ABDOMINAL HERNIAS FROM A TO Z: PRACTICAL TIP AND TRICKS FOR RADIOLOGISTS

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LEARNING OBJECTIVES

- To describe the complete dictionary of abdominal hernias (common and uncommon ones, using an alphabet approach from A to Z) that may be encountered during clinical practice with practical tip and tricks for the imaging diagnosis.

- For each type of hernia will be discussed:
  - The anatomical district and the involved organs.
  - The most important imaging signs suggesting the presence of complications (occlusion, ischemia, incarceration and strangulation).

Background

- Abdominal hernias are common disease encountered in daily clinical practice.
- Abdominal hernias may be congenital or acquired. They may be commonly found in imaging exam as incidental findings, or may cause symptoms (pain or discomfort especially with coughing, exercise) and complications that may require emergency evaluation.
- Inguinal hernia is the most common encountered type of abdominal hernia. It may be direct or indirect, and involve all the abdominal viscera.
- Other uncommon hernias include congenital diaphragmatic hernia, internal hernias or Spigelian hernia.

Imaging findings

- Radiologists have a crucial role for diagnosis and management of abdominal hernias.
- Although CT scan is the best imaging method for both detection and preoperative evaluation of abdominal hernias, imaging features may be visualized also with ultrasound and MR imaging.
- Intravenous administration of contrast agent is useful to exclude presence of complications.

What a radiologist have to describe in the report:

- Anatomical district.
- Size of the abdominal wall defect.
- Content of the sac.
- Imaging signs suggesting complications.

ABDOMINAL HERNIA FROM A TO Z: PRACTICAL TIP AND TRICKS FOR RADIOLOGISTS

DICTIONARY OF ABDOMINAL HERNIA

A: Amyand's

B: Bochdalek

D: Diaphragmatic, Direct

E: Epigastric

F: Femoral

H: Hiatal, Hypogastric

I: Incisional, Incarceration,Inguinal, Internal

L: Lumbar

M: Morgagni, Maydl

O: Obturator

P: Pantaloon, Paraduodenal, Parastomal

R: Richter

S: Spigelian, Strangulation

T: Transmesenteric

U: Umbilical

A: Amyand's

Definition: a rare (< 1%) form of an inguinal hernia containing vermiform appendix.

Anatomy: the name ''Amyand's hernia'' is used irrespective of the vermiform appendix's situation (normal, inflamed, perforated, or gangrenous).

Clinical presentation:

- Asymptomatic
- The neck of the hernia can strangle the vermiform appendix and cause vascular obstruction, appendicitis, perforation, and peritonitis.

Imaging findings

- Blind-ending tubular structure in connection with the cecum inside the hernia sac.
- Dilated lumen, wall enhancement and thickening, peri-appendiceal fat stranding are suggestive of acute appendicitis.

Amyand's hernia
CT axial and coronal reconstruction: appendix and fat herniation

B: Bochdalek

Definition: congenital diaphragmatic hernia.

