

Future Perspectives in EUS

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Disclosures

Consultant for Boston Scientific, Olympus America, Medtronic

Diagnostic EUS

Slim Echoendoscopes
Detachable EUS probes
Endohepatology

Digestive Endoscopy 2016; **28**: 650–656

doi: 10.1111/den.12658

Original Article

Endoscopic ultrasonography is not required for staging malignant esophageal strictures that preclude the passage of a diagnostic gastroscope

Ji Young Bang,¹ Jayapal Ramesh,² Muhammad Hasan,³ Udayakumar Navaneethan,³
Bronte A. Holt,³ Robert Hawes³ and Shyam Varadarajulu³

Olympus UCT



Pentax J10UT



Linear Echoendoscopes

Pentax J10U



Distal tip 12.9mm

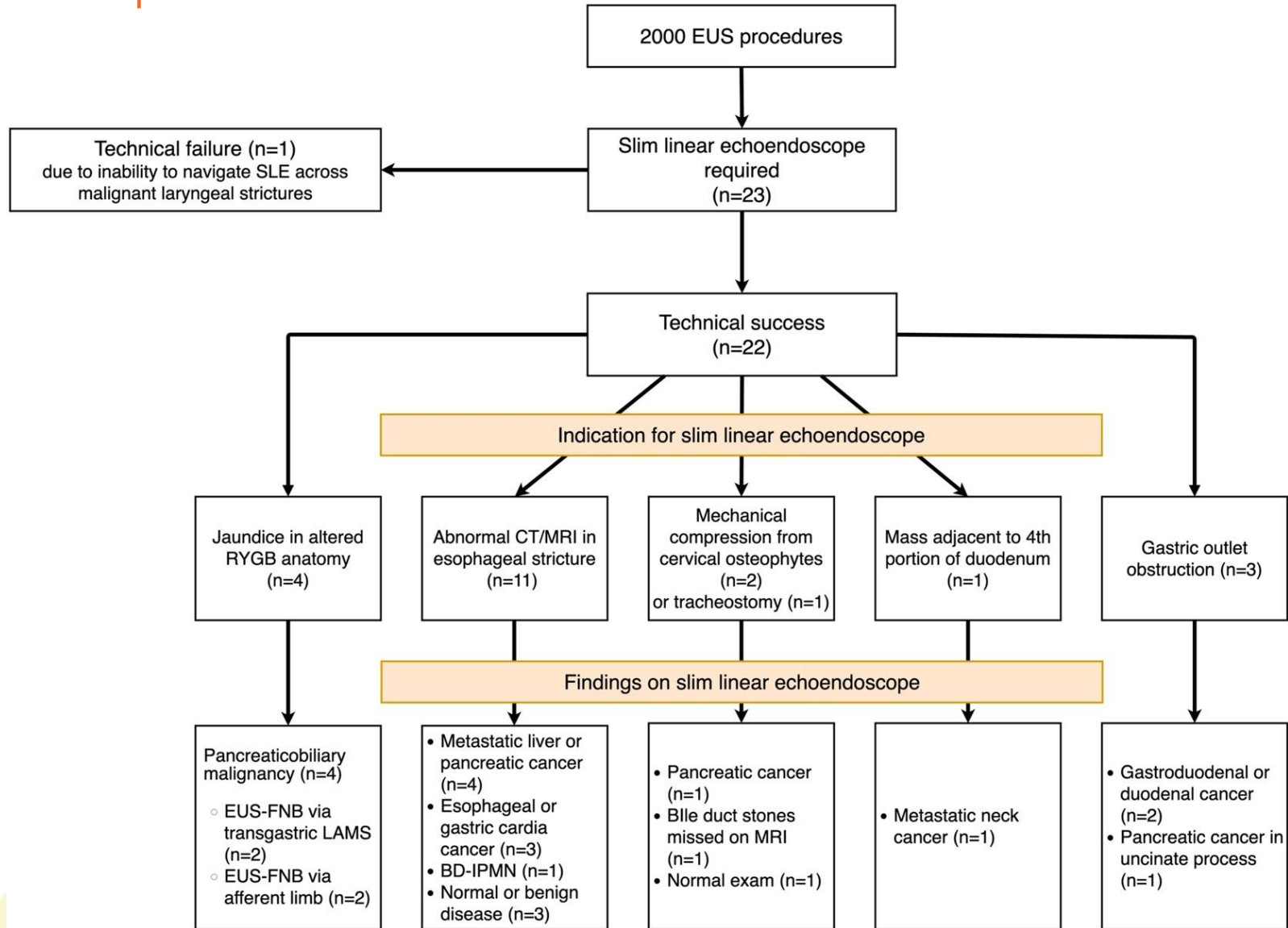
Fuji 580UT



Slim Linear Echoendoscope

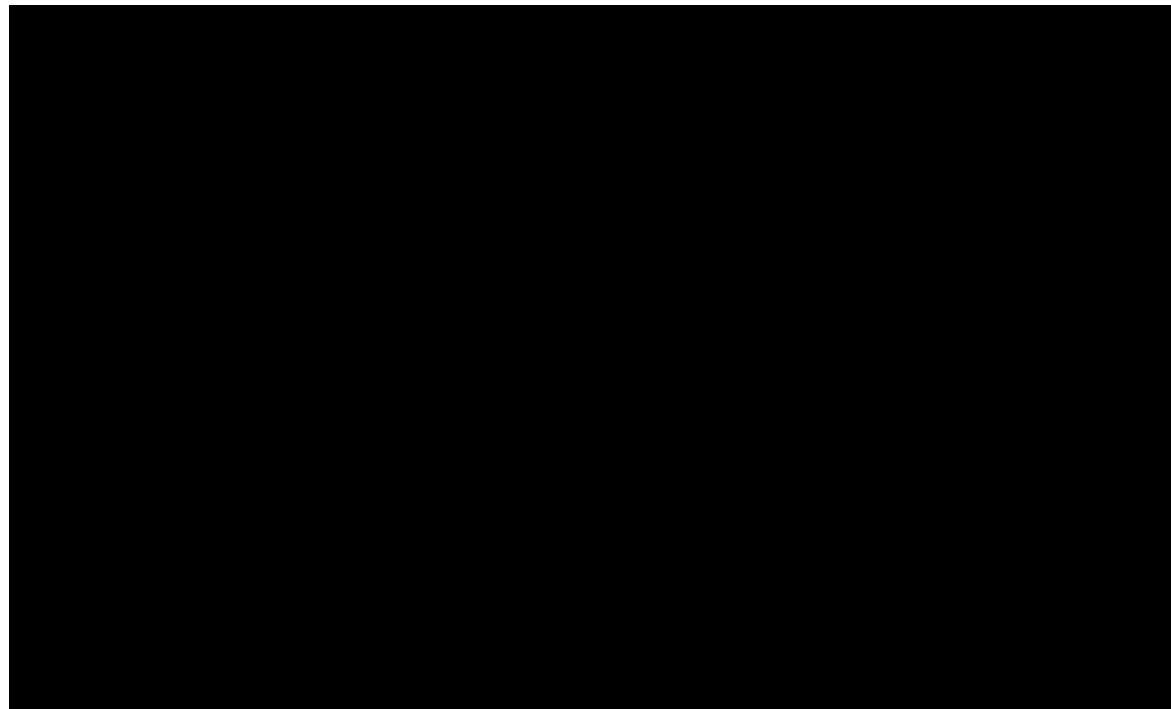
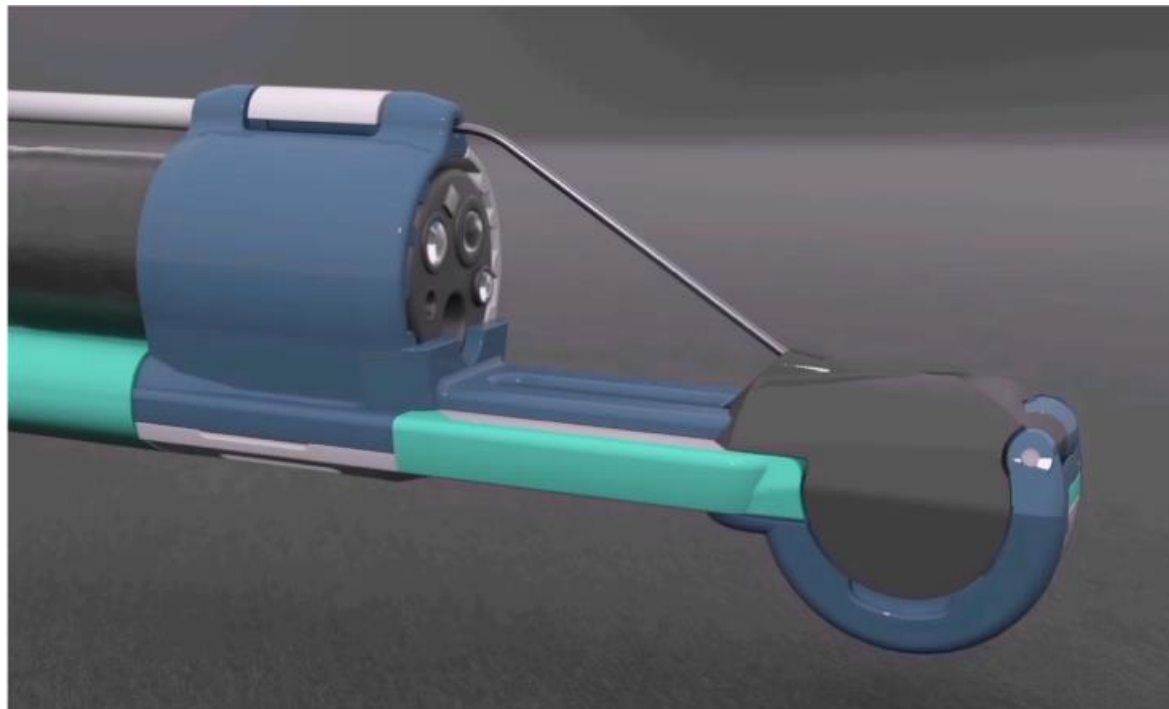
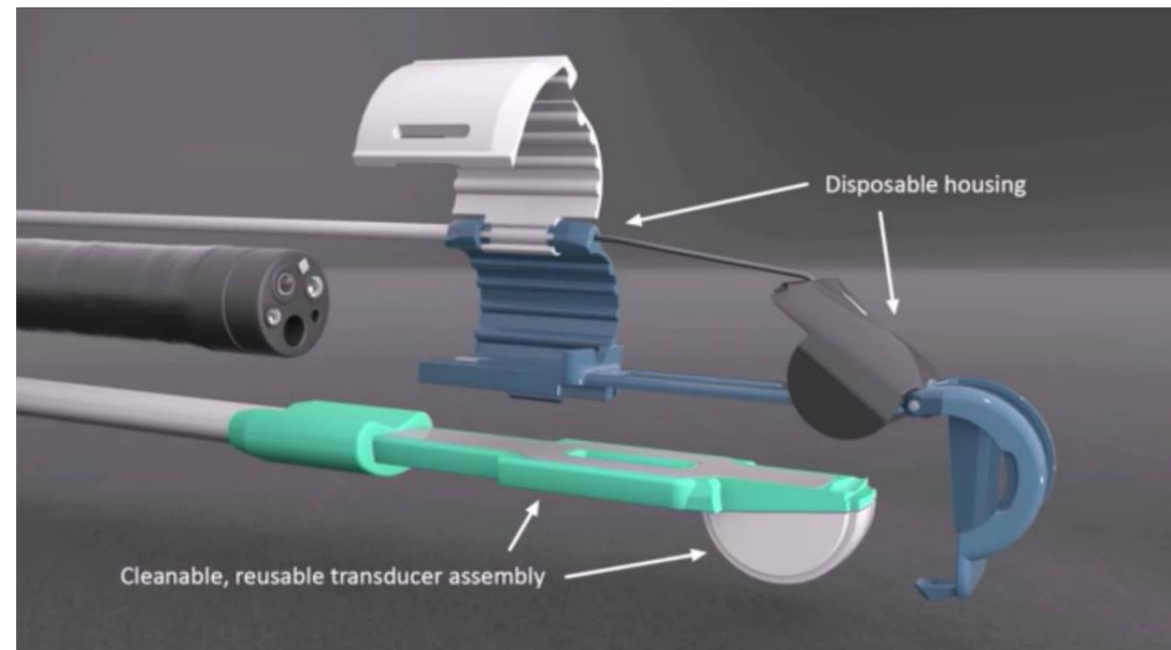


