

Laparoscopic Vs. Open Ventral Hernia Repair

Irina Kovatch, MD

Brooklyn VA Hospital

Morbidity and Mortality

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Case Presentation

- 63 yo M with symptomatic recurrent ventral hernia
- PMH: HTN, hypercholesterolemia
- PSH: primary repair of ventral hernia in 2009, repair of bilateral inguinal hernias in 1980s
- Meds: lipitor, lotril
- NKDA
- SH: former smoker (quit 25 years ago)
- PE: moderate size incisional hernia, reducible
- BMI: 33.6 after 81lb of intentional weight loss

OR – August 31, 2011

- Laparoscopic approach - open Hasson technique
- Findings: ~10x15cm defect with omentum adherent to the sac
- Repair with Physiomesh (20x25cm) and SecureStrap tacks
- Uneventful recovery and discharge home on POD 5
- Outpatient follow-up as of Nov 8, 2011 – no recurrence



Abdominal Wall Hernias

- Common problem encountered by surgeons
- Despite the large volume of hernia repairs performed, there remains no single best technique
- Many issues continue to influence the evolution of ventral hernia repair methods
 - increasing laparoscopic experience
 - influx of new mesh materials into the market
 - changing patient population

Ventral Hernias

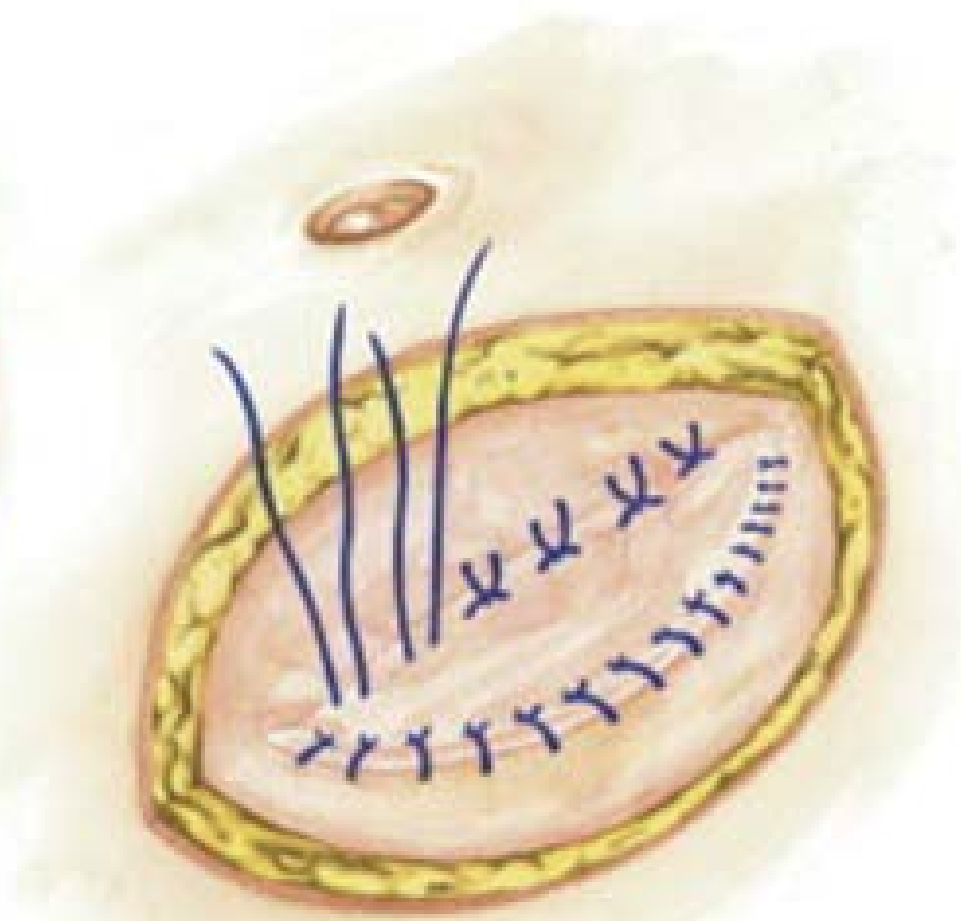
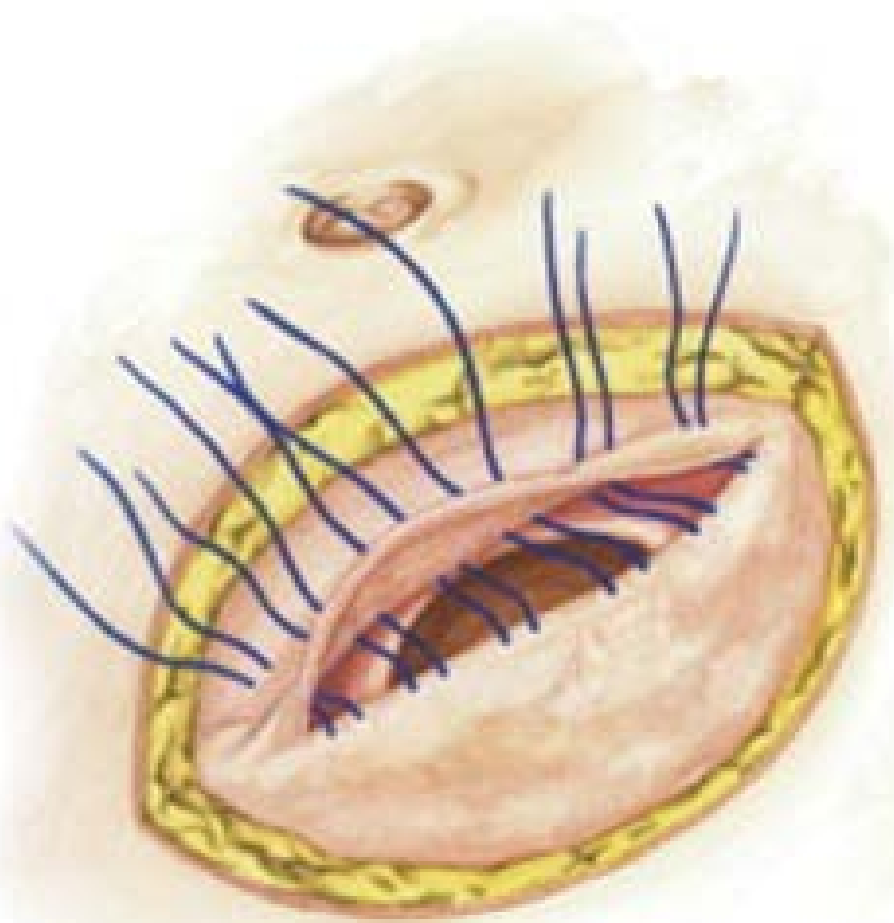
- Incisional - develop in up to 13% of patients who undergo a midline laparotomy (>28% if a wound infection develops)
- Epigastric - frequent in obese individuals with attenuated tissues
- Umbilical - congenital in origin, but may occur later in life resulting from aging and increases in abdominal girth and pressure
- Repair of all of these defects frequently requires the use of a prosthetic material to achieve a lasting repair

Indications for Repair

- Pain and discomfort that limit patient's ability to perform activities of daily life
- Risk for incarceration and strangulation of visceral organs
- Abdominal wall dysfunction that decreases quality of life
- Bulge in the abdominal wall that negatively affects appearance