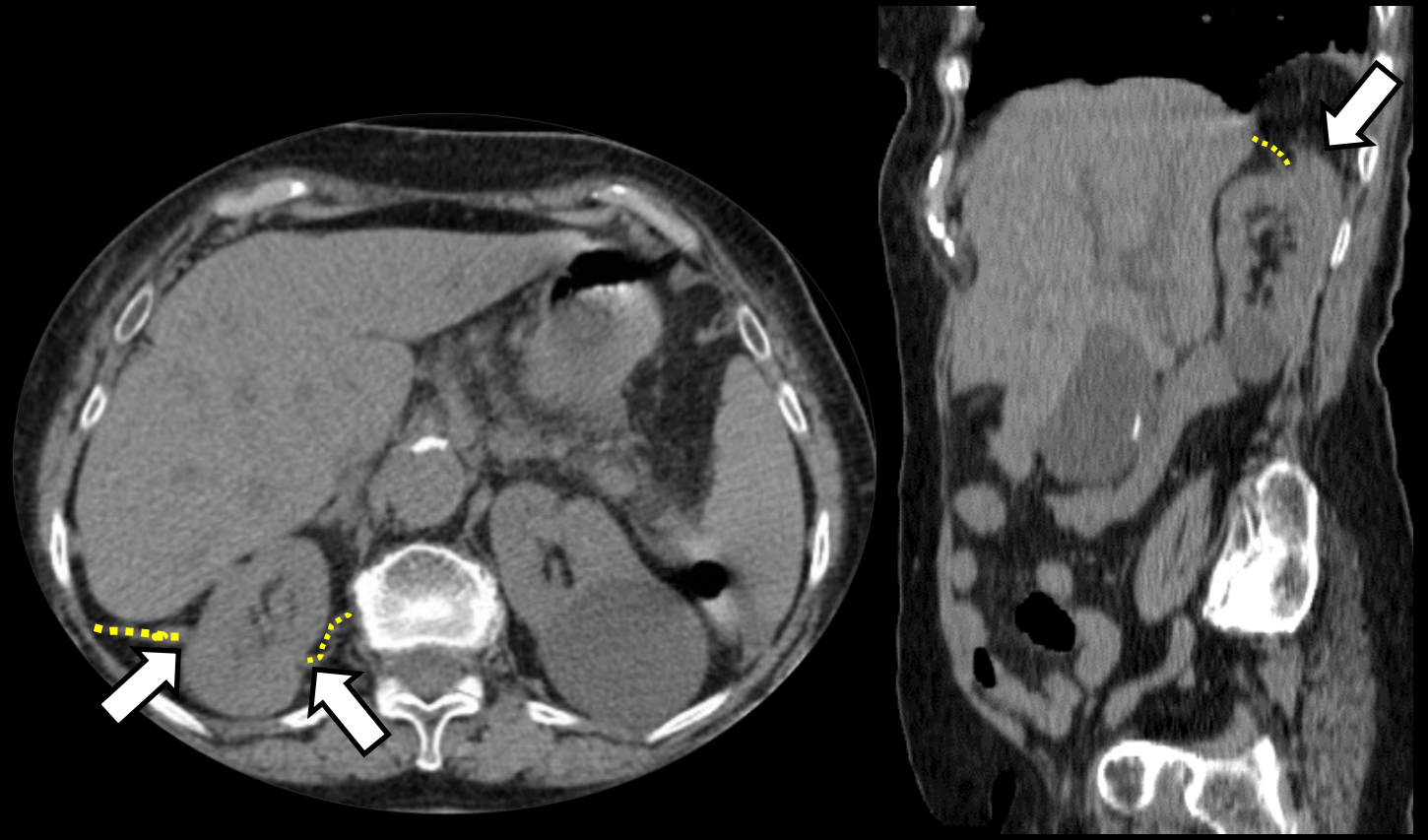
Anatomy: it is caused by incomplete closure of the normal pleuroperitoneal canal, which leads to a posterolateral defect in the Diaphragm.

Clinical presentation:

- Neonatal period: cardiorespiratory symptoms, gastric volvulus, splenic rupture, gastric or other intestinal obstruction and/or perforation.
- Adults: asymptomatic, usually discovered as an incidental finding.

Imaging findings

- Radiograph: lung base soft-tissue opacity lesion seen posteriorly on lateral images.
- CT: discontinuity of the posterior diaphragmatic profile, demonstrating the presence of fat or organ herniation above the diaphragm.



CT axial and sagittal reconstruction: Right Bochdalek hernia
Herniation of omental fat and upper renal pole(white arrows) through the diaphragmatic postero-lateral defect (yellow lines).

D: Diaphragmatic

Definition: due to defects in the diaphragm. They may be congenital (Bochdalek and Morgagni hernia) or acquired (traumatic, hiatus and iatrogenic). We discuss below the traumatic and iatrogenic type.

For Bochdalek, Morgagni and Hiatus hernia, see the specific letter of the alphabet.

