuries.

Present status of EUS-BD

PTD

1. Success rate (95%)
2. Adverse events rate (30%):
   - Bleeding
   - Infection
   - Drain dislodgement
   - Bile leak
   - External fistula



~~Ascites~~

~~Liver metastasis~~

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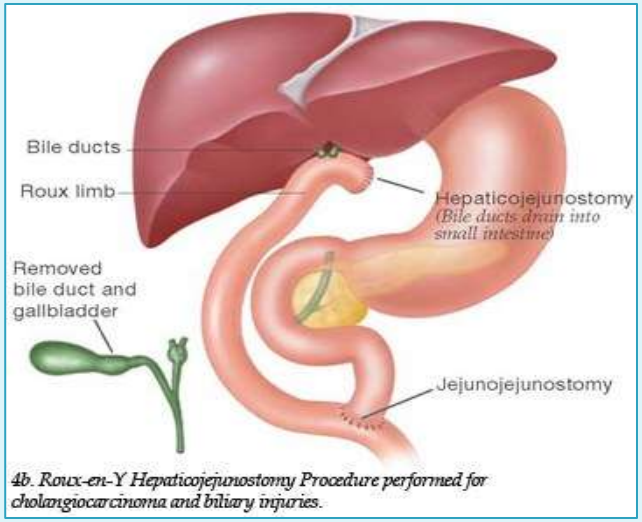
Present status of EUS-BD

Surgical bypass

- Morbidity (35-50%)
- Mortality (10-15%)



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Present status of EUS-BD

- Advantage of EUS-BD is the possibility to shift to EUS-BD **within the same procedure**, avoiding delayed biliary decompression and avoiding repeated procedures.

- Also, EUS-BD improves **patient satisfaction** and offers a **longer patency** of the stents which naturally reduce the patient costs.

Present status of EUS-BD

- The first EUS-BD was described by **Giovannini** in **2001**.
- In **Egypt**, the first EUS-BD was done by **our group** in Mansoura University in **2013** .

Endoscopic ultrasound-guided choledechoduodenostomy for palliative biliary drainage of obstructing pancreatic head mass

Ahmed Youssef Altonbary, Ahmed Galal Deiab, Monir Hussein Bahgat
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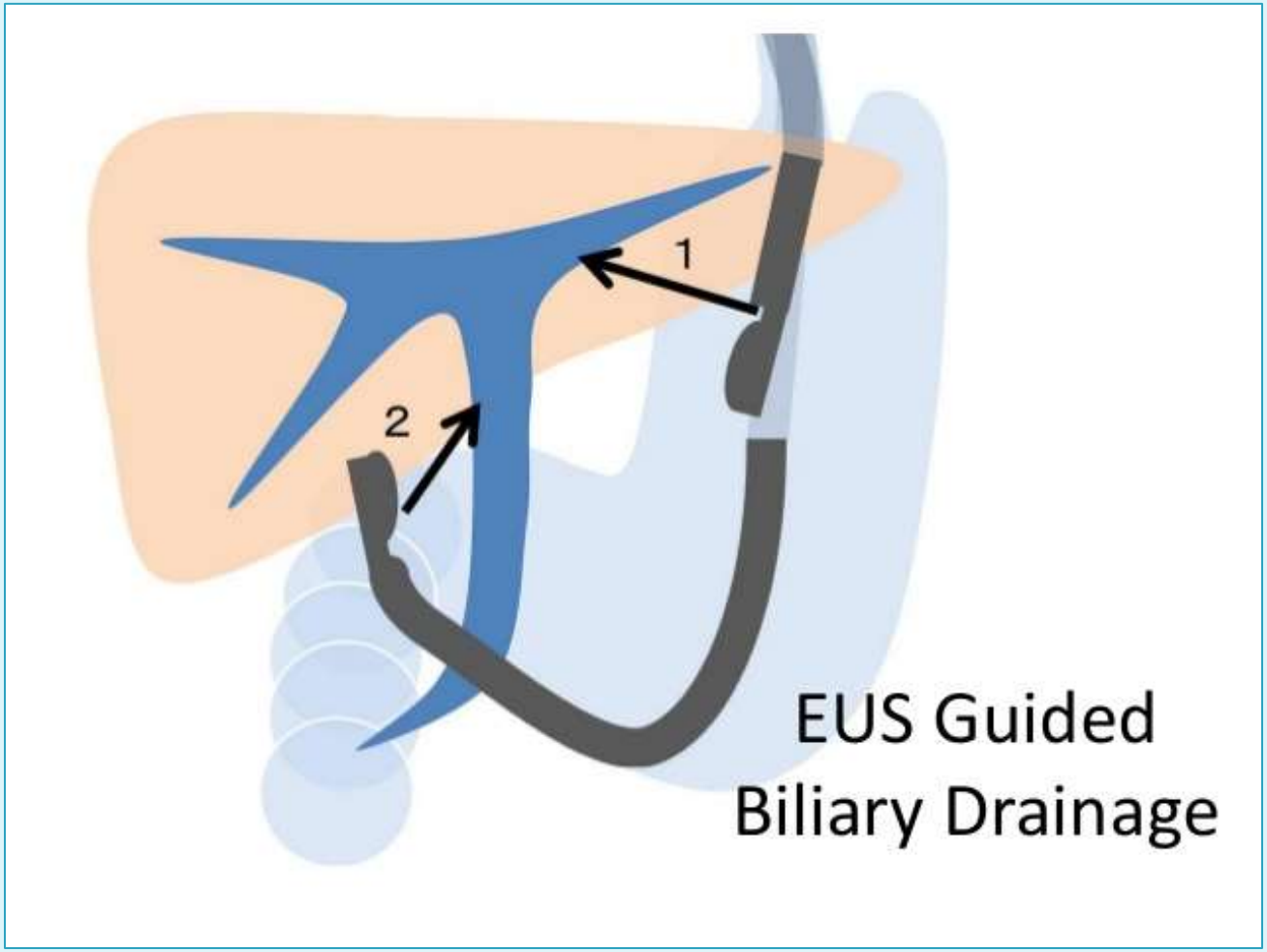
Technique



