NEW YORK SOCIETY FOR GASTROENTEROLOGY & ENDOSCOPY
48th Annual
NEW YORK COURSE
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NYSGE
New York Society for Gastroenterology and Endoscopy

EUS Biliary Drainage:

When ~~Why~~ and How

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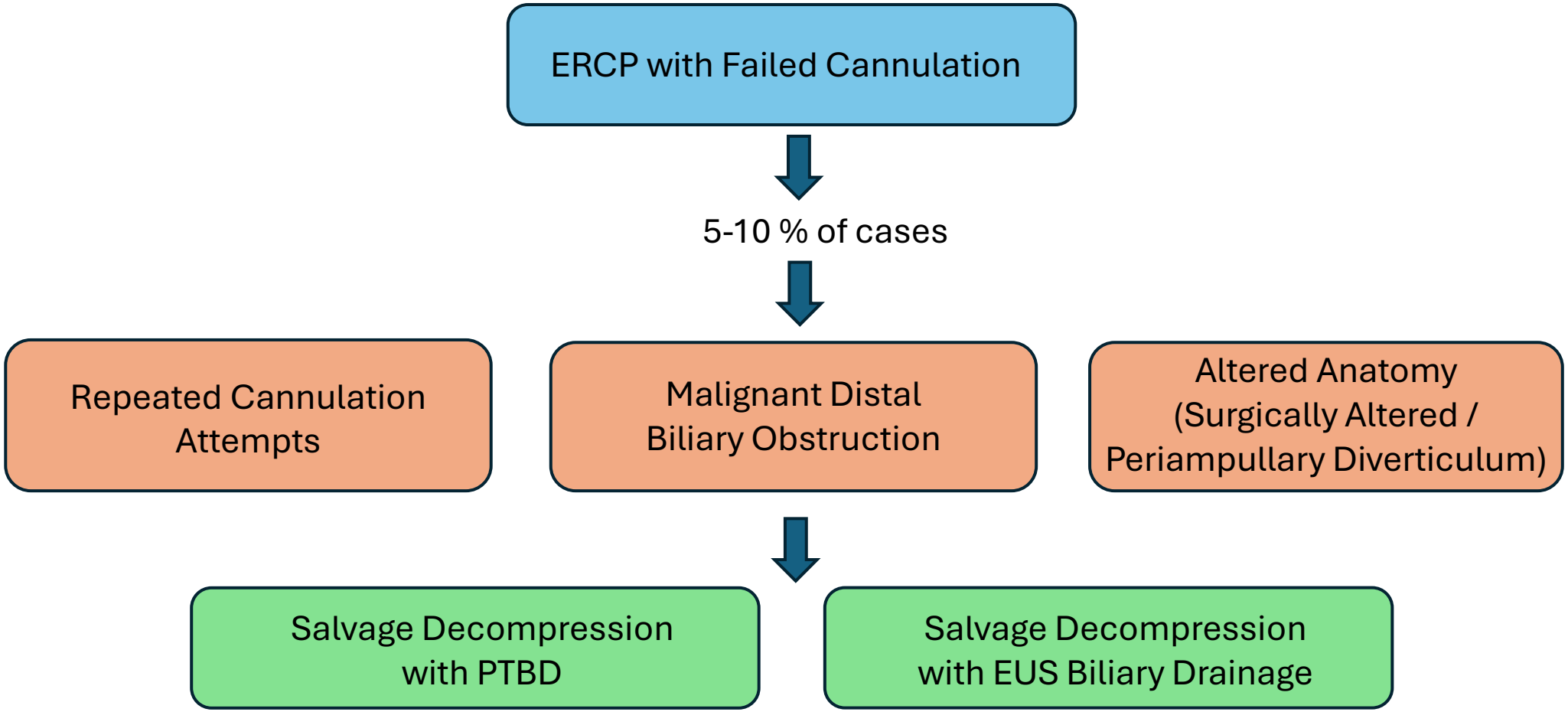
I have no disclosures

When: Is There a Need for EUS Biliary Drainage?



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Ann Gastroenterol . 2024 Aug 19;37(5):602–609
J Clin Med. 2023 Apr 6;12(7):2736.

Why: Is there a Benefit of EUS Biliary Drainage?

