Indian Journal of Medical Case Reports ISSN: 2319–3832(Online)
An Online International Journal Available at http://www.cibtech.org/jcr.htm
2013 Vol.2 (2) April-June, pp.64-70/Singla et al.

Case Report

SPECTRUM OF ABDOMINAL WALL HERNIAS AND ROLE OF CT IN THEIR MANAGEMENT

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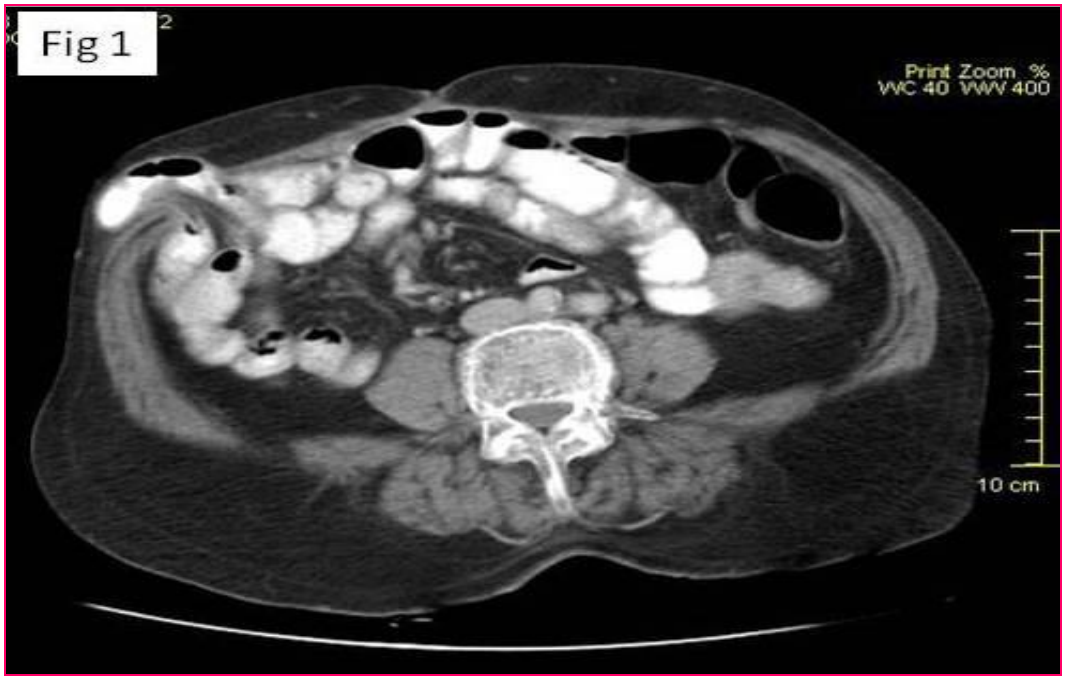
ABSTRACT
Abdominal wall hernias are a common imaging finding in the abdomen and may be asymptomatic or complicated by strangulation, incarceration, or trauma. Multi-detector row computerised tomography (CT) provides exquisite anatomic detail of the abdominal wall, thereby allowing accurate identification of wall hernias and their contents, differentiation of hernias from other abdominal masses (tumours, hematomas, abscesses), and detection of pre- or postoperative complications. We present a series of cases to demonstrate the spectrum of abdominal wall hernias with their CT findings. Knowledge of CT findings in unrepaired and post-operative abdominal wall hernias is essential for making the correct diagnosis and may help guide clinical management and manage complications if they occur.

Key Words: *Abdominal Wall Hernia, Differentiation of Hernia*

CASES

Case 1

A 70 year old female, known case of carcinoma ovary stage IV, post chemotherapy and TAH + BSO. CECT abdomen shows a herniated bowel loop with normal contrast opacification lateral to the rectus abdominis on the right side -***Spigelian hernia*** (Figure 1).