1.15% of 2000 EUS procedures



.....

EndoSound Vision System

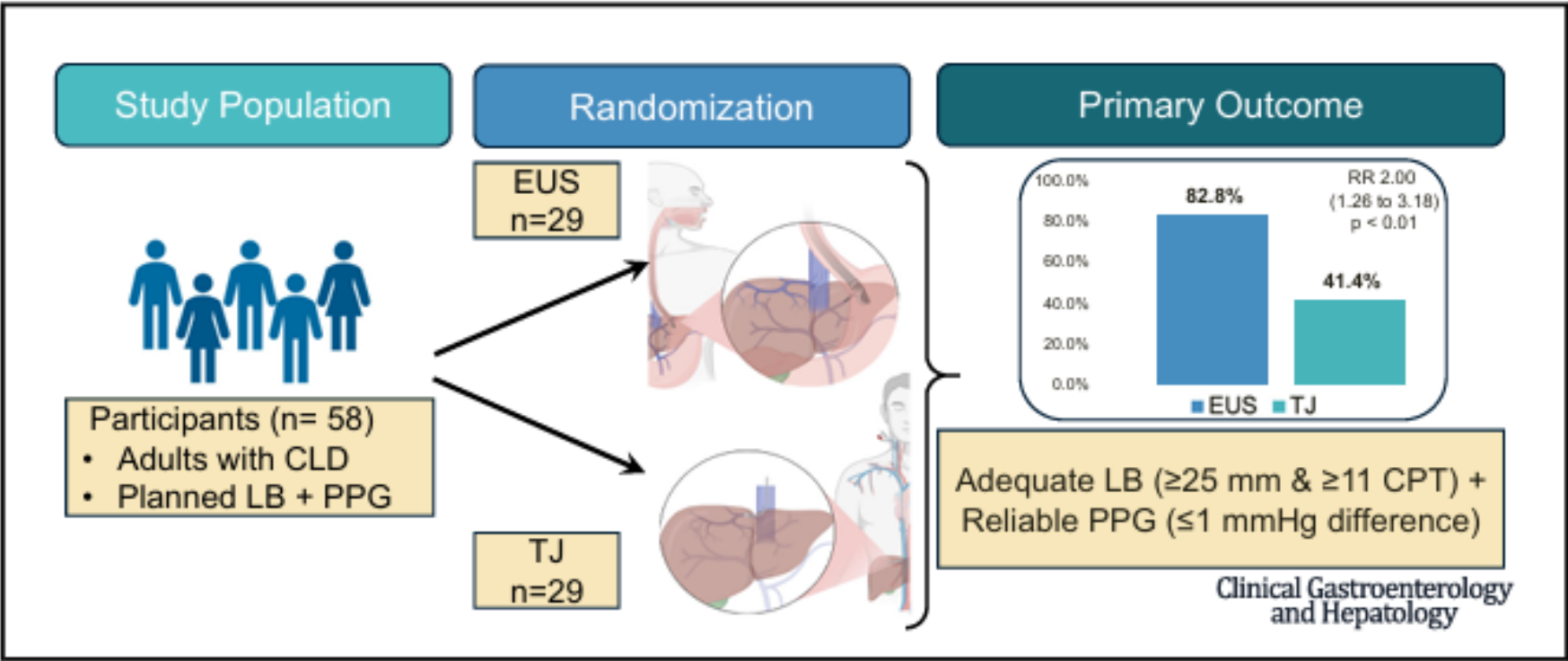


Endohepatology

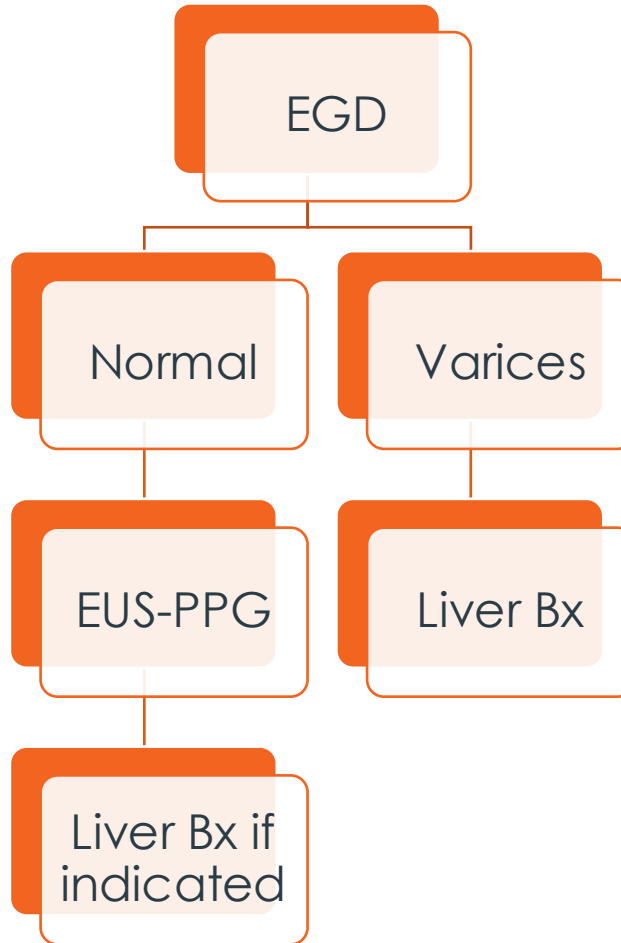


ENDOSCOPY

EUS-Guided Liver Biopsy and Portal Pressure Measurement Compared With a Transjugular Approach: A Randomized Controlled Trial



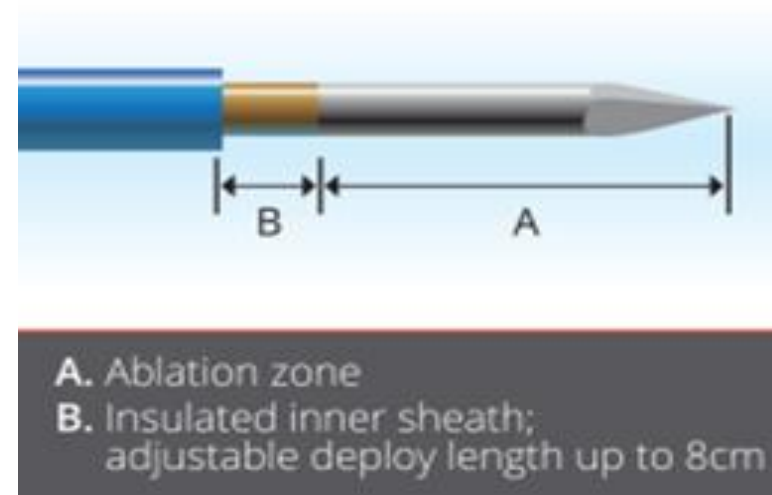
Work-up of suspected cirrhosis



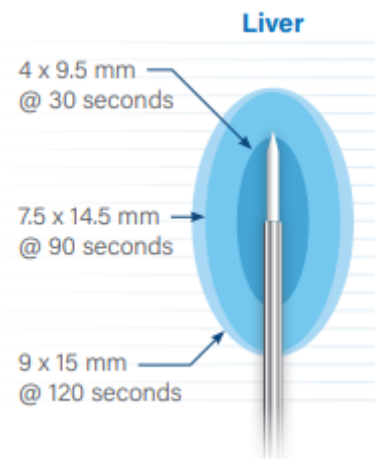
Interventional EUS

Tumor/Cyst Ablation
Acute Necrotic Collections
Gallbladder & Biliary Drainage
Lumen-Apposing Metal Stents