Comparison of PTBD vs EUS Biliary Drainage

Table 1. Rates of clinical and technical success in the included studies

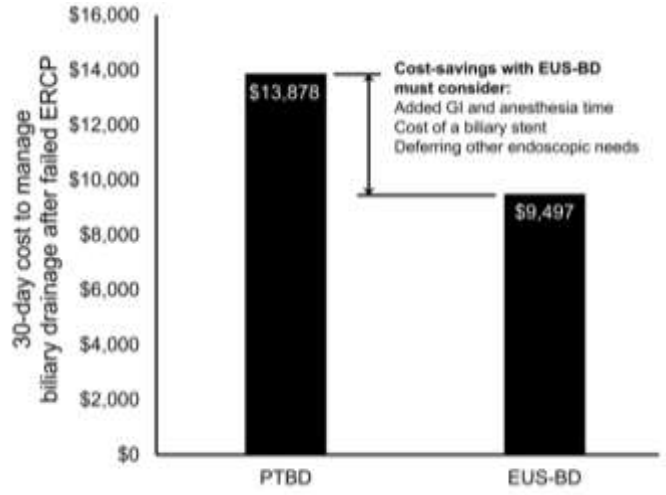
Study	Technical success		Clinical success	
	EGBD, event/ total cases, n	PTBD, event/ total cases, n	EGBD, event/ total cases, n	PTBD, event/ total cases, n
Artifon *et al*[1]	13/13	12/12	13/13	12/12
Bapaye *et al*[2]	23/25	26/26	23/25	26/26
Khashab *et al*[3]	19/22	51/51	19/19	47/51
Giovannini *et al*[4]	19/20	17/17	18/19	17/17
Jung *et al*[5]	32/34	31/32	28/32	27/31
Sharaiha *et al*[6]	43/47	12/13	27/43	3/12

EGBD = endoscopic ultrasound-guided choledochoduodenostomy; PTBD = percutaneous transhepatic biliary drainage.

Table 4. Safety and efficacy rates of outcomes of both procedures

Events	EUS-BD *versus* PTC (%)	OR with 95% CI	*P*
Technical success rate	86.2 *versus* 95	0.47 (0.20-1.07)	0.27
Clinical success rate	90 *versus* 88.6	2.24 (1.10-4.55)	0.51
Acute adverse events	7.8 *versus* 24.8	0.17 (0.09-0.31)	0.03
Chronic or delayed adverse events	2.1 *versus* 2.5	0.73 (0.34-1.57)	0.97
Total adverse events	10 *versus* 27.3	0.09 (0.02-0.38)	0.01
Death rate	1.4 *versus* 1.4	0.99 (0.37-0.266)	0.99
Re-intervention rate	3.7 *versus* 13.8	0.99 (0.16-0.45)	0.01

OR: Odds ratio; CI: Confidence interval; PTC: Percutaneous transhepatic cholangiography; EUS-BD: EUS-biliary



Endosc Ultrasound. 2022 Jan-Feb;11(1):4-16
Clin Med (Lond). 2022 Jul;22
Front Oncol. 2022 Feb 25;12:844083.

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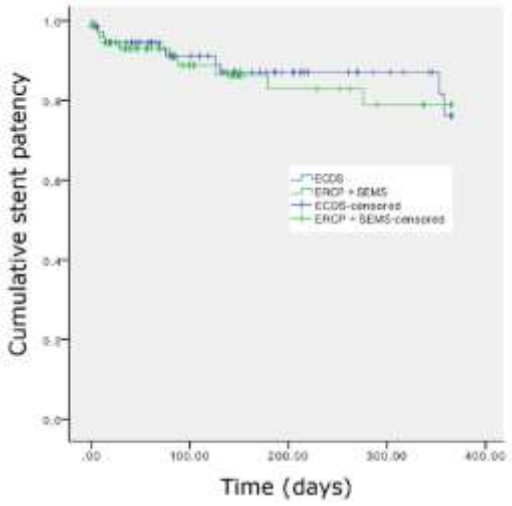
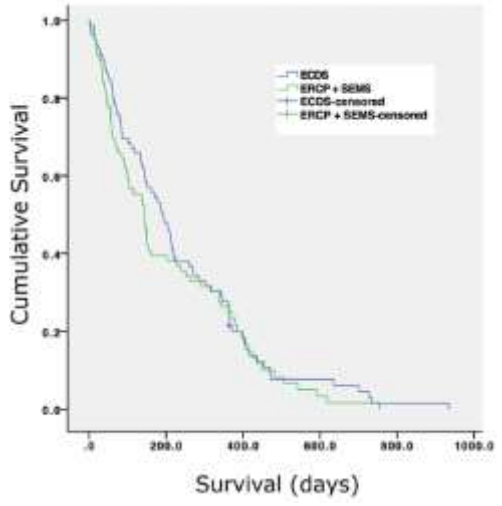
Why: Is there a Benefit of EUS Biliary Drainage?

