

Issues in Management of Pancreatic Pseudocysts

Dinesh Singhal¹, Rahul Kakodkar¹, Randhir Sud², Adarsh Chaudhary¹

Departments of ¹Surgical and ²Medical Gastroenterology, Sir Ganga Ram Hospital,
New Delhi, India

ABSTRACT

Pancreatic pseudocysts (PPs) comprise more than 80 % of the cystic lesions of the pancreas and cause complications in 7-25% of patients with pancreatitis or pancreatic trauma. The first step in the management of PPs is to exclude a cystic tumor. A history of pancreatitis, no septation, solid components or mural calcification on CT scan and high amylase content at aspiration favor a diagnosis of PP. Endoscopic ultrasound (EUS)-guided FNAC is a valuable diagnostic aid. Intervention is indicated for PPs which are symptomatic, in a phase of growth, complicated (infected, hemorrhage, biliary or bowel obstruction) or in those occurring together with chronic pancreatitis and when malignancy cannot be unequivocally excluded. The current options include percutaneous catheter drainage, endoscopy and surgery. The choice depends on the mode of presentation, the cystic morphology and available technical expertise. Percutaneous catheter drainage is recommended as a temporizing measure in poor surgical candidates with immature, complicated or infected PPs. The limitations include secondary infection and pancreatic fistula in 10-20% of patients which increase complications following eventual definitive surgery. Endoscopic therapy for PPs including cystic-enteric drainage (and transpapillary

drainage), is an option for PPs which bulge into the enteric lumen which have a wall thickness of less than 1 cm and the absence of major vascular structures on EUS in the proposed tract or those which communicate with the pancreatic duct above a stricture. Surgical internal drainage remains the gold standard and is the procedure of choice for cysts which are symptomatic or complicated or those having a mature wall,. Being more versatile, a cystojejunostomy is preferred for giant pseudocysts (>15cm) which are predominantly inframesocolic or are in an unusual location. In PPs with coexisting chronic pancreatitis and a dilated pancreatic duct, duct drainage procedures (such as longitudinal pancreaticojejunostomy) should be preferred to a cyst drainage procedure.

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Issues

- *Observation or intervention?*
- *Pseudocyst or tumor?*
- *Management strategy*
 - *Endoscopy or surgery?*
 - *Complicated pseudocyst?*

Indications for Intervention

- **Absolute indications**
 - *Symptomatic*
 - *Chronic pseudocysts**
 - *In a phase of growth*
 - *Complications*
 - *Malignancy?*

* In the setting of chronic pancreatitis, pseudocysts are often thick-walled and associated with morphological changes (disruption, strictures, stones) in the pancreatic duct. Hence they are less likely to undergo spontaneous resolution which is a common occurrence in post-acute pancreatitis pseudocysts.

Indications for Intervention

- **Relative indications**
 - *Duration: more than 6 weeks*
 - *Size: greater than 6 cm*
 - *Pancreatic duct abnormalities (stricture, stone, rupture)*
 - *Multiple cysts**

* Intraductal papillary mucinous tumors (IPMT), which may mimic multiple pseudocysts, are seen as a cystic dilatation of the main or a branch of the pancreatic duct

but they usually occur in elderly males, are located in the uncinata process, have septa, communicate with the duct with mural nodules and are characteristically associated with the fish mouth appearance of the papilla spewing mucus. The association of IPMT with pancreatitis is not well understood.

Expectant Management

- *Asymptomatic*
- *Uncomplicated*
- *Stable or decreasing size*

Beware of a Cystic Tumor !