Taewoong RFA



Creo Medical MicroBlate Flex



Exploration of Targeted Anti-tumor Therapy

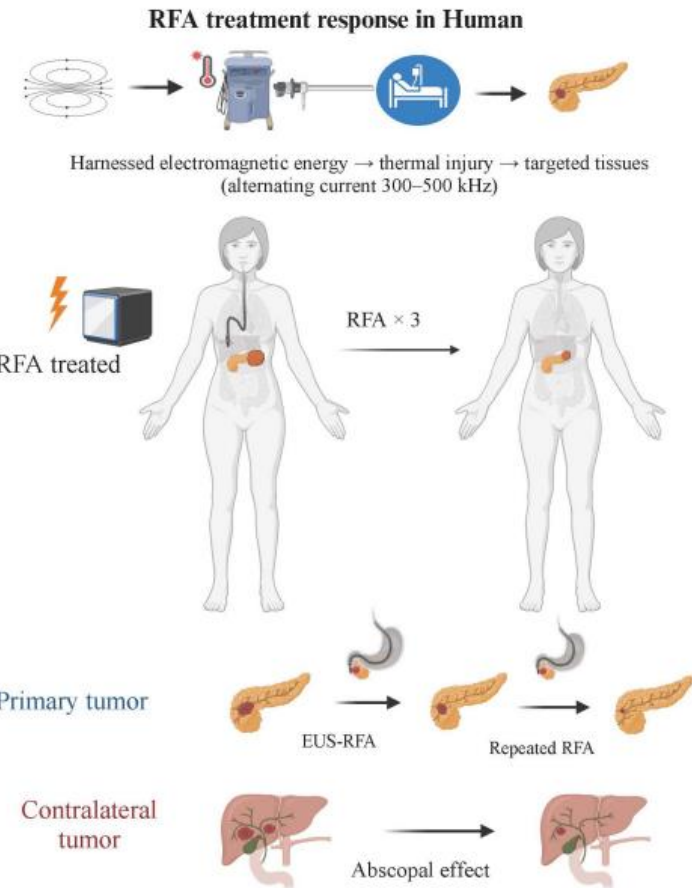


Open Access Review



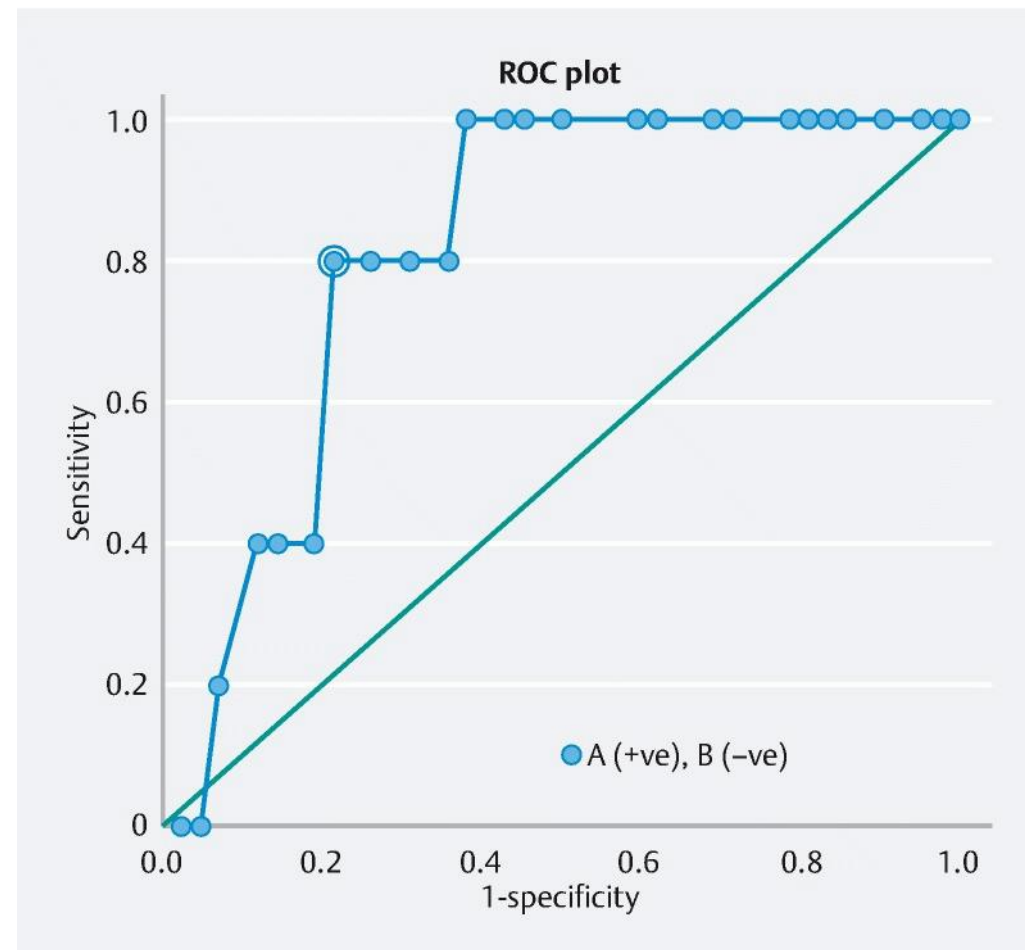
Harnessing endoscopic ultrasound-guided radiofrequency ablation to reshape the pancreatic ductal adenocarcinoma microenvironment and elicit systemic immunomodulation

Vishali Moond¹ , Bhumi Maniyar^{2,3} , Prateek Suresh Harne⁴ , Jennifer M. Bailey-Lundberg^{2,3} ,
Nirav C. Thosani^{1,5*}



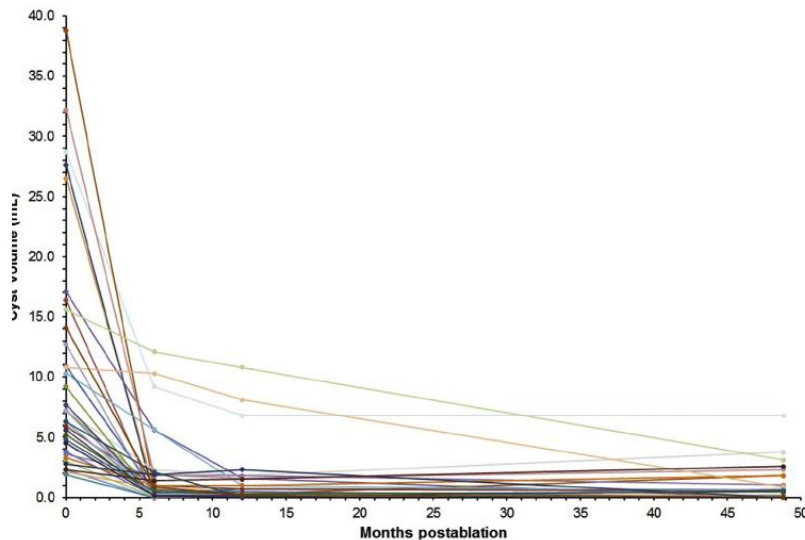
EUS-guided RFA

- Total 19 studies, 183 patients
 - ✓ F-PNET: Efficacy 95%, AE 17.8%. 5/16 reports 1 patient, 10/16 < 1yr f/u.
 - ✓ NF-PNET: Efficacy 93.4%, AE 24.6%. Efficacy decreased with f/u. 4/9 reports 1 patient. 6/9 ≤1yr f/u.



Rx response: Size < 18 mm

The Safety and Efficacy of an Alcohol-Free Pancreatic Cyst Ablation Protocol



NEW FINDINGS

With a 67% rate of complete ablation at 12 months, alcohol-free chemoablation of precancerous type pancreatic cysts is as effective as the current standard of ethanol + paclitaxel; in addition, it also provides a significant reduction in both serious and minor adverse events. AEs – 22% vs. 0

The Durability of EUS-Guided Chemoablation of Mucinous Pancreatic Cysts: A Long-Term Follow-Up of the CHARM trial

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ORIGINAL ARTICLE

Prospective study on the incidence, prevalence and 5-year pancreatic-related mortality of pancreatic cysts in a population-based study

- 1077 participants (55.8yrs $\pm$ 12.8yrs)
- Prevalence of 49.1% with size 2-29mm
- 5-year follow-up: 12.9% new cysts; 57.1% increased in size
- No participant died of pancreatic disease

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EUS-guided Ablation of Pancreatic Cysts and Solid Masses – Durable Treatment or Delaying the Inevitable?

