Management of Pancreatic Pseudocysts

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History

- 26M c PMHx of ETOH abuse, asthma
  - Admitted 5/12 for worsening abd pain, n/v x 3wks
  - No past surgical history
  - +Tobacco, marijuana use daily

- Prior admission KCH in 2/2012
  - Admitted to medical service for pancreatitis
  - Surgery not consulted

- Imaging 2/2012
Laboratory Values

- CBC 10.3>17.7/55.1<441
- BMP 140/4.9/96/27/12/0.7<207
- LFTs 7.8/4.2/15/16/111/1.1
- Lactate 3.6
- Amylase 828   Lipase 775
- Ranson’s Score (5/2012): 4
Hospital Course

- Admitted to SICU 5/17
- Aggressive resuscitation, NPO
- Nasojejunal tube placed for feeds 5/24
- MRCP to delineate anatomy:
  - Trilobulated pseudocyst 3.2 x 3.8 cm
  - Increase in size of perisplenic collection
  - Suspected direct communication
Hospital Course

- Return to SICU: recurrent pancreatitis, sepsis
- 5/29: CBC 24>11.6/34<313
- Lipase 3250  Amylase 3302
- Multidisciplinary Conference 5/31:
  - Octreotide, NPO
  - Repeat Imaging
  - Possible ERCP
Hospital Course

• 6/1: Fever 104.8; ABx, GNR in blood
• Intermittent fevers not improving
• Concern for secondary infection of pseudocyst

• IR consulted for sampling to rule out infection
Hospital Course

- 1300mL of purulent fluid drained – *Klebsiella*
- Improved clinical status
- Repeat CT 6/16: re-accumulation of fluid
- GI recs outpatient ERCP/cystgastrostomy
- Discharged home 6/17
Hospital Course

- Returns 6/29 with abd pain, fever to 102
- 7/1: Transferred to SICU for worsening exam
- IR drainage of ruptured pseudocyst
- No improvement with IR drainage
- 7/4: Exploratory laparotomy/ext drainage
  - Unable to visualize anatomy
  - Sump drains placed
Hospital Course

- Tolerated procedure
- Postop complicated by *S. maltophilia* PNA
- Extubated POD#6, NJ tube feeds started
- Drains progressively removed
- Transferred to floor 7/17 with three drains
QUESTIONS?
What is a Pseudocyst?

- Many fluid collections following pancreatitis
- Capsule of pseudocyst not lined by epithelium
  - Acute peripancreatic fluid collection
  - Pancreatic necrosis
  - Pancreatic Pseudocyst
  - Pancreatic Abscess
Revised Atlanta Criteria

• Acute Peripancreatic Fluid Collection
  – Fluid collections without definable wall
  – Common manifestation of acute pancreatitis
  – Seen in 30-50% of cases within 48h of disease
  – Majority located in lesser sac
  – Usually sterile
  – Most resolve spontaneously
  – Intervention if clinically suspect infection
Revised Atlanta Criteria

• Post Necrotic Pancreatic Fluid Collection
  – Containing fluid, necrosis +/- loculation
  – Associated with necrotizing pancreatitis
Revised Atlanta Criteria

• Pancreatic Pseudocyst
  – Fluid collection encapsulated by fibrous wall
  – Occurring >4 weeks after symptom onset
  – Most resolve spontaneously, particularly <4cm

– Older indications for drainage:
  • size greater than 6cm
  • Symptomatic
  • Persistence beyond 6 weeks
Revised Atlanta Criteria

• Walled-Off Pancreatic Collection
  – Necrotic collection persisting beyond 4 weeks
  – May be infected or sterile
  – MRI, EUS may help identify solid component
Incidence of Pseudocysts

- Seen in 5% of patients with acute pancreatitis
- Up to 40% with chronic pancreatitis
- More common in alcoholic pancreatitis
Pathophysiology

- Occur secondary to ductal disruption
  - Acute Pancreatitis
  - Chronic Pancreatitis
  - Trauma
- Pancreatic duct injury may not always resolve
  - Pseudocysts +/- ductal communication
Why Not Treat All Pseudocysts?

• Up to 40% will resolve spontaneously
• Asymptomatic & smaller (<6 cm) pseudocysts
• First 6 weeks, follow by ultrasound
• Follow by CT at 3-6 month intervals
Indications for Drainage

- Overall size greater than 6cm
- Persistence over 6 weeks
- Infection
- Compression of major vessels/viscera
- Pancreaticopleural fistula
- Chronic pancreatitis with duct abnormalities
Techniques of Intervention

- Percutaneous drainage
- Endoscopic drainage
- Open surgical drainage
- Laparoscopic drainage
Pre-procedural Studies

• CT Abd/Pelv with thin cuts through pancreas
• ERCP
  – Need to delineate duct anatomy
  – 80% of pseudocysts have pancreatic duct stricture

• Rule out Neoplasm
  – IPMN
  – Cystic adenocarcinoma
Percutaneous Drainage

- Emergent treatment in infected pseudocysts
- High surgical risk patients
- Immature cysts
- Best in solitary pseudocyst
- Appropriate anatomy required

