Massive Ventral Hernias

Postgraduate Course in General Surgery
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Ventral Hernias: National Experience

- Occur following 11-23% of laparotomies, resulting in ~400,000 ventral hernia repairs/year in the U.S.;
- Average patient in their 5th decade of life;
- Risk factors include obesity, diabetes, lung disease, smoking, wound infection, and steroids;
- No universally accepted classification system or evidence-based management guidelines;
- Wide variation in surgical techniques and strategies for repair.

Complex Ventral Hernias: Definition

A ventral hernia that;
- involves a compromised surgical field in which gastrointestinal, biliary or genitourinary procedures are performed or frank infection is present;
- includes enterocutaneous or enteroatmospheric fistulas;
- includes an infected prosthetic mesh;
- has recurred;
- is large (>10 cm in any dimension) +/- loss of domain.
Massive Ventral Hernias: Definition

A ventral hernia that:
- is giant (>20 cm in at least one dimension);
- involves loss of abdominal domain;
- hernia sac volume : abdominopelvic cavity volume ≥ 0.50

Massive Ventral Hernias: Operative Goals

- Create adequate intraperitoneal or “neoperitoneal” space to accommodate reduction of hernia sac contents (“acquired omphalocele”)
- Enter the abdomen with minimal iatrogenic injury;
- Develop a repair strategy;
- Reconstruct the abdominal wall;
- Close the abdominal wound.

Create adequate intraperitoneal space to accommodate reduction of hernia sac contents

Surgical strategies:
- Prosthetic “quilting”;
- Staged repair;
- Progressive pneumoperitoneum.

Massive Ventral Hernias: Cases

How do you fix this?
Massive Ventral Hernias: Surgical Techniques

- **Prosthetic “Quilting”**
  - involves dissection and reduction of the hernia;
  - placement of several large sheets of a synthetic, composite prosthetic mesh (e.g., Goretex Dual mesh, SepraMesh, Parietex) that are first secured to the fascial edges circumferentially;
  - quilt together the prosthetic mesh pieces under acceptable tension;
  - complex wound closure with drains;

Massive Ventral Hernias: Prosthetic Quilting

56 M with hypertension, depression, urethral stricture and a recurrent ventral hernia presents for elective repair.

He notes his first hernia repair occurred ~10 years ago, complicated by gangrenous bowel requiring resection. Over the next 8 years he underwent 6 additional attempts at repair, each failing within a year. He reports that his hernia is increasing in size, causes chronic pain and impedes his ability to walk.

Clinical issues:
- one-stage versus multi-staged repair strategies
- set clear clinical goals
Reconstruct the abdominal wall

Point of Emphasis:
- Establish clear and reasonable clinical goals.
- Consider one-stage v. multi-stage procedures;
- "The enemy of good is better";
- Anticipate complications and exit strategies.
49 year old man presents with a massive ventral hernia s/p five failed repairs and a chief complaint of increasing abdominal pain for the past four days after hearing something go “pop”;

Found on CT scan to have a strangulated ventral hernia containing an intestinal perforation;
Massive Ventral Hernias: Prosthetic Quilting

- **Staged Repair**
  - initial stage involves reduction of the hernia and placement of a large sheet of GoreTex Dual mesh secured to the fascial edges;
  - serial excision of the mesh until the fascia can be approximated in the midline without tension;
  - final stage involves excision of the mesh re-approximation of the fascia via component separation with biologic mesh underlay.

N = 8 patients, mean age 53 years (range 35–76)
- avg. fascial defect 535 cm² (300–884 cm²)
- an average of 6 serial operations needed to achieve fascial closure
- average LOS = 36 days (range 9–90)
- 13% severe wound infection rate
- 13% recurrence rate at <1 year

Loss of domain defined as hernia sac volume >25% abdominal cavity volume

Massive Ventral Hernias: Surgical Techniques

- Progressive pneumoperitoneum

  - initial stage involves 3-D abdominal CT scan with volumetric analysis;
  - insertion of a peritoneal dialysis catheter;
  - daily insufflation with CO₂ increasing the total volume inserted in 500 ml increments each day;

  N = 23 patients, mean age 56 years (range 31 – 83), mean BMI = 38.5
  - Avg. hernia sac volume 4,500 ml (1,850 – 6,600 ml)
  - Avg. volume ratio 36% (26 – 73%)
  - Avg. pneumoperitoneum sessions 10 (4 – 18)
  - 26 % wound infection rate
  - 4 % 30-day mortality rate
  - 4 % recurrence rate at 2 years (82% follow up)

Massive Ventral Hernias: Progressive Pneumoperitoneum

55 year old woman with a history of morbid obesity, osteoarthritis and depression, who presents s/p multiple failed umbilical hernia repairs.

She presents now with a large ventral hernia that is becoming progressively more symptomatic, including interference with acts of daily living and work.

Clinical issues:
- staged versus progressive pneumoperitoneum;
- avoidance of iatrogenic abdominal compartment syndrome;
- evaluation for pulmonary hypertension;
- one-stage versus two-stage abdominal wall reconstruction
- set clear clinical goals

Hernia 2010;14:63-69
Massive Ventral Hernias: Progressive Pneumoperitoneum

<p>| abdome-no- | hernia | HSV/AP | follow up |</p>
<table>
<thead>
<tr>
<th>age (days)</th>
<th>pelvic sac volume (ml)</th>
<th>V ratio</th>
<th>(days)</th>
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<tr>
<td>55</td>
<td>8,700</td>
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</table>

| mean       | 57                   | 9,153  | 7,207  | 0.83   | 213    |
| SD         | 9                    | 1,703  | 1,165  | 0.26   | 112    |

Average number of insufflations was 14; no wound infections or mortalities. One aborted surgery.

Massive Ventral Hernia Repairs: Summary

- Multiple options / strategies for reconstruction of the abdominal wall:
  - Prosthetic quilting
  - Staged repairs
  - Progressive pneumoperitoneum

- Requires a flexible and creative surgical strategy
  - One size will not fit all

- Perioperative risk assessment is critical

- Establish clear & reasonable clinical goals

- Manage patient expectations