Groin Hernias

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• Approximately 20 million groin hernias are repaired each year
• Lifetime risk = men 27%; women 3%
• In men, indirect inguinal hernias are the most common type
  - more often located on the right
  - occurring approximately twice as frequently as direct inguinal hernias
  - femoral hernias account for a smaller %
In female patients, indirect inguinal hernias are also the most common type.

- Femoral hernias are seen more frequently than direct hernias, which are rare in this population.
- Femoral hernias account for fewer than 10% of all groin hernias.
  - 40% present as emergencies (with incarceration or strangulation).
Background

• Mortality is higher for emergency repair than for elective repair
• A two-peak theory has been described
• A new diagnosis of an inguinal hernia is most likely in patients younger than 1 year and in patients older than 55 years
• Hernias can be diagnosed across any given age group
Anatomy
Operative Techniques
Approach

- There are a great deal of described techniques for inguinal hernia repair, both open and laparoscopic
- Controversy remains regarding the ideal approach to and outcome for inguinal hernia repair
- The evidence supports the use of mesh
  - it is associated with a significant reduction in the risk of recurrence between 50 and 75%
Approach

• With the evolution of the open anterior approach to tension-free prosthetic mesh repair, determining which patients will benefit significantly from lap approach has become increasingly important.

• Patients are well served when a surgeon has several approaches at their command that can be applied to and, if necessary, modified for individual circumstances.
Many surgeons consider the presence of an inguinal hernia to be reason enough to operate.

Recent studies have shown that the presence of a reducible, asymptomatic inguinal hernia in males is not an indication to operate.

- Incarceration rate is < 1%
Two trials were conducted to study the effects of watchful waiting for asymptomatic hernias (LTFU) – there was no significant difference in hernia-related symptomatology.

– most patients with an asymptomatic groin hernia eventually develop symptoms and should be offered surgical repair if they are medically fit.
The natural history of an untreated, minimally symptomatic inguinal hernia was addressed in a randomized, controlled trial in which 364 men were assigned to "watchful waiting" and 356 men underwent routine operation.

Only two patients in the WW group required emergency operations for strangulation over the follow-up period of 2 to 4.5 years.
Asymptomatic

- Rate of 1.8 per 1,000 patient-years (0.18%), or about one fifth of 1% for each year that the hernia remains unrepaired
- The two patients who required emergency operations recovered uneventfully
- At the conclusion of the study, functional status (quality of life instruments and pain scales) was identical in the two groups
About 1/3 in the WW group crossed over to undergo operative treatment, principally because of symptom progression.

No penalty for delaying surgery.

Before this study, most surgeons assumed that a hernia would become harder to repair the longer it remained—because of enlargement and buildup of scar tissue.
Thought was that patients whose operations were delayed would experience more complications.

Post-operative complication rates were the same in patients who underwent immediate surgery as in those who were assigned to WW but had to cross over to surgical treatment.
The most important consideration in choosing an inguinal hernia procedure may well be the experience of the surgeon. The next consideration should be to tailor the operation to the patient:
- high-risk
- incarcerated
- large scrotal
- previous lower abdominal surgery or radiation
Recurrent or Bilateral
Incarcerated & Strangulated

- Surgical emergency associated with high morbidity and mortality (up to 9%)
  - rate varies between 0.9 and 2.9%

- Prompt clinical diagnosis is needed

- A delay of 6 to 12 hours increases the likelihood of intestinal necrosis and requires bowel resection in up to 15% of cases
Approach

• The basic surgical principles are as follows:
  – the approach that offers the most optimal exposure and access to the small bowel
  – the hernia sac should be reduced with minimal trauma to its contents
  – synthetic mesh should be avoided

• Tissue repairs are preferable, and the higher risk of recurrence should not be a deciding factor
Anterior

- Initial incision
- Mobilization of the cord structures
- Management of the hernia sac
- Repair of the inguinal floor
- Closure
• Indirect
  – anterior and medial

• Dissected free of the cord structures

• Can then be ligated and divided or simply reduced into the peritoneal cavity
• Sac inversion
  – less pain (because the richly innervated peritoneum is not incised)
  – less likely to cause adhesive complications
  – protects intra-abdominal viscera in cases of unrecognized incarcerated sac contents or sliding hernia
For large inguinal scrotal hernias, it may be preferential to divide the sac in the middle of the canal once it is clear that no abdominal contents are present rather than persist at full removal of the sac.

The anterior wall of the distal sac is opened as far as possible, and the proximal sac is closed and reduced into the peritoneal cavity.
Tissue Repairs
After performing the initial dissection and the reduction or ligation of the sac, the transversalis fascia is opened from the internal inguinal ring to the pubic tubercle.

This exposes the preperitoneal fat, which is then bluntly dissected away from the undersurface of the superior flap of the transversalis fascia.
The first stitch includes the triple layer (the TF, the TA, and the IO muscle) superiorly and the periosteum of the medial side of the pubic tubercle + the rectus sheath

The repair is continued laterally, and the triple layer is secured to the reflected inguinal ligament

The sutures are continued until the internal ring is closed on its medial side
The initial steps proceed as per the Bassini repair, including division of the transversalis fascia.

