

Endoscopic Management of Acute Pancreatitis

Sammy Ho, M.D.

**Director of Pancreaticobiliary Services
and Endoscopic Ultrasound
Montefiore Medical Center**

Take Home Points

- ERCP is not needed for most patients with gallstone pancreatitis
- Asymptomatic pancreatic pseudocysts do not warrant intervention regardless of size
- Transpapillary drainage can be considered for smaller pseudocysts that communicate with the pancreatic duct

Take Home Points

- Transmural drainage has become the preferred approach for all pseudocysts
- A minimally invasive approach starting with endoscopic necrosectomy is the initial procedure of choice for WOPN

Etiologies for Acute Pancreatitis

- Gallstones
- ETOH
- Medications (6-MP, Azathioprine)
- Hypertriglyceridemia
- Hypercalcemia
- Autoimmune pancreatitis
- Malignancy
- Idiopathic

Agenda

- Diagnosis and therapy for CBD stones
- Endoscopic management of pancreatic pseudocyst
- Endoscopic management of pancreatic necrosis

Do most patients with gallstone
pancreatitis require an ERCP?

No

American College of Gastroenterology Guideline: Management of Acute Pancreatitis

Scott Tenner, MD, MPH, FACG¹, John Baillie, MB, ChB, FRCP, FACG², John DeWitt, MD, FACG³ and Santhi Swaroop Vege, MD, FACG⁴

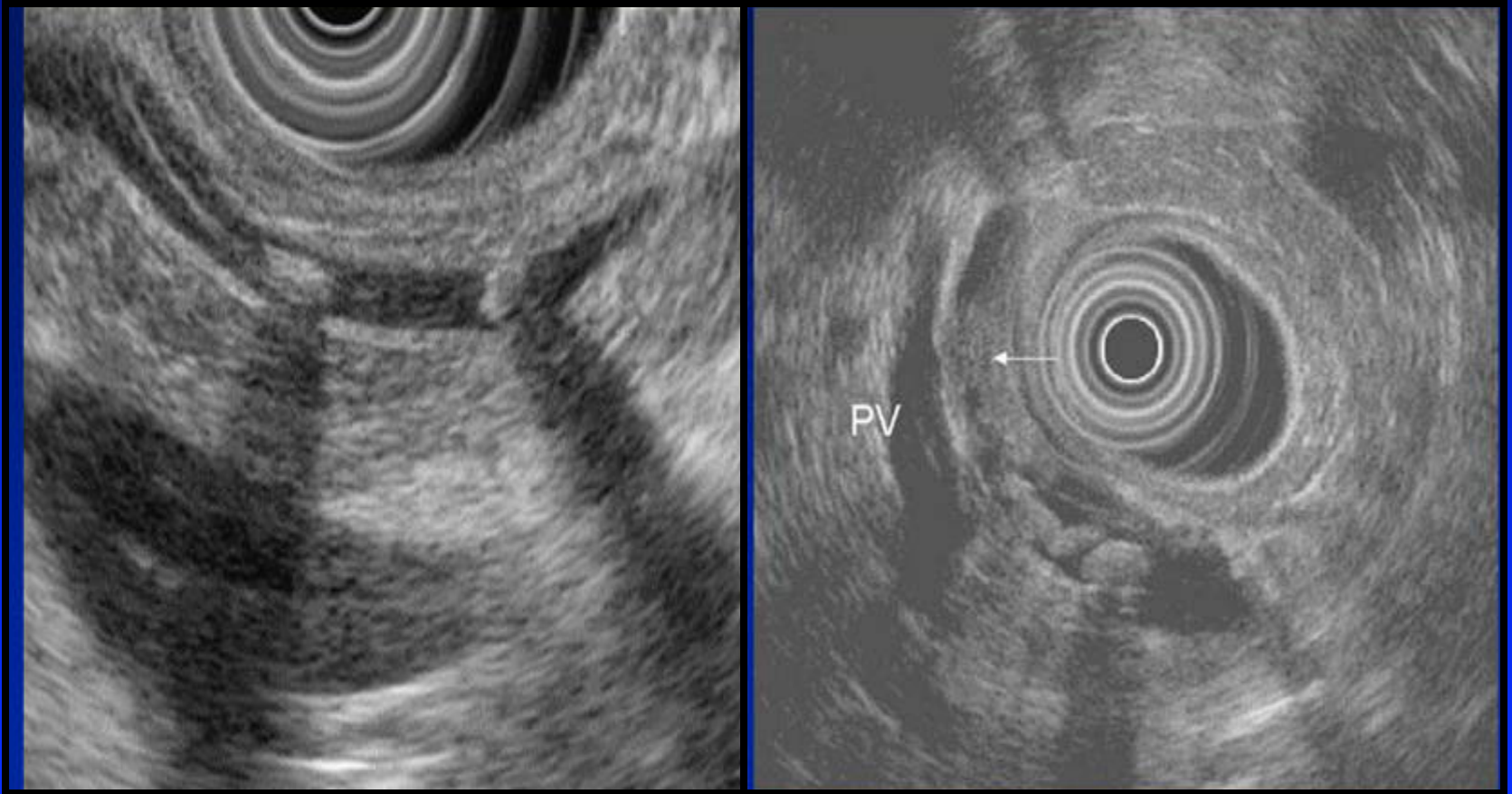
- ERCP is not needed in most patients with gallstone pancreatitis who lack evidence of ongoing biliary obstruction
- Patients with AP and concurrent cholangitis should undergo ERCP within 24h of admission
- In the absence of cholangitis and/or jaundice, MRCP or EUS rather than diagnostic ERCP should be used to screen for choledocholithiasis

EUS for Choledocholithiasis

- Highly accurate in detecting CBD stones (sensitivity >95%)
- Less invasive than ERCP
- Average procedure time: 10 minutes
- Can be performed with ERCP under one setting