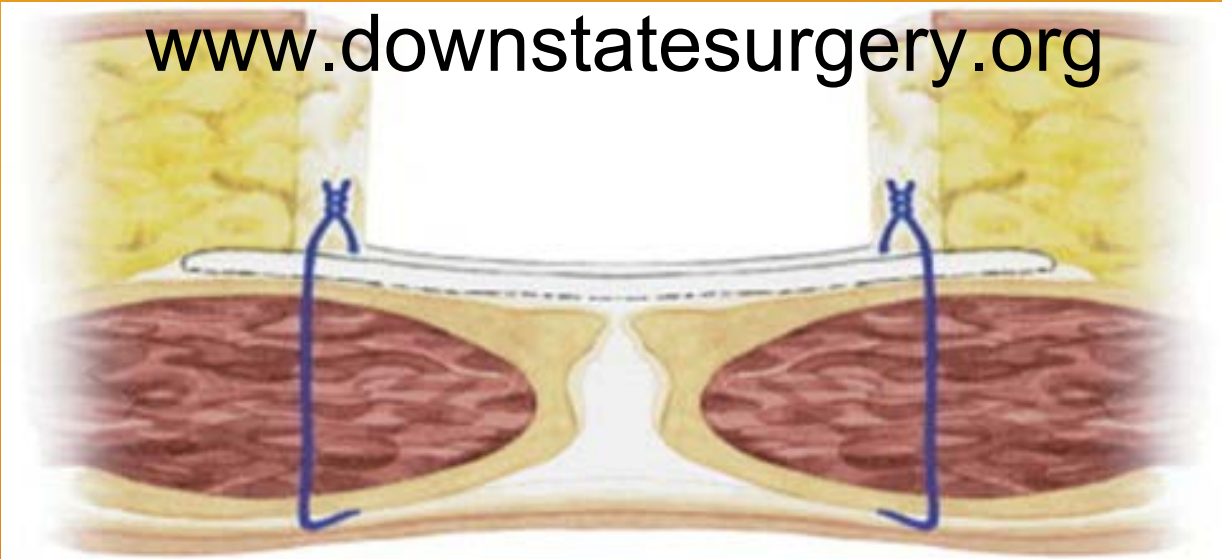
Hernia Repair

- Sutured closure alone is often inadequate to provide a durable repair
- Defect <4 cm could be considered for primary closure unless predisposing factors for recurrence are present
 - obesity, smoking, steroid usage, advanced age
- Defects >4 cm should always be repaired with a prosthesis unless an associated infection or other source of contamination is present

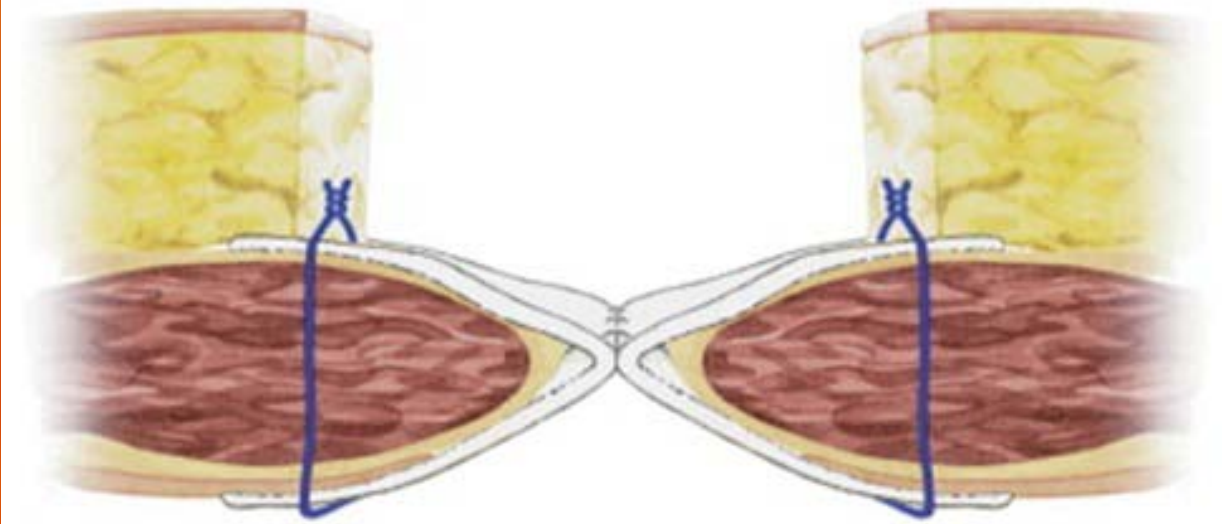


Mesh

- Mesh products can be used either laparoscopically or in the open technique
- The open tissue repair has recurrence rates of 25-50% without mesh, and 10-25% for inlay repair with mesh
- Because of the high recurrence rate, the use of any mesh as a bridge is contraindicated in most instances (with exception of infection or open abdomen)



