SURGICAL MANAGEMENT OF ACUTE PANCREATITIS
INTRODUCTION

• A very common disease with increasing incidence over past 20 years.
• All age groups and both genders vulnerable.
• Multiple causes.
• Highly variable disease course.
• High mortality rates even in the centers of excellence.
• Difficult to standardize the treatment options.
SURGICAL INTERVENTION–INDICATIONS

- ABSOLUTE INDICATION
- INFECTED PANCREATIC NECROSIS

- OBLIGATORY INDICATION
- PERFORATED VISCUS
- HAEMORRHAGE

- DEBATED INDICATION
- SEVERE STERILE NECROSIS
- SYMPTOMATIC ORGANIZED NECROSIS

- OBSELETE INDICATION
- DIAGNOSTIC UNCERTAINTY
Management – Overview

Mild
  ↓ Symptomatic treatment
  ↓ Plan discharge

Acute pancreatitis
  ↓ improvement
  ↓ No infection
    ↓ Continue supportive treatment
    ↓ improvement
    ↓ No improvement

Severe
  ↓ ICU admission
  ↓ Supportive treatment
  ↓ Ct abdomen > 72hrs
  ↓ FNA if no improvement for 2 weeks
  ↓ infected
    ↓ Surgical intervention
Surgical interventions

**PANCREATIC RESECTIONS - HISTORICAL**

**PANCREATIC NECROSECTOMY –**
- Debridement of necrotic pancreatic tissue
- Current standard of practice

**MINIMAL INVASIVE INTERVENTIONS –**
- Current interest of research
- Rapidly being accepted in practice
Necrosectomy – Principles

GOOD QUALITY PREOPERATIVE CONTRAST ENHANCED CT ABDOMEN IS ESSENTIAL FOR IDENTIFICATION OF –
✓ ALL AREAS OF NECROSIS
✓ LOCALIZED COLLECTIONS

WIDE REMOVAL OF ALL DEVITALIZED AND NECROTIC TISSUE

UNROOFING OF ALL COLLECTIONS

STRATZIZE TO REMOVE THE PRODUCTS OF ONGOING INFLAMMATION AND INFECTION THAT PERSISTS AFTER THE INITIAL NECROSECTOMY
Necrosectomy – Approach

- **Bilateral Subcostal Incision**
- **Midline Incision**
- **Through Gastrocolic Ligament**
- **Through Transverse - Mesocolon**
- **Pancreas & Lesser Sac**
The lesser sac can be approached through the base of the mesocolon; attention should be paid to avoid injury to the middle colic artery.
Approach to lesser sac via gastrocolic ligament.
Necrosectomy – technique

- IDENTIFICATION OF VIABLE AND NECROTIC PANCREATIC TISSUE
- BLUNT FINGER DISSECTION OF THE NECROTIC TISSUE
- AVOID OVERZEALOUS HANDLING OF INFLAMED & DOUBTFUL VIABLE TISSUE
- CONTROL OF BLEEDING
- ADDITIONAL EXPOSURE

- RELEASE OF SPLENIC/HEPATIC FLEXURES
- EXTENSIVE KOCHERIZATION
- OPENING OF PARACOLIC GUTTERS, PARARENAL SPACES AND GASTROHEPATIC LIGAMENT
(B) Anterior view
Post-Necrosectomy management

OPTIONS

CLOSED DRAINAGE
- Multiple drains in the lesser sac
- Retained till output is insignificant

PLANNED REXPLORATIONS
- Laparostomy/
  Temporary abdominal closure
- Re-exploration once in 2-3 days till all necrotic material clears

CLOSED LAVAGE
- Drains placed in lesser sac
  Continuous postoperative lavage till effluent is clear
Necrosectomy and closed packing with stuffed Penrose drains.
closed lavage of the lesser sac.
The lesser sac is closed by suturing the greater omentum to the transverse colon for closed postoperative lavage.
## Comparison of options

