

The Synapse

The Medical Professionals' Network

M E D I C A L I M A G I N G

Abdominal Wall Hernias: Imaging with Spiral CT

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Abdominal wall hernias are one of the most common indications for surgery. Although hernias are often diagnosed by physical examination, equivocal cases frequently occur and are well evaluated with Spiral CT.

Abdominal wall **hernias** may be complicated by strangulation, incarceration, or trauma and are therefore surgically repaired even if asymptomatic. Post-surgical complications are also common and include hernia recurrence, infected and non-infected fluid collections, and complications related to prosthetic material. Spiral CT provides exquisite anatomic detail of the abdominal wall, thereby allowing accurate identification of clinically unconfirmed **hernias** and their contents, differentiation of **hernias** from other abdominal masses (tumors, hematomas, abscesses), and detection of pre- or postoperative complications. Spiral CT with multiplanar reconstructions is especially helpful for optimal treatment planning.

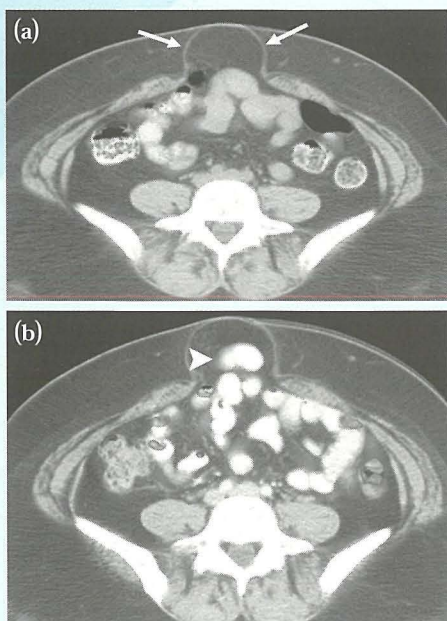


Figure 1: Axial spiral CT images of an umbilical hernia (arrows) without (a) and with (b) Valsalva showing herniation of small bowel loops (arrow head) during Valsalva



Figure 2: Axial spiral CT image of the abdomen shows a direct inguinal hernia (arrow) in the right side of the groin containing bowel loops in the hernia sac

IV and oral contrast material are helpful to demonstrate strangulation of the hernia.

While postural manoeuvres (eg prone or lateral decubitus patient positioning) and manoeuvres to increase intraabdominal pressure (eg, straining, Valsalva manoeuvre) can help depict subtle hernias and their true extent (Figure 1).

Groin Hernias

Inguinal hernias are the most common type of abdominal wall hernia. They may occur in children (most commonly indirect type **hernias**) or adults (both direct and indirect types), manifesting medial (direct type) (Figure 2) or lateral (indirect type) to the inferior epigastric vessels. Regardless of patient age, inguinal **hernias** are more common in males than in females. In boys, most inguinal **hernias** develop because the peritoneal extension accompanying the testis fails to obliterate. In adults, inguinal **hernias** are caused by acquired weakness and dilatation of the internal inguinal ring.

Femoral **hernias** are less common than inguinal **hernias**. They occur medial to the femoral vein

Editor's Word

Welcome to this issue of *TheSYNAPSE*. This issue is once again fully packed with interesting and relevant articles.

Our main focus for this issue is recent advances in the fields of **Stem Cell technology** – three articles by three experts in the field give us some insight in this new and exciting field. Some of the articles will be continued in the next issue.

We also tackle very topical problems met with in practice like the ominous *pelagia noctiluca* (also known as the jellyfish that has been keeping many people from enjoying a good swim) and problems like **Chronic Venous Insufficiency**.

We also have the second and last section of the review of STT's in Malta as well as the regular articles like the current status avian influenza and moneywise.

We thank you, the readers, for your messages of encouragement. We would also like to thank the sponsors and advertisers for their trust and support. Last but not least a big thank you to the authors who have accepted our invitation to contribute to this publication.

May we invite you to benefit more from *TheSYNAPSE* services by using our state of the art services provided via the Internet through www.thesynapse.net

Wilfred Galea

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Abdominal Wall Hernias: Imaging with Spiral CT

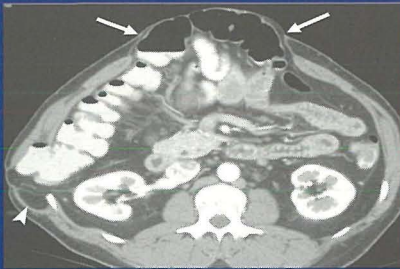


Figure 3: Axial Spiral CT image of the abdomen shows an epigastric hernia (arrows) containing the transverse colon and small bowel loops. Note also the interparietal hernia through the right lateral aspect of the abdominal wall (arrowhead) containing the hepatic flexure of the colon

and posterior to the inguinal ligament, usually on the right side. Unlike inguinal hernias, they are more common in females.

