

Surgical Drainage of Pancreatic Pseudocyst

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Abstract:

A pancreatic pseudocyst is an encapsulated collection of homogenous fluid with little or no necrotic tissue within it. It is usually well circumscribed and located outside of the pancreas, often in the lesser sac. Regardless of the cause, the overall incidence of pseudocysts is low; 0.5 to 1 per 100,000 adults per year. Pancreatic pseudocysts are often seen as a complication of chronic pancreatitis and less commonly from acute pancreatitis. The incidence of pseudocysts is higher in males as it follows the incidence of pancreatitis, which is slightly male predominant. In acute pancreatitis, the incidence of pseudocysts ranges from 5% to 16%. Pseudocysts tend to be more common in the setting of chronic pancreatitis, with incidence rates between 20% to 40%. The majority of the cases were alcohol-induced (70%) followed by biliary tract disease (8%), trauma (6%), and the remaining attributed to the idiopathic cause. Symptoms of pseudocysts are typically non-specific and may present only with vague abdominal pain, nausea, or vomiting. A contrast-enhanced CT scan of the abdomen is the diagnostic modality of choice. Most pseudocysts resolve spontaneously, and treatment is usually conservative with supportive care. In general, larger cysts are more likely to become symptomatic or cause complications. Potential complications include infection, hemorrhage, pseudocyst rupture, and disruptions of the pancreatic duct system.

Keywords: Pancreatitis cyst drainage alcohol

Introduction

- A pancreatic pseudocyst is an encapsulated collection of homogenous fluid with little or no necrotic tissue within it. It is usually well circumscribed and located outside of the pancreas, often in the lesser sac.
- Regardless of the cause, the overall incidence of pseudocysts is low; 0.5 to 1 per 100,000 adults per year.
- Pancreatic pseudocysts are often seen as a complication of chronic pancreatitis and less commonly from acute pancreatitis
- The incidence of pseudocysts is higher in males as it follows the incidence of pancreatitis, which is slightly male predominant.
- In acute pancreatitis, the incidence of pseudocysts ranges from 5% to 16%.
- Pseudocysts tend to be more common in the setting of chronic pancreatitis, with incidence rates between 20% to 40%.
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- Symptoms of pseudocysts are typically non-specific and may present only with vague abdominal pain, nausea, or vomiting.
- A contrast-enhanced CT scan of the abdomen is the diagnostic modality of choice.
- Most pseudocysts resolve spontaneously, and treatment is usually conservative with supportive care.
- In general, larger cysts are more likely to become symptomatic or cause complications.
- Potential complications include infection, hemorrhage, pseudocyst rupture, and disruptions of the pancreatic duct system.

Case presentation

- 64 years / male, known chronic alcoholic and smoker with no known comorbidity.
- Pain abdomen for past 8 months acute onset pain abdomen, radiating to back associated with nausea and vomiting.
- Yellowish discoloration of eyes for 2 months progressively deepening associated with high coloured urine and clay stools itching present
- H/o of undocumented weigh loss with anorexia

On Examination

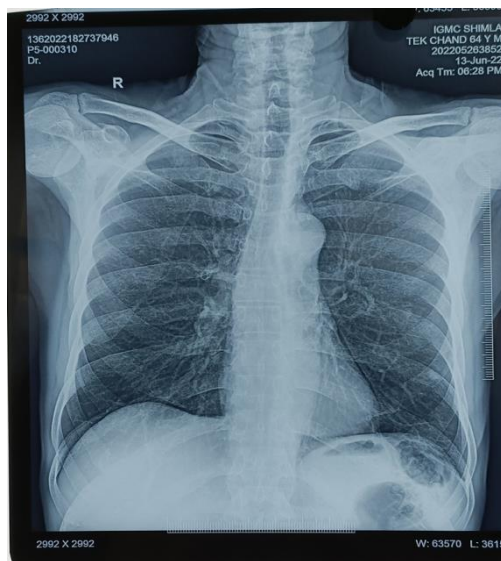
- VITALS – PR :76/min BP :122/84 mmHg sPO₂ : 93% on room air
- GPE- ECOG 1, BMI - 18.34kg/m², Icterus ++ Scratch marks +ve No LAP
- Per Abdomen : Soft and non tender, No organomegaly, A lump of size around 12 x 12cm is palpable in the right hypochondrium and epigastrium, non-tender, not moving with respiration, no local rise in temperature ,bowel sounds present, digital rectal examination – Clay colored stools present.