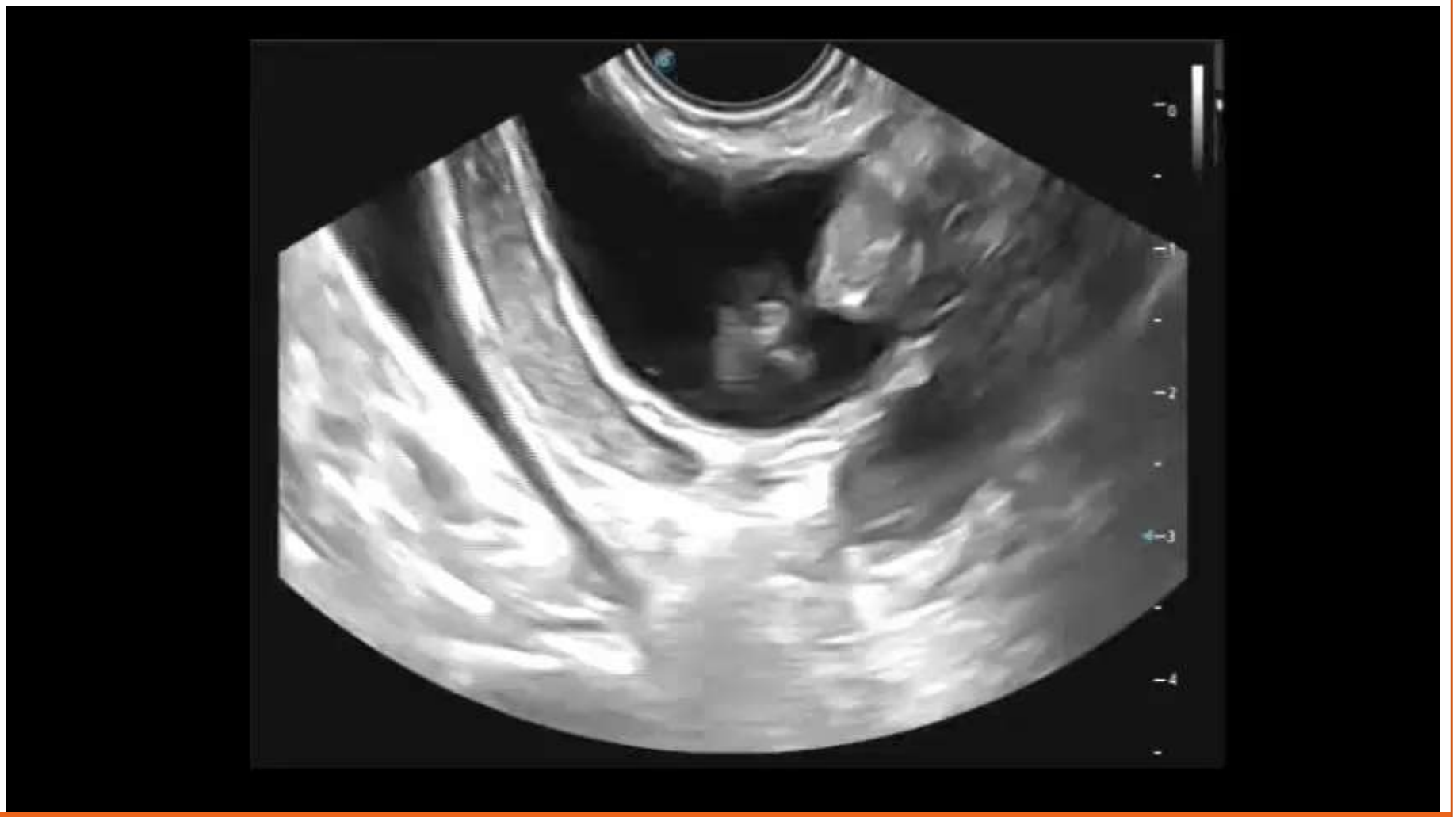
Technique

	IHBD	EHBD	
Scope position	Straight	Push (long)	Pull (short)
Schema			
Puncture site	Stomach	D1	D2
Scope stability	Stable	Stable	Unstable
Needle maneuverability	Easy	Difficult	Normal
Diameter of bile duct	Small	Large	Large
Needle direction	Ampulla	Hepatic hilar	Ampulla
Distance to papilla	Long	Short	Very short

Technique

1. EUS-CDS

Technique



Technique

- Recently, LAMS (Hot axios) have been developed for CDS in small size (6, 8 mm) as a single step procedure which significantly shortens the procedure time and adverse events (mainly bile leak).