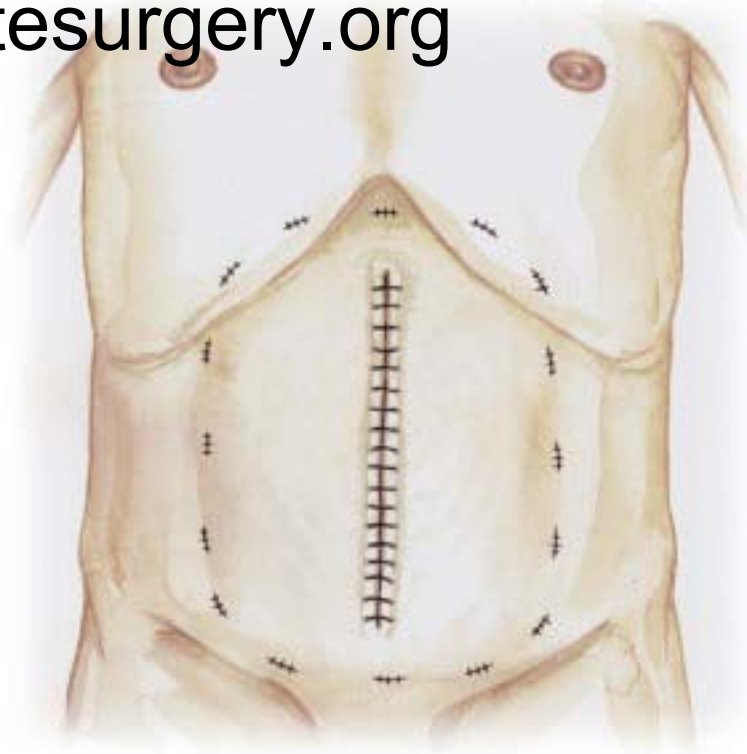
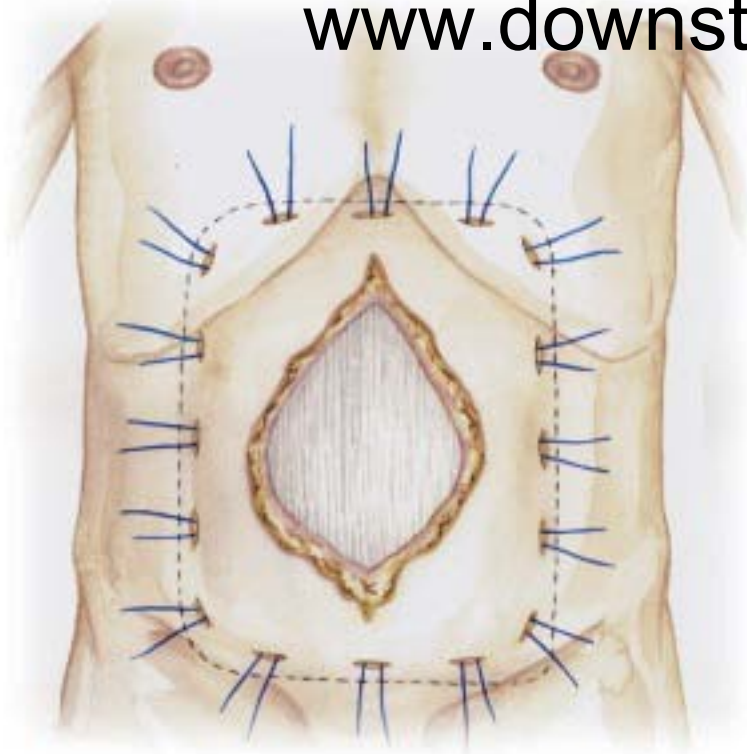
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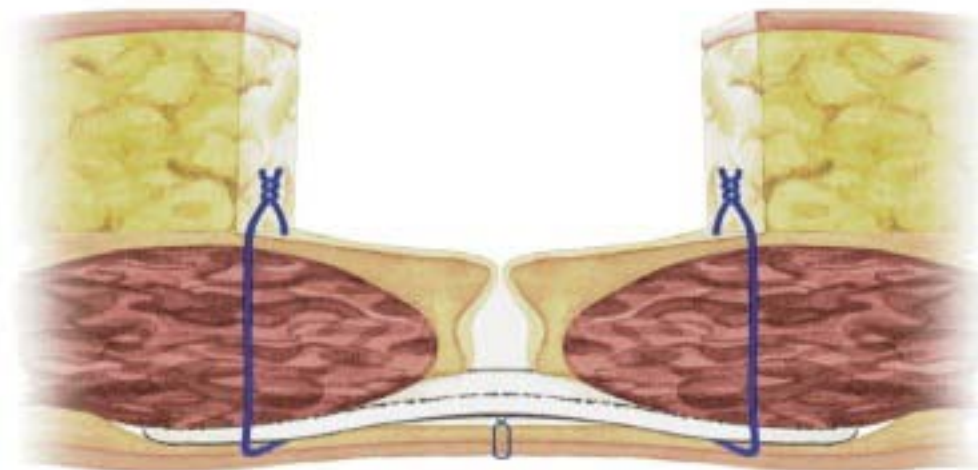
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Underlay Method

- Biomaterial is applied to the undersurface of the abdominal wall with strong fixation
- Provides the most durable repair
- Minimum overlap of the fascial defect by the prosthesis should be 3 cm (4-5 cm in high-risk patients)
- Application of the mesh in the open technique can be difficult, and transfascial sutures are required to adequately fixate the biomaterial



A



B



Large Hernias

- Hernias larger than 15-18 cm, especially in lateral dimension, are increasingly being seen
- Component separation technique is increasingly being used in these cases
- For extreme cases, the application of progressive pneumoperitoneum to increase the intraabdominal cavity may aid in the final closure

Laparoscopic Approach

- Laparoscopic repair of ventral hernias is one of the fastest growing minimally invasive techniques
- Mesh is placed inside the peritoneal cavity with wide overlap of the hernia defect
- Intraabdominal pressure acts to fix the mesh in place, and forces are dispersed over the entire abdominal wall

Benefits of Laparoscopic Approach

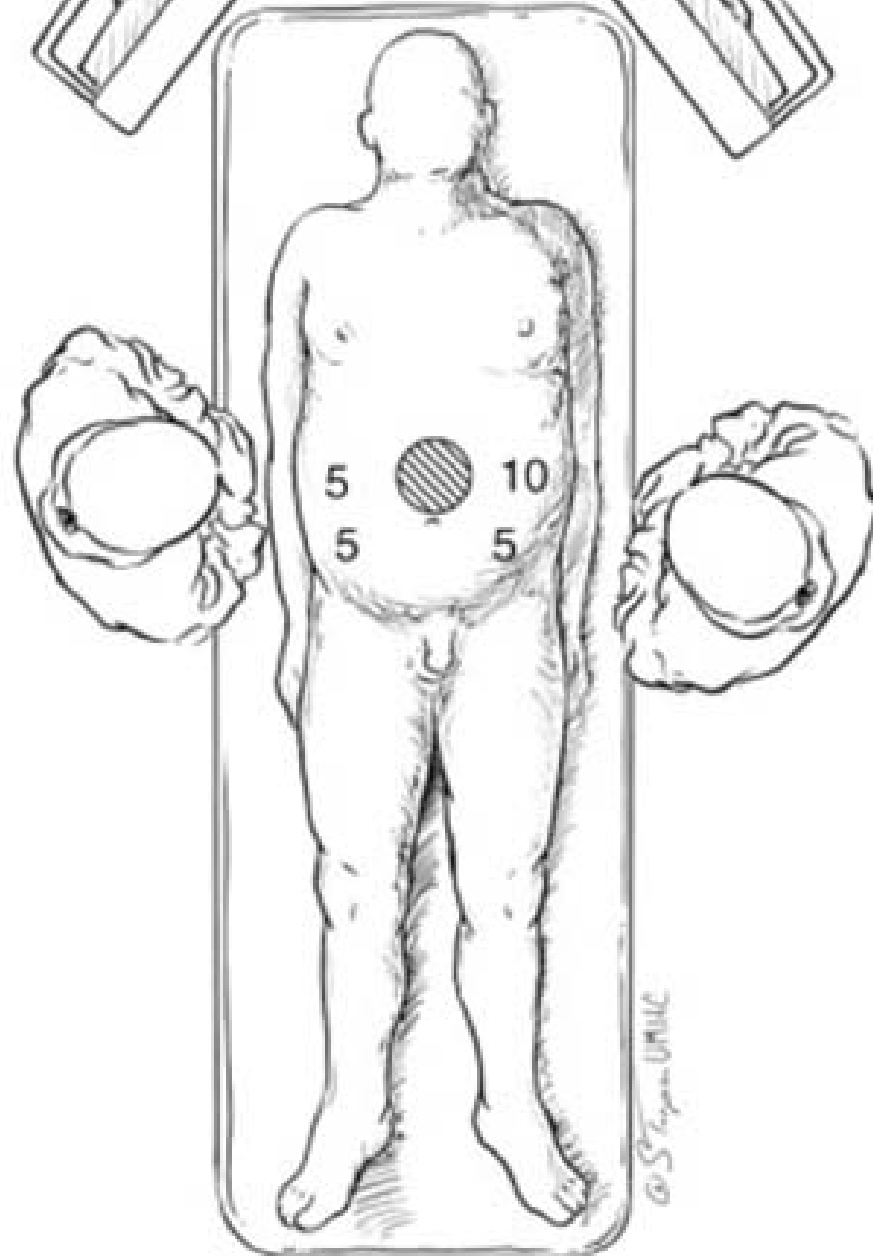
- Laparoscopic approach allows for clear visualization of the abdominal wall, wide mesh coverage beyond the defect, and secure fixation to abdominal wall fascia
- Associated with a reduction in postoperative pain, decreased morbidity (esp. wound infections), shorter length of stay, decreased costs, and a quicker recovery time
- Recurrence rates with laparoscopic approach average at ~5%