God grant me the serenity to accept the things I cannot
change, the courage to change the things I can, and the
wisdom to know the difference

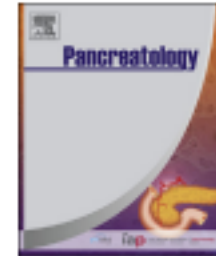
Reinhold Niebuhr



Contents lists available at ScienceDirect

Pancreatology

journal homepage: www.elsevier.com/locate/pan



Early infection is an independent risk factor for increased mortality in patients with culture-confirmed infected pancreatic necrosis



20.9%

Severe Acute Pancreatitis

Pancreatic Necrosis (Tissue Damage)

Systemic inflammation (SIRS)



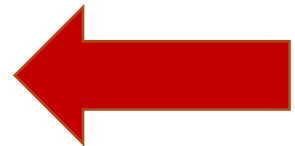
0-2 weeks ↓ $\xrightarrow[\text{UFA}]{\text{DAMPs}}$ OF (1⁰)

3 weeks ↓ $\xrightarrow{\text{PAMPs}}$ OF (2⁰)

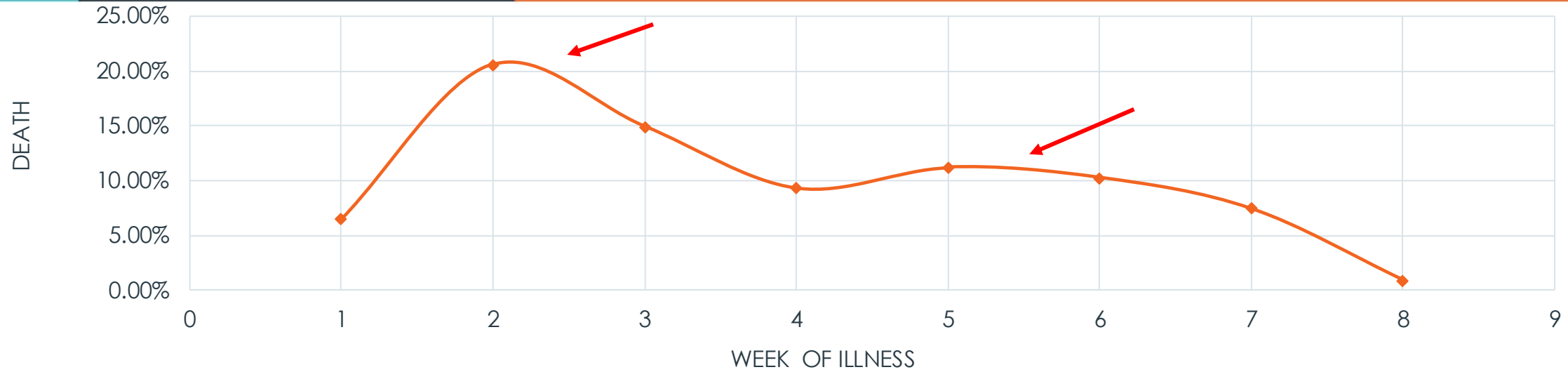
Mortality: 1⁰ OF + INP = 49.5% vs. 2⁰ OF + INP = 36% vs. INP = 4%

TABLE 4. Differences Between Primary and Secondary OF

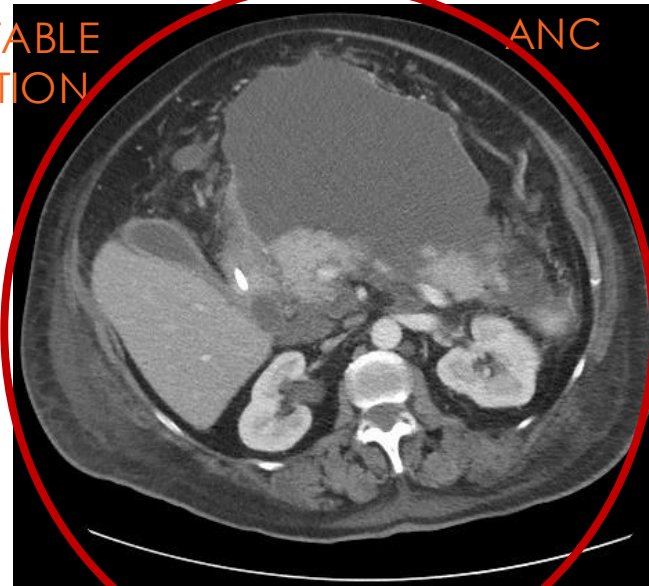
Characteristic	Primary OF	Secondary OF
Cause	Sterile inflammation	Sepsis
Timing	Early	Late
Window of opportunity	Small	Large
Treatment	Supportive	Control of sepsis
Prognosis	Poor	Relatively better



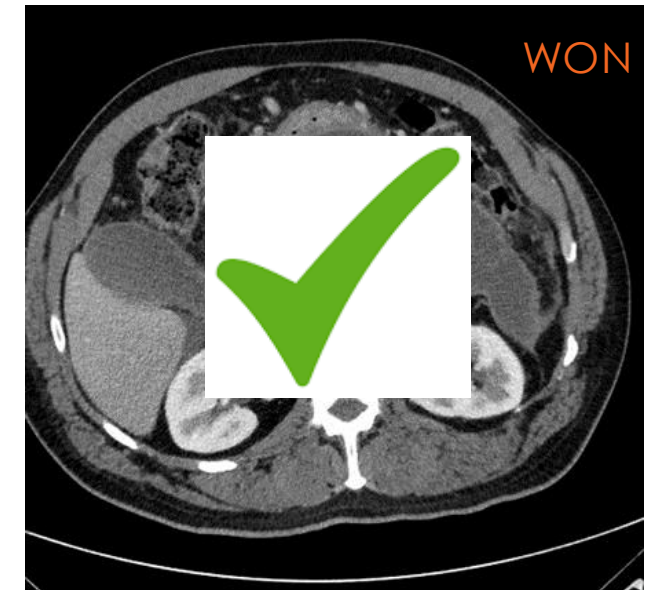
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Week 1

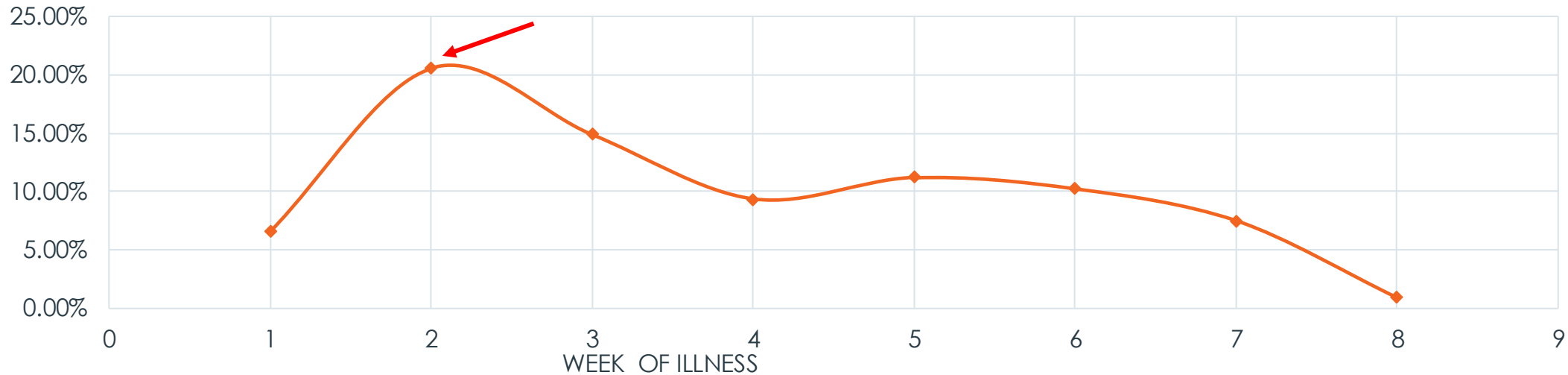


Week 2-3



Week 4

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Early Infection: Benefit the most from endoscopic drainage, particularly if there is a **treatable collection**, as this likely is associated with reduction in inflammatory cytokines as compared to minimally invasive percutaneous surgery.

Late infection: Difference may not be apparent between approaches except for treatment burden and costs.

MISER vs. TENSION vs. POINTER

	MISER	TENSION	POINTER
ASA (III/IV)	94%	10%	49% (III)
CTSI	8-10 in 97%	Median 6 (6-8)	Mean 7 $\pm$ 2
APACHE II	33.7 (SD = 13.5)	$\geq$ 20 in 6%	12 (8-14)
<30% Necrosis	25%	51%	67%
Time to Rx	25% $\leq$ 20	39 (28-54)	24 (20-30)
Necrosectomy	3	10 (5-16)	-
Length of stay	16.5 (SD=12.2)	53 (SD=47)	57 (48-68)

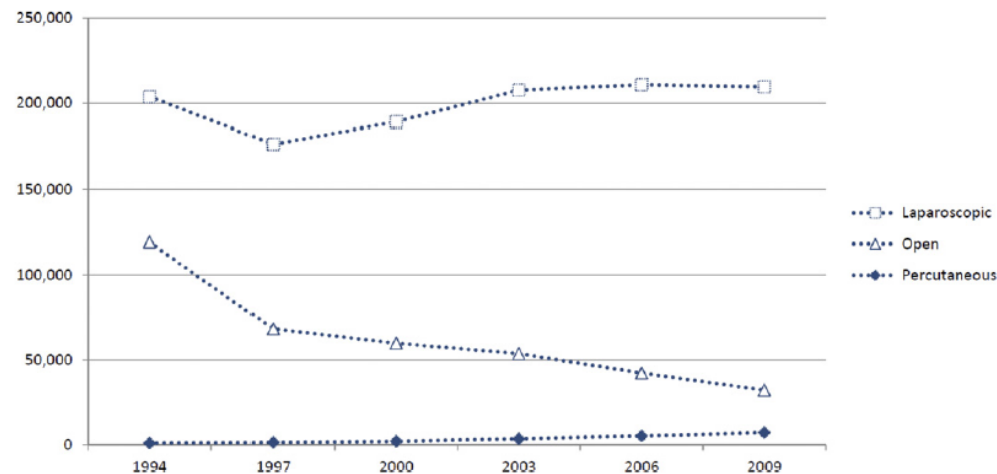
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STRATEGIC TIMING OF ENDOSCOPIC PROCEDURAL INTERVENTIONS IN INFECTED NECROTIZING PANCREATITIS. STEP-IN RANDOMIZED TRIAL