- A recent meta-analysis examined 7 studies including 284 patients who underwent EUS-BD using LAMS. The technical and clinical success were 95.7% and 95.9%, respectively and postprocedure adverse events was 5.2%.

- A major limitation of LAMS is that the procedure can be undertaken only when the biliary ductal system is dilated (preferred more than 12 mm).

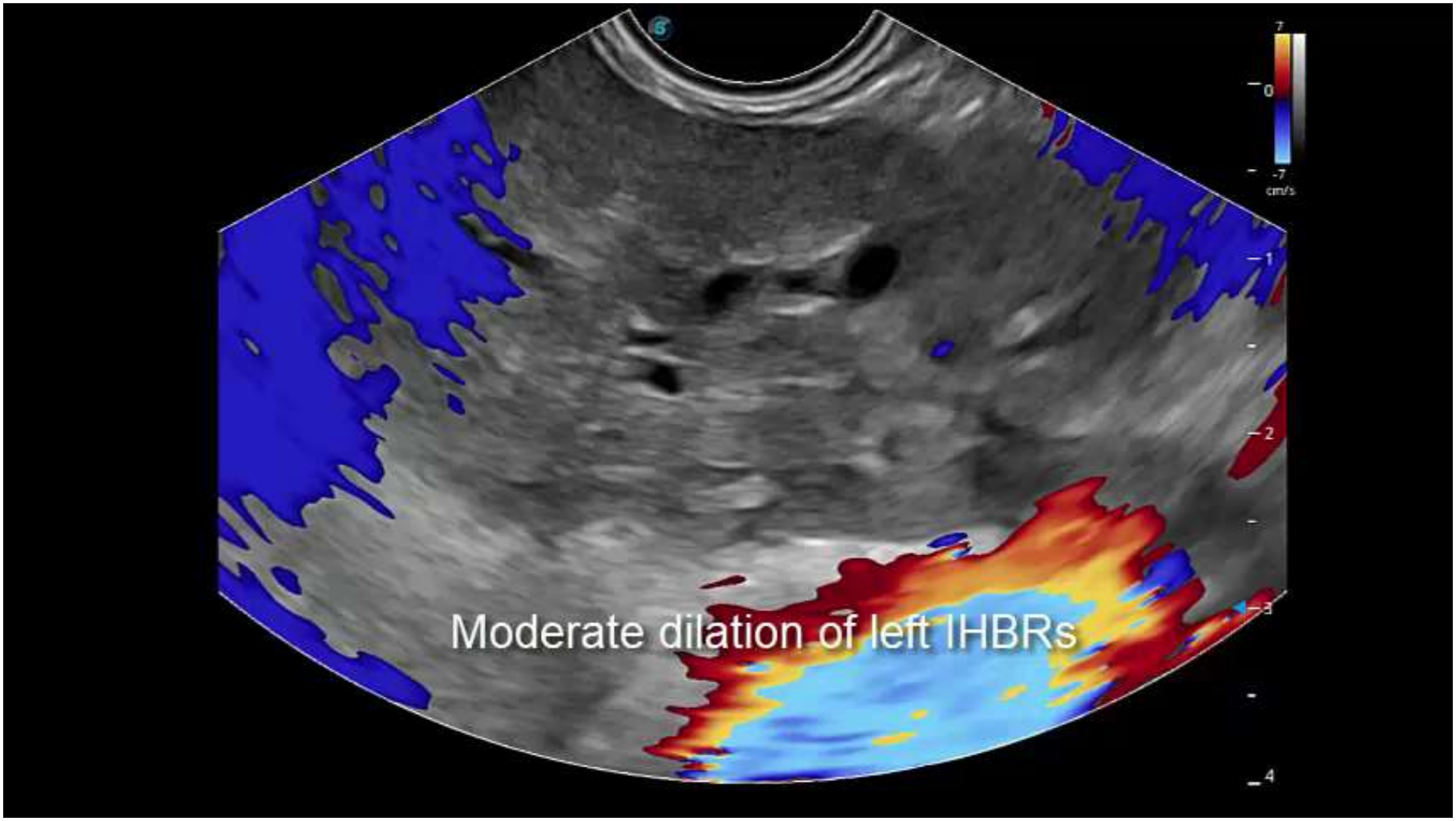
Bang JY, Hawes R, Varadarajulu S. Endoscopic biliary drainage for malignant distal biliary obstruction: Which is better – endoscopic retrograde cholangiopancreatography or endoscopic ultrasound? Digestive Endoscopy 2022, 34: 317-324.