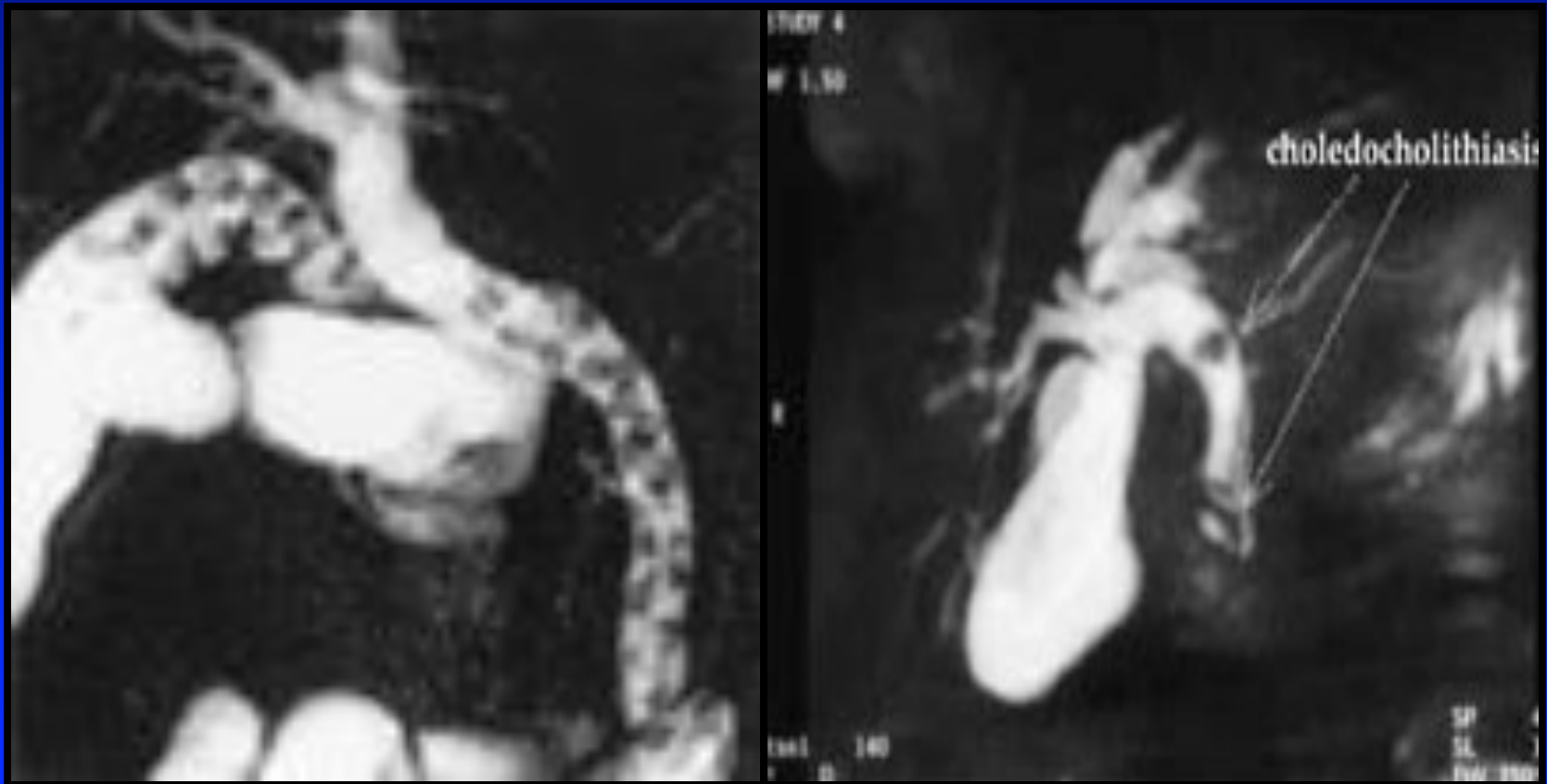
Diagnosis by EUS



MRCP for Choledocholithiasis

- Accuracy about the same as EUS
- Completely non-invasive
- Average time of examination: 15 minutes
- Contraindications: pacemaker, claustrophobia

Diagnosis by MRCP



SYSTEMATIC REVIEW

EUS vs MRCP for detection of choledocholithiasis

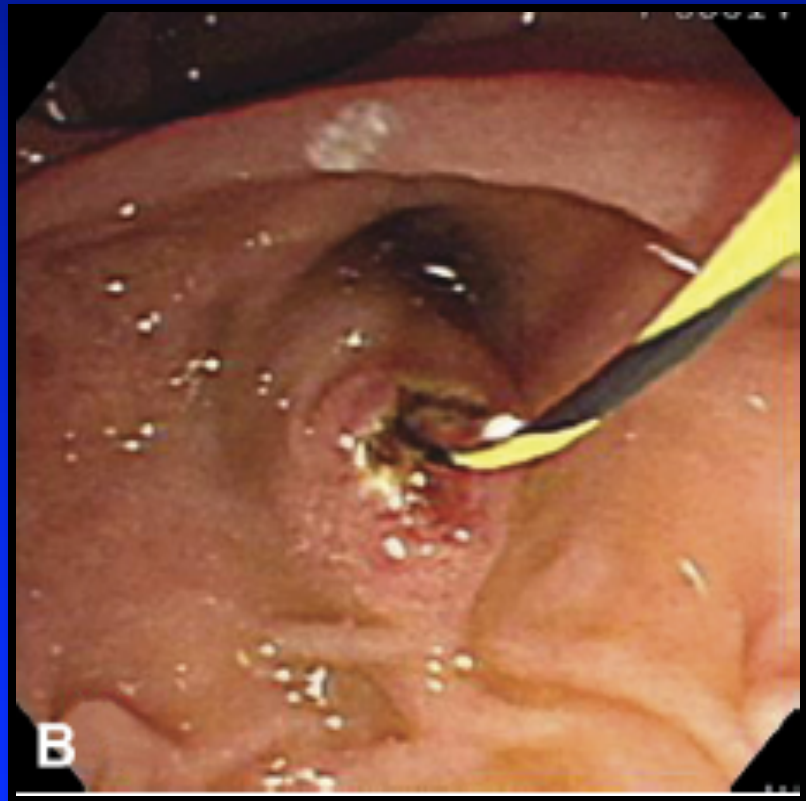
Dharmendra Verma, MD, Asha Kapadia, PhD, Glenn M. Eisen, MD, MPH, Douglas G. Adler, MD

Houston, Texas, USA

- Systemic review of 5 randomized, prospective trials comparing EUS and MRCP in diagnosing CBD stones
- 301 patients underwent both EUS and MRCP
- 108 with confirmed CBD stones
- EUS: Sensitivity 93% Specificity 96%
- MRCP: Sensitivity 85% Specificity 93%

Verma D, et al. Gastrointest Endosc 2006

ERCP for Stone Removal



Endoscopic Management of Pancreatic Pseudocysts

Definitions

Term	Definition	Contrast-enhanced CT findings
Acute peripancreatic fluid collection (peri-PFC)	Peripancreatic fluid associated with interstitial edematous pancreatitis with no associated peripancreatic necrosis. This term applies only to areas of peripancreatic fluid seen within the first 4 weeks after onset of interstitial edematous pancreatitis and without the features of a pseudocyst.	Homogeneous collection with fluid density Confined by normal peripancreatic fascial planes No definable wall encapsulating the collection Adjacent to the pancreas (no intrapancreatic extension)
Pancreatic pseudocyst	An encapsulated collection of fluid with a well-defined inflammatory wall usually outside the pancreas with minimal or no necrosis. This entity usually requires >4 weeks after onset of interstitial edematous pancreatitis to mature.	Well circumscribed, usually round or oval homogeneous fluid density No non-liquid component Well-defined wall (completely encapsulated) Maturation usually requires >4 weeks after onset of acute pancreatitis Occurs after interstitial edematous pancreatitis
Acute necrotic collection	A collection containing variable amounts of both fluid and necrosis associated with necrotizing pancreatitis; the necrosis can involve the pancreatic parenchyma and/or the peripancreatic tissues.	Occurs only in the setting of acute necrotizing pancreatitis Heterogeneous and non-liquid density of varying degrees in different locations (some appear homogeneous early in the course) No definable wall encapsulating the collection Can be intrapancreatic and/or extrapancreatic
Walled-off necrosis	A mature, encapsulated collection of pancreatic and/or peripancreatic necrosis that has developed a well-defined inflammatory wall. This usually occurs >4 weeks after the onset of necrotizing pancreatitis.	Heterogeneous with liquid and non-liquid density with varying degrees of loculations (some may appear homogeneous) Well-defined wall (completely encapsulated) Intrapancreatic and/or extrapancreatic location Maturation usually requires 4 weeks after onset of acute necrotizing pancreatitis

Pseudocyst Management

1. Surgical drainage/resection
2. Percutaneous drainage
3. Endoscopic drainage
 - ✓ transmural
 - ✓ transpapillary

Equal Efficacy of Endoscopic and Surgical Cystogastrostomy for Pancreatic Pseudocyst Drainage in a Randomized Trial

SHYAM VARADARAJULU,¹ JI YOUNG BANG,¹ BRYCE S. SUTTON,² JESSICA M. TREVINO,¹ JOHN D. CHRISTEN,³ and C. MEL WILCOX¹

¹Division of Gastroenterology-Hepatology, ²Department of Surgery, University of Alabama at Birmingham, Birmingham, Alabama; ³Health Services and Rehabilitation Research and Development, Center of Excellence, James A. Haley Veterans Affairs Medical Center, Tampa, Florida