Principal Investigator: JY Bang, MD, MPH

Multicenter Trial – USA, Germany, Italy, Denmark, India

EUS-guided gallbladder drainage

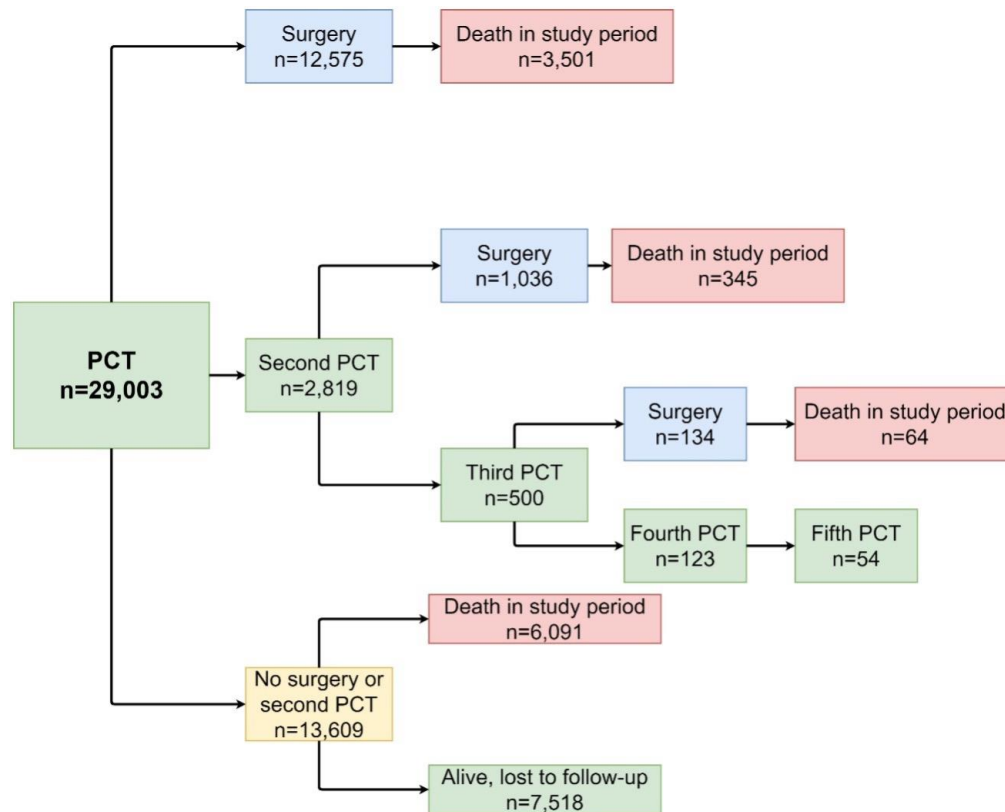


EUS-guided drainage of the gallbladder using
lumen-apposing metal stent

Ji Young Bang and Shyam Varadarajulu

Results: Between 1994 and 2009, annual PC procedures increased by 567% (from 1,085 to 7,239). Laparoscopic cholecystectomy increased by 3% (from 203,836 to 209,650), and open procedures declined by

What happens after Percutaneous Cholecystostomy....



Study period: January 1, 2016 to June 30, 2022

Abbreviations: PCT, percutaneous cholecystostomy tube

- 52.6% never received cholecystectomy $\geq$ 12 months after PCT
- 46.9% patients who had no further intervention beyond their index PCT, 44.7% died over median 825 days, presumably with indwelling catheter.
- 40% patients who had a PCT placed and never underwent surgery lived median 2 ¼ years after index PCT.
- 9.7% required multiple PCT exchanges.

GUIDELINE

Tokyo Guidelines 2018: management strategies for gallbladder drainage in patients with acute cholecystitis (with videos)

Yasuhisa Mori • Takao Itoi • Todd H. Baron • Tadahiro Takada • Steven M. Strasberg • Henry A. Pitt •

Q1. What are the standard gallbladder drainage methods for AC in surgically high-risk patients?

We recommend PTGBD as a standard drainage method for surgically high-risk patients with AC. (Recommendation 1, level B). However, ETGBD or EUS-GBD could be considered in high-volume institutes when performed by skilled endoscopists. (Level B)

5.4.1 How does EUS-GBD compare with PTGBD?

RECOMMENDATIONS

ESGE recommends EUS-guided gallbladder drainage (EUS-GBD) or percutaneous gallbladder drainage (PTGBD) in patients at high surgical risk with acute cholecystitis requiring gallbladder drainage.

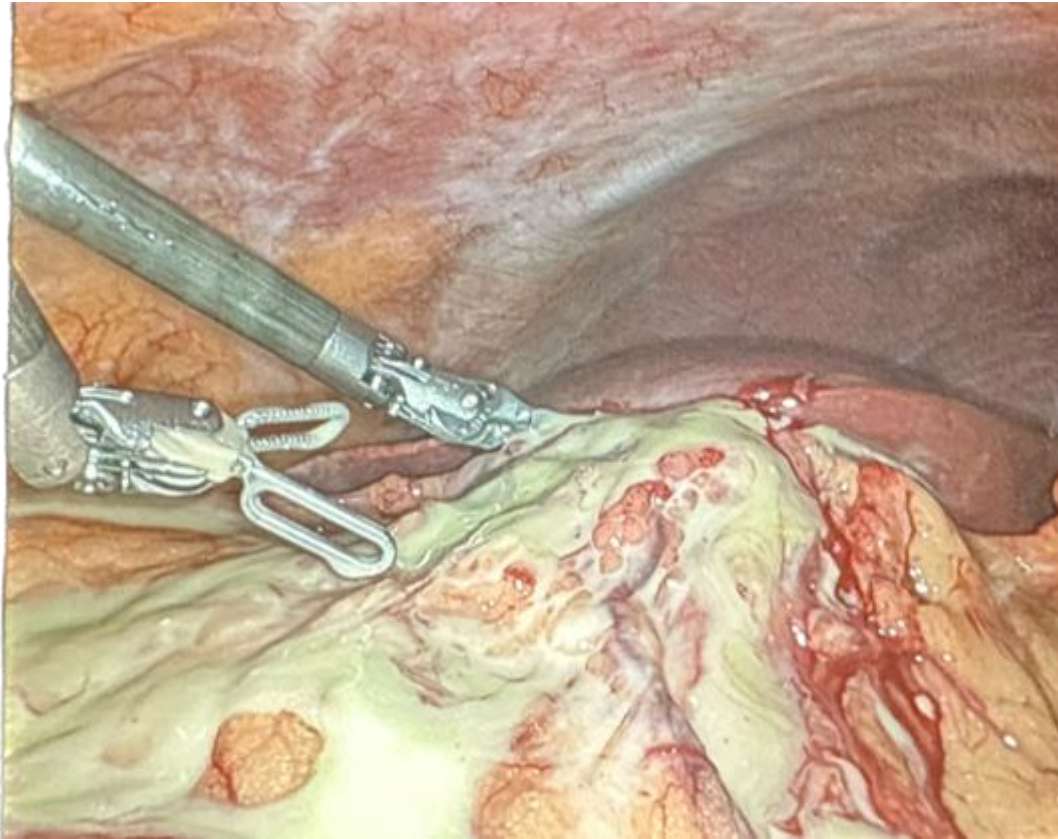
Strong recommendation, high quality of evidence.

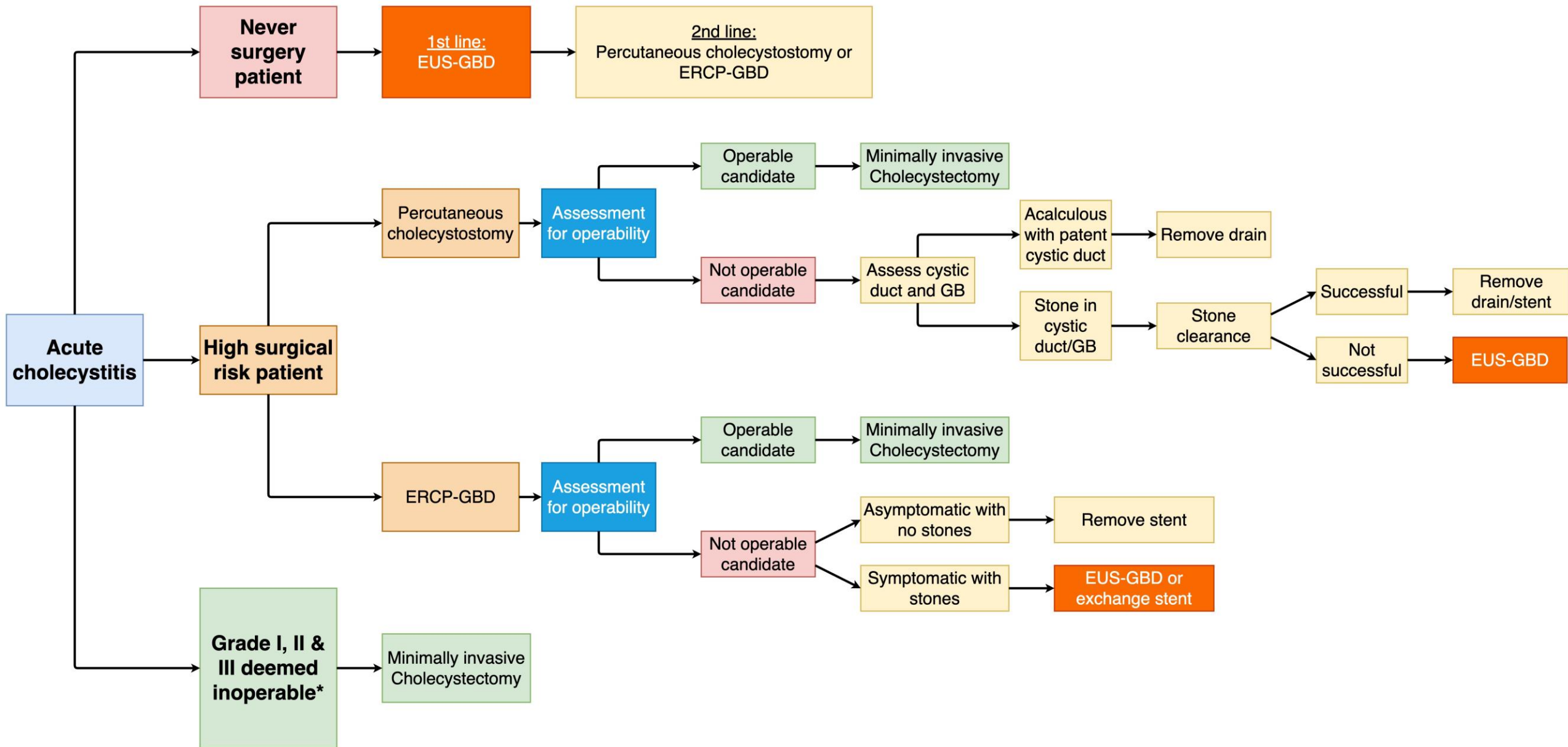
ESGE recommends that, in patients at high surgical risk, EUS-GBD should be favored over PTGBD where both techniques are available, owing to the lower rates of AEs and need for re-intervention in EUS-GBD.