Technique

Technique

2. EUS-HGS

Technique



Technique

3. EUS-RV

Technique

Technique

4. EUS-AGS

Technique

Technique

Overall, the success of EUS-BD procedures is significantly high, with pooled data showing:

Technical success rate of 94.7%

Clinical success rate of 91.7%

•**Wang K, Zhu J, Xing L, et al. Assessment of efficacy and safety of EUS-guided biliary drainage: a systematic review. Gastrointest Endosc 2016; 83:1218-1227.**

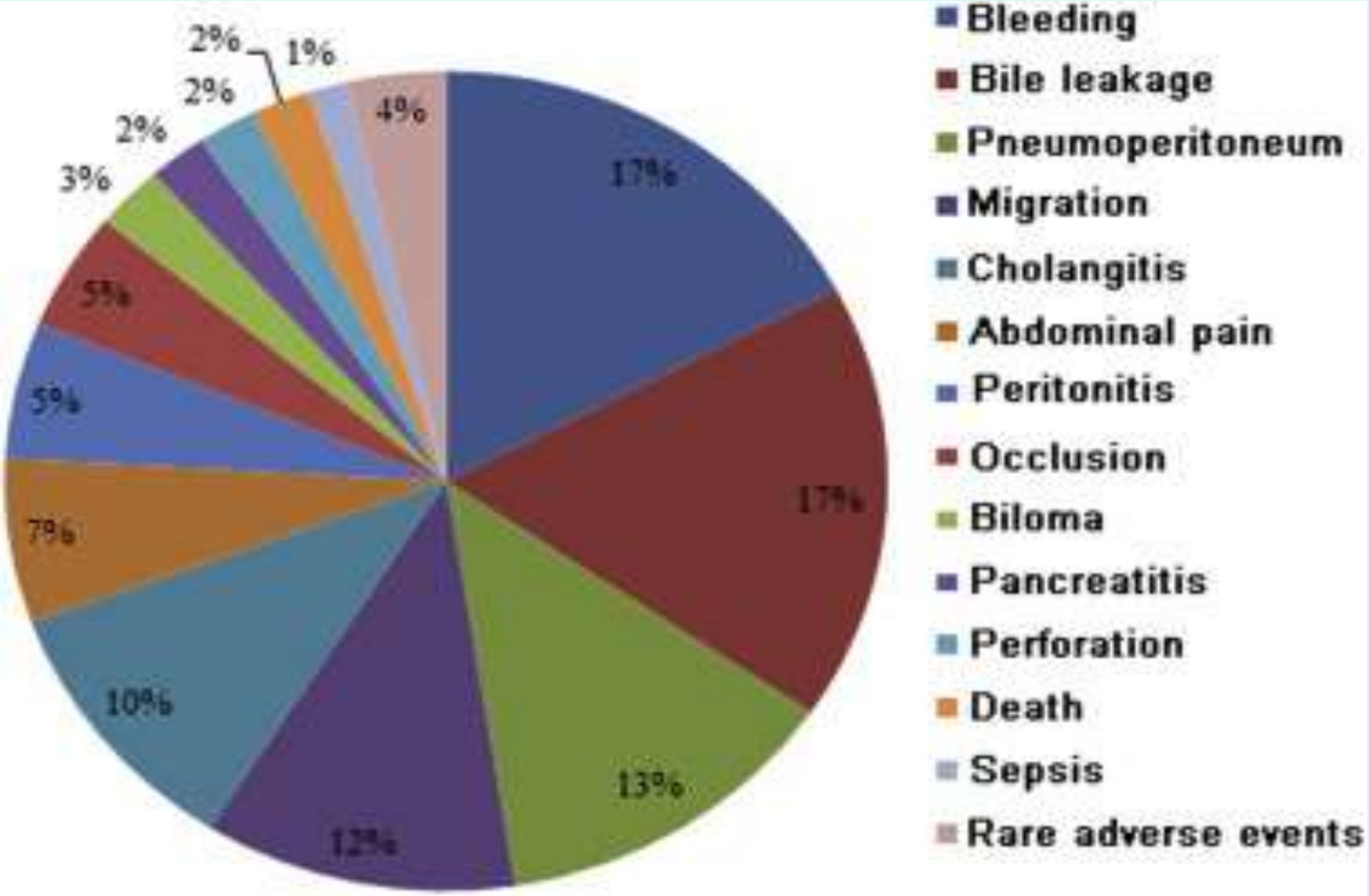
Complications

Complications

In a large meta-analysis of 42 studies including 1,192 patients, the **complication rate** was estimated as **23%.**