A continuous suture is used for the repair.

Eventually, 4 suture line layers are placed.

The repair starts at the pubic tubercle by approximating the iliopubic tract laterally to the undersurface of the lateral edge of the rectus abdominis.
The suture is continued laterally, approximating the iliopubic tract to the medial flap, which is made up of the transversalis fascia, the internal oblique muscle, and the transversus abdominis.

The continuous suture is extended to the internal ring, where the lateral stump of the cremaster muscle is picked up to form a new internal ring.
Next, the direction of the suture is reversed back toward the pubic tubercle, approximating the medial edges of the internal oblique muscle and the transversus abdominis to the Poupart ligament, and the suture is tied to itself and then the first knot.

Thus, two suture lines are formed by the first suture.
• A second suture is started near the internal ring, approximating the internal oblique muscle and the transversus abdominis to a band of external oblique aponeurosis superficial and parallel to the Poupart ligament
• Third suture line ends at the pubic crest
• The suture is then reversed, and a fourth suture line is constructed in a similar manner, superficial to the third line
• Although the Shouldice clinic has outstanding results, a major criticism of this operation is that the results may not be reproducible in general practice because surgeons may find it hard to identify the various layers in the medial flap reliably
  – a step that is crucial for developing the multiple suture lines
McVay Cooper Ligament

- Unlike Bassini, uses Cooper’s ligament instead of the inguinal ligament for the medial portion of the repair.
- Interrupted sutures are placed from the pubic tubercle laterally along Cooper’s ligament, progressively narrowing the femoral ring.
- The most common application of the repair: femoral hernia repair.
McVay Cooper Ligament

- The last stitch is known as a transition stitch and includes the inguinal ligament
  - completes the narrowing of the femoral ring by approximating the inguinal ligament to the Cooper ligament
  - provides a smooth transition to the inguinal ligament over the femoral vessel so that the repair can be continued laterally
McVay Cooper Ligament

• Given the considerable tension required to bridge such a large distance, a relaxing incision should always be used
• This tension results in more pain than with other repairs and predisposes to recurrence
• This repair is rarely chosen today
  – femoral hernia or with specific contraindications to mesh repair
Relaxing Incision

- Made in the anterior sheath, extending superiorly from the pubic tubercle
- A hockey-stick incision oriented laterally at the superior end is a common choice
- Posterior rectus sheath is strong enough to prevent future incisional herniation
- Works – as the anterior sheath separates, the various components of the abdominal wall are displaced laterally and inferiorly
Lichtenstein

- This operation is the current standard for inguinal herniorrhaphy
- The transversalis fascia is not opened
- The key to the operation is the placement of a large prosthesis extending from a point 2 cm medial to the pubic tubercle (to prevent the commonly seen pubic tubercle recurrences) to the anterosuperior iliac spine laterally
Lichtenstein

- A slit is made on the lateral side of the prosthesis to create two tails
- The tails are positioned around the cord structures and placed beneath the external oblique aponeurosis
- A single interrupted suture is placed to secure the lower edge of the superior tail to the lower edge of the inferior tail and the inguinal ligament – shutter valve
• Prevents indirect recurrences
• Provides a cradling effect and prevents direct contact between the cut edges of the prosthesis and the cord structures
• Incorporates the shelving edge of the inguinal ligament and creates a domelike buckling effect over the direct space – ensuring there is no tension, especially when the patient is upright
Complications
Recurrence

- Influenced by the type of repair, type of hernia (primary versus recurrent), patient characteristics, and surgeon characteristics (hernia specialist or not)

- The use of mesh is an important factor
Pain

• Chronic post-op groin pain is one of the major complications facing patients undergoing inguinal hernia repairs
• Some degree of post-op groin pain in as many as 53% of patients
• Significant long-term pain is probably seen in 5 to 15% of patients
  - regardless of whether the nerves were divided or preserved
Pain

- Persistent pain and burning sensations in the inguinal region, the upper medial thigh, or the spermatic cord/scrotal skin region occur when the genitofemoral or ilioinguinal nerve is entrapped or injured.

- When the lateral cutaneous nerve is involved, lateral or central upper medial thigh numbness is experienced and often lasts several months or longer.
Pain

- Patients who undergo lap repair occasionally describe a deep discomfort that can be positional and are often of a transient, shooting nature suggestive of nerve irritation.
- Post-op chronic pain is more likely to be observed in younger patients and in patients who report pre-op pain attributable to their hernia.
Testicular

- The most common cause of post-op testicular swelling, orchitis, and ischemic atrophy is surgical trauma to the testicular veins (venous congestion and subsequent thrombosis).

- Orchitis is defined as post-op inflammation of the testicle occurring within the first 2 post-op days.
Testicular

- Experience painful enlargement and hardening of the testicle
  - usually associated with a low-grade fever
  - the pain is severe and may last several weeks but is usually self-limited
- The vast majority go on to recover without atrophy,
  - occurs in < 0.04% of primary inguinal hernia repairs and < 0.5% of recurrent hernia repair
What You Need to Know

- Know your outs
- Know more than one type of repair
- Be prepared for the worst
- Nothing beats a good PE
- The most common reason for a persistent hernia is a missed hernia