Clinical impression

Obstructive Jaundice With Lump Abdomen

D/D Ca Periapillary CA GALL BLADDER Pseudocyst Pancreas

INVESTIGATIONS



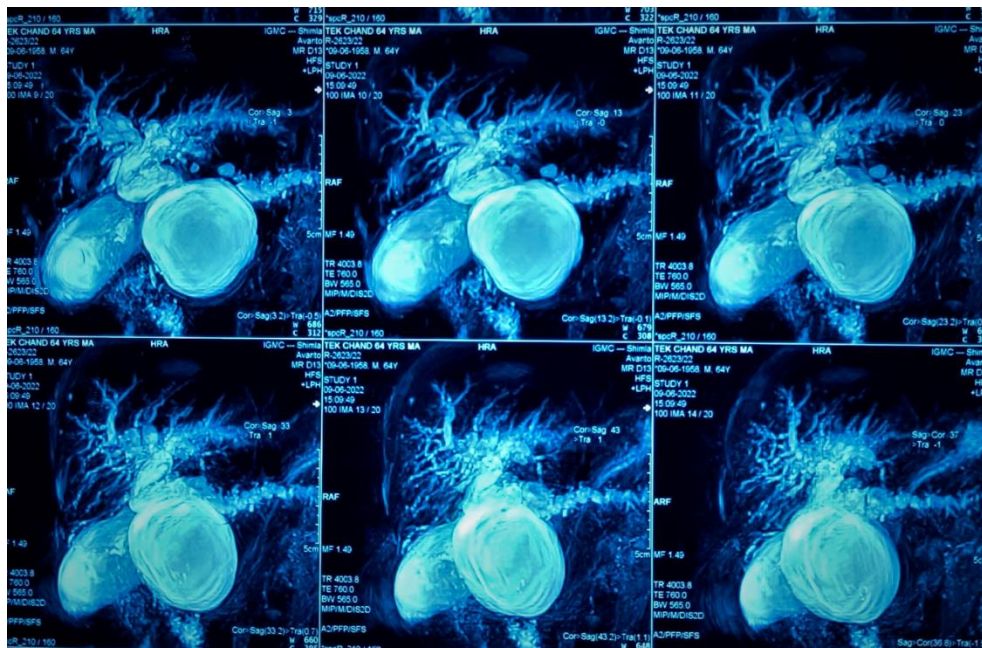
- Hb:13.3gm/dl TLC:7.1 PLT:171 HCT:37.8

- UREA: 31.6 CREAT:0.25
- **BIL T: 19.36 BIL D:10.67 AST:107.1 ALT:80.5 ALP:603**
- Na:135.90 K:4.07 Cl:104.5
- CXR PA- WNL

MRCP

- Liver measures 12.3cm, normal in size & outline. Gall bladder is distended measures 7x4.8mm and shows p/o signal void in its lumen - GB sludge
- There is p/o T2 hyperintense well defined cystic lesion with wall thickness of
- 7.5mm seen in head region of pancreas measuring 0x6.7cm.
- **Pancreatic duct is dilated and tortuous measuring 9mm** side branches visualized.
- Pancreas is **atrophic** measuring 13 mm in body and 14 mm in tail.
- Portal vein is normal. SMV is compressed by the lesion. SMA is normal.
- LHD- 8mm
- RHD- 7mm
- CHD- 13mm .
- Central IIBRs. LHD .RHD & CHD are dilated.
- **Distal CBD measures (14.5 mm.)**
- Free fluid is seen in pelvis, right paracolic gutter. perihepatic region and morrison pouch.
- Spleen is normal in size, outline & signal intensity.
- Bilateral kidneys are normal in size, outline & signal intensity.