Strong recommendation, high quality of evidence.

Laparoscopy converted to Open Partial Cholecystectomy

Procedural duration: 3 hours; LOS 8 days

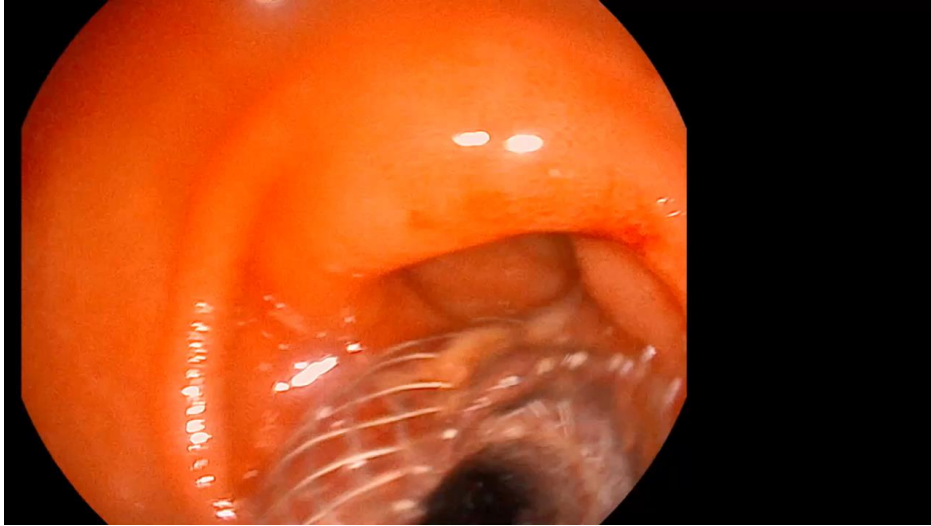




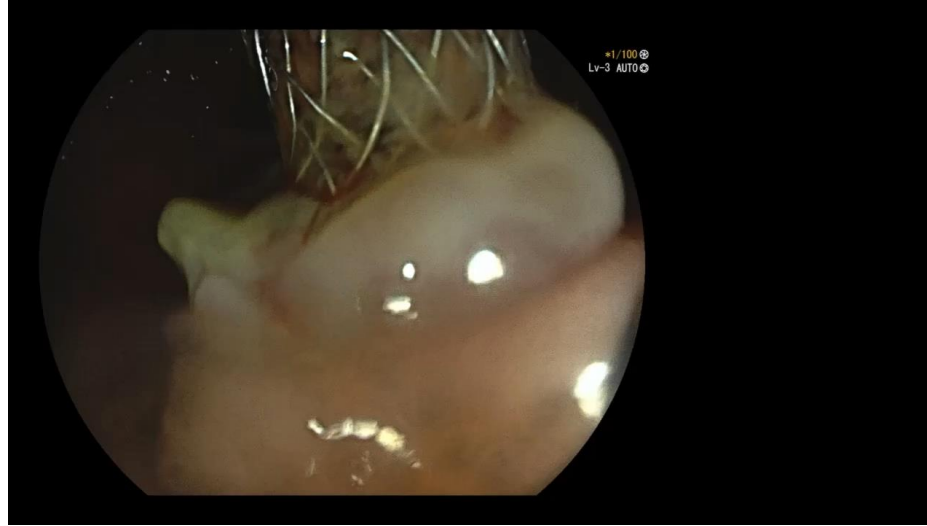
*Grade II & III deemed inoperable should be operated on in an advanced surgery center per Tokyo guidelines 2018.

Abbreviations: EUS, endoscopic ultrasound; ERCP, endoscopic retrograde cholangiopancreatography; GBD, gallbladder drainage.

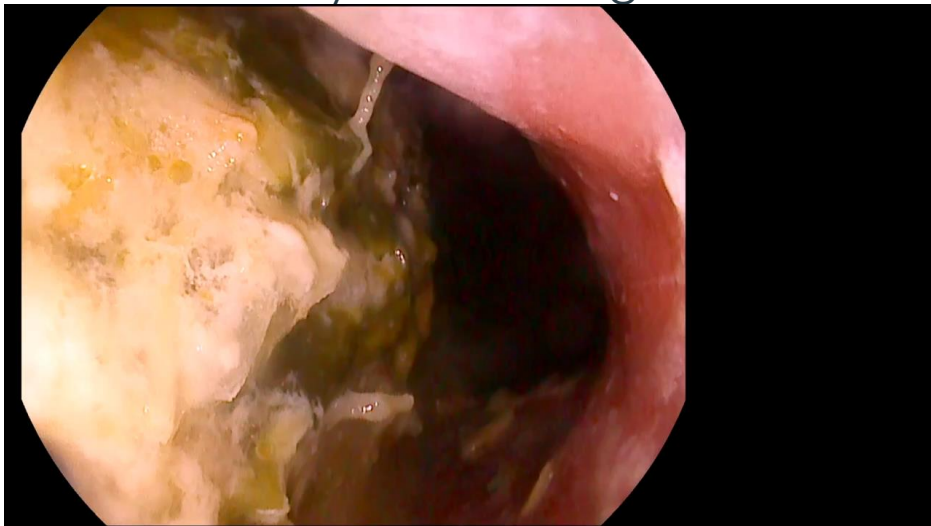
Long-term adverse events



Delayed bleeding



Ulceration



Food Impaction

- Bleeding
- Stent migration
- Food impaction
- Buried stent
- Ulceration
- Acute cholecystitis

Long-term management options

➤ Proposals:

- Short survival time (< 6 months): Indwelling LAMS
- Longer survival time – Stone removal via cholecystoscopy
Exchange of LAMS for plastic stents

➤ Still evolving!

ORIGINAL ARTICLE: Clinical Endoscopy

Stent placement by EUS or ERCP for primary biliary decompression in pancreatic cancer: a randomized trial (with videos)