•**Wang K, Zhu J, Xing L, et al. Assessment of efficacy and safety of EUS-guided biliary drainage: a systematic review. Gastrointest Endosc 2016; 83:1218-1227.**

Complications



Complications

A recent review reported lower event rates between **10-20%**, this could be attributed to wider availability and better training in EUS-BD techniques.

Jovani M, Ichkhanian Y, Vosoughi K et al. EUS-guided biliary drainage for postsurgical anatomy. Endosc Ultrasound 2019; 8 (1): S57–66.

Approach

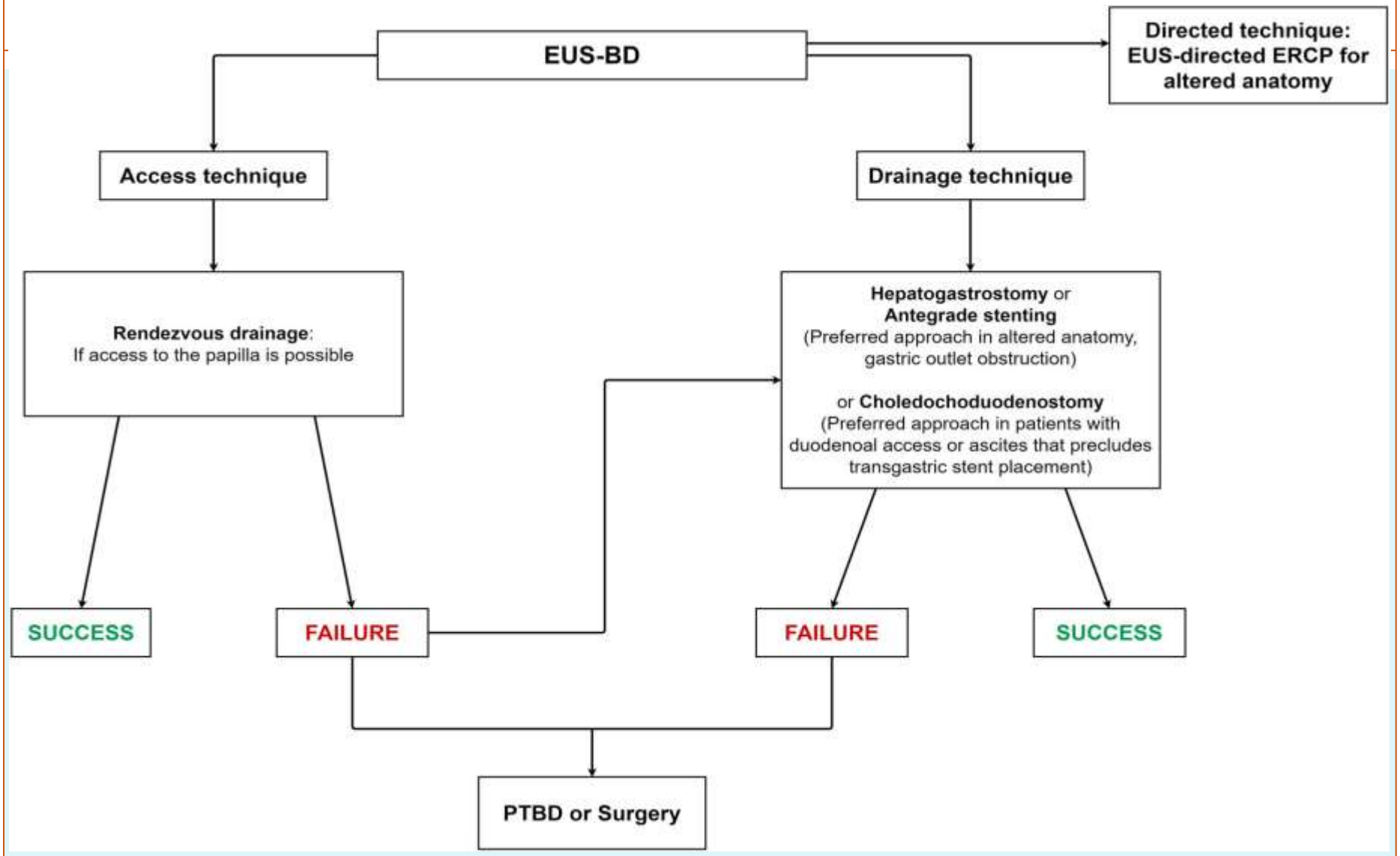
A recent meta-analysis showed equal efficacy and safety for EUS-CDS and EUS-HGS

