Complex Ventral Hernias

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Ventral Hernias: National Experience

- Occur following 11-23% of laparotomies, resulting in ~250,000 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;
- is large (>10 cm in any dimension) +/− loss of domain
- has recurred (what was “plan A,” and why did it fail?)
Complex Ventral Hernias: Pre-operative Evaluation

- Complete history and physical examination
- Optimize patient’s physiology
  - nutritional status (alb>3.0)
  - control serum glucose levels
  - smoking cessation
  - taper immunosuppressants, anticoagulants, NSAIDs
  - cardiac & pulmonary evaluations, if indicated
  - exercise program & weight loss
- Abdominopelvic CT scan
- Review most recent operative reports, if available

Complex Ventral Hernias: Operative Goals

- Enter the abdomen with minimal iatrogenic injury;
- Define the relevant anatomy;
- Re-establish / certify intestinal continuity
- Develop a repair strategy;
- Reconstruct the abdominal wall
- Close the abdominal wound

**Enter the abdomen with minimal iatrogenic injury.**

Point of Emphasis #1:
A careful & meticulous dissection is essential

- Allow adequate time for the surgery; reduce external stressors;
- Sharp v. electrocautery dissection;
- A thorough adhesiolysis as indicated;
- Scrutinize potential bowel injuries (first tag and then repair).

**Define the relevant anatomy.**

Point of Emphasis #2:
Optimize treatment of bowel injuries and fistulas

- Quantify intra-op findings, e.g., location & number of bowel injuries, length of involved small bowel;
- Minimize length of bowel resected & number of anastomoses;
- Avoid short-gut syndrome & anastomotic leaks.
Primary suture v. prosthetic repair:

- N = 200 patients randomized to primary v. mesh repair of a midline incisional hernia (<6 cm), followed for 3 years for hernia recurrence.
- The 3-year cumulative rates of recurrence were 43% v. 24% (p=0.02) among patients who had suture repair v. mesh repair.
- The risk factors for recurrence were suture repair, infection, prostatism (in men), and previous surgery for AAA.
- The size of the hernia did not affect the rate of recurrence.


Repair Principles & Techniques

- Primary suture v. prosthetic repair;
- Prosthetic-fascia interface options;
- Component separation;
- Suture & points of fixation:
  + suture-to-wound length ratio >4
  + debride fascial edges/hernia sac to healthy tissue
  + continuous v. interrupted suture technique
  + heavy, permanent, monofilament suture
- Synthetic v. biologic prosthetics

Develop a repair strategy.

Point of Emphasis #3:

- Standardize your approach & surgical technique
  - Collect follow up data on your patients;
  - Determine what techniques & materials work best in your practice;
  - Read the literature with a critical (skeptical) eye.
Reconstruct the abdominal wall.

- Case A: ventral hernia repair with *wound contamination*
- Case B: incisional hernia with *mesh infection*
- Case C: incisional hernia with *enteric fistula*
- Case D: large ventral hernia with *loss of domain*

**Case A: ventral hernia repair with wound contamination**

Otherwise healthy 54 M presents 9 months s/p perforated sigmoid diverticulitis
- Sigmoid colectomy, end colostomy & Hartmann’s pouch;
- Course complicated by abdominal sepsis, ARDS, renal failure and wound dehiscence;
- Open abdomen managed with a negative pressure dressing, followed by a split-thickness skin graft;
- Fully recovered, back to hiking and biking, but wants hernia repaired.

**Clinical issues:**
- one-stage versus two-stage repair
- biologic versus synthetic prosthesis
Case A: ventral hernia repair with *wound contamination*

Case B: incisional hernia with *mesh infection*

47 year old man with a history of an open cholecystectomy through a right subcostal approach, complicated by an incisional hernia. Four years ago the hernia was repaired with a Gore-Tex composite mesh prosthetic.

He has been well, but three months ago developed a small draining sinus at the medial aspect of his right subcostal incision, which has persisted despite two courses of oral antibiotics.

**Clinical issues:**
- Infected Gore-Tex prosthetics are very difficult to “sterilize”
- What is the source of infection?
- One-stage versus two-stage abdominal wall reconstruction
Case B: incisional hernia with mesh infection
Case C: incisional hernia with *enteric fistula*

39 year old woman with a history of a severe acute pancreatitis, complicated by ARDS, renal failure, and abdominal compartment syndrome managed with an open abdomen.

She presents now several years later after failed ventral hernia repair with a high-output enteric fistula, mesenteric venous hypertension and a wound that is technically difficult to manage.

Clinical issues:
- preoperative abdominopelvic CT scan;
- optimizing patient’s physiology;
- challenging abdominal cavity entry;
- importance of defining the anatomy;
- one-stage versus two-stage abdominal wall reconstruction
- complicated wound closure
Case C: incisional hernia with *enteric fistula*
Case C: incisional hernia with *enteric fistula*

Case D: large ventral hernia with *loss of domain*

What is loss of abdominal domain?

**Repair Principles & Techniques**

How do you repair this specific ventral hernia?

- Staged repair
- Progressive pneumoperitoneum
Repair Principles & Techniques

- Loss of abdominal domain: **Staged Repair**
  - initial stage involves reduction of the hernia and placement of a large sheet of Gore-Tex 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 cm$^2$ (300–884 cm$^2$)
  - 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


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Case D: large ventral hernia with *loss of domain*

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 5 years he underwent 3 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

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Reconstruct the abdominal wall.

Point of Emphasis #4:

Establish clear and reasonable clinical goals.

- Consider one-stage v. multi-stage procedures;
- “The enemy of good is better”;
- Anticipate complications and exit strategies.
Case D: large ventral hernia with *loss of domain*

Summary

- Multiple options / strategies for reconstruction of the abdominal wall:
  - primary suture repair (rarely indicated)
  - synthetic prosthetics (absorbable v. permanent)
  - biological prosthetics (porcine, bovine, human)
  - onlay, inlay and underlay
  - component separation
  - one stage versus two-stage repair
  - negative pressure dressings
Summary

Points of Emphasis:
- a careful and meticulous dissection
- optimize treatment of fistulas and bowel injuries
- standardize your approach & surgical technique
- establish clear and reasonable clinical goals