# Unusual Hernias

Martin Zielinski, MD

*Editorial Review:* *Stephanie A. Savage, MD, MS*

*Joseph Galante, MD*

*Clay Cothren Burlew, MD*

- Femoral Hernias
    - *Anatomic location* - Femoral hernias lie within the femoral canal, inferior to the inguinal ligament, medial to the femoral vein, and lateral to the lacunar ligament.
    - *Injury & Disease Demographics* - Commonly confused for inguinal hernias, they account for approximately 4% of groin hernias but are more commonly incarcerated or strangulated. They are more common in elderly women.
    - *Clinical Presentation & Evaluation* - Often confused for an inguinal hernia, the most common presentation is an infra-inguinal bulge, below the inguinal ligament and medial to the femoral artery. In the obese patient, these anatomic landmarks can be difficult to appreciate. If uncertainty exists, ultrasound is up to 86% sensitive in detecting the presence of a femoral hernia.[1]
    - *Operative Techniques* - Several approaches exist to repair femoral hernias including totally extraperitoneal (TEP) femoral hernia repair, Transabdominal Preperitoneal Patch (TAPP) femoral hernia repair, open posterior preperitoneal femoral hernia repair, and Cooper's Ligament (McVay) femoral and inguinal hernia repair. To conduct the open posterior preperitoneal approach, a tranverse incision 2 cm cephalad to the internal inguinal ring is created on the affected side. Transection of the anterior rectus sheath is then performed with the rectus muscle retracted medially. This allows access to the preperitoneal space, the contents of which should be retracted cephalad. At this point, you will visualize the posterior inguinal wall. The key to repair, no matter the approach used, is obliteration of the femoral canal space medial to the femoral artery by approximation of the iliopubic tract to Cooper's Ligament for tissue based repairs or with prosthetic mesh in non-contaminated cases. (Figure 1).
    - *Intraoperative Considerations* - Rates of strangulation approach 22-45%. If strangulated bowel is discovered, a tissue based repair is recommended to avoid mesh contamination. If a bowel resection is required, this can frequently be performed through the open incision, however, laparoscopic exploration or laparotomy may be required if the bowel reduced prior to examination or resection.
- Spigelian Hernias
    - *Anatomic location* - A defect of the abdominal wall along the semilunar line, the hernia lies at the caudal extent of the posterior rectus sheath. Abdominal components will herniate through the defect of the transversus abdominus and internal oblique fascial planes but the external oblique fascia remains intact.(Figure 2)
    - *Injury & Disease Demographics* - Most commonly occur on the right side during the $4^{th}$ to $7^{th}$ decades. Up to 20% of Spigelian hernias will be incarcerated on presentation.
    - *Clinical Presentation & Evaluation* - Unilateral swelling and pain in the mid-abdomen, commonly without a definitive bulge due to the intact external oblique fascia. Up to 20% will be incarcerated.
    - *Operative Techniques* - Laparoscopic, robotic, and open hernia repairs can be performed successfully. A laparoscopic approach is generally considered the standard approach as it has been associated with fewer wound complications and