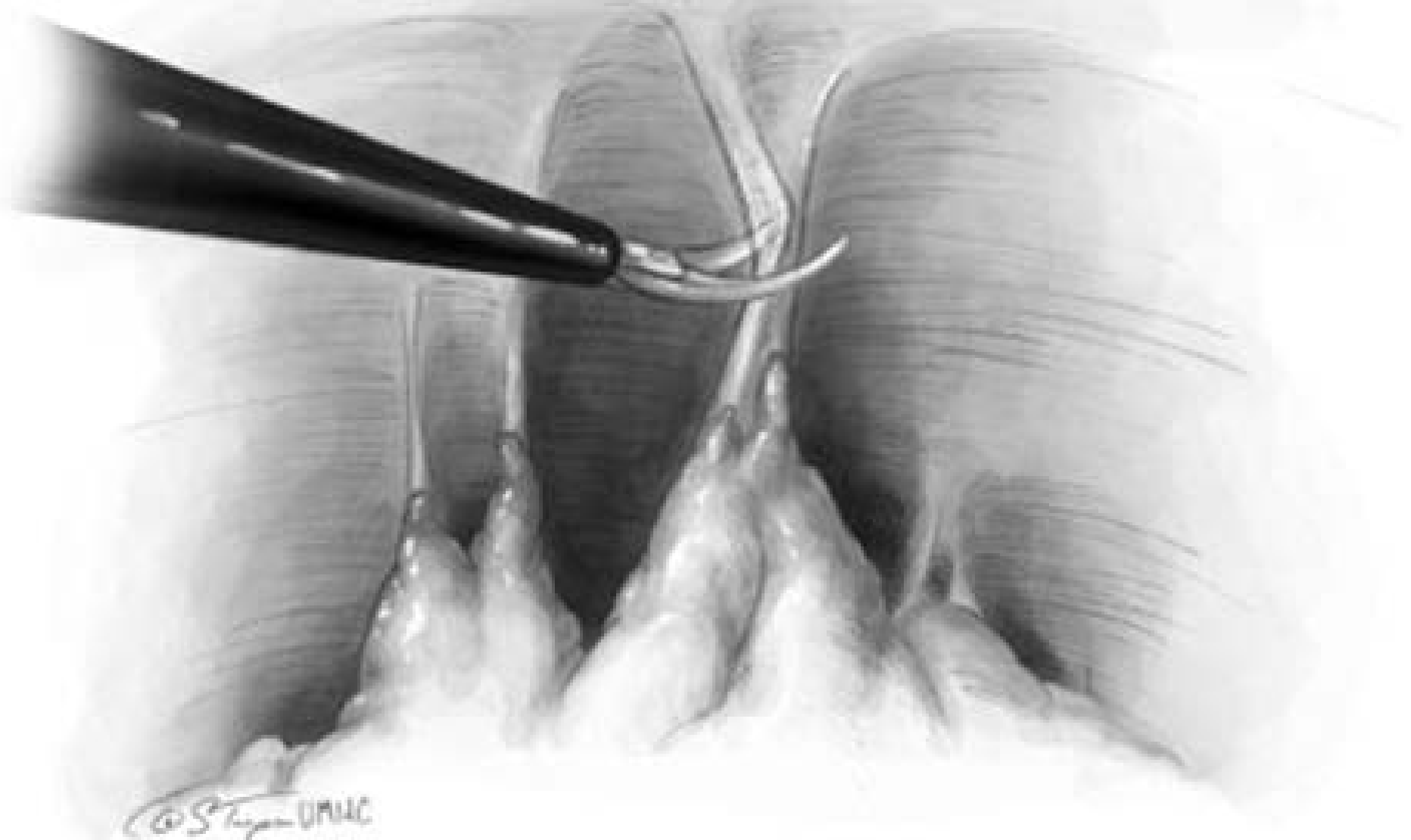
Laparoscopic Approach – Limitations

- Leaves some patients with an abdominal wall bulge and persistent abdominal wall dysfunction
- Hernia defect is not closed, and the hernia sac is left in place
- Postop seroma rate after elective laparoscopic ventral hernia repair
 - 56% on clinical examination, 100% on US
 - In 16% seromas persist for 6 weeks or longer, cause chronic pain, or become infected
 - Some require therapeutic intervention

Laparoscopic Approach – Technique

- Access: open Hasson technique, Veress needle, and direct laparoscopic guidance
- Lysis of adhesions to the abdominal wall using blunt and sharp dissection
- Bleeding is controlled with pressure, hemoclips, or electrocautery
- Enterotomies may be repaired laparoscopically or through an open incision (delay mesh placement after 3-5 days on Abx)