<table>
<thead>
<tr>
<th>Studies Between 1980-1998</th>
<th>No. of Patients</th>
<th>Morality</th>
<th>Re-exploration</th>
<th>GI Fistula</th>
<th>Bleeding</th>
</tr>
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<tbody>
<tr>
<td>Closed Drainage</td>
<td>236</td>
<td>6-30%</td>
<td>16-40%</td>
<td>3-26%</td>
<td>1-30%</td>
</tr>
<tr>
<td>Planned Re-exploration</td>
<td>297</td>
<td>14-27%</td>
<td>100%</td>
<td>5-40%</td>
<td>5-29%</td>
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<tr>
<td>Closed Lavage</td>
<td>405</td>
<td>8-36%</td>
<td>9-64%</td>
<td>7-43%</td>
<td>5-13%</td>
</tr>
</tbody>
</table>

*Maingot’s Abdominal operations -11th edition*
Recommendations

Lack of standard definitions of the conditions for which each of these options were utilized

Options individualized to the patient

Early necrosectomy - planned re-exploration/closed lavage

The options have not been compared adequately by randomized prospective studies

Delayed necrosectomy – closed drainage
Minimal Access Interventions

Why Minimal Access?

To reduce the access trauma and associated proinflammatory response with open necrosectomy

To delay necrosectomy as much as possible

Timing of Surgery vs Mortality

- <14 days: 75%
- 15-29 days: 45%
- >30 days: 8%

Arch Surg 142: 1194-1201, 2007
Minimal Access Interventions

- **Interventions**
  - **Routes Used**
    - Percutaneous
    - Transgastric
    - Peritoneum
    - Retroperitoneum
  - **Instrumentation**
    - Radiological Guidance
    - Endoscopy
    - Laparoscopy
    - Operating Nephroscope
Minimal Access Interventions

ENDOSCOPIC TRANSGASTRIC NECROSECTOMY
Minimal Access Interventions

Percutaneous Drainage
Minimal Access Interventions

HAND ASSISTED LAPAROSCOPIC NECROSECTOMY PORT POSITIONING

LAPAROSCOPIC NECROSECTOMY
Minimal Access Interventions

RETROPERITONEAL NECROSECTOMY

OPEN TECHNIQUE

VIDEO-ASSISTED TECHNIQUE
Percutaneous necrosectomy using operating nephroscope and supplemental laparoscopic port.
Evidence in favour of minimal invasive approach

A multicenter RCT including 88 patients with confirmed or suspected infected pancreatic necrosis

- 45 underwent open necrosectomy
- 43 underwent step-up approach (initial percutaneous drainage followed by VARD)

<table>
<thead>
<tr>
<th>Out-come</th>
<th>Open - necrosectomy</th>
<th>Step-up approach</th>
<th>P - value</th>
</tr>
</thead>
<tbody>
<tr>
<td>New onset MODS</td>
<td>42%</td>
<td>12%</td>
<td>0.001</td>
</tr>
<tr>
<td>Death</td>
<td>16%</td>
<td>19%</td>
<td>0.7</td>
</tr>
<tr>
<td>Hospital stay</td>
<td>60 days</td>
<td>50 days</td>
<td>0.53</td>
</tr>
<tr>
<td>New –onset DM</td>
<td>38%</td>
<td>16%</td>
<td>0.02</td>
</tr>
<tr>
<td>Pancreatic insufficiency</td>
<td>33%</td>
<td>7%</td>
<td>0.002</td>
</tr>
<tr>
<td>Incisional hernia</td>
<td>24%</td>
<td>7%</td>
<td>0.03</td>
</tr>
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To conclude......

• Necrotizing pancreatitis though less common is responsible for the most of the deaths of acute pancreatitis patients.

• Unresolved issues in the management of this condition.

• Open necrosectomy is still the standard of care but is associated with high mortality and morbidity.

• Minimal access interventions give some hope.
References –

- Maingot’s abdominal surgeries -11th edition
- www.google.com-images