shorter duration of stay than open approaches but requires permanent prosthetic mesh so should not be used if strangulation is present.[2] Other options include TAPP and TEP techniques due to the proximity to the inguinal canal.
    - *Intraoperative Considerations* - Mesh placement may not be necessary for small defects when performed in an open approach. Strangulated bowel may necessitate conversion to an open procedure for bowel resection and primary hernia repair.
- Obturator Hernias
    - *Anatomic location* - Herniation of abdominal contents through the obturator foramen due to weakening of the obturator membrane. The obturator foramen is the opening created between the ischium and pubic bones which contains the obturator artery, vein, and nerve (Figure 3a).
    - *Injury & Disease Demographics* – This rare hernia represents less than 1% of abdominal wall hernias but generally found in women, aged 70-90 years, after significant weight loss with a body mass index less than 19 $kg/m^2$ as the potential space is usually filled by preperitoneal fat and lymphatic tissue.[3]
    - *Clinical Presentation & Evaluation* - A challenging diagnosis, a bulge may be present as a proximal thigh mass between the adductor longus and pectineus muscles (Figure 3b). More than 90% are diagnosed intra-operatively during exploration for small bowel obstruction. Obturator neuralgia, with pain radiating from the ipsilateral groin to the knee, may also be present.
    - *Operative Techniques* - Laparoscopic and open posterior preperitoneal hernia repairs can be performed successfully. As obturator hernias are extremely uncommon, the optimal surgical approach is not known but experience from other abdominal wall hernias can be applied. Strangulated and obstructed hernias are likely best approached through an open transperitoneal technique as to reduce the bowel contents by releasing the obturator membrane downward and medially at its lower edge in order to avoid damage to the obturator vessels and nerve which are generally located laterally in half of patients or medially, anteriorly or posteriorly in the rest. Repair of the defect can be done primarily if 1 cm in size or less. For larger defects, prosthetic mesh can be placed if not contaminated, or, for contaminated cases, an omental flap can be brought in to fill the potential space.
    - *Intraoperative Considerations* – While the incidence of a contralateral obturator canal hernia is unknown, it should be examined and repaired if present.
- Lumbar Hernias
    - *Anatomic location* - There are two potential defects for lumbar hernias; the superior lumbar triangle and the inferior lumbar triangle. The lumbar region is defined as the $12^{th}$ rib superiorly, the iliac crest inferiorly, the erector spinae medially, and the internal oblique laterally. (Figure 4)
    - *Injury & Disease Demographics* - Most patients will have had a prior flank incision, typically from nephrectomy, causing denervation of the surrounding muscles which exacerbates congenital weaknesses in the lumbar region.
    - *Clinical Presentation & Evaluation* - A palpable bulge is most commonly present in the posterolateral abdominal wall near the site of a prior incision. Bulges may disappear while the patient is in a decubitus position.
    - *Operative Techniques* - Laparoscopic, robotic and open hernia repairs can be performed successfully. Small and large defects should be approached via a

preperitoneal/retromuscular approach with prosthetic mesh placement, however, huge defects greater than 15 cm may require an open approach.[4] The preperitoneal space should be dissected free from the defect for at least 5 cm circumferentially, generally up to or even beyond the ipsilateral psoas muscle, iliac crest, rectus muscle, and costal margin.
    - *Intraoperative Considerations* - Mesh placement is almost universally required whether performed in an open or laparoscopic approach as the defect lies in a region with limited mobility of the surrounding tissues. Due to the bony structures exposed, the surgeon may need to fix mesh to the iliac crest and rib, with or without bone anchors.
- Sciatic Hernias
    - *Anatomic location* - There are three potential defects associated with sciatic hernias. Abdominal contents may pass through the greater sciatic foramen above or below the pyriformis muscle or through the lesser sciatic foramen (e.g. subspinous hernia; Figure 5).
    - *Injury & Disease Demographics* - Patients commonly have a prior history of synchronous hernias, malignancy, pelvic fractures, congenital pelvic abnormalities, or prior pelvic surgery.
    - *Clinical Presentation & Evaluation* - Sciatica, buttock masses and abdominal pain are the most common presentation symptoms. Less commonly, patients may present with small or large bowel obstruction and urinary obstruction.
    - *Operative Techniques* - Laparoscopic and open hernia repair can be performed successfully. A transgluteal approach can be used to approach the hernia posteriorly. After placing the patient in a prone position, an incision is created from the greater trochanter towards the medial extent of the hernia. The piriformis muscle will be exposed once the gluteus maximus muscle fibers have been spread along their trajectory. Care must be taken to not damage the sciatic nerve present in the operative field. A prosthetic mesh is generally required to close the defect present between either the piriformis and ischium or piriformis and iliac.
    - *Intraoperative Considerations* - May contain ovary, ureter, small and large intestine, tumors, or bladder.
- Imaging
    - The majority of abdominal wall hernias can be diagnosed on physical examination although obese patients may obscure typical findings. With rare exceptions, however, the presented "unusual" hernias will require cross-sectional imaging in order to provide clues to complications of hernias such as bowel obstruction, bowel strangulation, or urinary obstruction.
    - Cross-sectional imaging can also provide information to guide hernia repair techniques including the size of the hernia, mesh landing sites, and hernia sac contents identification.
    - Cross-sectional imaging is best to confirm the diagnosis of lumbar, obturator, and sciatic hernia.
    - Ultrasound provides less information on surrounding anatomic structures than cross sectional imaging but can reliably diagnose femoral and Spigelian hernias.
- Indications for operative intervention
    - Any incarcerated or strangulated hernia mandates emergent repair.