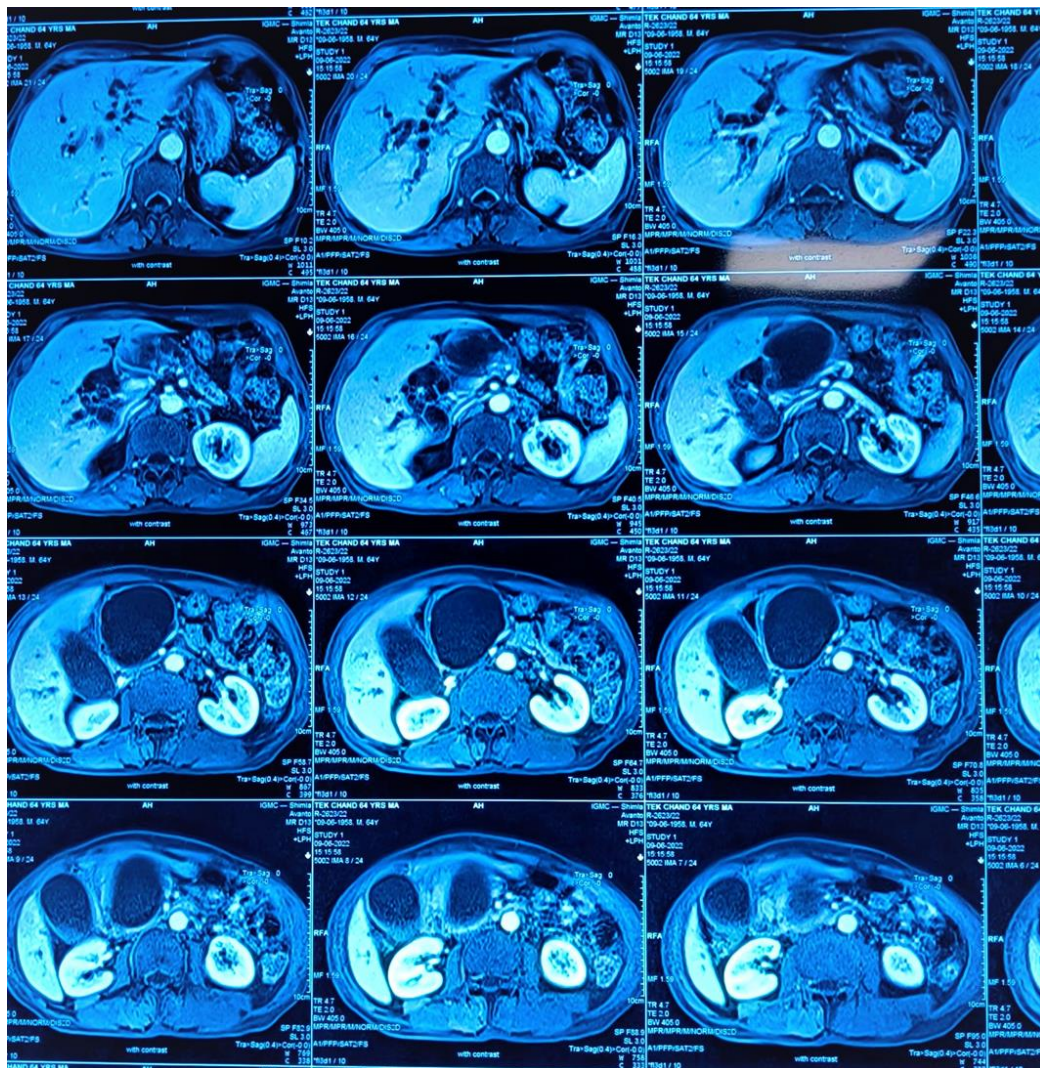
IMPRESSION: Chronic pancreatitis with walled off necrosis and dilated biliary system



CECT Abdomen

- There is presence of well defined peripherally enhancing hypodense lesion with average CT value of 15-20 HU measuring **7.3 X 5.1 cm seen in the head and neck region of the pancreas.**