To date, there is no agreement on the best route to achieve biliary drainage.

The choice based on a combination of factors including procedural expertise, anatomical factors such as the presence of dilated bile duct or biliary radicals, duodenal stenosis, and altered anatomy.

•Uemura RS, Khan MA, Otoch JP, et al. EUS-guided Choledochoduodenostomy Versus Hepaticogastrostomy: A Systematic Review and Meta-analysis. J Clin Gastroenterol 2018; 52:123-130.

Approach


EUS-BD
Directed technique: EUS-directed ERCP for altered anatomy
Access technique
Drainage technique
Rendezvous drainage: If access to the papilla is possible
Hepatogastrostomy or Antegrade stenting (Preferred approach in altered anatomy, gastric outlet obstruction)
or Choledochoduodenostomy (Preferred approach in patients with duodenoal access or ascites that precludes transgastric stent placement)
SUCCESS
FAILURE
FAILURE
SUCCESS
PTBD or Surgery

Can EUS replace ERCP as a primary treatment modality?

ERCP versus primary EUS-BD

Table 1 Summary of outcomes in recently published data on endoscopic ultrasound-guided biliary drainage-endoscopic retrograde cholangiopancreatography comparative analysis

Ref.	Type of evidence	Patients, *n* (%)	Technical success, EUS-BD–ERCP, *n* (%)	Clinical success, EUS-BD-ERCP, *n* (%)	AE, EUS-BD-ERCP, *n* (%)
Dhir *et al*[23], 2015	Multicenter retrospective analysis	208	94.23-93.26 (98/104-97/104)	N/A	8.65-8.65 (N/A)
Kawakubo *et al* [27], 2016	Retrospective study	82	N/A	96.2-98.2 (25/26-55/56)	26.9-35.7 (7/26-20/56)
Park *et al*[29], 2018	Prospective randomized controlled study	30	92.9-100.0 (13/14-14/14)	92.9-100.0 (13/14-14/14)	0.0-0.0 (0/14-0/14)
Paik *et al*[30], 2018	Multicenter randomized trial	125	93.8-90.2 (60/64-55/61)	84.4-85.2 (54/64-52/61)	10.9-39.3 (7/64-24/61)
Bang *et al*[28], 2018	Prospective randomized trial	125	90.9-94.1 (30/33-32/34)	97.0-100.0(32/33-34 /34)	21.2-14.7 (7/33-5/34)
Logiudice *et al* [34], 2019	Meta-analysis	222	91.96-91.81 (N/A)	84.81-85.53 (N/A)	N/A (4/79-25/76)

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ERCP versus primary EUS-BD

- A meta-analysis, published in 2019 involving 222 patients, reports **comparable** procedure time, technical and clinical success and complication rate.
- The authors report a significantly **lower rate** of stent dysfunction in the EUS-BD group.