    - Non-incarcerated “unusual” hernias should be repaired soon after diagnosis to avoid complications of hernias such as incarceration, obstruction, and strangulation.
    - Emergent operations are associated with greater rates of bowel resection and mortality
    - There are no definite contraindications to emergent repair for complicated hernias, but attempts at reduction should be undertaken
    - Asymptomatic unusual hernias can be observed but elective surgical repair is recommended.
- Postoperative management and Complications
    - Post-operative management is similar among all the hernia repairs
    - Laparoscopic repairs are associated with lower superficial wounds infection rates compared to open repairs, but the rate of mesh infections is the same no matter the technique.
    - Post-herniorrhaphy neuralgia complicates less than 1% of inguinal hernia repairs. Mesh infections occur in 0.1%-0.2% of patients
    - The recurrence risk for the presented unusual hernias is low but unknown

Proposed reading list


1. Murphy KP, O'Connor OJ, Maher MM. Adult abdominal hernias. Am J Roentgenol. 2014 Jun;202(6):W506-11.
2. Salameh JR. Primary and unusual abdominal wall hernias. Surg Clin North Am. 2008 Feb;88(1):45-60, viii..
3. Moreno-Egea A, Carrasco L, Girela E, Martín JG, Aguayo JL, Canteras M. Open vs laparoscopic repair of spigelian hernia: a prospective randomized trial. Arch Surg. 2002;137(11):1266.
4. Losanoff JE, Basson MD, Gruber SA, Weaver DW. Sciatic hernia: a comprehensive review of the world literature (1900-2008). Am J Surg. 2010 Jan;199(1):52-9.
5. Stamatiou D, Skandalakis LJ, Zoras O, Mirilas P. Obturator hernia revisited: surgical anatomy, embryology, diagnosis, and technique of repair. Am Surg. 2011 Sep;77(9):1147-57.

## IMAGES

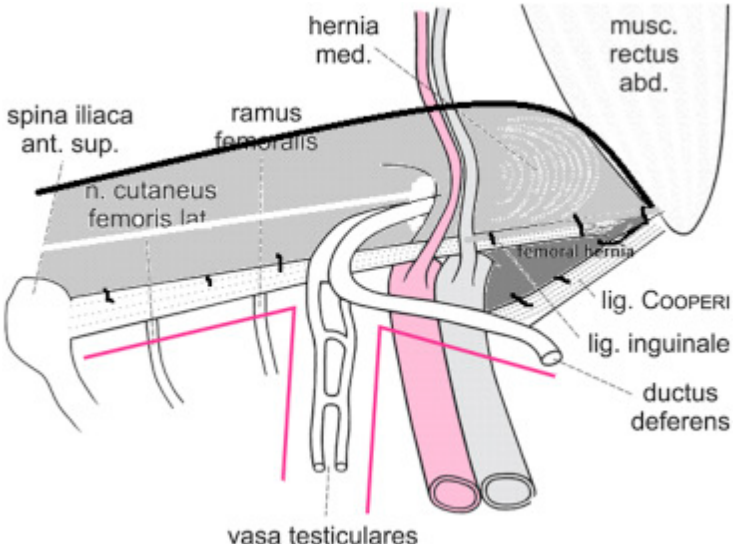


**Figure 1.** Cooper's ligament tissue based repair for Femoral hernias. Aksoy F. Open-tension free three-dimensional Cooper ligament repair for femoral hernia. Asian Journal of Surgery. 41(2) March 2018; 183-186.

**Figure 2.** Left Spigelian hernia. The defect traverses the transversus abdominus and internal oblique fascia but the external oblique fascia remains intact.