- No internal calcification / mural nodule is seen in this lesion.
- **It is showing wall thickness with maximum thickness of 6.8mm laterally.** Fat planes with the adjacent organs appears to be well maintained.
- Laterally this mass is compressing upon the distal end of the CBD resulting in upstream dilation of the IHBR.
- This mass is abutting and compressing the portal vein inferiorly in the head region of the pancreas. However it is normal in contrast pacification. No filling defect seen. There is presence of minimal peri-pancreatic standing seen.
- **MPD is dilated in the body and tail and measures upto 1 cm**

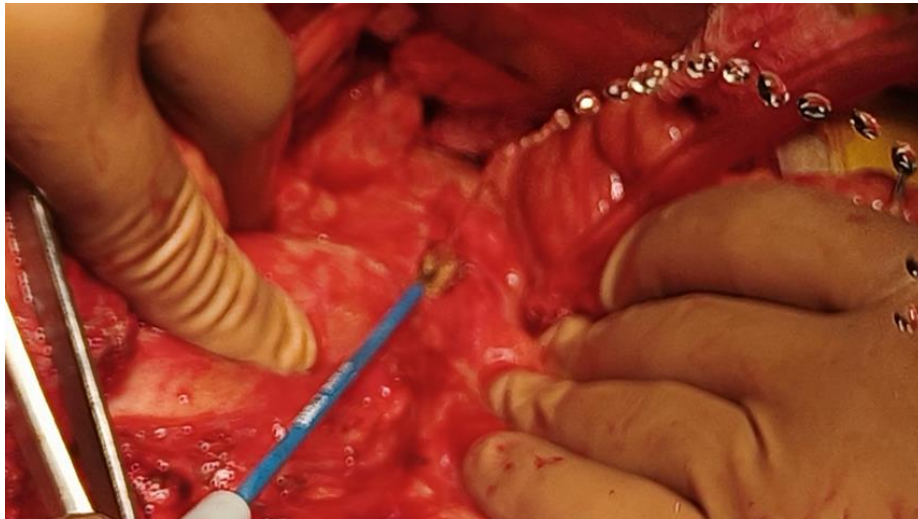


Surgery done

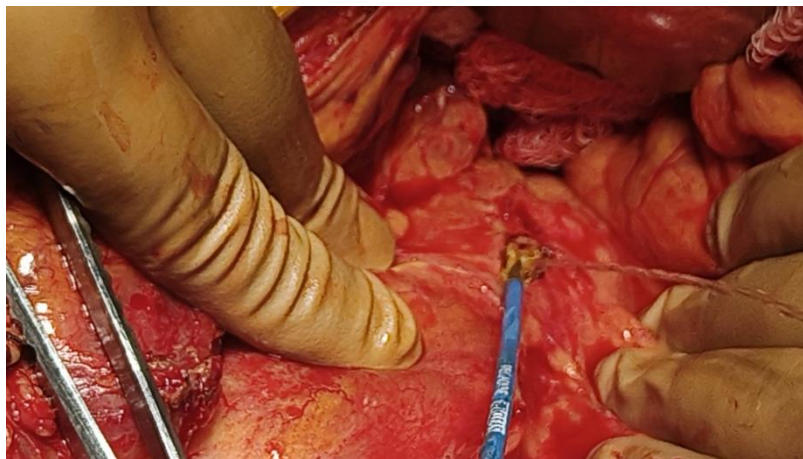
- Exploratory Laprotomy by Chevron Incision
- Roux-en-Y Cystojejunostomy With Lateral Pancreatico-Jejunostomy – Izbicki Procedure
- Cholecystectomy With Choledochoduodenostomy
- Feeding Jejunostomy With Omentectomy (Devascularisation of omentum)