Logiudice FP, Bernardo WM, Galetti F, et al. Endoscopic ultrasoundguided vs endoscopic retrograde cholangiopancreatography biliary drainage for obstructed distal malignant biliary strictures: A systematic review and meta-analysis. World J Gastrointest Endosc 2019; 11: 281-291.

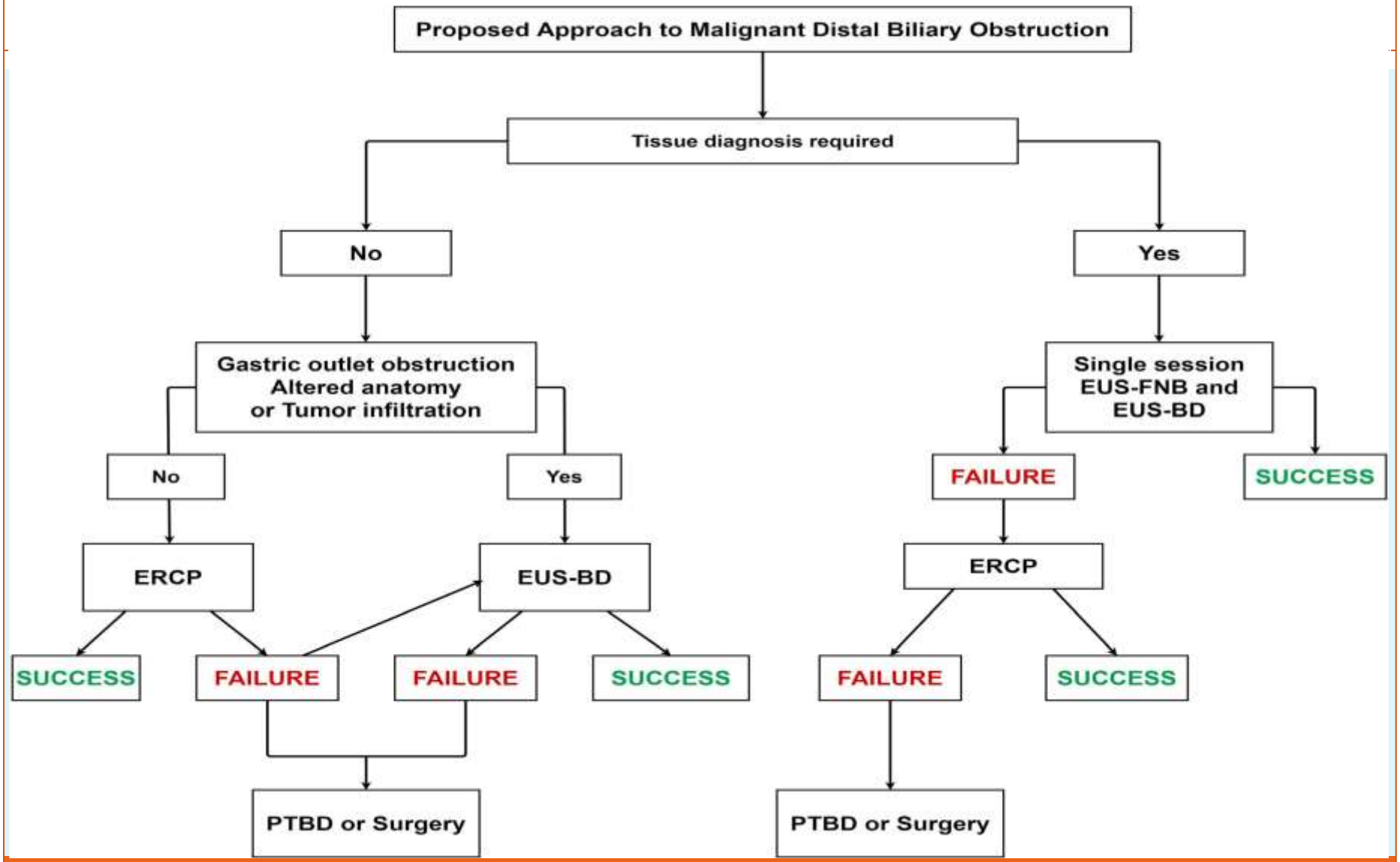
ERCP versus primary EUS-BD

- Another meta-analysis, published in 2019 including 428 patients, **no significant difference** was reported concerning procedure duration, technical and clinical success.