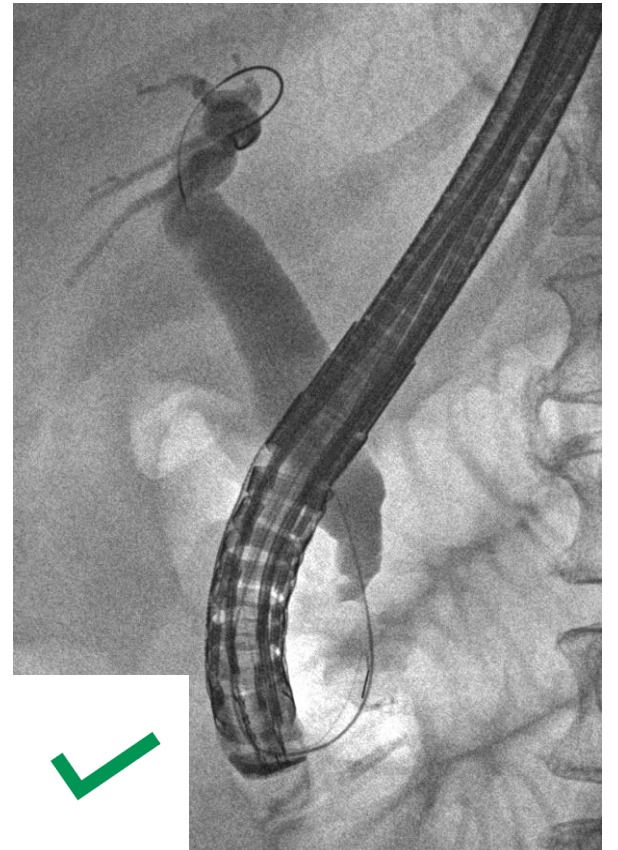
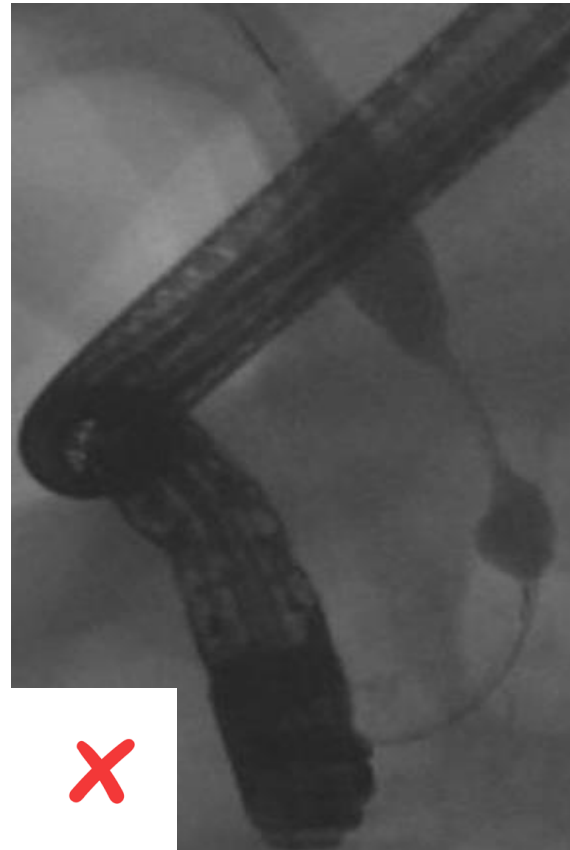
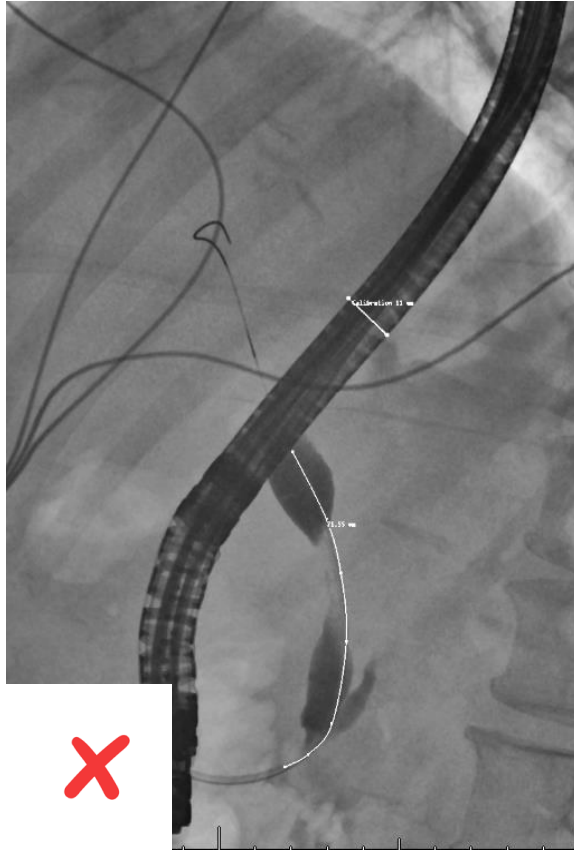
Conclusions: Given the similar rates of adverse events and treatment outcomes in this randomized trial, EUS-BD is a practical alternative to ERCP for primary biliary decompression in pancreatic cancer. (Clinical trial registration number: NCT03054987.) (Gastrointest Endosc 2018;88:9-17.)

Endoscopic Ultrasound–Guided vs Endoscopic Retrograde Cholangiopancreatography–Guided Biliary Drainage as Primary Approach to Malignant Distal Biliary Obstruction: A Systematic Review and Meta-Analysis of Randomized Controlled Trials

Harishankar Gopakumar, MD¹, Ritu Raj Singh, MD¹, Vakya Revanur, MBBS¹, Rajanikanth Kandula, MBBS¹ and Srinivas R. Puli, MD¹

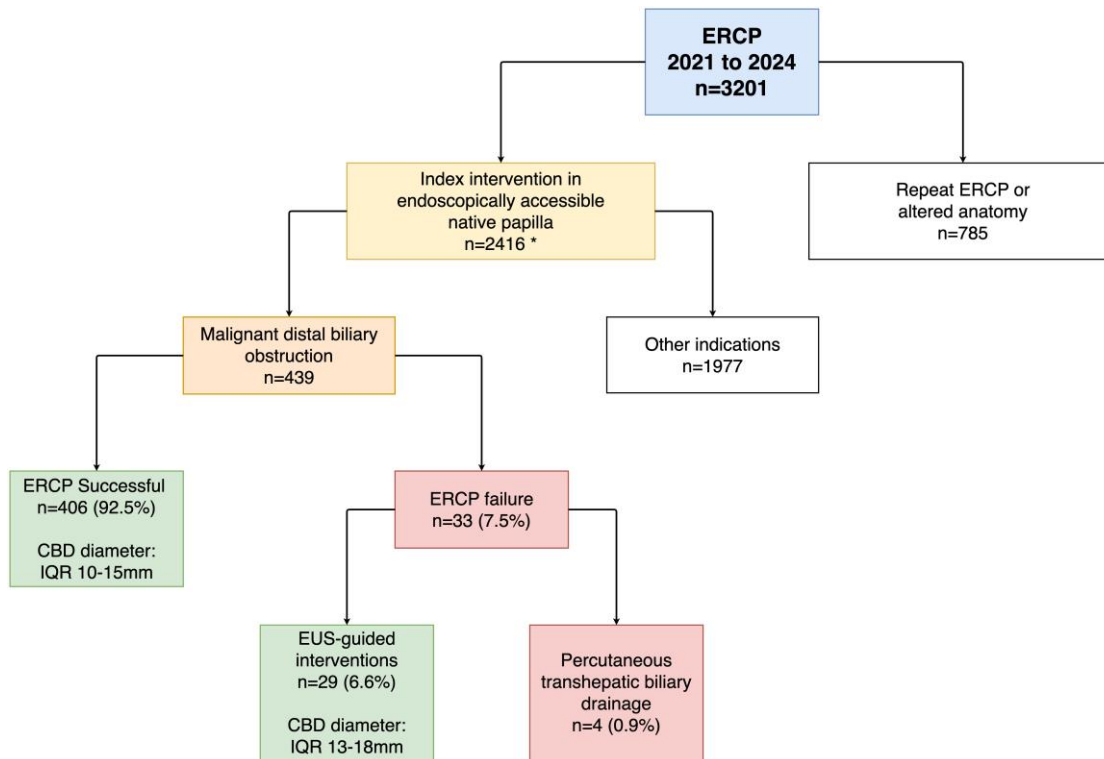
- 5 studies = 519 patients
- EUS cohort, Extrahepatic route = 4; Extra and Intrahepatic route = 1
- SEMS 3, LAMS 2 (entry criteria ≥ 12 mm)
- Mean CBD diameter, EUS: 16.03 mm (SD=1.56); ERCP: 18.35 mm (SD=4.95)

DISCUSSION: EUS-BD is an efficient and safe alternative to ERCP in MDBO. An almost nonexistent risk of procedure-related pancreatitis, lower procedure time, and ease of use make this an attractive primary approach to biliary decompression in centers with expertise.

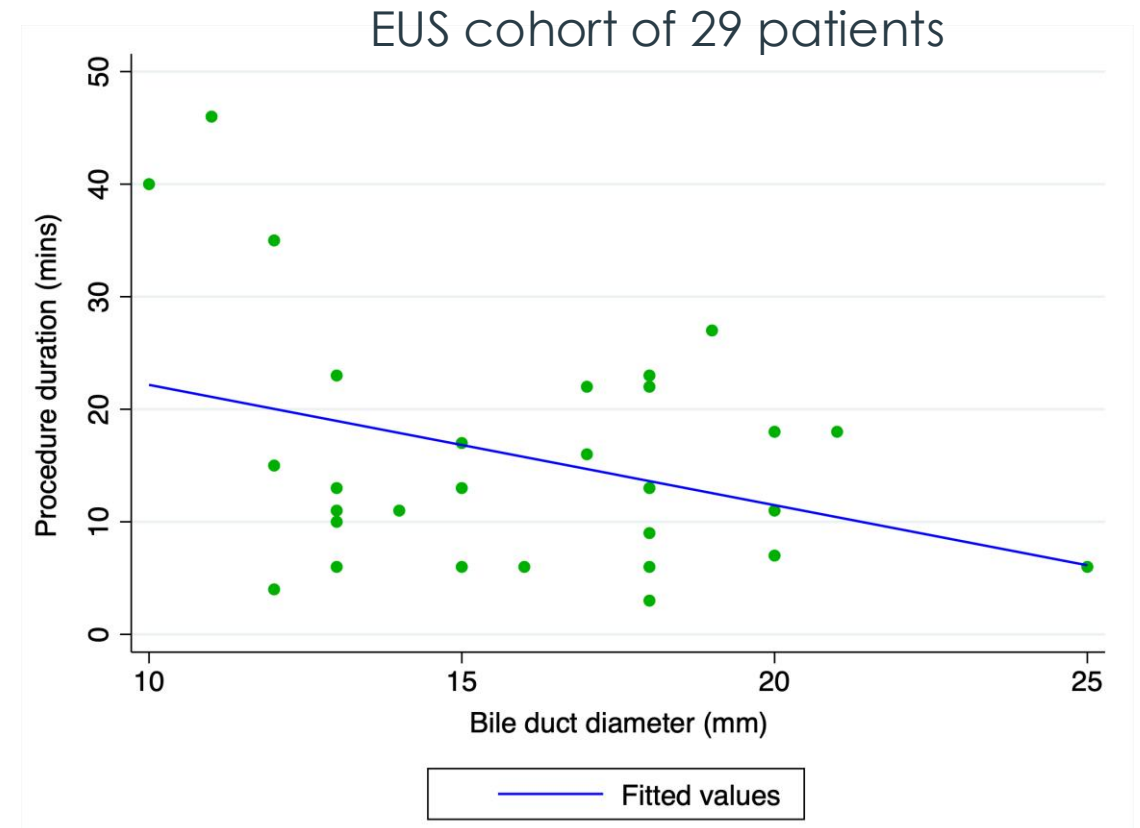


August 2024

What proportion of patients with malignant distal biliary obstruction have CBD < 12 mm that would preclude EUS-based intervention?