EUS Biliary Drainage vs ERCP

Table 1
Randomized controlled studies comparing outcomes of endoscopic ultrasound-guided biliary drainage and endoscopic retrograde cholangiopancreatography as first-line drainage

Author (Year)	Number of Patients (EUS-BD vs ERCP)	Technical Success (EUS-BD vs ERCP)	Clinical Success (EUS-BD vs ERCP)	Adverse Events	Stent Patency	Reintervention
Teoh et al,[48] 2023	155 (79 vs 76)	96.2% vs 76.3%	93.7% vs 90.8%	16.5% vs 17.1%	91.1% vs 88.1%	11.3% vs 12.7%
Chen et al,[46] 2023	144 (73 vs 71)	90.4% vs 83.1%	84.9% vs 85.9%	15.1% vs 16.9%	% not reported[b]	9.6% vs 9.9%
Paik et al,[50] 2018	125 (64 vs 61)	93.8% vs 90.2%	90.4% vs 94.5%	6.3% vs 19.7%	85.1% vs 48.9%	15.6% vs 42.6%
Park et al,[47] 2018	28 (14 vs 14)	93% vs 100%	100% vs 93%	31%[a]	69%[a]	n/a
Bang et al,[49] 2018	67 (34 vs 33)	90.9% vs 94.1%	97% vs 91.2%	14.7% vs 6.1%	n/a	3 vs 2.9%





Gastro. 2023 Aug;165(2):473-482
Gastro. 2023 Nov;165(5):1249-1261.
Gastrointest Endoscopy Clin N Am 34 (2024) 487–500

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Why: Is there a Benefit of EUS Biliary Drainage?

Surgery after EUS Biliary Drainage

n = 145	EUS-BD, n = SS	ERCP, n = 87	
Type of surgery performed	Whipple = 41, Diagnostic Lap = 2, BD deviation = 5, CCY = 2, Partial hepatectomy = 7, Gastroenterostomy = 1	Whipple = 56, Diagnostic Lap = 4, COf = 2, Partial hepatectomy = 14, Aborted Surgery = ll	—
The time between initial procedure and surgery	Mean 37 d	Mean 64 d	*P* value 0.0205
Surgery technical success, n (%)	Yes, n = 56 (97)	Yes, n = 72 (83)	*P* value 0.009
Surgery clinical success (tumor resection, relief of obstruction, etc), n (%)	Yes, n = 56 (97)	Yes, n = 65 (75)	*P* value 0.0004
Surgery adverse events, n (%)	Leak = l, Bleeding = 2, Abscess = 2, Stricture = l (n = 6, 10)	Sepsis = 2, Skin infection = 3 , Post surgical collection = 6, Leak = 2, other = 5 (n = 18, 21)	*P* value 0.1152
Re-stenting after surgery, n (%)	Yes, n = 3 (5)	Yes, n = 13 (15)	—
Total length of hospital stay from Surgery to Discharge (d)	Mean l0 d	Mean 19 d	*P* value 0.0081
Total follow-up from initial intervention	Mean 12.8 mo	Mean 6.9 mo	—
Alive, n (%)	Yes, n = 36 (62)	Yes, n = 58 (67)	—