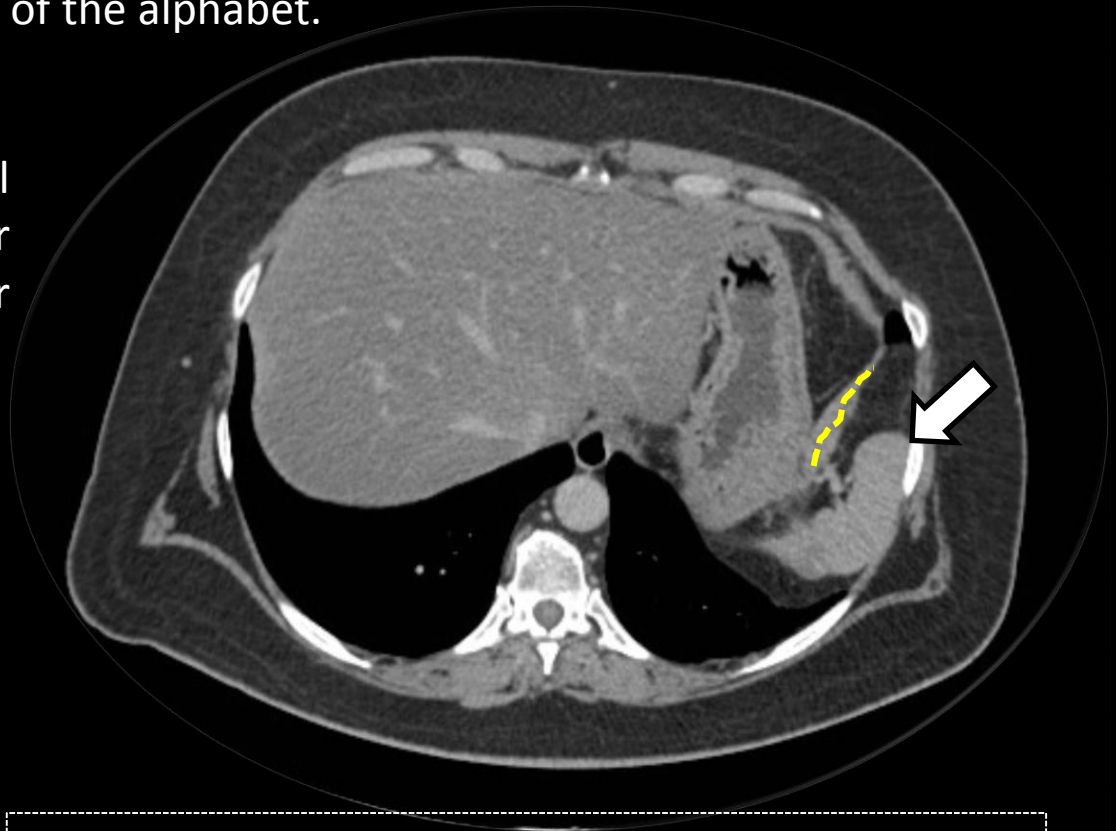
IATROGENIC DIAPHRAGMATIC HERNIAS

Anatomy: Diaphragm might be injured during thoraco-abdominal surgery, such as esophago-gastric surgery for esophagus cancer or gastric cancer. Diaphragmatic hernias may also occur after other intra-abdominal procedures, such as abdominal laparoscopy.

Clinical presentation: minor hernia may be silent, massive herinas may complicate with intestinal obstruction and cardiovascular–respiratory insufficiency.

Imaging findings

- Air-lucencies visualised in the retrocardiac or retrosternal area, or within the left thorax on follow up may suggest intestinal herniation.
- Obscuration of diaphragmatic shadow, pleural fluid, and irregularity of the contour of the diaphragm.



Iatrogenic Left Diaphragmatic hernia
(post-lapaoroscopic surgery)
CTscan: discontinuity of the diaphragm (yellow line) with herniation of fat and spleen.