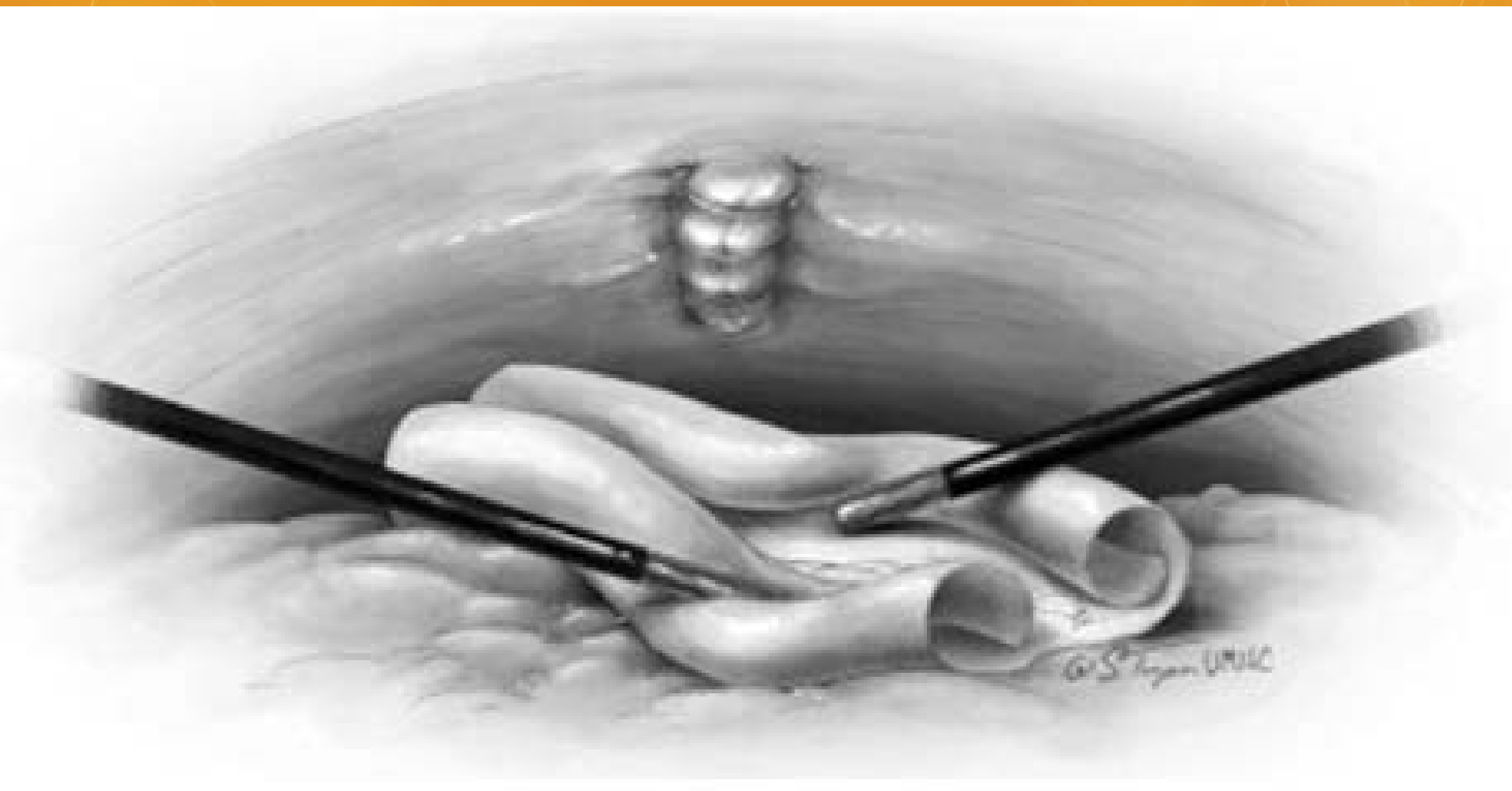


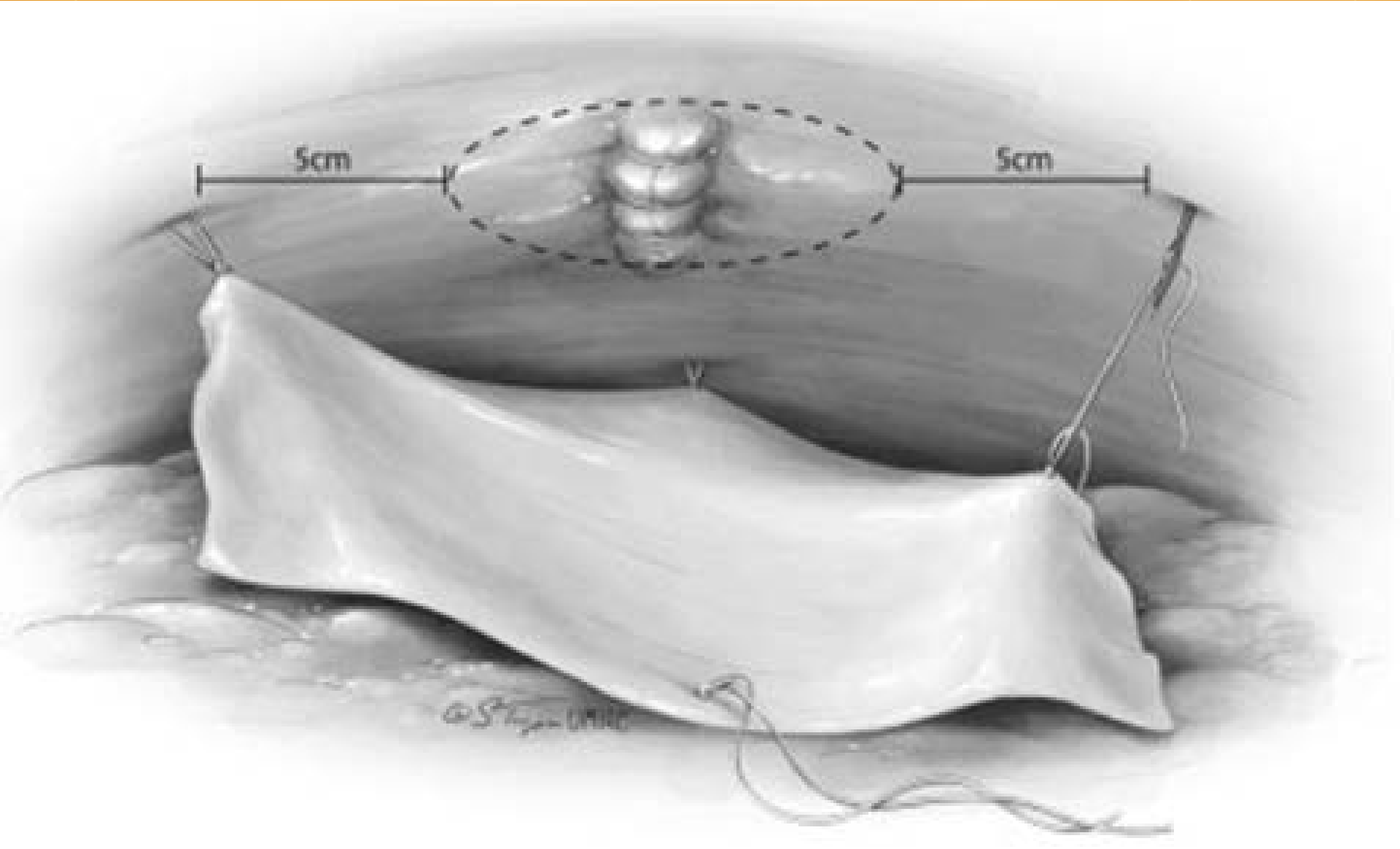


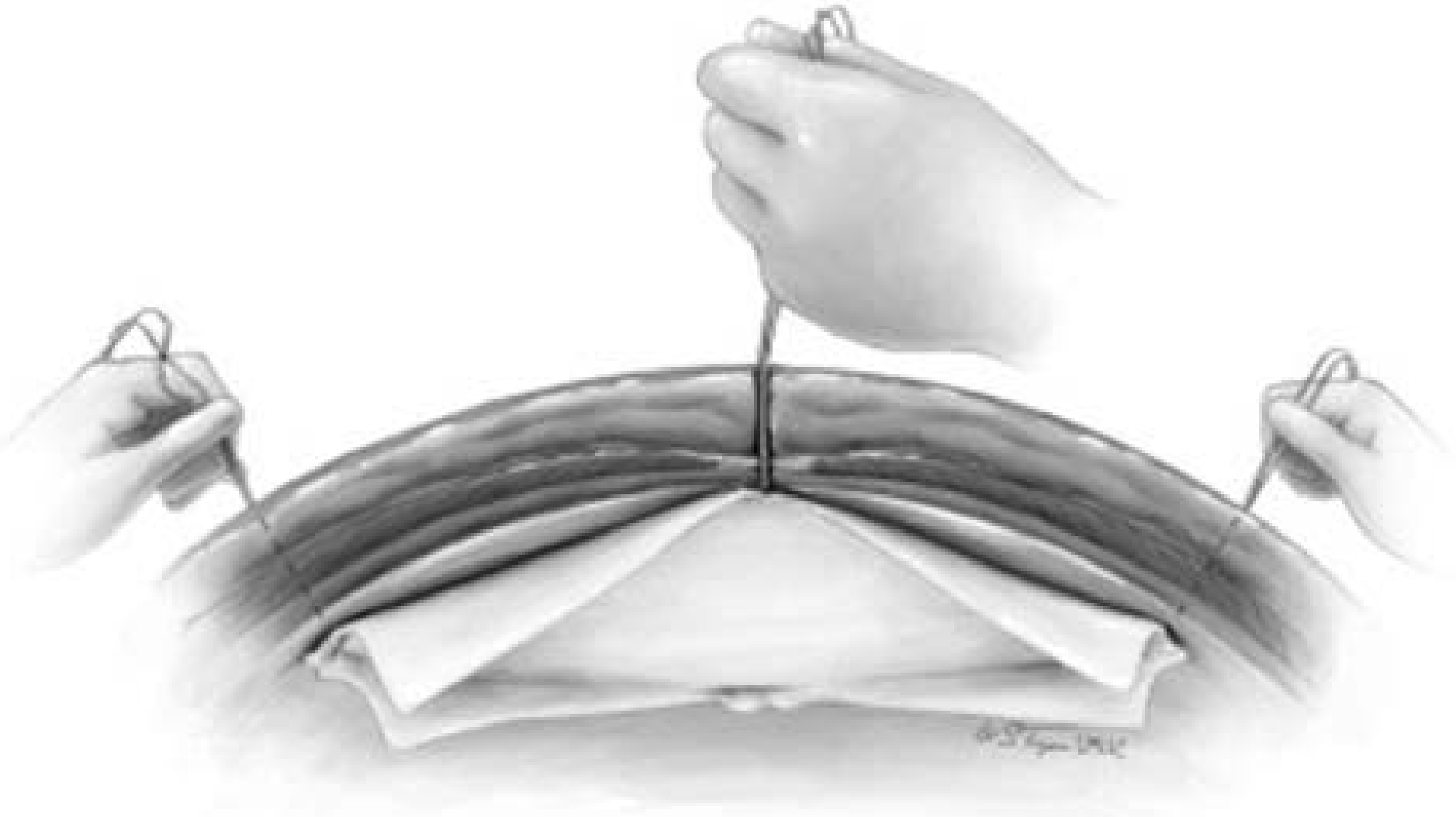
Laparoscopic Approach – Technique

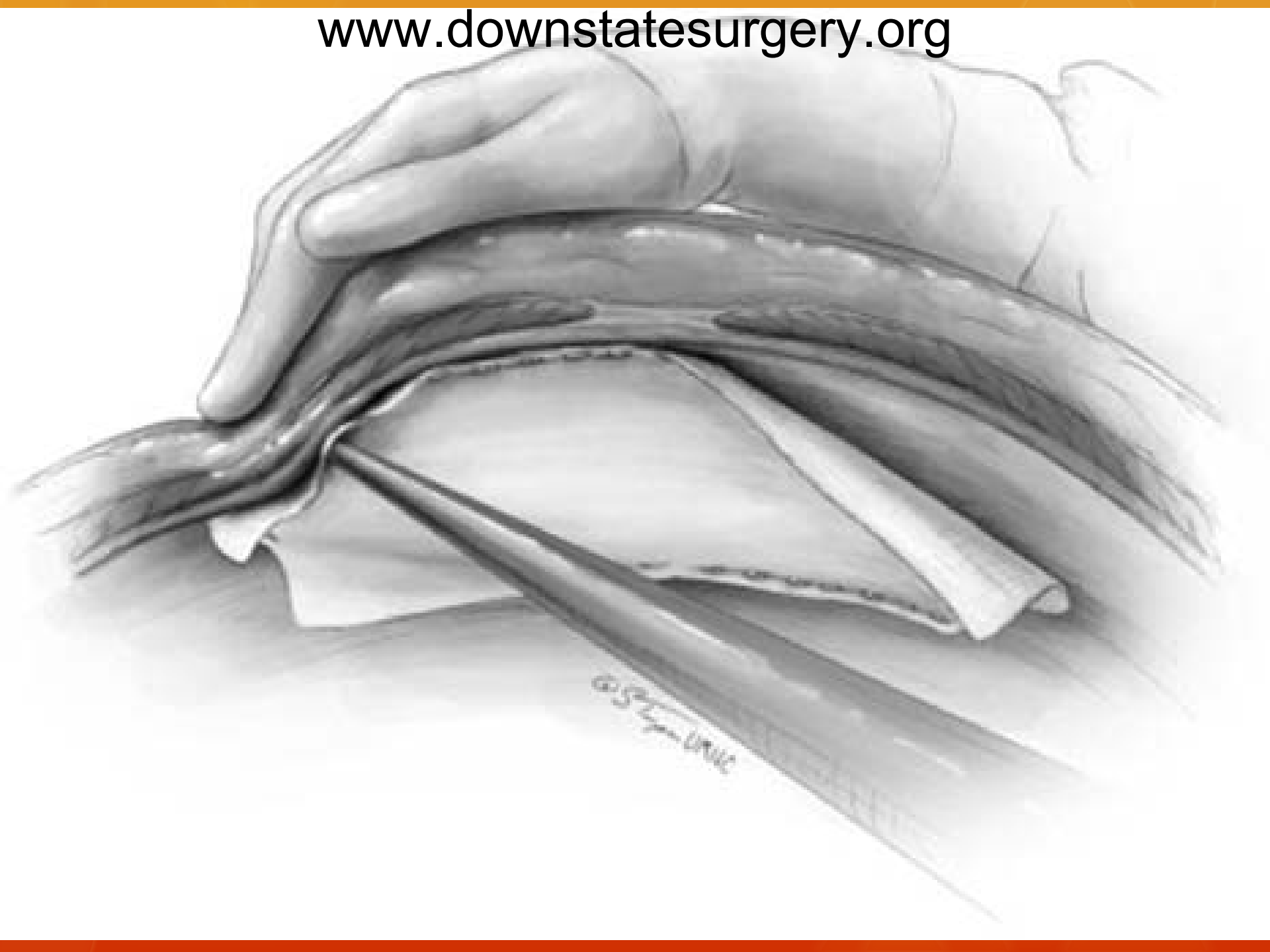
- After the hernia is completely reduced the defect is measured using spinal needle/umbilical tape/ruler
- Mesh should overlap all fascial defect margins by at least 5 cm
- Using a transfascial suture passer cardinal sutures are placed to anchor the mesh
- Tacks applied at 1cm interval at the outer edge of the mesh