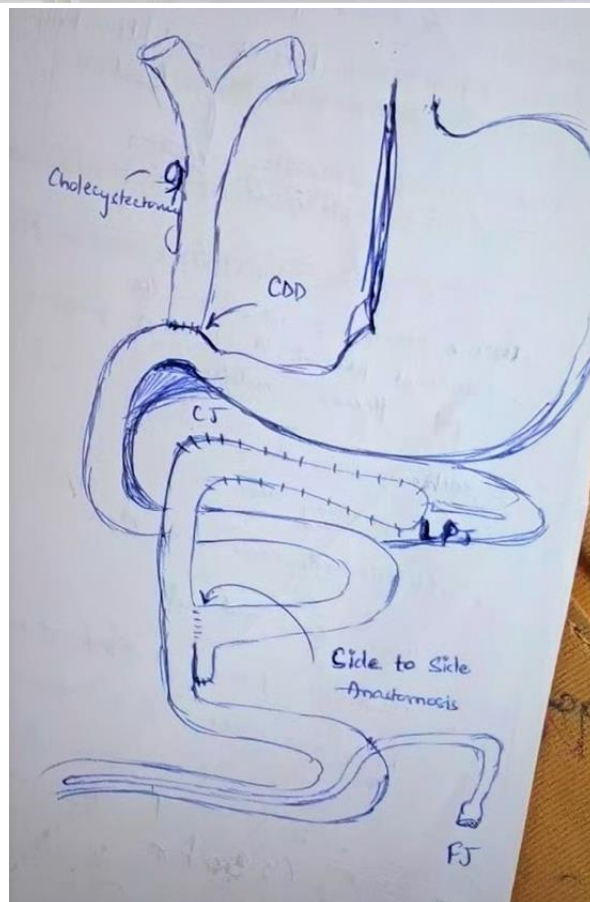
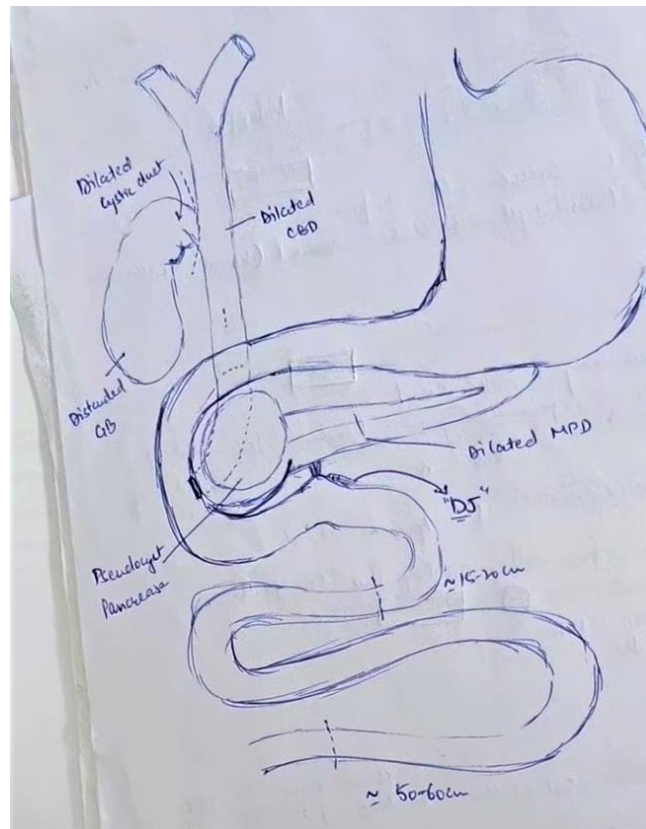
Intra Operative Findings

- Pseudocyst present at head of pancreas of size around 8x8cm.
- MPD (Main Pancreatic Duct)- Collapsed after drainage of cyst (dilated around 1 cm, upstream dilation – due to compression by Pseudocyst in imaging).
- Pancreas firm in texture - Chronic Pancreatitis.
- Portal vein was visible encased & coursing through the Pseudocyst.