D: Diaphragmatic

TRAUMATIC DIAPHRAGMATIC HERNIAS

Anatomy:

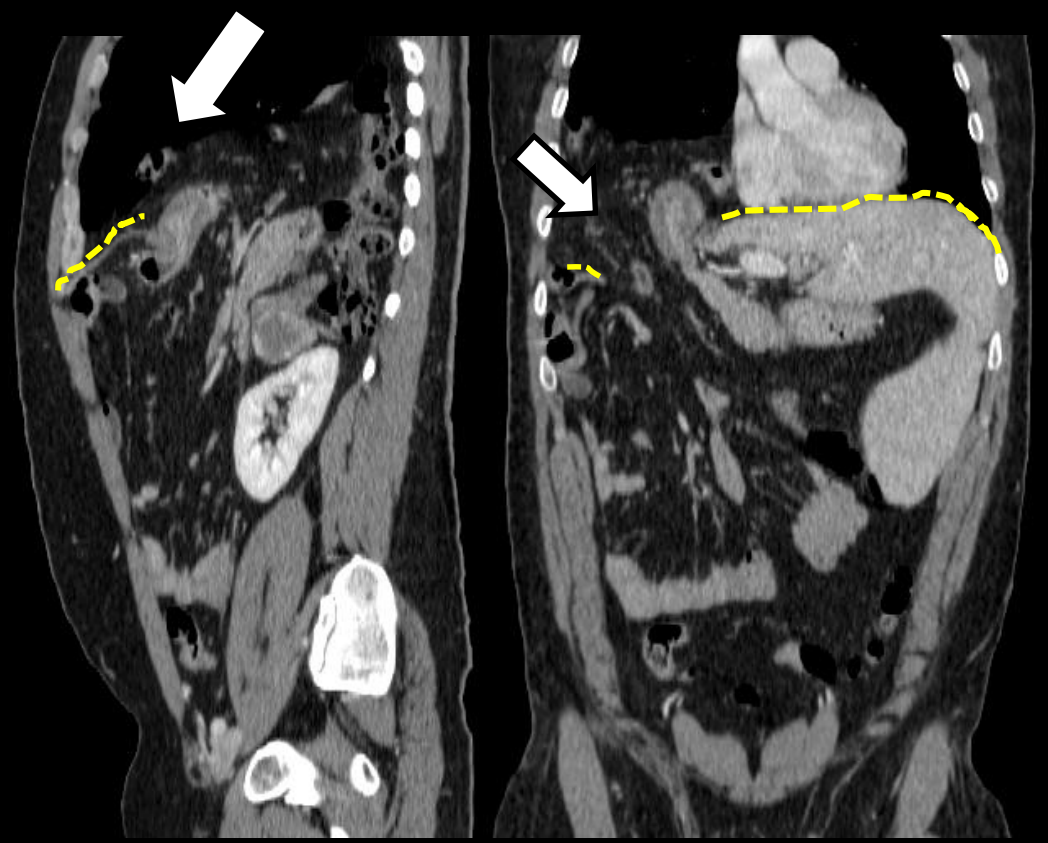
- In blunt or penetrating trauma: it is more often involved the left hemidiaphragm because of the protective effect of the liver. In this case the suddenly raised pressure difference forces the abdominal organs through the defect.
- In penetrating injuries: visceral migration within the thorax will occur gradually due to the normal pressure difference between thorax and abdominal cavity.
- Repeated minor traumas, such as violent coughing, multiparity, and obesity may also cause DH via enlargement of normal hiatuses or forming a new defect on the weakened or impaired closed segment of the diaphragm

Clinical presentation: it may be asymptomatic for months to years following the injury.

Imaging findings

- CT: best shows the discontinuity of diaphragmatic profile, demonstrating the presence of fat or organ herniation above the diaphragm. Signs of scheletric fractures suggest the traumatic origin of the hernia.

Post-traumatic Right Diaphragmatic hernia
CT multiplanar reconstruction: discontinuity of the diaphragm (yellow line) with fat and viscera herniation



D: Direct (inguinal hernia)

Definition: it is an inguinal hernia, generally acquired, which arises from protrusion of abdominal viscera through a weakness of the of the transversalis fascia in the Hesselbach triangle.