Ventral Hernias

Ventral hernias include all hernias in the anterior and lateral abdominal wall. Midline defects include umbilical, paraumbilical, epigastric, and hypogastric hernias. Umbilical hernias are by far the most common type of ventral hernia; they are usually small and are particularly common in women. Paraumbilical hernias are large abdominal defects through the linea alba in the region of the umbilicus and are usually related to diastasis of the rectus abdominis muscles. Epigastric hernias (Figure 3) and hypogastric hernias occur in the linea alba above and below the umbilicus, respectively.

Strangulation (ischemia caused by a compromised blood supply) and incarceration (irreducible sac) are common in all midline hernias. Clinical diagnosis is difficult: Physical examination is limited, especially in obese patients, and symptoms are nonspecific. Paramedian or lateral defects may also occur, although they are less common. Typically, omentum and short segments of bowel protrude through the defect. These entities have a high prevalence of incarceration.



Figure 4: Axial Spiral CT image shows herniation of omental fat through a narrow umbilical orifice (arrow) with stranding of herniated fat indicating incarceration

Lumbar Hernias

Lumbar hernias occur through defects in the lumbar muscles or the posterior fascia, below the 12th rib and above the iliac crest. They usually occur after surgery or trauma. Herniation may occur through the superior (Grynflett-Lesshaft) (Figure 5) or, less commonly, the inferior (petit) lumbar triangle. The superior lumbar triangle is bordered by the internal oblique muscle anteriorly, the 12th rib superiorly, and the erector spinal muscle posteriorly. The inferior lumbar triangle is bordered by the external oblique muscle anteriorly, the iliac crest inferiorly, and the latissimus dorsi muscle posteriorly. Diffuse lumbar hernias may also occur, usually after flank incisions in kidney surgery, and may contain bowel loops, retroperitoneal fat, kidneys, or other viscera (Figure 6).

Incisional Hernias

Incisional hernias are delayed complications of abdominal surgery. They may manifest anywhere in the abdominal wall and are more commonly encountered in association with vertical than with transverse incisions. Incisional hernias usually manifest during the first few months after surgery. Their reported prevalence ranges from 0.5% to 13.9% for most abdominal surgeries but may be as high as 41% after aortic surgery.

Parastomal hernias are considered a subtype of incisional hernia. They occur adjacent to

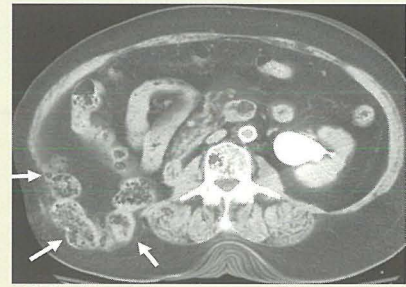


Figure 5: Superior lumbar hernia (arrows) in a 63-year-old man following right nephrectomy for renal cell carcinoma. Note the protrusion of the ascending colon into the subcutaneous tissue

a stoma and are particularly difficult to detect at physical examination.

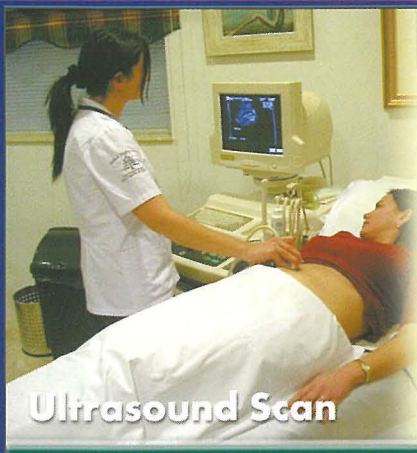
Other Hernias

Less common hernias include (a) interparietal, Richter, and Littre hernias of the abdominal wall; and (b) sciatic, obturator, and perineal hernias in the pelvis.

Interparietal (interstitial) hernia refers to a hernia sac located in the fascial planes between the abdominal wall muscles that does not exit into the subcutaneous tissue. This type of hernia occurs most frequently in the inguinal region. Richter hernia refers to herniation of the antimesenteric wall of the bowel that does not compromise the entire wall circumference. It most frequently occurs in association with femoral hernias. Littre hernia refers to an inguinal hernia that contains a Meckel diverticulum. All of these uncommon abdominal hernias are particularly prone to incarceration and strangulation.

Pelvic hernias most frequently occur in elderly women and are secondary to acquired weakness of the pelvic floor. Sciatic and obturator hernias are rare and usually manifest as herniation of small bowel loops or a ureter through the sciatic or obturator foramen, respectively. Perineal hernias are more common than sciatic or obturator hernias and occur adjacent to the anus or labia majora or in the gluteal region.

