Severe Acute Pancreatitis (SAP)

- Pancreatitis in the context of acute organ dysfunction;
- Ranson score ≥3 at 48 h
- APACHE II score ≥8
- Multiple organ dysfunction score ≥3 at 72 h

Diagnosis

- Clinical Presentation
  - Acute upper abdominal pain radiating to the back
  - Nausea and Vomiting
  - Low grade fever
  - mild tachypnea/tachycardia
  - epigastric tenderness ± mass
- Laboratory Values
  - Elevated pancreatic enzymes
  - CRP
Nomenclature

1. Acute fluid collections
2. Pancreatic necrosis
3. Pseudocyst
4. Pancreatic abscess

1. Acute peripancreatic fluid collections
2. Acute post-necrotic pancreatic/peripancreatic fluid collections
3. Pseudocysts
4. Walled-off pancreatic necrosis

Critical issues:
- Age of the fluid collection (>4 weeks);
- Necrosis present correlates collection type to treatment recommendation

Controversies in Management

- Indications for Intervention
- Optimal Timing
- Recommended Surgical Approach

Dutch Prospective Multi-Center Observational Cohort Study Treatment Outcomes in Patients with Necrotizing Pancreatitis (N=639, 2004-2008)
Indications for Surgery

- Infected Pancreatic Necrosis with Organ Failure
  - Level III evidence (Grade B Recommendation)

- However:
  - 50% of mortalities were in patients with sterile necrosis
  - Overall mortality with conservative treatment: 7% (28/397)
    - 16% had organ failure ➔ 37% mortality
    - 3% had infected necrosis ➔ 0% mortality

- Infection, Instability and Intransigence

Optimal Timing

- Dutch study favors delaying intervention and when possible for at least 4 weeks
  - Level III evidence (Grade B recommendations)

- However:
  - Lack of randomization confounds interpretation of this conclusion
  - Data are not corrected for actual start of illness
    - 50% who underwent an intervention were transferred from another hospital

- When the patient is medically optimized
Dutch Multi-Center RCT n = 88 with Infected Pancreatic Necrosis Randomized to Open Necrosectomy or “Step-up” approach

Step-up approach was associated with fewer complications (40% vs 69%, p=0.006);  
- 35% of patients in Step-up group were treated with drainage only  
- 7% of patients in Step-up group required Open Necrosectomy  
- Mortality did not differ between the two groups (19 vs 16%, p=0.70)

Surgical Approach

- Minimally Invasive Approach  
  - Step-up approach superior to Open Necrosectomy (40% vs 69%, p=0.006)  
  - 35% of patients in Step-up group were treated with drainage only  
  - 7% of patients in Step-up group required Open Necrosectomy  
  - Mortality did not differ between the two groups (19 vs 16%, p=0.70)  
  - Level Ib evidence! These data need to be confirmed

- However:  
  - Requires strong IR support (frequency of manipulations & access)  
  - Decreased composite complication score with MIS  
  - No difference in mortality compared to open necrosectomy

- Blunt Necrosectomy with Retroperitoneal Marsupialization

Recommended Surgical Approach

- Blunt Necrosectomy & Retroperitoneal “Marsupialization”
  - Technically straightforward  
  - Well-tolerated by critically-ill patients  
  - Avoids sacrifice of viable pancreas  
  - Enables spontaneous drainage & access for debridement of evolving retroperitoneal necrosis while limiting intra-peritoneal trauma  
  - Acceptable complication rates  
  - Reduction in mortality
Case Presentation

3BM c/o acute onset severe RUQ & epigastric pain radiating to his back, for the past 2 days following a “big night” on the town. Intermittent N/V, anorexia.

PMHx Unremarkable. No Meds or PSH

PE: T = 39.2°C, anicteric, distended abdomen, tender epigastrium.


KUB: Adynamic ileus, No free air or calcifications.

Initial conservative management

HD # 7 underwent exploratory laparotomy due to spiking fevers, abdominal distention and tenderness clinical instability and concern for infected necrosis.
UCSF Experience

- Retrospective review evaluating outcomes of the surgical management of necrotizing pancreatitis
- 1994-2012
- 59 patients with CT-documented necrosis
- Combined county and tertiary hospital experiences of a single surgeon

Demographics

<table>
<thead>
<tr>
<th>Age</th>
<th>48 years (range 20-79 years)</th>
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</thead>
<tbody>
<tr>
<td>Gender</td>
<td>63% male</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td>38%</td>
</tr>
<tr>
<td>White</td>
<td>41%</td>
</tr>
<tr>
<td>African-American</td>
<td>9%</td>
</tr>
<tr>
<td>Asian</td>
<td>12%</td>
</tr>
</tbody>
</table>

Age 48 years (range 20-79 years)

Gender 63% male

Ethnicity
- Hispanic 38%
- White 41%
- African-American 9%
- Asian 12%

Severity Assessment

- Ranson Score (0-11; 19/59): 5.2 ± 2.0
- Balthazar CT Score (1-10; 59/59): 7.3 ± 2.8
  - 42% (25/59) had a score of 10

Indications for Surgery

- Evidence of infection or sepsis: 44%
  - Pre-operative CT-guided FNA
- Clinical instability: 18%
  - Persistent/recurrent hypotension
  - Worsening respiratory function
  - Worsening acidosis
- Clinical intransigence: 44%
  - Failed repeated attempts to wean off vasopressors and/or mechanical ventilation
  - Inability to tolerate an oral diet
Outcomes Summary

<table>
<thead>
<tr>
<th>Necrosectomies (#)</th>
<th>3  (range 1-10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time from Diagnosis to OR</td>
<td>60 days (range 5-150)</td>
</tr>
<tr>
<td>Time from Admission to OR</td>
<td>15 days (range 0-65)</td>
</tr>
<tr>
<td>Infected Necrosis</td>
<td>57%</td>
</tr>
<tr>
<td>Antibiotics (# used)</td>
<td>4 (range 0-17)</td>
</tr>
<tr>
<td>TPN administration</td>
<td>27 days (range 0-111)</td>
</tr>
<tr>
<td>ICU LOS</td>
<td>31 ± 41 days</td>
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<tr>
<td>Hospital LOS</td>
<td>61 ± 52 days</td>
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Summary

- Severe acute pancreatitis remains a complex, lethal condition;
- Objective severity assessment is critical to optimal management;
- The patient’s clinical condition should dictate surgical intervention;
- Minimally invasive surgical techniques have extended the interventional armamentarium;
- Blunt necrosectomy remains a safe and effective surgical approach.

Outcomes Summary

<table>
<thead>
<tr>
<th>Morbidity</th>
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<tbody>
<tr>
<td>ARDS (29%)</td>
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<tr>
<td>Sepsis (27%)</td>
</tr>
<tr>
<td>Fistulas (24%)</td>
</tr>
<tr>
<td>AKI (17%)</td>
</tr>
<tr>
<td>Incisional hernia (5%)</td>
</tr>
<tr>
<td>Abscess (3%)</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Endocrine/Exocrine Dysfunction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulin (37%)</td>
</tr>
<tr>
<td>Enzymes (12%)</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Mortality</th>
</tr>
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<tbody>
<tr>
<td>7%</td>
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