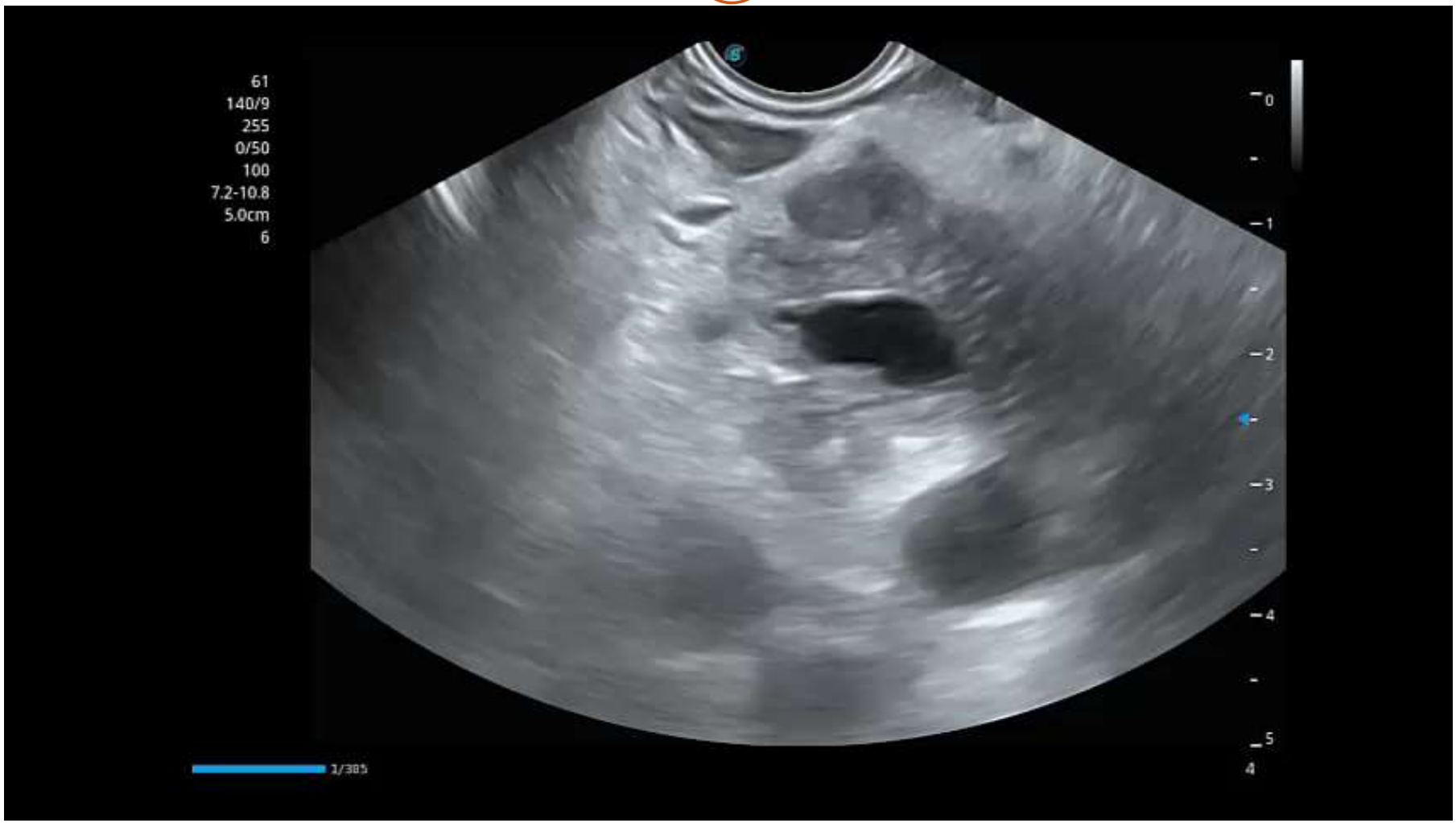
- EUS-BD, however, was associated with a **lower rate** of re-intervention and **fewer** procedure related AE regarding pancreatitis and cholangitis.

Lou X, Yu D, Li J, Feng S, Sun JJ. Efficacy of endoscopic ultrasound-guided and endoscopic retrograde cholangiopancreatography-guided biliary drainage for malignant biliary obstruction: a systematic review and meta-analysis. Minerva Med 2019; 110: 564-574

ERCP versus primary EUS-BD



Primary EUS-BD



Take home message

Take home message

- **EUS-BD** have high technical success when compared to ERCP and with a comparable safety profile.

- **EUS-BD** can be performed effectively and efficiently in expert hands. However, further procedural standardization are required to facilitate widespread adoption.

- In the future, EUS-BD **could replace** ERCP as the primary modality for biliary decompression in malignant obstruction

THANK YOU