Table 3. Outcomes of Endoscopic and Surgical Treatments After 24 Months of Follow-Up Evaluation

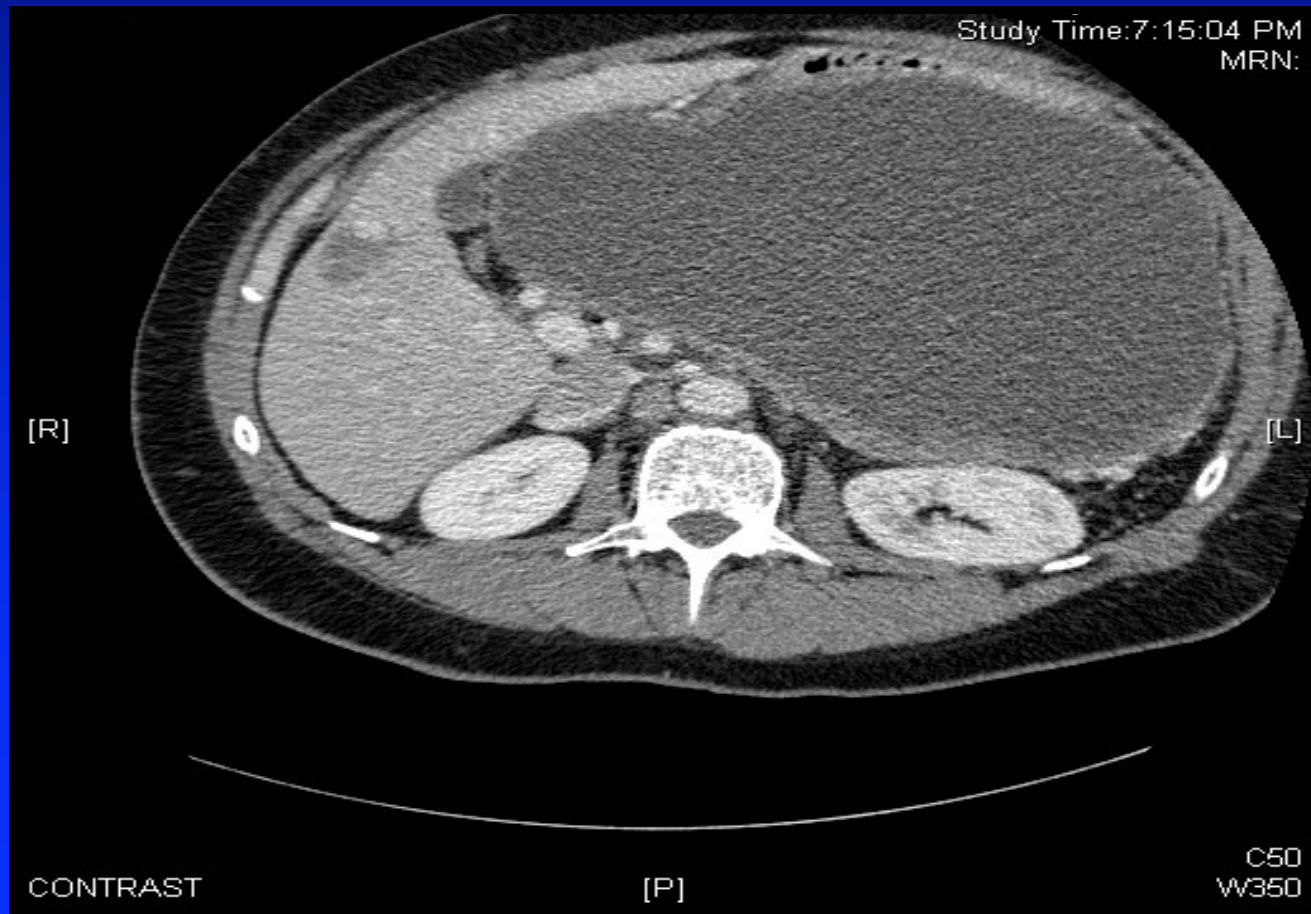
Variable	Endoscopy (n = 20)	Surgery (n = 20)	Endoscopic results vs surgical results (95% CI)	P value ^d
Recurrence, n (%) ^b	0	1 (5)	-	-
Treatment success, n (%)	19 (95)	20 (100)	-5 (-15 to 5) ^c	.50
Treatment failure, n (%)	1 (5)	0	5 (-5 to 15) ^c	.50
Complications, n (%)	0	2 (10)	-10 (-23 to 3) ^c	.24
Re-intervention, n (%)	1 (5)	1 (5)	0 (-14 to 14) ^c	.76
Hospital stay, median (IQR), days	2 (1-4)	6 (5-9)	-4 (-5 to -3) ^d	<.001 ^e
Hospital costs, mean (SD), 2009 US\$	7011 (4171)	15,052 (10,670)	-8040 (-13,458 to -2623)	.003 ^e

Varadarajulu S, et al. Gastroenterology 2013

Indications for Treatment

- Presence of symptoms
 - Abdominal pain, early satiety
 - Gastric outlet obstruction
 - Biliary obstruction
- Infection

Is Fluid Analysis Necessary Before Pseudocyst Drainage?



Assessing Main Pancreatic Duct

MRCP

- Pro
 - Non-invasive
 - Secretin to better assess presence/location of leak
- Con
 - Visualization of PD may be obscured by presence of a large collection
 - Non-therapeutic

ERCP

- Pro
 - May be more accurate than MRCP in identifying leak
 - Provide therapy if present
- Con
 - High failure rate of ERCP
 - Risk of infection the collection
 - Risk of post-ERCP pancreatitis

Pre-procedure Preparation

- Anticoagulation and antiplatelet medications should be discontinued
- Adequate surgical support
- General anesthesia is universally used
- Carbon dioxide insufflation is recommended
- Antibiotics are typically administered