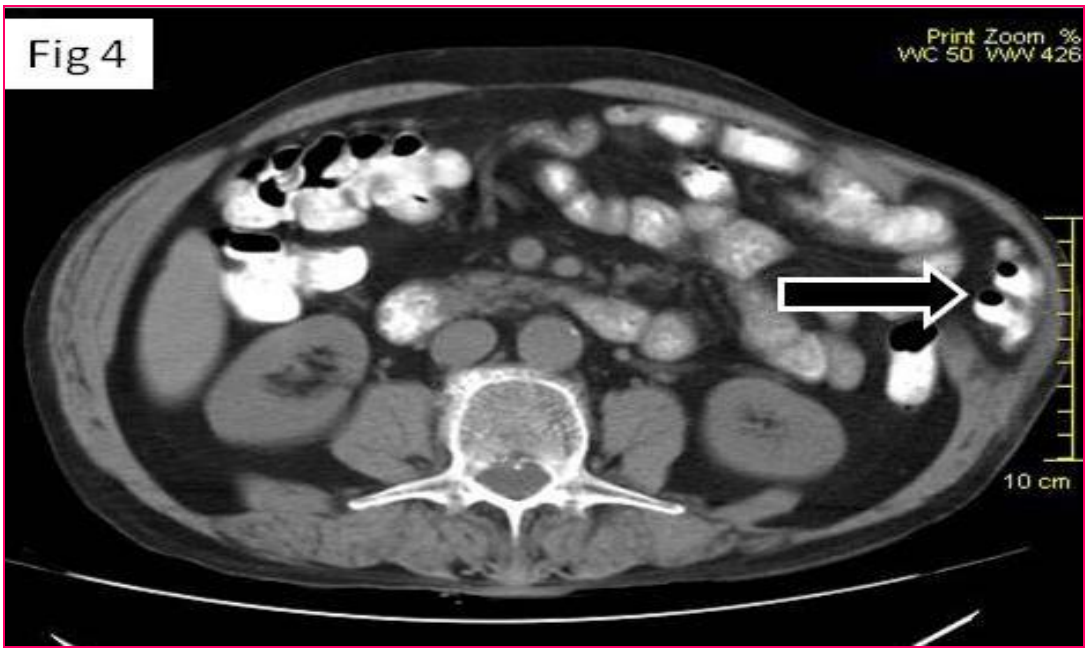
Case 2

A 32 year old female presented with abdominal pain and vomiting since one day. She had two caesarian sections in the past. CECT abdomen shows a large defect in the previous surgical site with herniated bowel loops, suggestive of ***Incisional Hernia*** (Figure 2).

Case Report

Case 3
A 50 year old man, known case of carcinoma head of pancreas, posts Whipple's surgery. CECT abdomen shows a small abdominal wall defect in the inferior lumbar triangle on the left side (arrow) suggestive of ***Lumbar (Petit) Hernia*** (Figure 3).

Case 4
A 76 year old male presented with swelling in the left lumbar region since 3 years. CECT abdomen shows a defect in the left internal oblique muscle (arrow) through which omentum and bowel is seen to herniate (Figure 4).



Case 5
A 56 year old male was evaluated for abdominal pain. CECT abdomen shows an incidental finding of a small ***Umbilical Hernia*** with omentum within it (Figure 5).

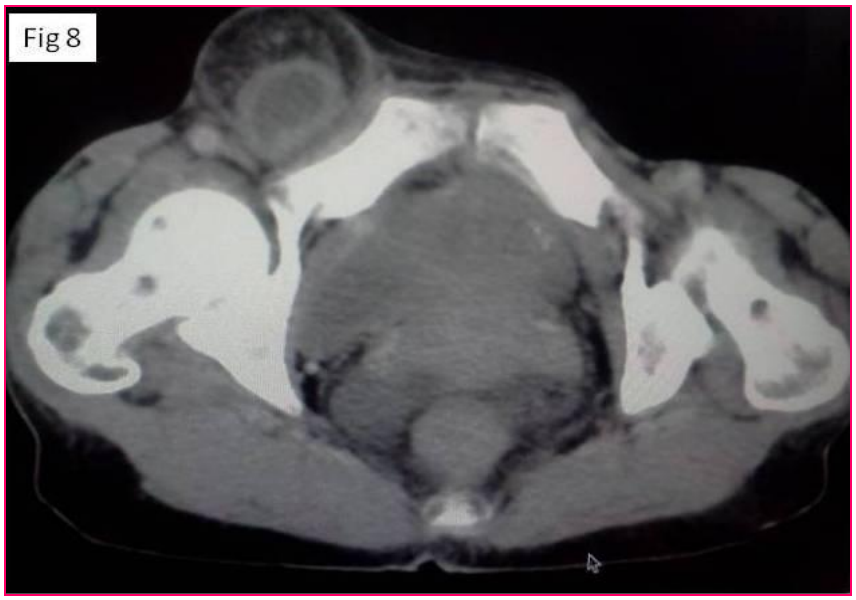
Case 6
A 54 year old male a known case of carcinoma colon status post end colostomy and chemotherapy for follow up. CECT abdomen shows an incidental ***Right Inguinal Hernia*** (Figure 6).

Case 7

A 45 year old male came with history of trauma with focal swelling and tenderness in the right hypochondrium. CECT abdomen shows a focal abdominal wall defect with omental herniation – ***Traumatic Abdominal Wall Hernia*** (Figure 7).

Case 8

A 65 year old female presented with abdominal pain and signs of intestinal obstruction. CECT abdomen shows a ***Right Femoral Hernia*** with bowel and omentum as its contents (Figure 8).