Gastro. 2023 Nov;165(5):1249-1261
J Clin. Gastro 2023; 57(9): 962-966

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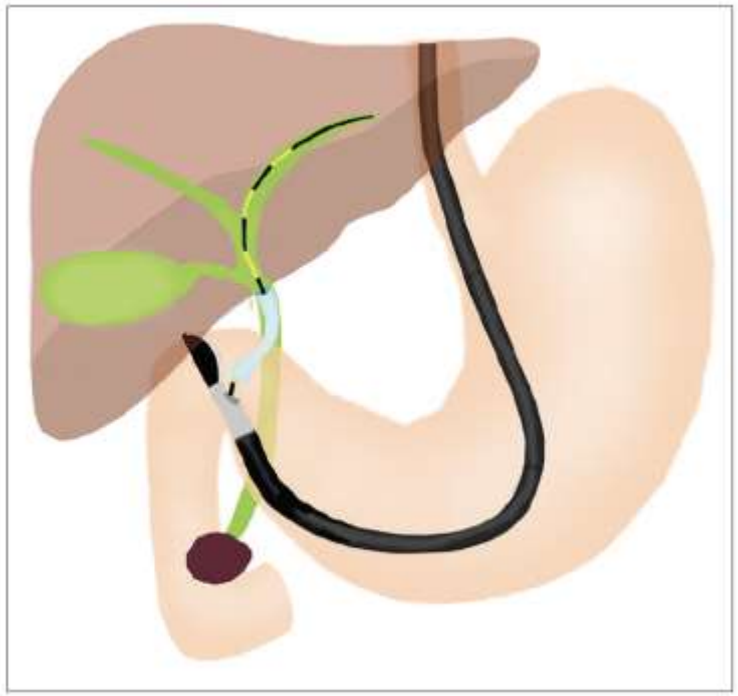
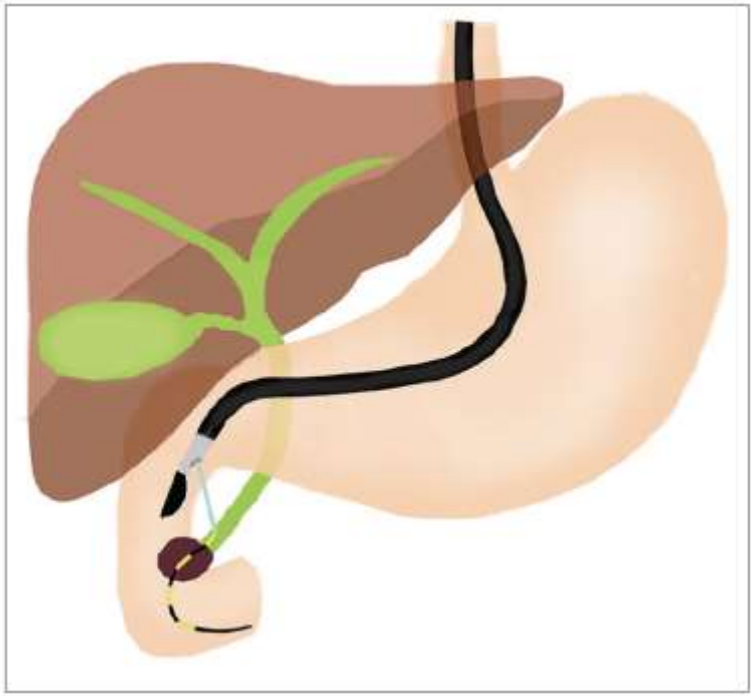
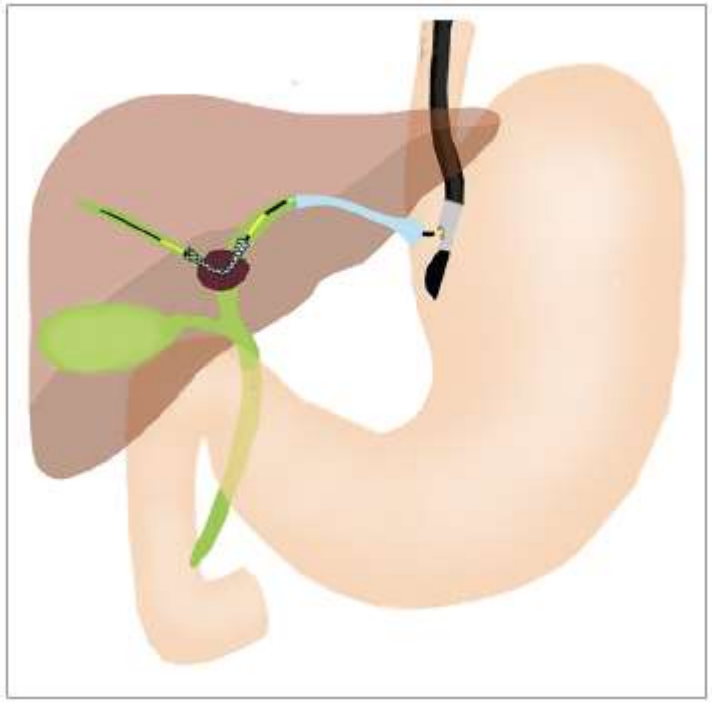
How: How to Perform EUS Biliary Drainage?