Cystic tumor erroneously drained by 'cystogastrostomy'

October 2002



Cystic tumour misinterpreted as pseudocyst

December 2003



Enhancing walls, solid content, evidence of neoplasm

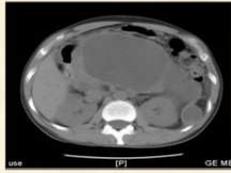
Pseudocyst vs. Cystic Tumor

- | | |
|---|---|
| ➤ <i>Previous pancreatitis/trauma</i> | ➤ <i>No history of pancreatitis</i> |
| ➤ Imaging (CT, US): <ul style="list-style-type: none"> • <i>Single, non-loculated</i> • <i>No septae or solid components</i> • <i>Thin wall (<4mm)</i> | ➤ Imaging: <ul style="list-style-type: none"> • <i>Often multilocular</i> • <i>Septae or solid components</i> • <i>Thick walled</i> |
| ➤ MRCP/ERCP | ➤ MRCP/EUS ± FNA /ERCP |
| Duct-cyst connection in ≥ 65% | No duct-cyst connection |

EUS-guided FNA is an adjunct for diagnosis when standard imaging techniques are unable to differentiate between tumor and pseudocyst. ERCP is performed when an

IPMT is suspected. Intraductal and/or intracystic biopsy is usually diagnostic.

Pseudocyst vs. Cystic Tumor



Pseudocyst



Cystic tumor

Cyst Fluid Analysis

	Viscosity	Amylase	Cytology
Pseudocyst	Low	High	Inflam.
SCA	Low	Low	25% +
MCA	High	Low	40% +
MCAC	High	Low	67% +

	CEA	CA 15-3	CA 72-4
Pseudocyst	Low	Low	Low
SCA	Low	Low	Low
MCA	High	High	Low
MCAC	High	High	High

MCA: mucinous cystadenoma; MCAC: mucinous cystadenocarcinoma; SCA: serous cystadenoma. [1, 2]

Pseudocyst vs. Cystic Tumor

- **Retrospective study of 21 cystic neoplasms; 8 diagnosed pseudocysts**
 - Only one patient had a history of pancreatitis
 - 7/8 CT scans lacked features which were suspicious of neoplasm
 - 16/18 investigations (ERCP, cyst fluid analysis, angiography) unhelpful
- **A mucinous cystic neoplasm is more likely to be misdiagnosed as a pseudocyst**
 - 5/13 MCA misdiagnosed; 2 underwent cystenterostomy
 - At imaging, classical findings of neoplasia (septae, wall calcification and papillary projections) were absent in 38% of cases

[3, 4]

Pseudocyst vs. Cystic Tumor

No imaging is infallible !

It is better to resect a pseudocyst than to drain a tumor !

Uncomplicated Cyst

- Bulge into stomach/ duodenum*
- No solid tissue/ vessels (EUS)*
- Wall thickness 0.5-1 cm (EUS)
- Technical expertise available

↓

Endoscopic drainage



Pseudocyst entered



Tract dilated



Drain placed

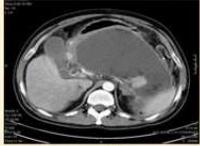
* EUS-guided drainage is an option for selected patients with non-bulging cysts or those with left portal hypertension or intervening vessels when performed by an expert. [5, 6, 7]

Surgical Strategy (I)

- **Symptomatic mature pseudocyst with bulging into the posterior gastric wall**

↓

Cystogastrostomy*



Pseudocyst with mature wall bulging into the stomach



Pseudocyst opened through posterior gastric wall

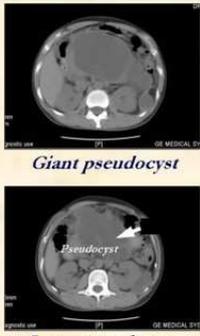
Cystogastrostomy-intraoperative

* Endoscopic cystogastrostomy may be safely performed for cysts which bulge into the stomach when surgical risk is unacceptable,

and whenever such endoscopic expertise is available.