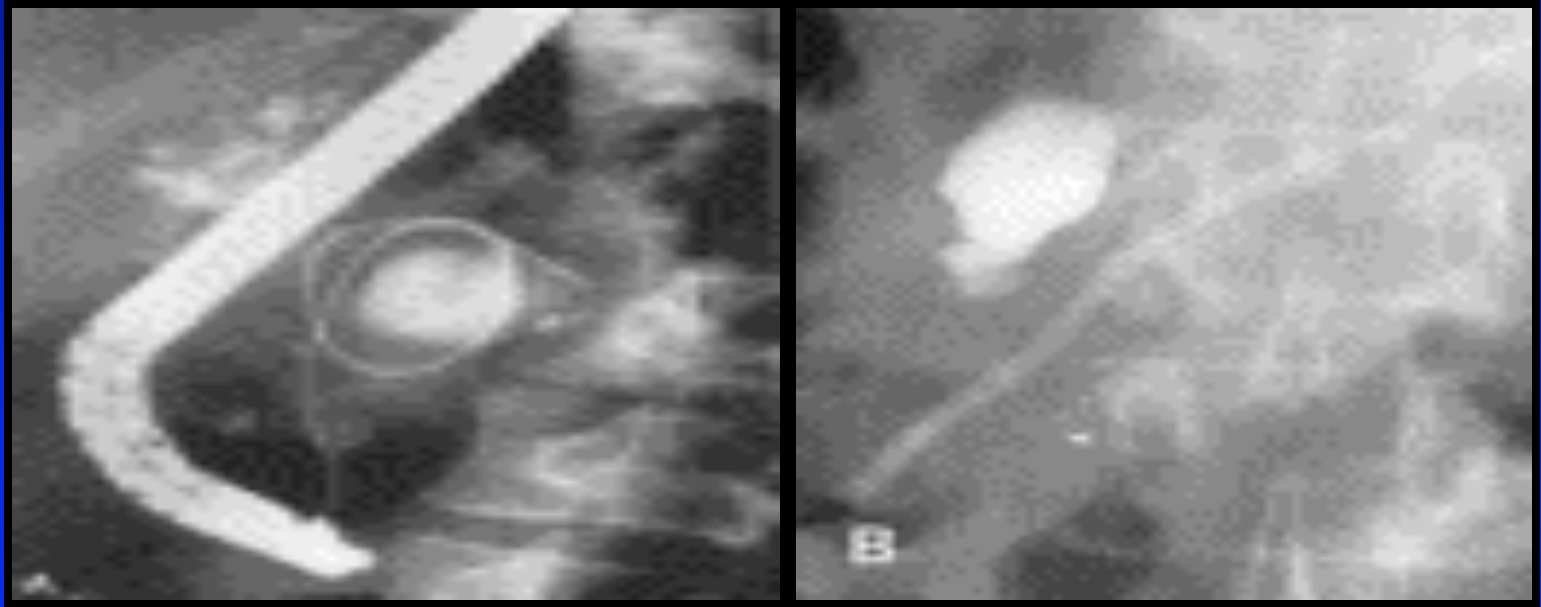
Endoscopic Transpapillary Drainage

- Cyst < 6cm
- Cyst in communication with pancreatic duct
- Cyst remote from the gastric and duodenal wall
- Presence of PD stones/strictures
- Ongoing PD leak

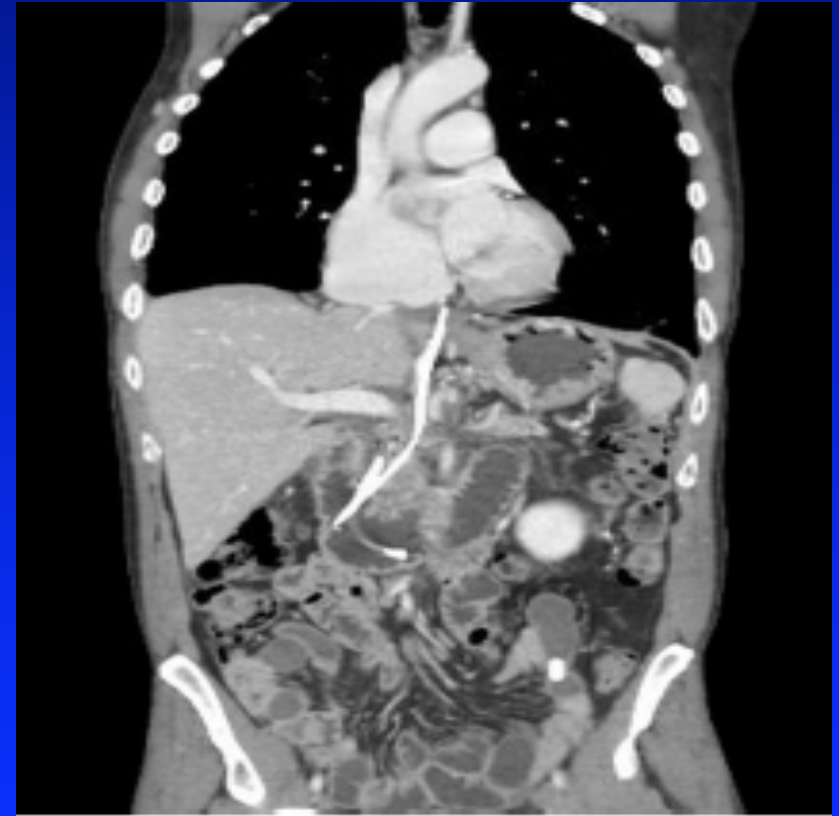
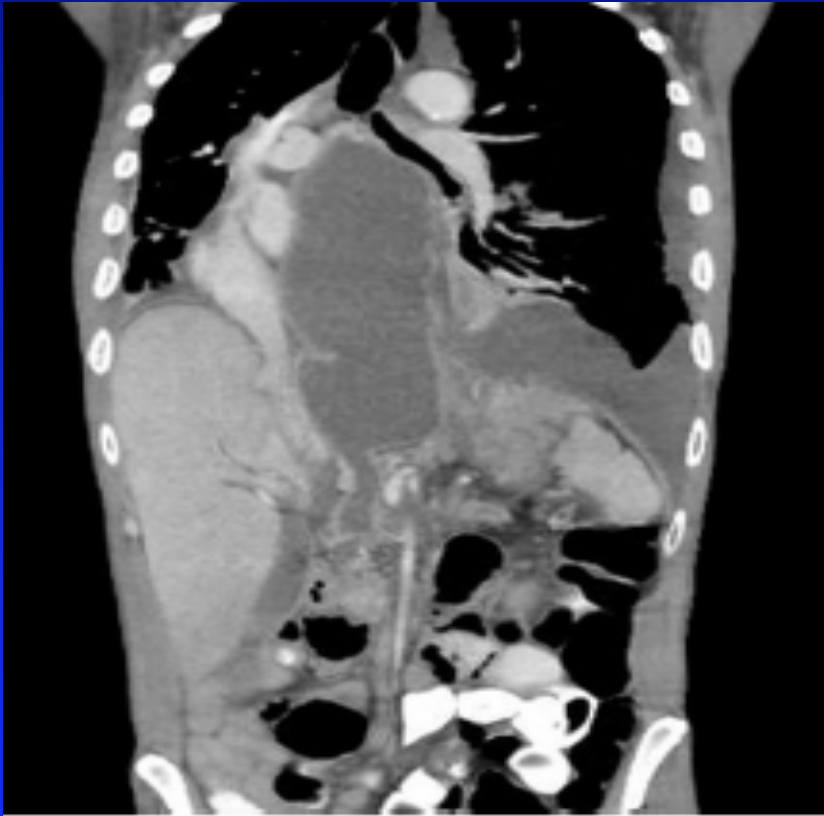
Technique

- Guidewire maneuvered either into the pseudocyst or across the leak
- Dilation of pancreatic duct strictures
- Prophylactic and postprocedural antibiotics for 5 days
- Scheduled stent exchange/removal in 4 to 6 weeks