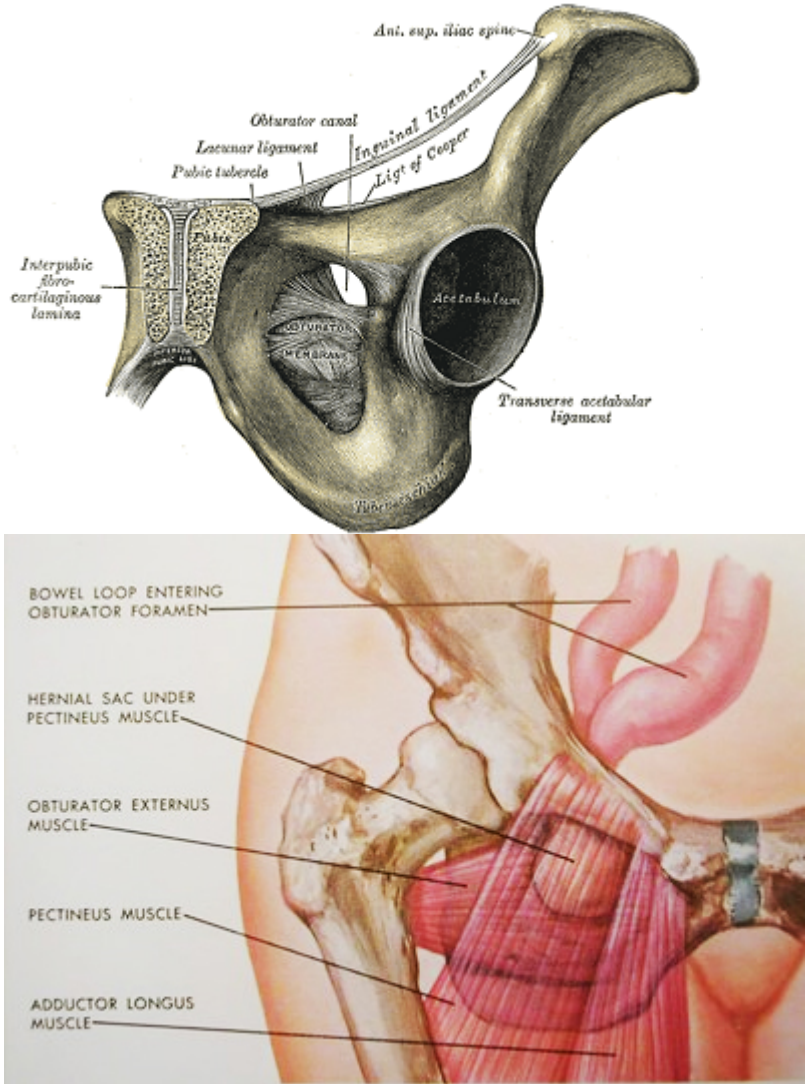


Figure 3. a) Obturator canal anatomic location between the pubic bone and ischium. b) bowel herniated through the obturator canal deep to the pectineus muscle.

Ogata, M. Crit Ultrasound J (2009) 1: 59. https://doi.org/10.1007/s13089-009-0017-4
Critical Ultrasound Journal . Incarcerated obturator hernia: pitfalls in the application of ultrasound. December 2009, Volume 1, Issue 2, pp 59–63