Opening The Cyst – PD Interface – Pancreatic juice came out as jet of water





Post operative period

HB: 16.1
 TLC: 5.59
 PLT: 177
 HCT: 55.5
 UREA: 18
 CREAT: 0.47
 BIL T: 11.02
 BIL D: 6.50
 AST: 155.3
 ALT: 93.8
 ALP: 306
 Na: 137.80
 K: 3.58
 Cl: 102.00

DRAIN AMYLASE	POD 1	POD 3	POD 5
Jejunostomy	366	18	14
MORRISON	272	114	10
Pancreaticojejunostomy	216	8	11



Discussion

- With serum enzyme levels of limited diagnostic utility, identification of a pancreatic pseudocyst is usually made with the combination of high clinical suspicion and imaging studies.
- Transabdominal ultrasound has a sensitivity of around 70% to 90% and is often used as the initial imaging study due to its portability, ease of use, and cost.

- The better option for initial imaging is a contrast-enhanced CT of the abdomen. It is the modality of choice with a remarkable sensitivity of 82% to 100% and a specificity of around 98%. The major limitation of using a CT scan is its inability to distinguish between a pseudocyst and neoplastic cystic lesions.
- Endoscopic ultrasound (EUS) proves resourceful in this regard as it is a minimally invasive procedure that allows for close up, detailed images of the pancreas. EUS also allows for the endoscopist to perform diagnostic and therapeutic drainage of the cyst. Findings suggestive of a cystic neoplasm includes a cyst wall thickness greater than 3 mm, multiple septations, the presence of a solid mass or nodule, and cystic dilation of the main pancreatic duct.
- An MRI-MRCP is the most accurate tool to study the anatomy of the pancreatic ducts. It is superior to CT scan imaging in characterizing debris within the pseudocyst. However, MRI-MRCP is not routinely used because a CT scan typically offers adequate diagnostic information. Pre-drainage MRI-MRCP can be useful in situations where identifying the type of debris is essential to avoid complications related to infection or bleeding.

Spontaneous resolution of pseudocysts is common, especially for those that occur after an episode of acute pancreatitis. Since stable, non-enlarging pseudocysts rarely cause any symptoms, the gold standard for the treatment of uncomplicated pseudocysts is conservative management. This includes analgesics and antiemetics as needed and a low-fat diet. Such patients usually have interval imaging for early detection in case the size of the pseudocyst does increase or if complications develop.

On the other hand, pseudocysts that develop as a complication of chronic pancreatitis rarely resolve spontaneously. Specific factors that correlate with a lower chance of spontaneous resolution include

The presence of multiple cysts, cysts located near the tail of the pancreas, coexistence of other local anatomic complications such as strictures or calcifications of the pancreatic ducts, and the progressive increase in the size of the cyst.

The three categories of invasive interventions are percutaneous, endoscopic, and surgical drainage or excision. Ideally, any intervention should be delayed to around six weeks after the inciting pancreatitis episode, in the absence of complicating factors, to allow the pseudocyst wall to thicken and mature.

Percutaneous Drainage (PD)

Percutaneous drainage is performed with either ultrasound or CT guidance. A pigtail catheter is placed into the pseudocyst and is left in place until the fluid output is minimal. PD can cause significant discomfort to the patient as the catheter tends to clog and may need frequent repositioning. It is contraindicated in patients with strictures of the pancreatic duct and those who cannot manage catheter care at home. There have been multiple studies evaluating the efficacy of PD compared to the other treatment modalities available. One of the most extensive studies comparing Surgical Drainage (SD) and PD found that, although they had similar success rates, SD had fewer complications in terms of mortality, duration of hospital stays, and rates of re-intervention. Compared to endoscopic drainage, PD was inferior with regards to residual fluid collections, frequency of re-intervention, and the need for surgery. Based on these studies, PD should only be considered in critically ill patients who cannot

tolerate surgical or endoscopic procedures or for patients with an immature infected or complicated pseudocyst as PD does not require wall maturation before the intervention.

Endoscopic Drainage

Endoscopic drainage methods are becoming the preferred treatment approach because it is less invasive than surgery and yields high long-term success rates. The aim is to create a canal that helps to drain the pancreatic pseudocyst into the gastrointestinal tract, avoiding the need to place an external drain. Construction of the canal can be done either through the trans papillary method (TPD) using ERCP or directly across the stomach or duodenal wall with transmural (TSM) drainage.