*Risks secondary infection, fistula, recurrence*
Endoscopic Techniques

• Transmural approach
• Transpapillary approach
• Use of endoscopic ultrasound minimizes risks

When compared to surgical techniques
• Less invasive, less expensive
• Lower risk of external pancreatic fistula
Fischer, Mastery of Surgery 6th Edition
Guidelines for Endoscopy

- Well-developed cyst wall
- Pseudocyst Wall < 1 cm
- Nonacute pseudocyst
- Noninfected Pseudocyst
- Pancreatic ductal disruption/stricture
Complications

• Bleeding
• Perforation
• Infection of pseudocyst
• Post-procedure pancreatitis
• Recurrence of pseudocyst
• Stent migration/occlusion
Surgical Techniques

• Open drainage
  – “Gold standard”
  – Back-up management to endoscopy
  – Recurrent pseudocyst, CBD/duodenal stenosis

• Laparoscopic
  – Intragastric pseudocyst-gastrostomy
  – Anterior transgastric pseudocyst-gastrostomy
  – Lesser sac approach
  – Pseudocyst-jejunostomy
Intragastric Approach

Open Surgical Options

• External Drainage
  – Free rupture; grossly infected

• Internal Drainage
  – Mature pseudocysts (>1cm)
  – Pancreatic duct stricture/leak

• Pancreatic/Pseudocyst Resection
  – Located body/tail with possible malignancy
  – Pancreatic pseudoaneurysms
So Many Options...

• Percutaneous

• Laparoscopy

• Endoscopy

• Open Surgery
Study

• Examines success rates of different modalities
  – Both primary and overall
• Retrospective study
• N = 83 patients
• March 1999 to August 2007
**Table 1** Patient demographic data, etiology of pancreatitis, and pseudocyst size (nonsignificant difference)

<table>
<thead>
<tr>
<th></th>
<th>Endo</th>
<th>Lap</th>
<th>Open</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of patients</td>
<td>45</td>
<td>16</td>
<td>22</td>
</tr>
<tr>
<td>Age (years)</td>
<td>51.8 ± 1.9</td>
<td>46.5 ± 3.6</td>
<td>52.0 ± 3.8</td>
</tr>
<tr>
<td>M:F</td>
<td>1.4 ± 1</td>
<td>1.7 ± 1</td>
<td>1 ± 1.2</td>
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<tr>
<td>BMI (kg/m²)</td>
<td>27.4 ± 1.1</td>
<td>29.2 ± 1.8</td>
<td>28.6 ± 1.5</td>
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<tr>
<td>Gallstone pancreatitis (%)</td>
<td>51.7</td>
<td>50.0</td>
<td>59.1</td>
</tr>
<tr>
<td>Pseudocyst size (cm)</td>
<td>9.1 ± 0.4</td>
<td>10.4 ± 0.5</td>
<td>9.5 ± 0.8</td>
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</tbody>
</table>

*Endo* endoscopic pancreatic cystgastrostomy, *Lap* laparoscopic pancreatic cystgastrostomy, *BMI* body mass index
Table 2  Success rates for pancreatic cystgastrostomy by method

<table>
<thead>
<tr>
<th></th>
<th>Endo (n = 45) (%)</th>
<th>Lap (n = 16) (%)</th>
<th>Open (n = 22) (%)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary success</td>
<td>35.5</td>
<td>87.5</td>
<td>81.2</td>
<td>&lt;0.01</td>
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<tr>
<td>Overall success</td>
<td>84.6</td>
<td>93.8</td>
<td>90.0</td>
<td>NS</td>
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*Endo* endoscopic, *Lap* laparoscopic, *NS* nonsignificant difference
Conclusions

• Laparoscopic and Open Surgery are best
• Endoscopic intervention is an option
  – Particularly with repeat endoscopic drainage
• Future directions: Endoscopy and NOTES

• Need for further study; randomized CT
Summary

- Pseudocyst management is multidisciplinary
- Important to determine ductal relationship
- Observation is an option as most regress
- Imaging CT/EUS/MRI provides key information
- Must rule out neoplasm prior to intervention
Question 1
Which of the following is the most important determinant of the need for drainage of a pancreatic pseudocyst?

a. Pseudocyst Symptoms
b. Pseudocyst Size
c. Pseudocyst Duration
d. Associated Chronic Pancreatitis
e. Patient Age
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Which of the following is an absolute contraindication to endoscopic drainage of the pancreatic pseudocyst?

a. Pancreatic Ascites/Pleural Effusion
b. Duodenal/Biliary Obstruction
c. Fistula formation into adjacent viscera
d. Pseudoaneurysm
e. Spontaneous Infection
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c. Fistula formation into adjacent viscera
d. **Pseudoaneurysm**
e. Spontaneous Infection
Question 3

A patient with chronic pancreatitis is unable to eat because of persistent postprandial pain. CT is performed. What is the recommended treatment?

a. Nothing by mouth and total parenteral nutrition for 4 to 6 weeks
b. Percutaneous catheter drainage
c. Endoscopic drainage
d. Operative internal drainage
e. Operative external drainage
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References

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