Technique



Mediastinal Pseudocyst



Ho S, et al. Gastroenterology 2016

Endoscopic Transmural Drainage

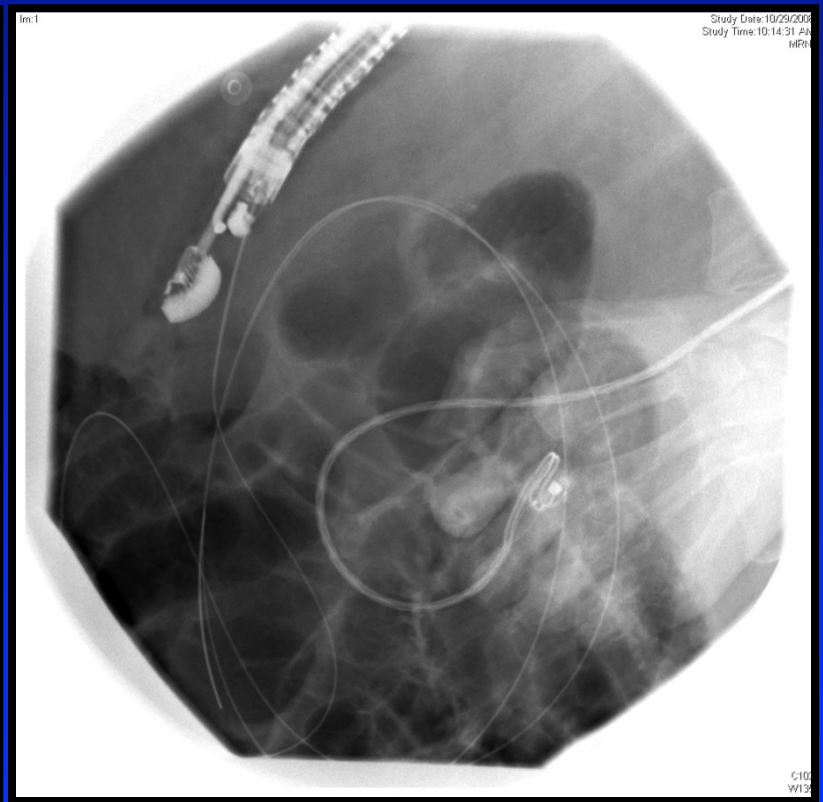
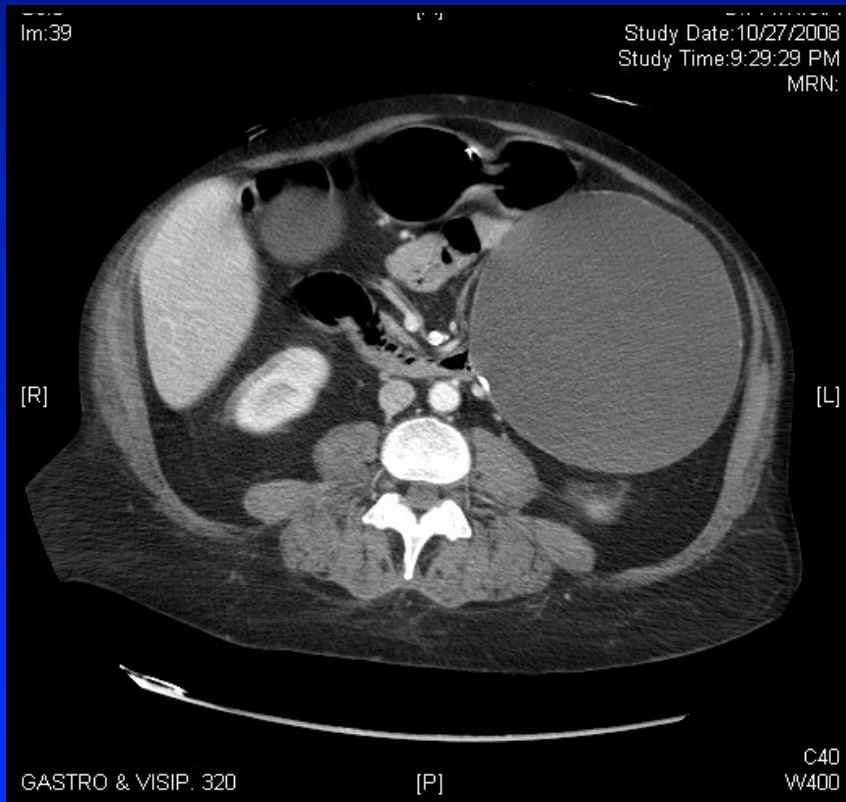
- Creation of a fistula between the pseudocyst and the lumen of the stomach or duodenum
- Allows rapid decompression of large cysts
- Immediate relief of pain, obstruction, infection
- EUS can be helpful in selecting the most favorable puncture site

Role of EUS

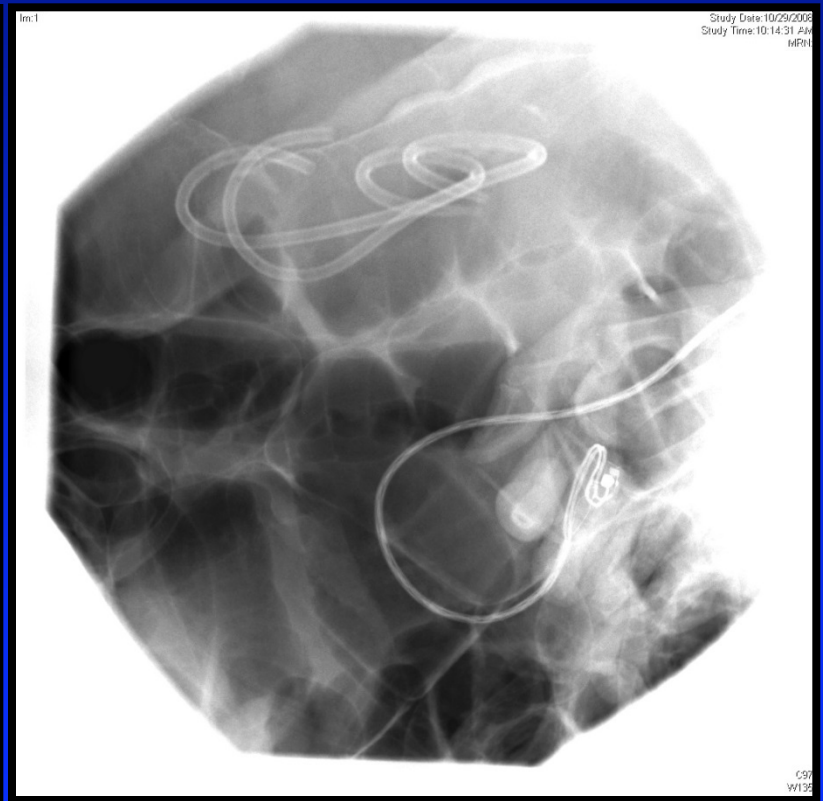
- Determine if a cyst is truly a pseudocyst
- Assist in localizing site of drainage
- Exclude vascular structures by color flow doppler
- Stent placement possible with therapeutic echoendoscopes