Choledochoduodenostomy



Rondezvous



Hepaticogastrostomy

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How: How to Perform EUS Biliary Drainage

EUS Biliary Drainage		ERCP
1) Transmural puncture of the biliary system under EUS with confirmatory cholangiography ➢ Not obligatory	→	1) Endoscopic cannulation of the ampulla with confirmatory cholangiography
2) Placement of a guidewire ➢ Not obligatory	→	2) Placement of a guidewire
3) Creation of a fistula between the enteral tract and bile duct	→	3) Sphincterotomy
4) Stabilization of the fistula with stent placement	→	4) Maintain duct patency with stent placement

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How: How to Perform EUS Biliary Drainage?

Endoscopy. 2023 Apr 21;55(Suppl 1):E643–E644.

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How: How to Perform EUS Biliary Drainage?

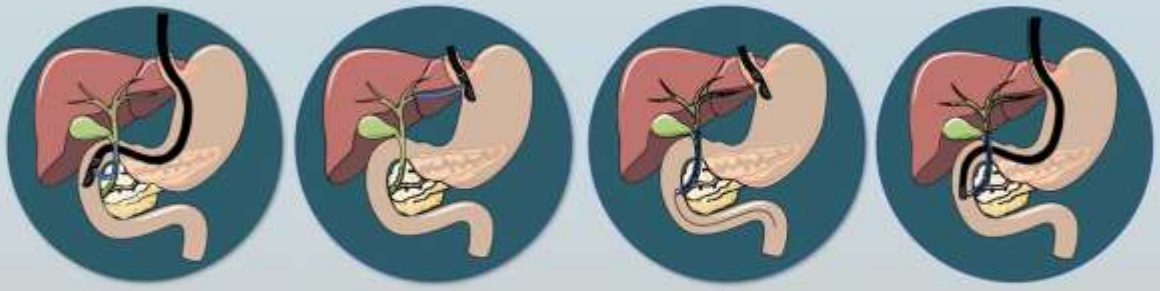
GIE Gastrointestinal Endoscopy

Adverse Events with Endoscopic Ultrasound-guided Biliary Drainage: A Systematic Review and Meta-analysis

Data source

- 3 Databases
- 155 studies
- 7887 patients

Results



	Overall	EUS-CDS	EUS-HGS	EUS-AG	EUS-RV
Clinical success	95.0% (94.1-95.9)	97.2% (96.1-98.3)	92.3% (90.2-94.3)	97.2% (95.3-99.1)	-
Adverse events	13.7% (12.3-15.0)	11.9% (9.9-14.0)	15.5% (12.9-18.0)	9.9% (6.3-13.4)	8.8% (5.9-11.7)
Major adverse events	0.6% (0.3-0.9)	0.6% (0.1-1.1)	0.6% (0.1-1.1)	0.2% (0.0-1.3)	0.0% (0.0-1.1)
Mortality	0.1% (0.0-0.4)	0.0% (0.0-0.4)	0.2% (0.0-0.5)	0.0% (0.0-1.1)	0.0% (0.0-1.5)
Reintervention	16.0 (13.9-18.2)	15.8% (12.2-19.5)	20.9% (16.3-25.6)	9.2% (6.0-12.4)	-

Giri S, et al. 2023

GIE 2023. 98(4):515-523.

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How: How to Perform EUS Biliary Drainage?

Resources:

Conferences -> Live cases & Videos

EUS guided choledochoduodenostomy

Dietrich et al. Endosc Ultrasound. 2022 Oct 5;11(5):342–354.
Dhir et al. Gastrointest Endosc. 2022 Nov;96(5):857-860.
Ogura et al World J Gastroenterol. Jan 21, 2015; 21(3): 820-828

EUS guided hepaticogastrostomy

Shah-Khan et al. Endoscopy. 2023 Apr 21;55(Suppl 1):E643–E644.
Ogura et al. Gut Liver. 2021 Mar 15;15(2):196-205.
Kadkhodayan et al VideoGIE. 2024 Jun 6;9(9):417-424.

How: How to Perform EUS Biliary Drainage?