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Complications of Hernias:

The most common complications of abdominal wall hernias are bowel obstruction secondary to the hernia, incarceration (Figure 4), and strangulation. These complications can often be detected at clinical evaluation. Presenting symptoms may include abdominal pain, vomiting, and distention. Physical examination may reveal a firm, tender abdominal wall mass. Abdominal distention, dehydration, or peritoneal signs eventually become manifest.

After adhesions, abdominal wall hernias are the second leading cause of small bowel obstruction (10%–15% of cases). Colonic obstruction caused by abdominal wall hernia is uncommon.

Most cases of bowel obstruction secondary to abdominal wall hernia occur after incarceration and strangulation. In these cases, bowel obstruction occurs with the transition point at the level of the hernia. Key CT findings include (a) dilated bowel proximal to the hernia and (b) normal-caliber, reduced-caliber, or collapsed bowel distal to the obstruction. Other findings may include tapering of the afferent and efferent limbs at the hernia defect, dilatation of the herniated bowel loops, and faecalization of small bowel contents proximal to the obstruction. Findings of strangulation may also be observed.

Incarceration refers to an irreducible hernia and is diagnosed clinically when a hernia cannot be reduced or pushed back manually. The diagnosis of incarceration cannot be made with imaging alone but can be suggested when herniation occurs through

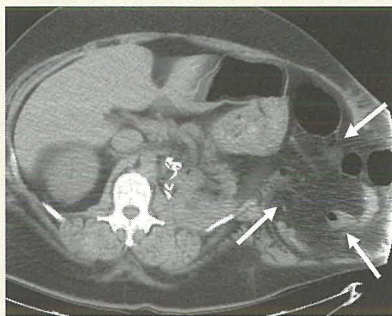


Figure 6: Diffuse lumbar hernia (arrows) in a 58-year-old man after left nephrectomy for renal cell carcinoma. Note the extensive herniation of the mesentery and bowel loops through the wall defect

a small defect and the hernia sac has a narrow neck (Figure 7).

Impending strangulation of these hernias should be suspected when there is free fluid within the hernia sac, bowel wall thickening, or luminal dilatation (Figure 7). Strangulation refers to ischemia caused by a compromised blood supply. It usually occurs when the hernia defect obstructs the afferent and efferent bowel loops, creating a closed loop within the herniated bowel.

Surgical Repair

Several different surgical procedures are used to repair abdominal wall hernias, ranging from open or laparoscopic suture repair to the use of mesh. To date, tension-free mesh repair has been accepted as the standard surgical technique for the majority of abdominal wall hernias, regardless of defect size, and is most commonly used.

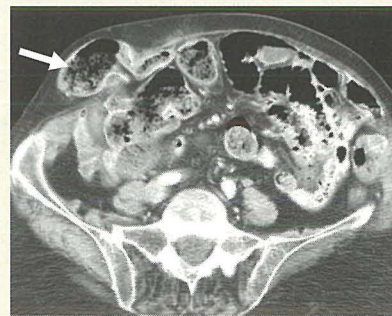


Figure 7: Incarcerated incisional hernia in a 78-year-old man. Herniation of stool-filled, thin-walled colon (arrow) is seen through a narrow abdominal wall defect. The patient was asymptomatic but presented with acute abdomen 1 month later. The sac of the hernia eventually contained extraluminal fluid and obstructed colon

Occasionally tissue expanders may be required to help stretch the abdominal wall to avoid tension. Complications after surgical hernia repair may occur in up to 50% of cases, depending on surgical technique and the status of the hernia sac vasculature. Approximately one-half of these complications may require surgical reoperation. Complications include hernia recurrence, fluid collections, infections, small intestinal obstruction due to adhesions and mesh-related problems (such as mesh shrinkage due to fibrosis). □

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Safety of Labile Blood Products

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5. Quality Systems – the development and continuous improvement of the blood transfusion service is based on Total Quality Implementation. This involves quality management, quality planning, quality assurance and quality control. The EU Directive 2002/98/EC sets the legal framework for quality in blood establishments.¹² Article 2 of Directive 2005/62/EC sets out the Quality system standards and specifications, which are elaborated in the relevant annex with the same directive.¹³

Conclusion

The provision of a safe and sustainable blood supply reflects the mission statement of the National Blood Transfusion Service. Obviously blood is not 100% safe though all the necessary measures have been implemented. Like any pharmaceutical agent that can potentially have harmful

effects (though life saving) it should be used appropriately. Just as there are quality systems in the collection, processing, screening and distribution of blood, quality systems to improve the clinical use of blood should be developed. □

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