DISCUSSION

Abdominal wall hernias are a frequent imaging finding in the abdomen. Although most abdominal wall hernias are asymptomatic, they may develop acute complications that necessitate emergent surgery. Prompt diagnosis is desirable because delay is associated with greater morbidity (Yu *et al.,* 2004). Elective surgeries are more common in case of the external hernias, unless complications necessitating emergent surgery (strangulation, incarceration) develop. Even in post-operative patients, complications from surgical repair such as hernia recurrence, postoperative fluid collections (infected and non-infected), and complications related to prosthetic material occur in up to 20% of cases (Parra *et al.*, 2004). Prompt diagnosis and management of these complications is crucial, and more so with the limitations of the clinical evaluation, imaging studies have become important for the detection and diagnosis of these complications.

Different imaging modalities have been used to confirm suspected complications of abdominal wall hernias and hernia repairs which include plain X-rays, barium procedures, fluoroscopy, ultrasonography, CT and MRI. Adequate visualization of intra-abdominal organs and the abdominal wall, fast imaging acquisition, three dimensional data sets, and multiplanar reconstruction capabilities are important advantages of multi- detector row computed tomography (CT) compared with other modalities. In addition, because of its superior anatomic detail, multi- detector row CT may help detect subtle signs of complication within the hernia sac, including bowel obstruction, incarceration, strangulation, and traumatic wall hernias (Aguirre *et al.*, 2004; Ianora *et al.*, 2000).

If hernias are seen, thin reconstruction (2.0 mm sections) are recommended to improve multiplanar reformation. Intravenous administration of contrast material is necessary for characterization of the vascular supply. Positive oral contrast material or water may be used to better visualize bowel loops. If multi– detector row CT is performed for the evaluation of known or suspected hernias, postural manoeuvres (eg, prone or lateral decubitus patient positioning) and manoeuvres to increase intra-abdominal pressure (eg, straining, Valsalva manoeuvre) can help depict subtle hernias that would otherwise be missed (Emby and Aoun, 2003).

Abdominal wall hernias can be broadly divided into the following categories:

1. Inguinal Hernias- 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) 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 (Lee and Cohen, 1993).

2. Femoral Hernias- Femoral hernias are less common than inguinal hernias. They occur medial to the femoral vein and posterior to the inguinal ligament, usually on the right side. Unlike inguinal hernias, they are more common in females.

3. Ventral Hernias-Ventral hernias include all hernias in the anterior and lateral abdominal wall. Midline defects include umbilical, para-umbilical, epigastric, and hypogastric hernias. Umbilical hernias are by far the most common type of ventral hernia; they are usually small and are more 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 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. Physical examination is limited, especially in obese patients, and symptoms are nonspecific, resulting in difficulty in clinical diagnosis. Typically, omentum and short segments of bowel protrude through the defect. These entities have a high prevalence of incarceration. So early diagnosis significantly improves the prognosis in these cases.

4. Lumbar Hernias-Lumbar hernias occur through defects in the lumbar muscles or the posterior fascia, below the 12^{th} rib and above the iliac crest. They usually occur after surgery or trauma. Herniation may occur through the superior (Grynflett-Lesshaft) or, less commonly, the inferior (petit) lumbar triangle. Diffuse lumbar hernias may also occur, usually after flank incisions in kidney surgery, and may contain bowel loops, retroperitoneal fat, kidneys, or other viscera.

5. Incisional Hernias- Incisional hernias are delayed complications of abdominal surgery usually manifesting during the first few months after surgery. They may manifest anywhere in the abdominal wall and are more commonly encountered in association with vertical than with transverse incisions. Their reported prevalence ranges from 0.5% to 13.9% for most abdominal surgeries but may be as high as 41% after aortic surgery (Raffetto *et al.,* 2003).

6. Parastomal hernias are considered a subtype of incisional hernia. They occur adjacent to a stoma and are particularly difficult to detect at physical examination.

7. Interparietal (interstitial) hernia refers to a hernia sac located in the fascial planes between the abdominal wall muscles that do not exit into the subcutaneous tissue. This type of hernia occurs most frequently in the inguinal region.

8. Richter hernia refers to herniation of the anti-mesenteric wall of the bowel that does not compromise the entire wall circumference. It most frequently occurs in association with femoral hernias.

9. Littre hernia and **Amyand's hernia** refer to the inguinal hernia that contains Meckel's diverticulum and appendix, respectively.

10. 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.

11. Perineal hernias are more common than sciatic or obturator hernias and occur adjacent to the anus or labia majora or in the gluteal region.

Abdominal wall hernias are the most common indication for major surgery in the world and are a common finding at abdominal imaging. They are well evaluated with multi-detector row CT, which allows assessment of unrepaired and surgically repaired hernias and of related complications. The multiplanar capabilities of multi- detector row CT are especially important, since they allow excellent anatomic delineation, enhancement of the communication of imaging findings, and optimal treatment planning.

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