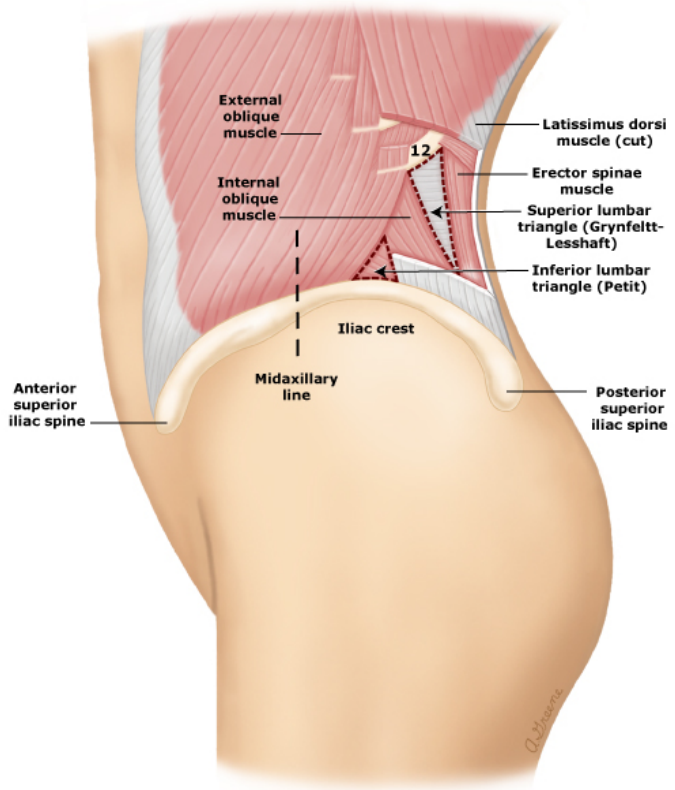


Figure 4. Superior and Inferior Lumbar Triangles, the locations of lumbar hernias.

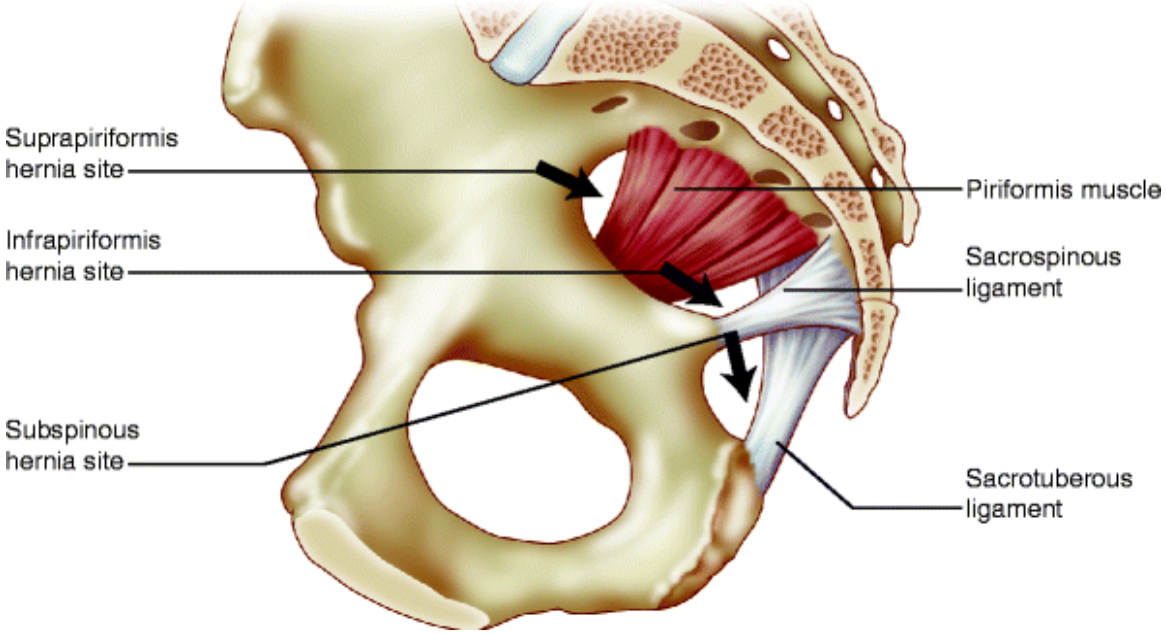


Figure 5. Potential Sciatic hernia spaces above or below the piriformis muscle or through the lesser sciatic foramen. Management of Abdominal Hernias pp 315-32. Springer 2013.

[1] Robinson A, Light D, Kasim A, Nice C. A systematic review and meta-analysis of the role of radiology in the diagnosis of occult inguinal hernia. Surg Endosc. 2013;27(1):11.

[2] Moreno-Egea A, Carrasco L, Girela E, Martín JG, Aguayo JL, Canteras M. Open vs laparoscopic repair of spigelian hernia: a prospective randomized trial. Arch Surg. 2002;137(11):1266.

[3] Stamatiou D, Skandalakis LJ, Zoras O, Mirilas P. Obturator hernia revisited: surgical anatomy, embryology, diagnosis, and technique of repair. Am Surg. 2011 Sep;77(9):1147-57.

[4] Beffa LR, Margiotta AL, Carbonell AM. Flank and Lumbar Hernia Repair. Surg Clin North Am. 2018;98(3):593. Epub 2018 Mar 12.