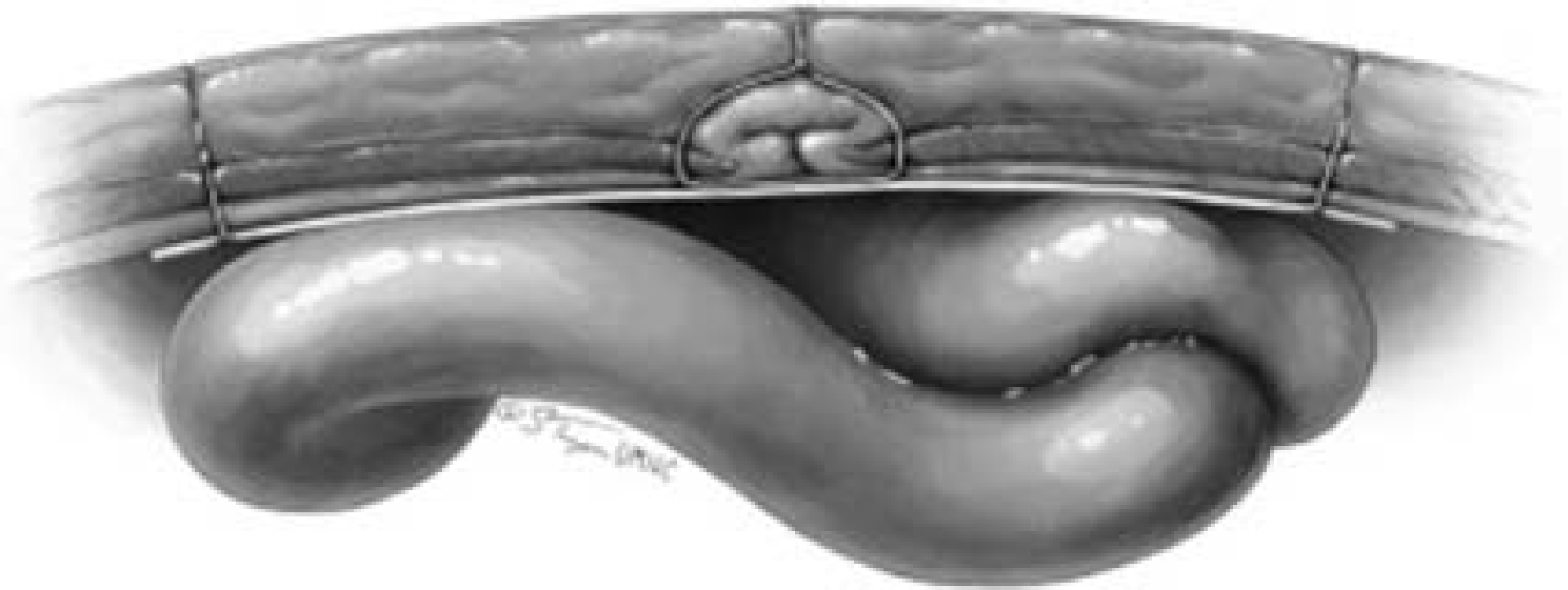




Absorbable Tacks

- Absorbable tacking devices fix the product and disappear after 3 to 12 months
- The use of these products is appealing, but there are no long-term data on them
- If these are chosen, it is best to place transfascial sutures to ensure a secure repair until such a time as data prove them unnecessary