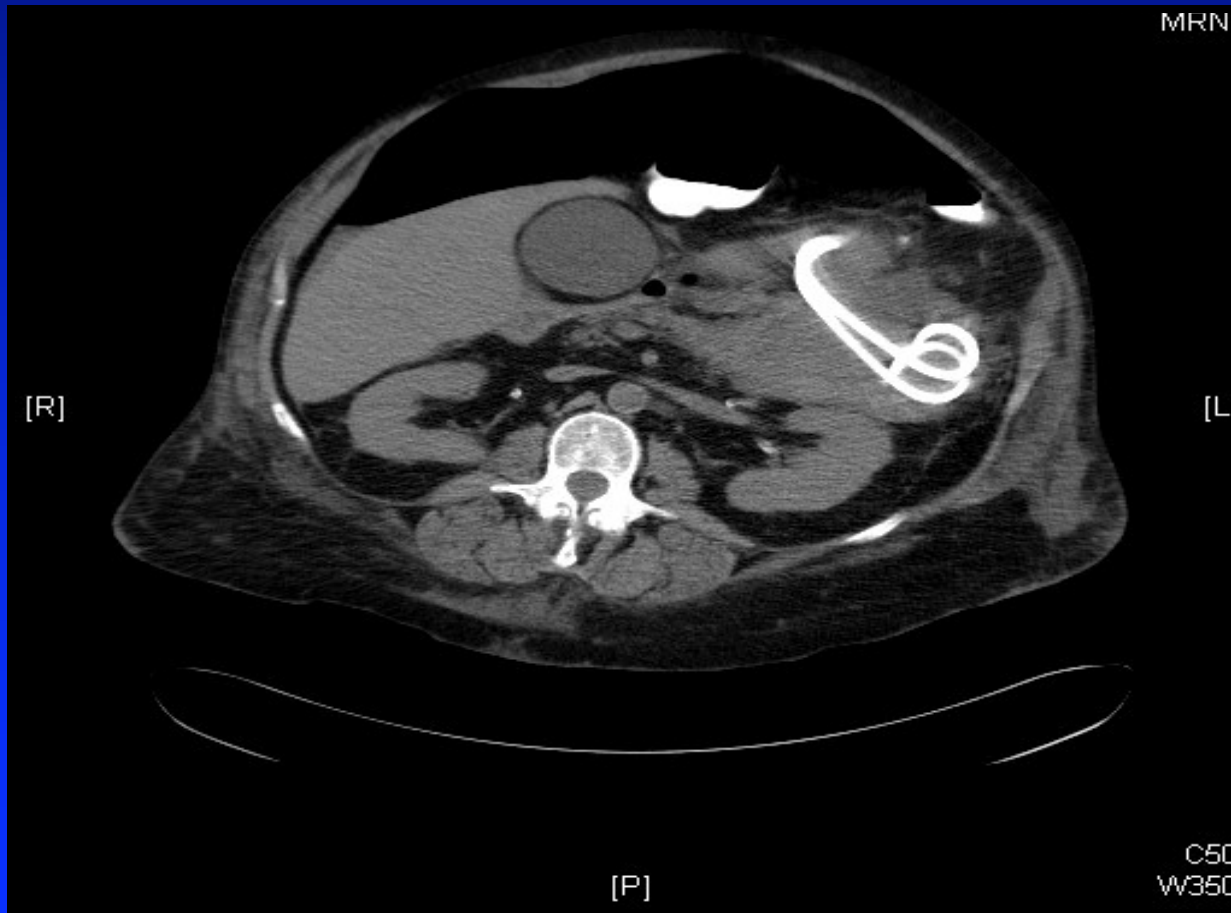
Transmural Drainage

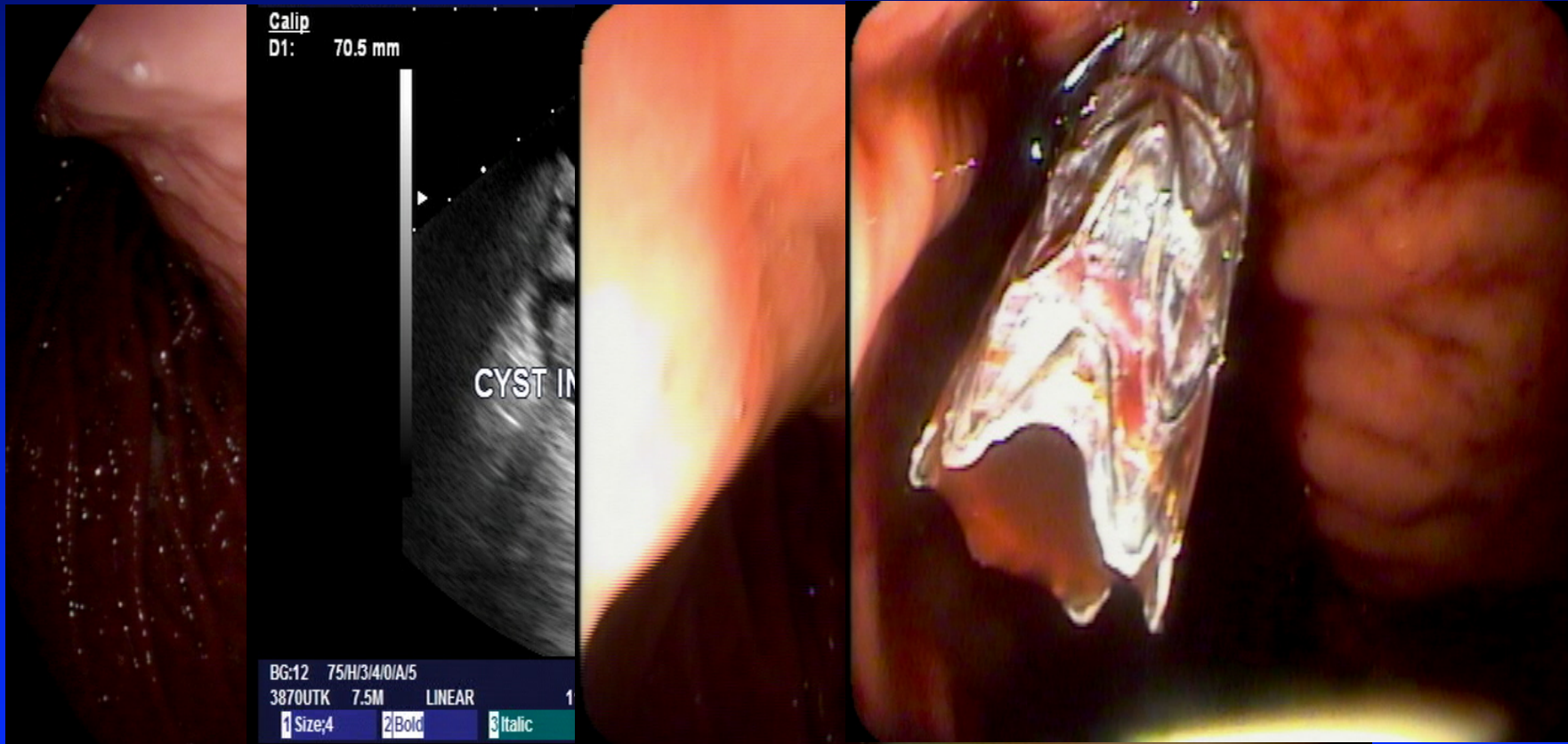


Transmural Drainage



Post-Cystgastrostomy

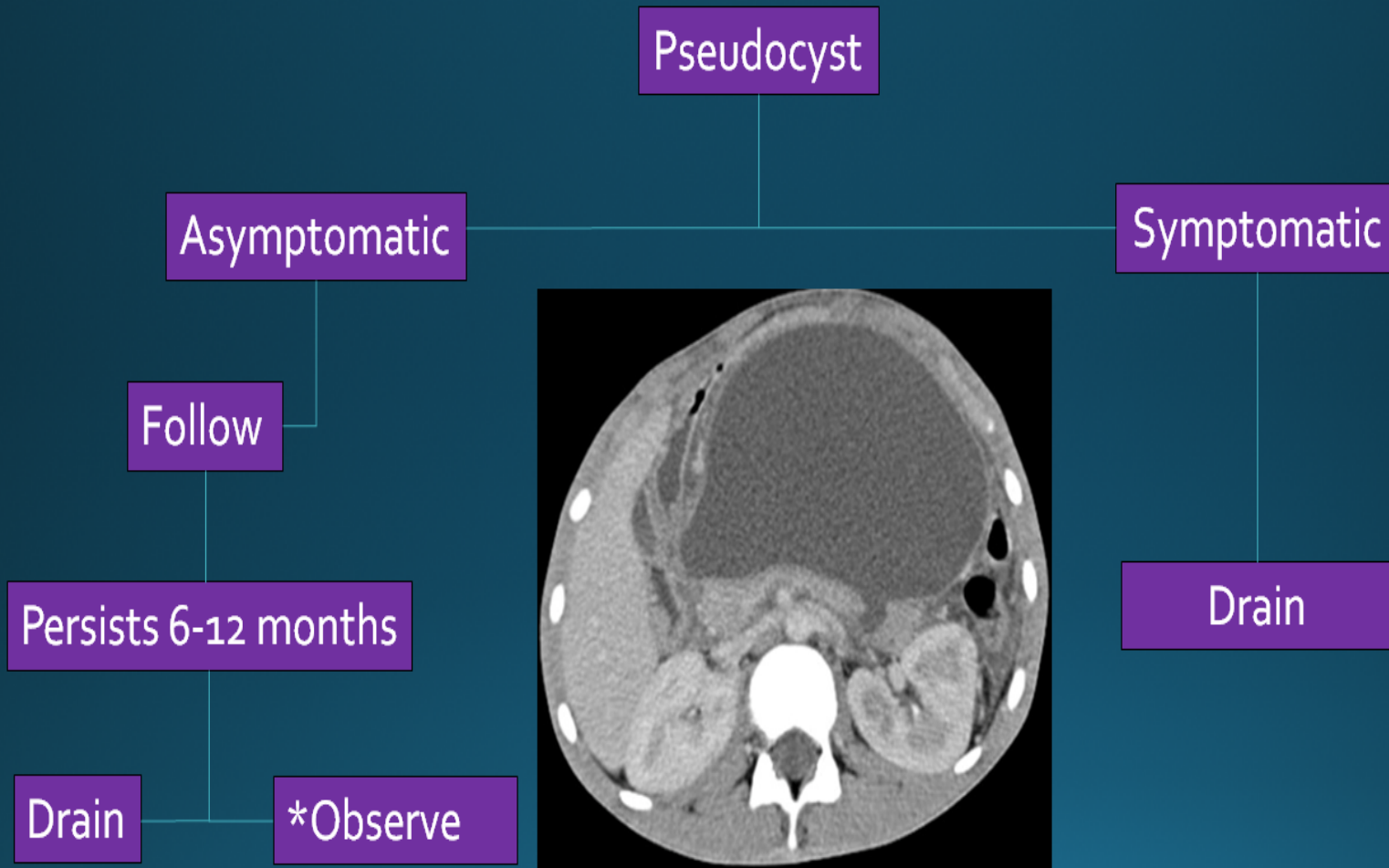




After-Procedure Care