Surgical Strategy (II)

➤ Symptomatic mature pseudocyst with infracolic bulging or giant pseudocyst



Cystojejunostomy

Surgical Strategy (III)

➤ Symptomatic mature pseudocyst + dilated main pancreatic duct



Partington-Rochelle

Surgical Strategy (IV)

➤ Symptomatic mature multiple pseudocysts in unusual locations + dilated main pancreatic duct



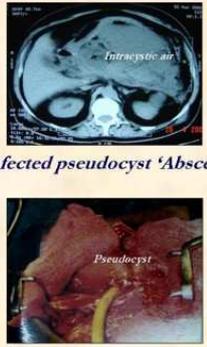
Partington-Rochelle

Complications

- Sepsis
- Biliary obstruction
- Hemorrhage
- Sinistral portal hypertension
- Duodenal obstruction

Sepsis

➤ Infected pseudocyst (abscess) not amenable to image-guided drainage



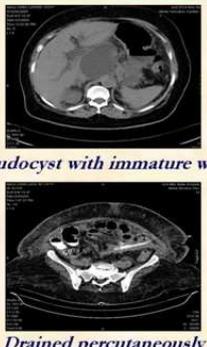
External drainage
(Risk of pancreatic fistula morbidity: 10-15%)

[8] Adams DB, Anderson MC. Ann Surg 1992; 215:571-8.
[9] Heider R, et al. Ann Surg 1999; 229:781-7.

External drainage (surgical or image-guided) is employed to stabilize patients with sepsis or complications when definitive surgery is not technically feasible (immature walls). The associated complications are pancreatic fistulas and drain tract infections. External drainage is best suited for patients with normal pancreatic duct without cyst-duct communication. In the setting of chronic pancreatitis, external drainage is more likely to fail and increase complications after subsequent definitive surgery [8, 9].

Biliary Obstruction (I)

➤ Complicated pseudocyst with immature wall

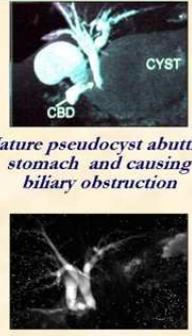


External drainage
(Risk of pancreatic fistula morbidity: 10-15%)

Biliary Obstruction (II)

➤ Mature pseudocyst with biliary obstruction

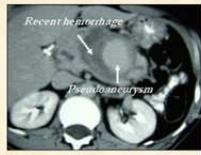
➤ Not amenable to ERC



Internal drainage
(Surgical/Endoscopic)

Hemorrhage (I)

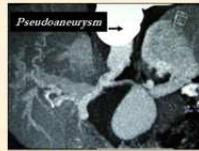
- Intracystic bleeding with mature wall (failed angioembolization)



↓
Ligation/Packing

Hemorrhage (II)

- Pseudoaneurysm without bleeding



↓
Angioembolization/Resection

Sinistral Portal Hypertension

- Sinistral portal hypertension with fundal variceal bleeding, dilated main pancreatic duct, and pancreatic pain



↓
Splenectomy + Ductal drainage



Duodenal Obstruction

- Duodenal obstruction



↓
Gastrojejunostomy*

* Endoscopic cystoduodenostomy can be performed for suitable cysts by expert endoscopists. In some patients with duodenal

obstruction and cystic dystrophy of the duodenal wall due to head dominant pancreatitis, a pancreaticoduodenectomy may be considered.

Key Points

- Rule out cystic tumor
- Endoscopic drainage in selected patients
- Surgery - gold standard for pseudocysts:
 - Giant
 - Complicated
 - Associated with ductal abnormalities

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Keywords Cystadenoma; Cysts; Endosonography; Pancreas; Pancreatic Pseudocyst; Surgery

Abbreviations MCA: mucinous cystadenoma; MCAC: mucinous cystadenocarcinoma; SCA: serous cystadenoma

Correspondence

Adarsh Chaudhary
Department of Surgical Gastroenterology
Sir Ganga Ram Hospital
New Delhi
India 110060
Phone: +91-11.4225.2226
Fax: +91-11.4225.2224
E-mail: adarsh@nda.vsnl.net.in

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