Learning Curve:
CUSUM analysis
for procedure time

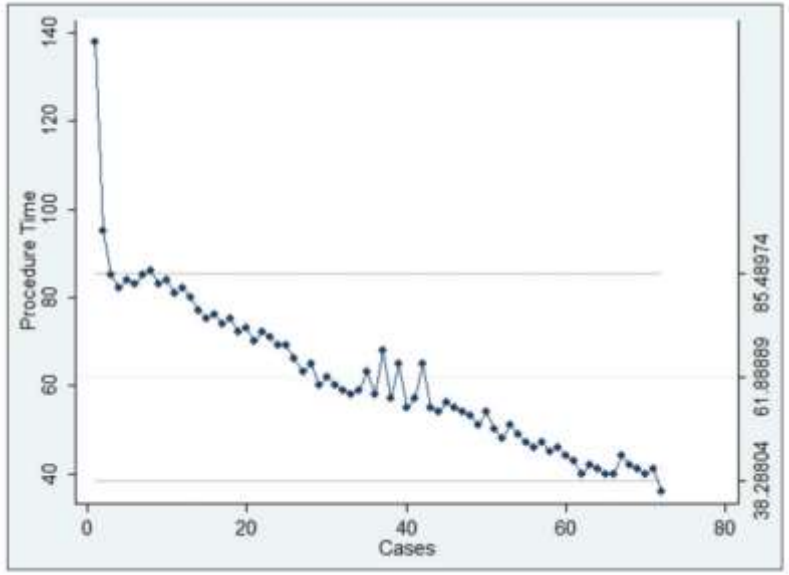

TABLE 1. Baseline study characteristics and demographics of included patients

Study	Year	Country	Study type	No. of operators	No. of centers	No. of patients	No. of procedures needed in the learning curve	No. of malignant biliary obstructions	No. of adverse events
Tyberg et al[18]	2020	USA	Prospective	1	1	72	32	56	7
Oh et al[19]	2017	South Korea	Prospective	1	1	129	33	113	32
James and Baron[20]	2019	USA	Retrospective	1	1	60	40	23	9

WJG 2016. 22:1297-1303
Endosc Ultrasound 2020. 9(6): 392-396
iGIE 2024. 3(2): 202-209

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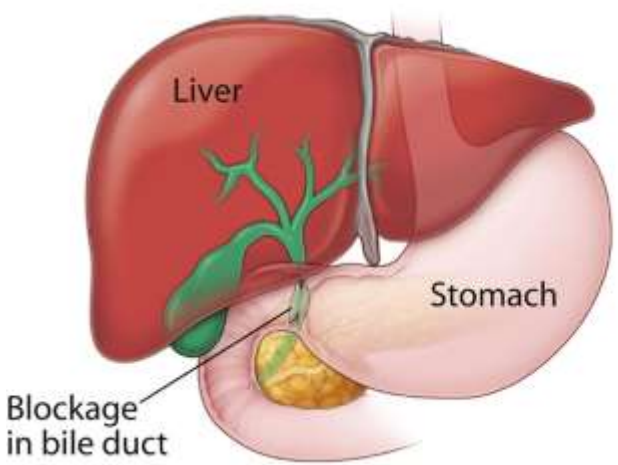
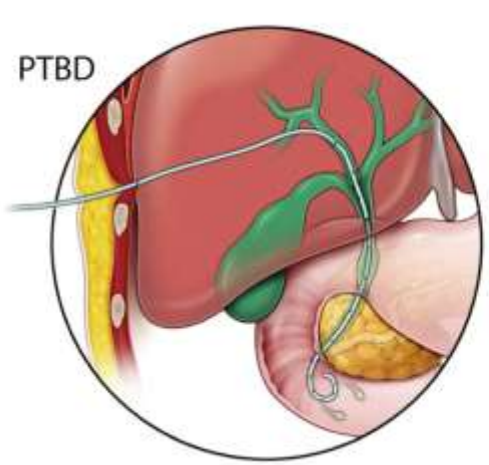
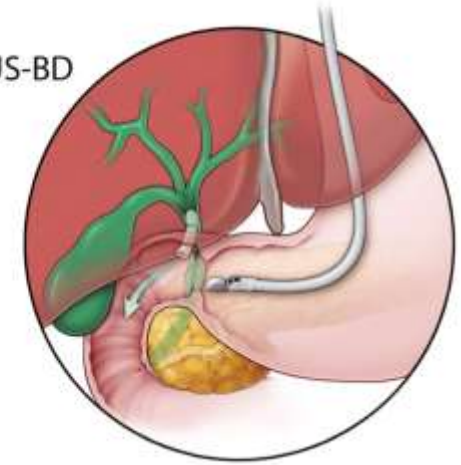
Conclusion

- When
- Why
- How







Thank you very much

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