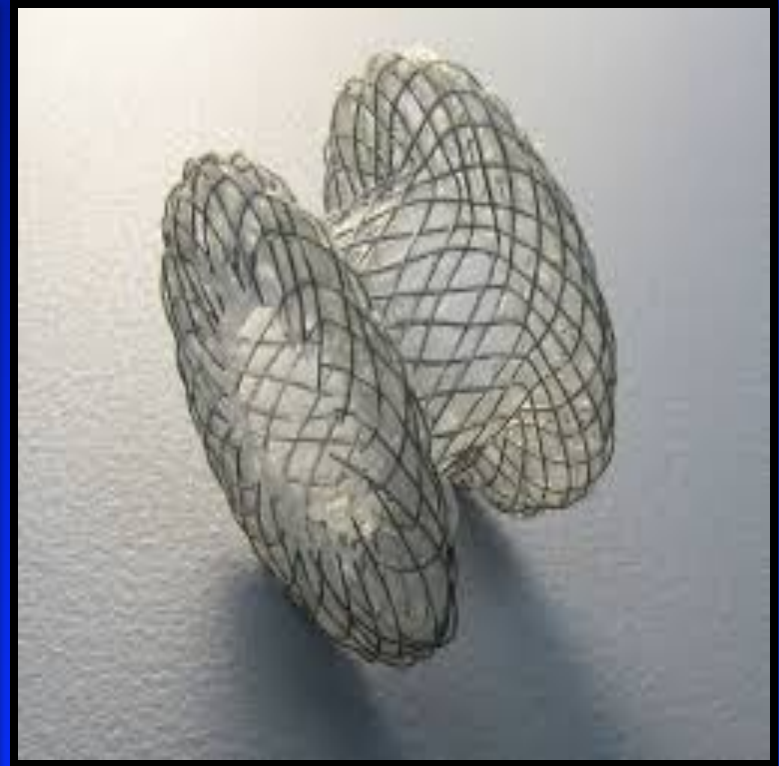
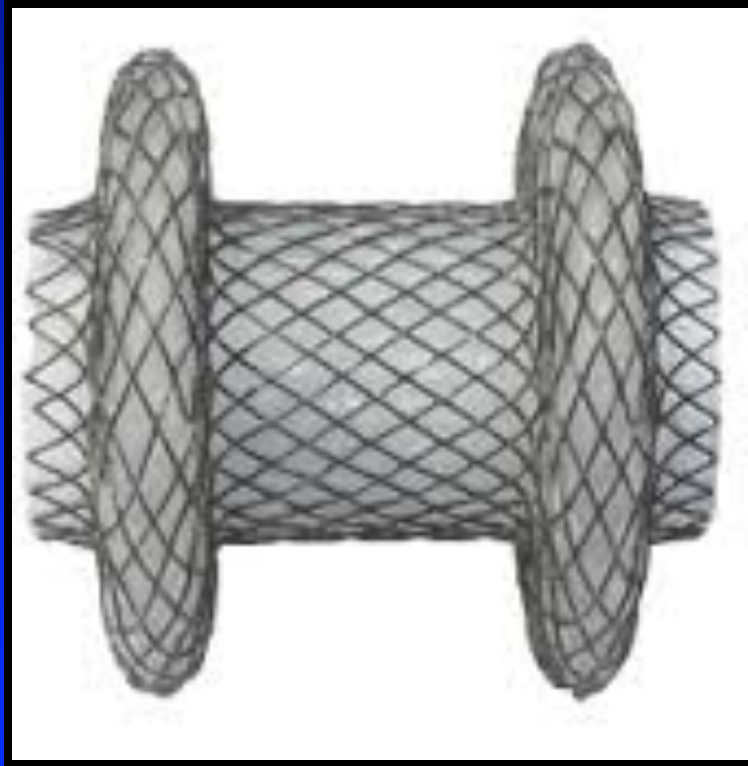
- Overnight observation
- Antibiotic coverage for 3 to 5 days
- Follow up CT in 1 to 2 weeks
- Endoscopic stent removal after cyst resolution