1. Transpapillary Drainage (TPD)

Transpapillary drainage is an option when there is a communicating tract between the pseudocyst and the main pancreatic duct or when the cyst is too far away from the gastrointestinal lumen to pursue TSM drainage. In this technique, a catheter is threaded through the pancreatic duct, and a stent is deployed within the communicating tract between the pseudocyst and the lumen of the pancreatic duct under ERCP guidance. This facilitates pseudocyst drainage and decompression. If strictures are encountered along the pancreatic duct, balloon dilation is performed to open the lumen and allow passage of the catheter. TPD is less likely to be successful for cysts located distally if multiple cysts are present, or multiple pancreatic duct strictures impair the ability to pass the catheter.

An advantage of using the TPD technique is the ability to dilate other pancreatic duct strictures encountered while threading the catheter to access the pseudocyst-pancreatic duct communicating tract. Alleviating strictures along the pancreatic duct could potentially reduce the chance of further pseudocyst formation in the future. TPD has a success rate, which ranges from 81% to 94%. However, a recent multicentre study published in 2016 showed no benefit in treatment outcomes in patients undergoing TPD vs. EUS-guided transmural drainage. TPD was associated with lower rates of long-term cyst resolution after a mean follow up of 200 days.

2. Transmural Drainage (TSM)

TSM is performed across the stomach or the duodenal wall using EUS or the conventional endoscope to guide drainage of the pseudocyst. With recent advances in technology, EUS guided drainage has mostly replaced the use of conventional endoscopy. Conventional endoscopy relies on the presence of a bulge in the gut wall caused by a compressing pseudocyst to identify an ideal puncture site. The advantage of using EUS is the ability to identify and access a pseudocyst that is non-bulging (which occurs in approximately 42% to 48% of cases), pseudocysts that are adjacent to, but not directly abutting the gastrointestinal wall and pseudocysts that are located more distally along the pancreas. Additionally, EUS helps identify and avoid overlying blood vessels, and thus, decreasing the risk of bleeding complications. Once the puncture site is established, a needle is inserted into the pseudocyst, and positioning is confirmed using fluoroscopy. After the cyst-gut tract is confirmed, it is dilated pneumatically, and multiple pigtail stents are deployed for drainage. In two randomized control trials comparing EUS with non-EUS guided transmural drainage, the technical success rates were better in EUS guided drainage; ~95% versus 59%. The major adverse events associated with TSM are hemorrhage, perforation, and infection. In summary, TSM is indicated when the pancreatic duct

anatomy is disrupted or complicated with stricture formation. With management archetype moving towards less invasive techniques, the endoscopic approach is gaining popularity for treating pseudocysts. EUS assisted techniques are associated with a higher success rate and a decreased percentage of serious complications.

Surgical Drainage

Historically surgical drainage, which includes cystogastrostomy, Cystoduodenostomy, or cystojejunostomy, was the method of choice for pancreatic pseudocyst drainage. However, with evolving endoscopic techniques, surgical drainage is now limited to certain situations such as recurrent pseudocysts, pseudocysts of uncertain origin, resection of a malignant cyst, or pseudocysts that are difficult to access endoscopically. Clinical features that should raise concerns for malignancy are weight loss, a palpable mass, multilocular pseudocysts, thick walls, and an elevated CEA level in the pseudocyst fluid. For surgical drainage, either the open or laparoscopic method can be opted for as both are effective; however, the laparoscopic approach carries lower morbidity and mortality. A systematic review found that laparoscopic drainage is associated with a 98.3% success rate, 2.5% recurrence rate, a mean hospital stay of 5.7 days, and a less than 2% complication rate. A retrospective study done in 2009 comparing endoscopic drainage with surgical drainage (open or laparoscopic) found a similar rate of complications, but surgical drainage was associated with a higher treatment success rate. In conclusion, surgical drainage is a safe alternative to other less invasive procedures and is reserved for cysts that need a wider stoma for drainage, resection of pancreatic necrosis, or cysts of unknown etiology.

In summary, the treatment of choice depends on the individual patient profile, and it is essential to understand the risks and benefits associated with each treatment modality.

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