Components Separation

Abdominal Wall Reconstruction

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Case Presentation

- 72 yo M with Crohn’s disease
- Chronic midline abdominal pain
- Multiple incisional hernias
- No vomiting or constipation
Medical History

- HTN
- Hepatitis C cirrhosis (2003)
- Crohn’s disease (8/2008) – remission
- Recto - sigmoid adenocarcinoma
- Ex-smoker, quit 17 yrs ago
Surgical History

- Lap cholecystectomy (7/2004)
- Distal sigmoidectomy & protective transverse loop colostomy (12/2008)
- Colostomy reversal (8/2009)
- Incisional hernia repairs
Physical Exam

- AVSS
- Wt 185 lbs (213); BMI 31.8 (39.0)
- Protuberant abdomen
- Midline incisional hernia
- Multiple lateral incisional hernias
- Rt middle colostomy scar
Pre - Op Workup

- Colonoscopy (1/11):
  - Moderately active ileitis
  - Luminal narrowing
  - Two rectal polyps

- Routine pre-op work-up: normal

- Bowel prep on pre-admission day
Operative Procedure

- Long midline incision
- Subcutaneous flaps developed
- Peritoneal cavity entered
- Lysis of adhesions
- Bowel dissected from hernia, stoma & mesh suture sites
Operative Procedure

- Primary repair of linea alba
- Reinforced with onlay PhysioMesh
- JP drains x 2 in lateral skin flap dead spaces
- Skin closure
Post-Op Course

- POD#1: Left-sided ecchymosis
- POD#3: Bowel function
- POD#4: Peri-umbilical skin ischemia
- POD#5: Localized skin necrosis
Post - Op Course

- POD#6: Diarrhea; Flagyl started
- POD#8: C. diff positive
- POD#10: Worse necrosis
- POD#12: OR
Operation # 2

- Wound debridement & mesh removal
- Fascial repair intact
- Wound packed
Incisional Hernia

- Incidence: 10% after celiotomy

- Causative factors
  - Surgical technique
  - Post-op infections
  - Patient factors
  - Emergency operations

Medline Plus; Merck Manual; Current Surg Diag: Ch 32 p19-20; Maingot: Ch 5 p70
Surgical Options

- Tension repair
- Tension – free repair with mesh
- Lap incisional hernia repair
- Components separation
- Local flaps

Maingot: Ch 5 p71; Current Surg Diag: Ch 32 p20-21
Retrofascial Repair

Fig. 1a, b. The peritoneum is incised in the midline. Dissection begins between the posterior sheath and the rectus abdominis muscle.

Fig. 2. Dissection continues laterally until the perforating vessels are clearly seen. Care is taken to preserve this blood supply to the rectus muscle.

Fig. 3. The posterior sheath is closed primarily (this can almost always be accomplished). Any gaps in coverage can be sutured or covered with vicryl mesh to prevent contact between the prosthesis and the intra-abdominal contents.
Components Separation

- What is it?
- When?
- Success?
Oscar Ramirez (1990)

- Cadaveric dissection
- Incision lateral to linea semilunaris
- Ext oblique (EO) and int oblique (IO) separated in AVASCULAR plane
- Rectus w/ IO flap advanced
Bridging the Gap

Unilateral Rectus-Complex Mobility

- 4 cm + 2 cm
- 8 cm + 2 cm
- 3 cm + 2 cm

Components Separation

Fitzgibbons ACS Surgery: Principles and Practice Ch 27.
Indications

- Infected wound
- Concomitant bowel surgery
- Closure of giant defects
- Multiple hernia recurrences

Advantages

- Autologous tissue
- Cutaneous coverage
- Dynamic muscular support
Modified Technique

- Bilateral transverse subcostal incision
- Perforator vessel preservation

Ko JH. Arch Surg 2009
Contra - Indications

- Concurrent stoma creation
- Invading malignancy
- Select patient disease
Complications

- Hernia recurrence
- Infection
- Skin necrosis
- Seroma
### Table 1. Results of the Repair of Large Abdominal Wall Defects with the Component Separation Technique

<table>
<thead>
<tr>
<th>First author</th>
<th>Year</th>
<th>Patients</th>
<th>Clean/contaminated</th>
<th>Complications (n)</th>
<th>Rehemiation n (%)</th>
<th>Followup mean (range, mo)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ramirez⁵</td>
<td>1990</td>
<td>11</td>
<td>8/3</td>
<td>0</td>
<td>0 (0.0)</td>
<td>? (4–42)</td>
</tr>
<tr>
<td>DiBello⁹</td>
<td>1996</td>
<td>35*</td>
<td>20/15</td>
<td>Wound infection (2) Hematoma (1) Seroma (1)</td>
<td>3 (8.6)</td>
<td>22 (1–43)</td>
</tr>
<tr>
<td>Girotto¹⁰</td>
<td>1999</td>
<td>33</td>
<td>30/3</td>
<td>Wound infection (8) Enterocutaneous fistula (1)</td>
<td>2 (6.1)</td>
<td>21 (6–57)</td>
</tr>
<tr>
<td>Shestak¹¹</td>
<td>2000</td>
<td>22</td>
<td>?</td>
<td>Wound infection (2) Seroma (1) Death (1)</td>
<td>1 (5)</td>
<td>52 (8–84)</td>
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<tr>
<td>Lowe¹²</td>
<td>2000</td>
<td>30†</td>
<td>?</td>
<td>Wound infection (12) Skin ischemia (6) Skin dehiscence (13)</td>
<td>3 (10)</td>
<td>12</td>
</tr>
<tr>
<td>Cohen¹³</td>
<td>2001</td>
<td>24</td>
<td>15/9</td>
<td>Skin dehiscence (2) Seroma (1)</td>
<td>1 (4)</td>
<td>? (12–36)</td>
</tr>
<tr>
<td>Authors</td>
<td>2002</td>
<td>43</td>
<td>28/15</td>
<td>Wound infection (6) Hematoma (5) Seroma (2) Skin necrosis (1) Fascial dehiscence (1)</td>
<td>12 (30)</td>
<td>15.6 (12–30)</td>
</tr>
</tbody>
</table>

*In 15 patients, an onlay synthetic prosthesis was implanted as well.
†In 10 patients, an onlay polypropylene mesh was implanted as well.
Mesh Position

Recurrence

7.4 - 29.1 %

7.3 - 13.6 %

Hernia Recurrence

Hernia Recurrence

- Fewer hernia recurrence with open mesh repair
- No difference of hernia recurrence with mesh position

Van Geffen *Recurrent Hernia*, 2007
**Mesh Infection**

- Pre-existing infection
- Skin ulceration
- Obesity
- Incarcerated / perforated bowel
Wound Infection

- Less wound infections with primary repair
- Occurrence with mesh: 5 - 10%
- No difference in wound complication with mesh position

Conclusion

- Close the gap
- Component separation with mesh preferred technique
- Perforator vessel preservation
- Risk of re-herniation and infection
- Patient selection


References


References

Questions ?