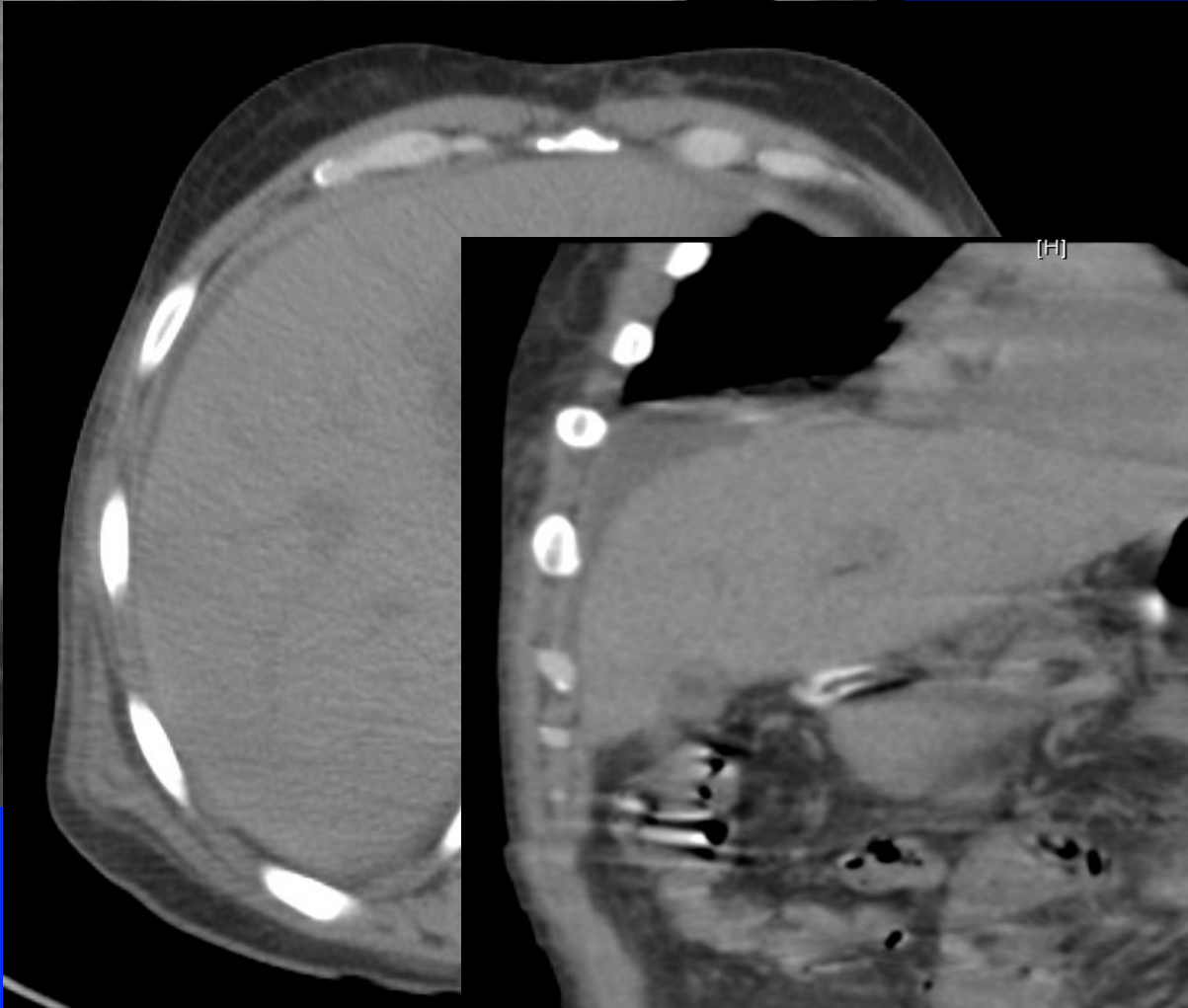
Pseudocyst Management



*Large cysts can be safely followed, but are more likely to require drainage

Lumen-apposing Metal Stent





American College of Gastroenterology Guideline: Management of Acute Pancreatitis

Scott Tenner, MD, MPH, FACG¹, John Baillie, MB, ChB, FRCP, FACG², John DeWitt, MD, FACG³ and Santhi Swaroop Vege, MD, FACG⁴

- Consensus favors minimally invasive methods (endoscopic necrosectomy) over surgery for the management of pancreatic necrosis
- Early referral to an expert center is important

Tenner S, et al. Am J Gastroenterol 2013

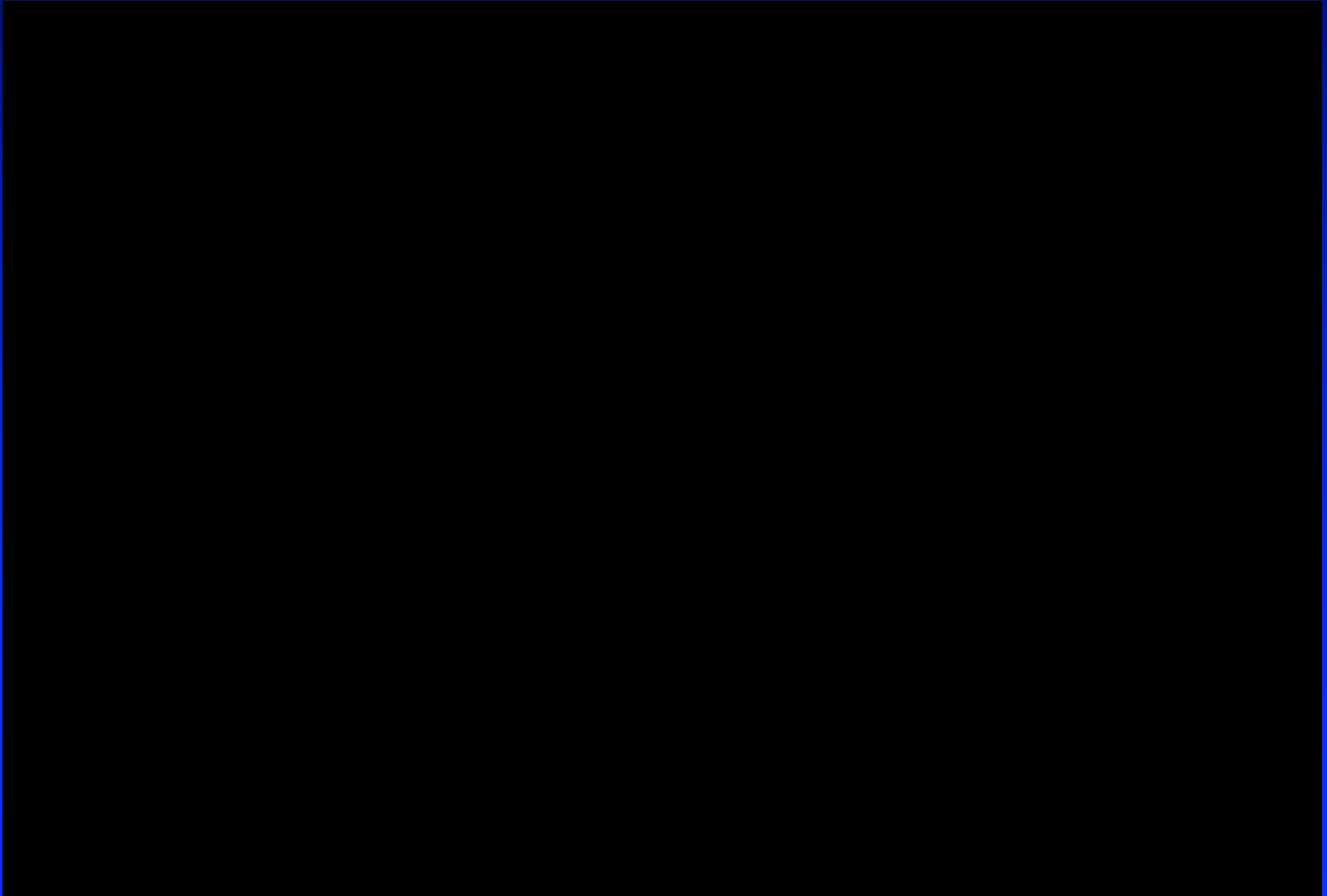
Endoscopic Therapy With Lumen-apposing Metal Stents Is Safe and Effective for Patients With Pancreatic Walled-off Necrosis



Reem Z. Sharaiha,* Amy Tyberg,* Mouen A. Khashab,[‡] Nikhil A. Kumta,* Kunal Karia,* Jose Nieto,[§] Uzma D. Siddiqui,^{||} Irving Waxman,^{||} Virendra Joshi,[¶] Petros C. Benias,[#] Peter Darwin,^{**} Christopher J. DiMaio,⁺⁺ Christopher J. Mulder,^{§§} Shai Friedland,^{|||} David G. Forcione,^{¶¶} Divyesh V. Sejpal,^{##} Tamas A. Gonda,^{***} Frank G. Gress,^{***} Monica Gaidhane,* Ann Koons,^{||} Ersilia M. DeFilippis,* Sanjay Salgado,* Kristen R. Weaver,* John M. Poneros,^{***} Amrita Sethi,^{***} Sammy Ho,⁺⁺⁺ Vivek Kumbhari,[‡] Vikesh K. Singh,[‡]

- Retrospective case series: 124 patients
- Direct endoscopic debridement (78/124: 63%)
- Technical success: 100%
- Clinical success: 86% (13 IR/3 Surgery)
- Adverse events: Bleeding (2), Stent occlusion (9), Stent migration (3)

Pancreatic Necrosectomy



Take Home Points

- ERCP is not needed in most patients with gallstone pancreatitis
- Asymptomatic pancreatic pseudocysts do not warrant intervention regardless of size
- Transpapillary drainage can be considered for smaller pseudocysts that communicate with the pancreatic duct

Take Home Points

- Transmural drainage has become the preferred approach for draining all pseudocysts
- A minimally invasive approach starting with endoscopic necrosectomy is the initial procedure of choice for WOPN

Thank you for your attention