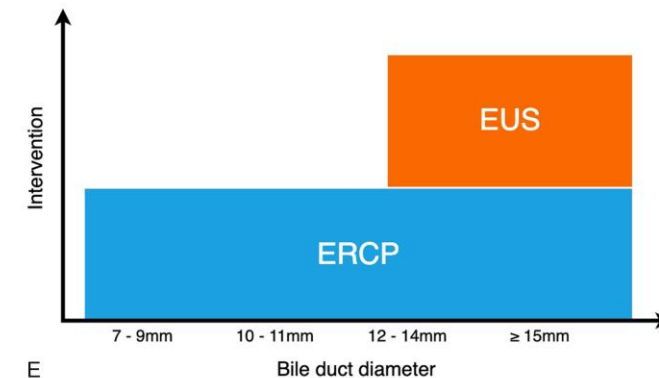
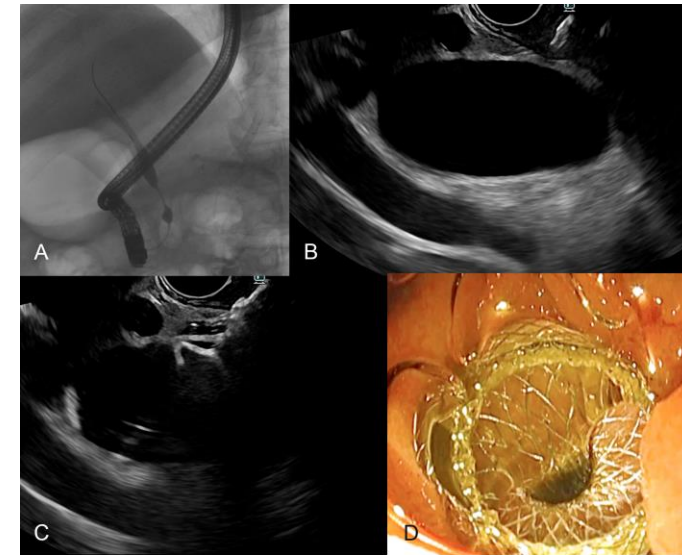


* ERCP was technically successful in 2383 of 2416 patients (98.6%) with endoscopically accessible papilla



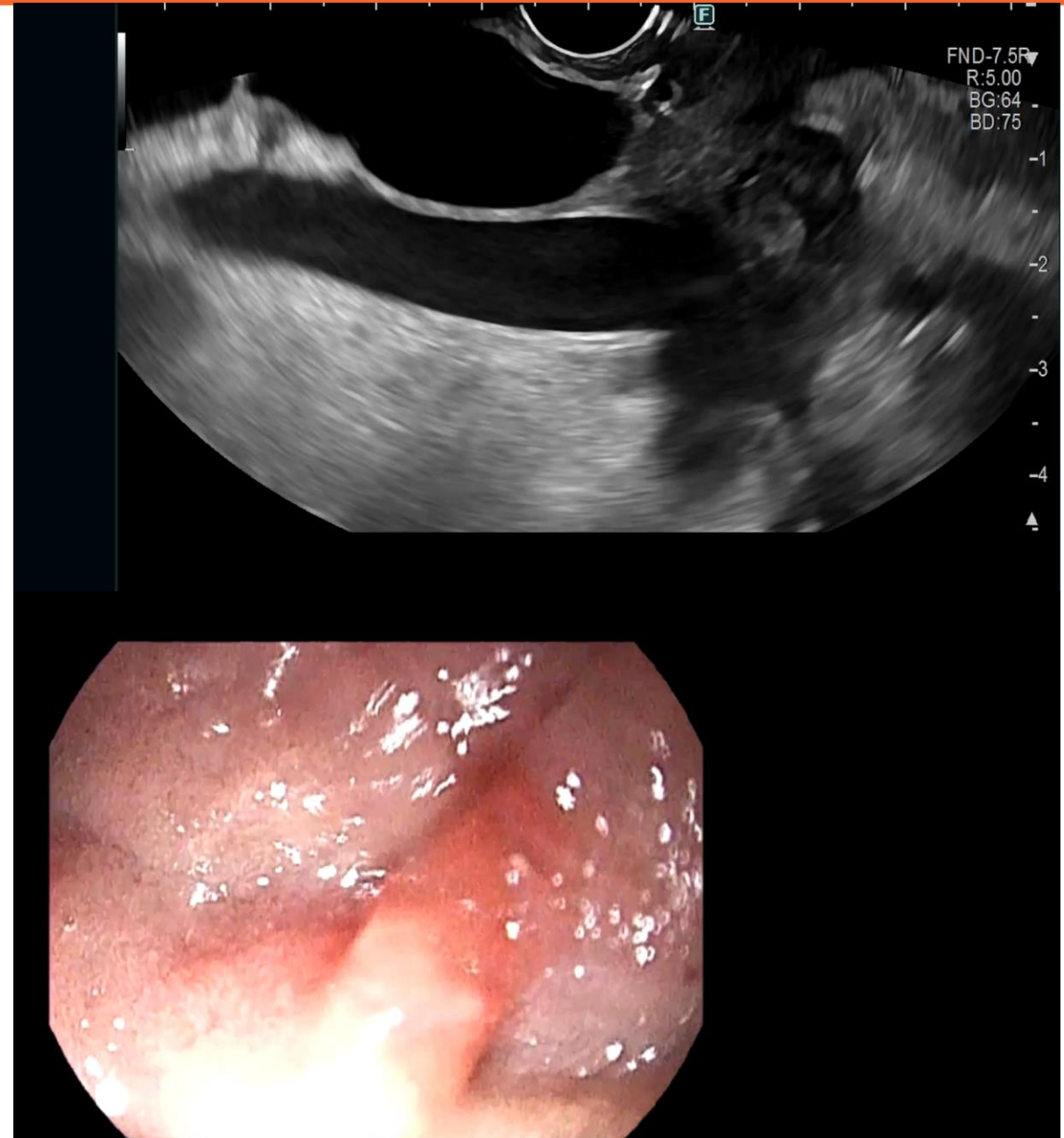
What proportion of patients with malignant distal biliary obstruction have CBD < 12 mm that would preclude EUS-based intervention?

- 197 of 439 (44.9%) or 4.5 of 10 patients with MDBO at clinical presentation had CBD < 12mm that would preclude an EUS-based intervention.



What is new with LAMS?

- Choledochoduodenostomy: stent dysfunction (25%) and adverse events (20%) remain a concern.
- Deployment range:
 - 6mm = 24.68mm
 - 8mm = 27.67mm
 - 10mm = 36.25mm
 - 15mm = 38.22mm
- Design change is needed. Good quality comparative data is lacking



A FIRST-OF-ITS-KIND SINGLE DEVICE FOR EUS PUNCTURE, GUIDEWIRE ACCESS, AND TRACT DILATION

Sharp injection port
attaches to a syringe for
diluted contrast injection through
the sharp to confirm access

Yellow button
unlocks electrocautery tip to
advance and create fistula

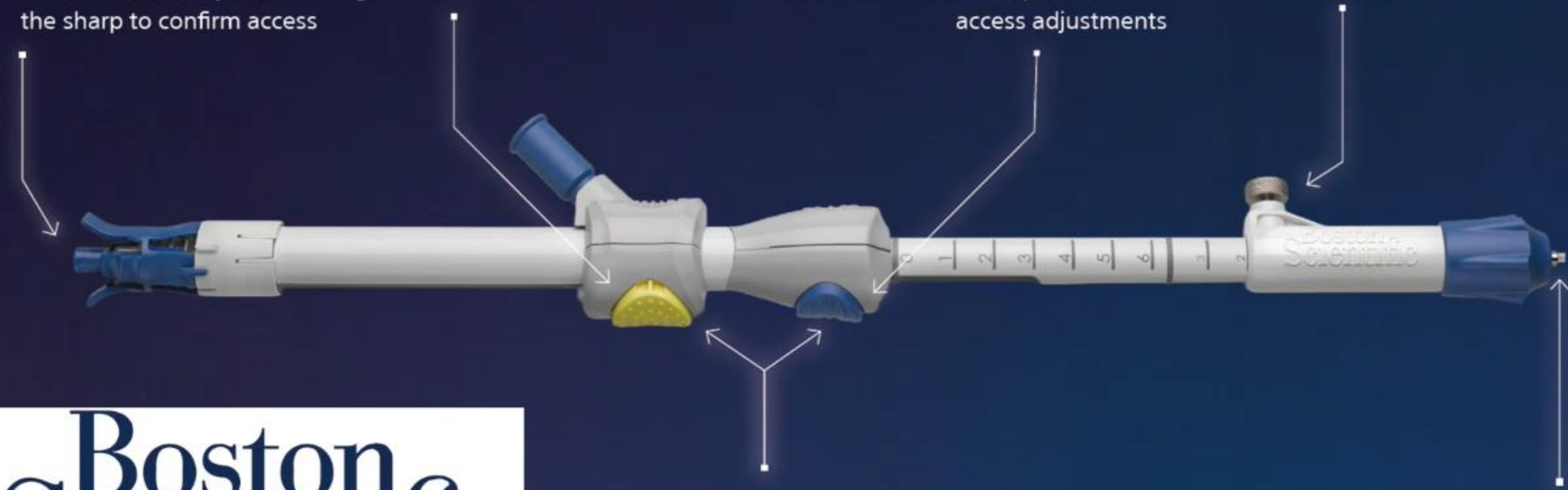
Blue button
unlocks sharp and access cannula
to enable controlled puncture and
access adjustments

Catheter adjust lock
designed to prevent unintended
movement during positioning

Buttons auto-lock
on release to secure positioning

Standard luer fitting
secures endoscope for
physician-controlled operation

**Boston
Scientific**





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