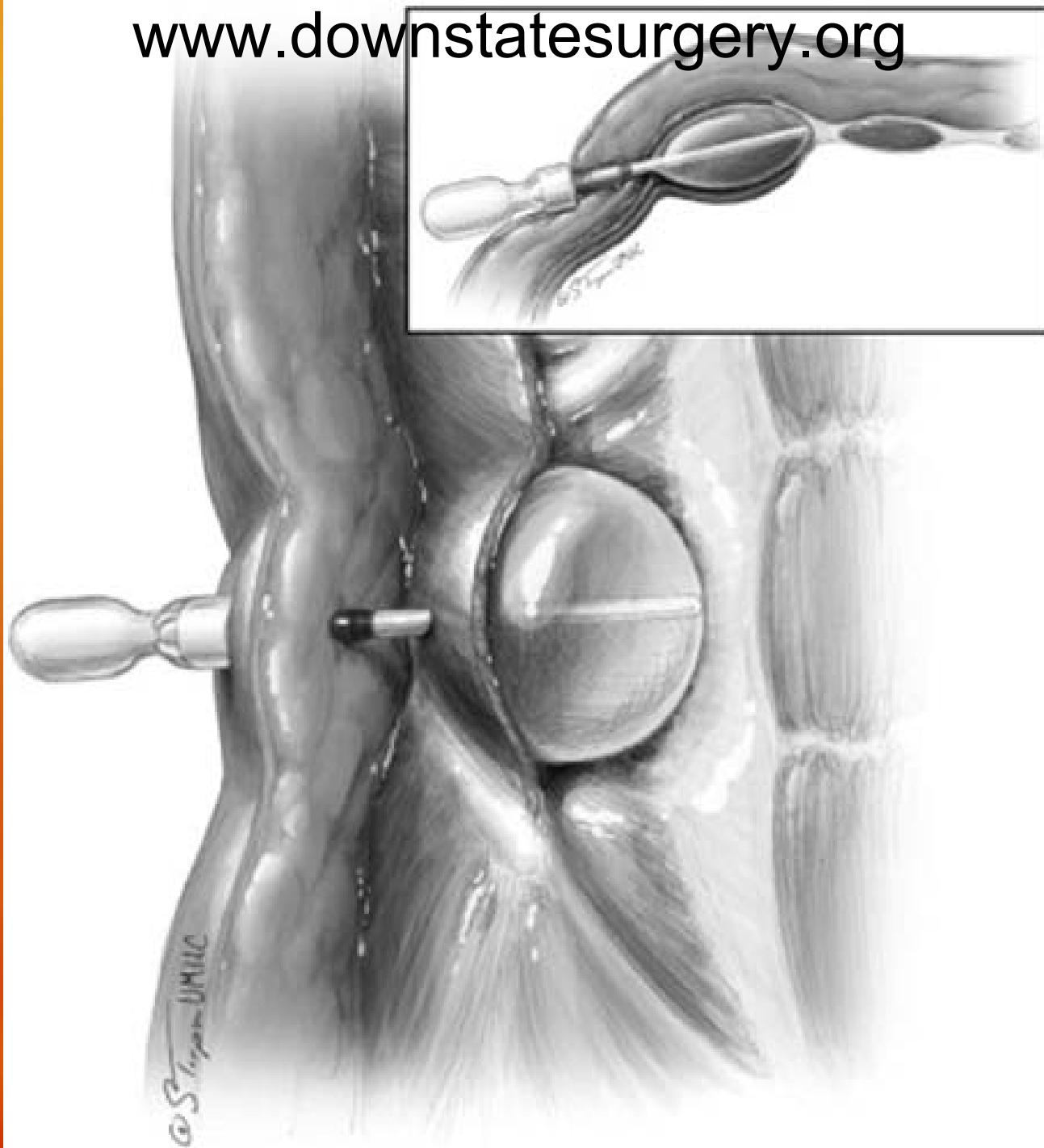
Laparoscopic Approach – Defect Closure

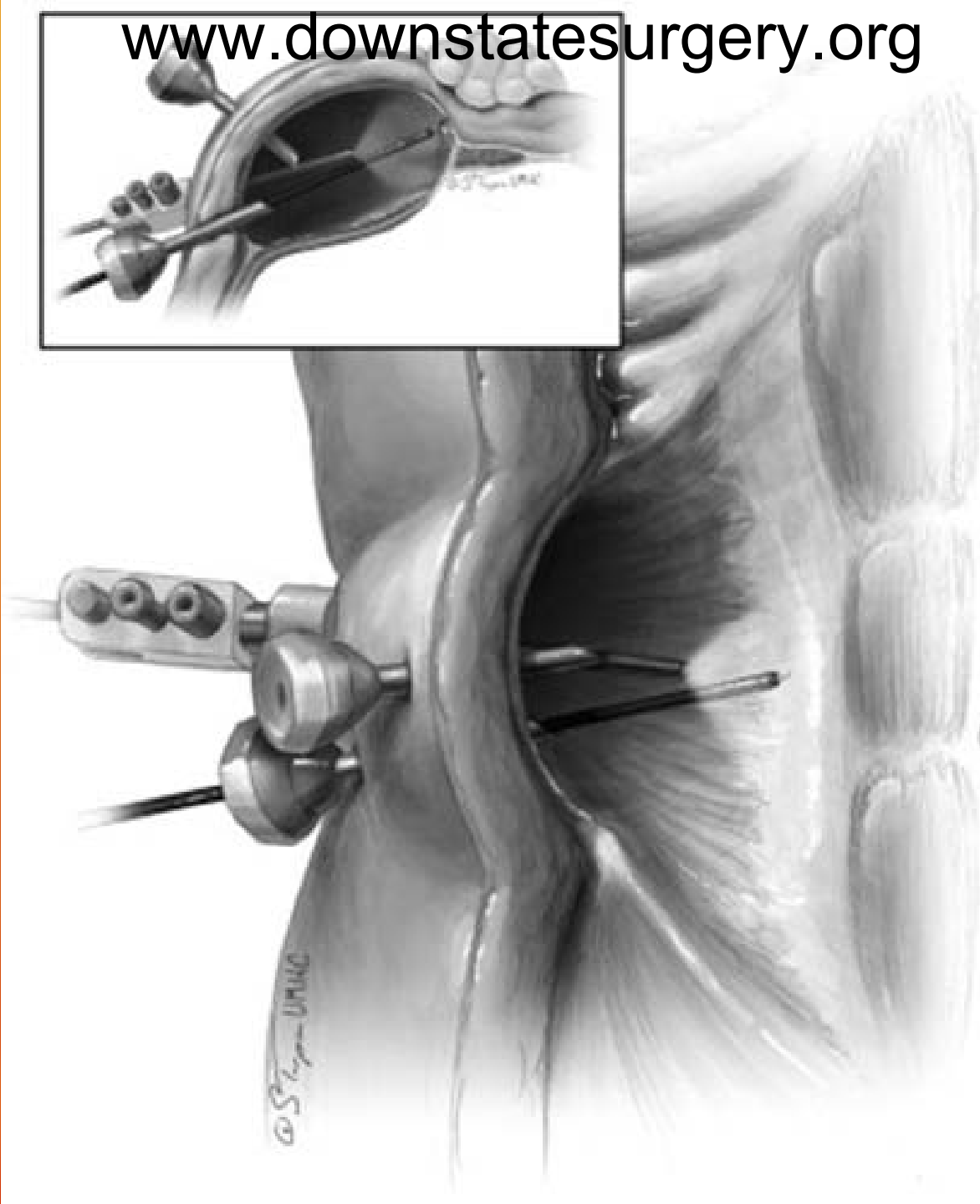
- Primary closure may be performed prior to placement of the mesh in select patients (seldom feasible, but might result in decreased seroma formation)
- Placement of a mesh with dimensions similar to what would be placed in the absence of fascial closure is recommended
- If primary approximation is difficult, a bilateral laparoscopic myofascial separation of components and advancement may be performed
- Closure of defect does not reduce recurrence rates and could result in more pain for the patient, so most surgeons do not employ it

Laparoscopic Approach – Defect Closure

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Perioperative Considerations: Enterotomy

- Extensive lysis of adhesions is often required
- Small bowel injuries can be catastrophic, especially if they are missed
- Nearly 20% of open adhesiolysis operations may result in inadvertent enterotomy
- Enterotomy has been reported in an average of 1% of patients in all large series of laparoscopic ventral hernia repair

Perioperative Considerations: Enterotomy

- Management varies according to the type and extent of the injured intestine and the type of mesh available
- Small lacerations in the small intestine or bladder without contamination are not an absolute contraindication to mesh placement
- Placement of standard mesh in the presence of significant contamination is contraindicated

Perioperative Considerations: Enterotomy

If fecal spillage is present and a prosthetic is required

- bowel should be repaired
- adhesiolysis completed
- patient placed on antibiotics
- delayed hernia repair is performed in 3-4 days if there are no signs of infection
- biologic or natural tissue may be used, although the long-term durability of these repairs is worse

Perioperative Considerations: Pain

- PCA is useful until the patient is transitioned to PO
- Postop pain after open retrorectus or laparoscopic repair is noted at sites of full-thickness transfascial sutures
- Suture site discomfort may last 2-4 weeks postop and is effectively treated by subfascial injections
- Long-term complaints after laparoscopic repair are 2-4%

Perioperative Considerations: Seroma

- Ubiquitous in the early postop period regardless of the approach but rarely require any intervention
- Drains are recommended with open repairs
- Expectant management is the preferred approach to all asymptomatic seromas
- Aspiration of fluid is performed if significant or persistent symptoms are present or if there is a question regarding infection
- Long-term problems are rare

Perioperative Considerations: Wound Complications

- 12-18% develop wound complications after open prosthetic repair
 - large abdominal incisions
 - wide tissue dissection with the creation of flaps
 - placement of a prosthetic
- Laparoscopic approach has dramatically reduced wound-related morbidity

Perioperative Considerations: Wound Complications

- The consequences of any mesh infection are severe regardless of how the prosthetic was originally placed
- Traditional recommendation is to remove contaminated or exposed prosthetics
 - associated morbidity is high
 - mesh removal often results in recurrence, an open wound, and a larger hernia

Perioperative Considerations: Wound Complications

- Mesh removal is not mandatory
- Infected polypropylene, polyester, and ePTFE mesh is often capable of being salvaged
 - intravenous antibiotics
 - local wound debridement
 - VAC
 - subsequent soft tissue coverage of the granulated mesh

Meta-analysis of randomized controlled trials comparing open and laparoscopic ventral and incisional hernia repair with mesh.

Forbes SS, Eskicioglu C, McLeod RS, et al.

- Methods: Randomized controlled trials comparing laparoscopic and open incisional or ventral hernia repair with mesh that included data on effectiveness and safety were included in a meta-analysis.
- Results: Eight studies met the inclusion criteria. There was no difference between groups in hernia recurrence rates (relative risk 1.02). Duration of surgery varied. Mean length of hospital stay was shorter after laparoscopic repair in six of the included studies; the longest mean stay was 5.7 days for laparoscopic and 10 days for open surgery. Laparoscopic hernia repair was associated with fewer wound infections (relative risk 0.22), and a trend toward fewer hemorrhagic complications and infections requiring mesh removal.
- Conclusion: Laparoscopic repair of ventral and incisional hernia is at least as effective, if not superior to, the open approach in a number of outcomes.

Laparoscopic ventral hernia repair: a systematic review

Pham CT, Perera CL, Watkins DS, et al.

- Method: A systematic review with comprehensive searches identifying six randomized controlled trials (RCTs) and eight nonrandomized comparative studies
- Results: The laparoscopic approach has a lower recurrence rate than the open approach and required a shorter hospital stay. Open approach complications generally were wound related, whereas the laparoscopic approach reported both wound- and procedure-related complications and these appeared to be less frequently reported.
- Conclusion: The laparoscopic approach may be more suitable for straightforward hernias, with open repair reserved for the more complex hernias. Laparoscopic ventral hernia repair appears to be an acceptable alternative that can be offered by surgeons proficient in advanced laparoscopic techniques.

Open vs. Laparoscopic

- There have been six prospective randomized trials comparing laparoscopic versus open techniques for ventral hernia repair
- They consist of small study populations with short-term follow-up and use laparoscopic and open techniques that significantly vary between studies, making results difficult to interpret
- Laparoscopic repair of ventral hernias is a safe, feasible, and effective alternative to open ventral hernia repair, and it has the benefits of shorter operative times and hospital stays and lower incidence of postoperative complications

References

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