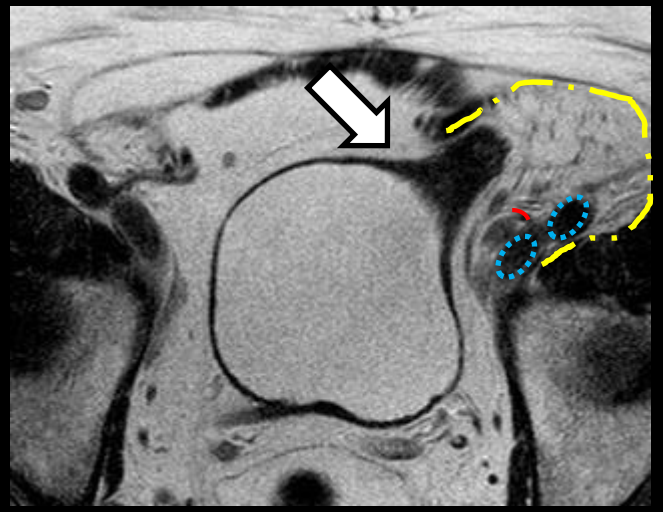
Anatomy: it emerges anteromedial to the origin of the inferior epigastric vessel. It is associated with COPD, bladder outflow obstruction, chronic constipation, which increase intra-abdominal pressure.

Clinical presentation: it is less often associated with strangulation than indirect inguinal or femoral hernias, possibly because direct inguinal hernia usually doesn't traverse the entire course of the canal and thus is less vulnerable to constriction.

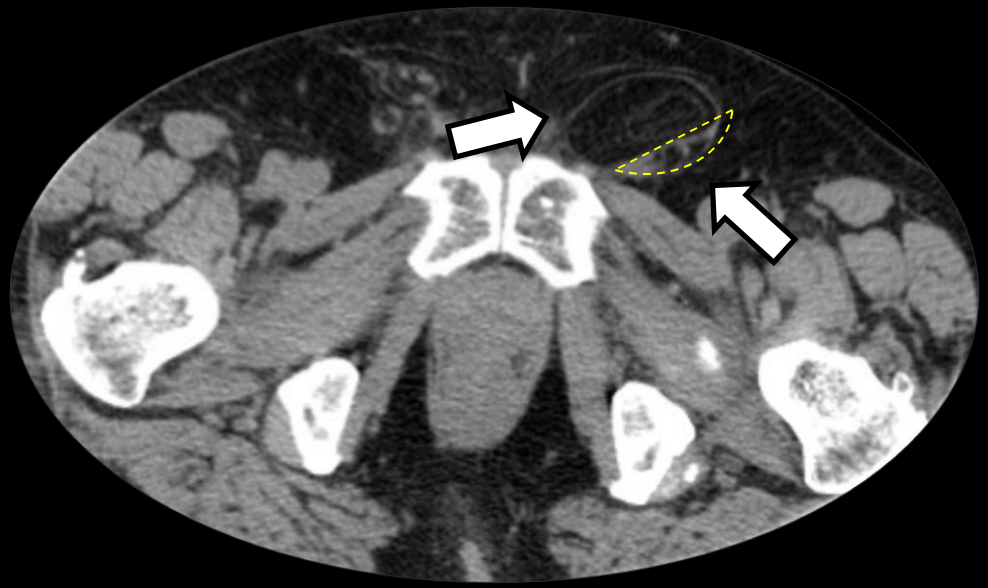
Imaging findings

CT:

- Lateral crescent sign: the inguinal canal contents (ie, testicular vessels, vas deferens, etc) are compressed and stretched laterally by the hernia, and the normal fat of the inguinal canal is pushed into a semicircle of tissue that resembles a moon crescent.



MR T2w axial: hernia sac containing bladder and fat, arising medial to the inferior epigastric vessels (red line). Femoral vessels (blue line)



CT scan : direct hernia containing fat. Lateral crescent sign (yellow lines)

E: Epigastric

Definition: it is a ventral hernia of the abdominal wall.

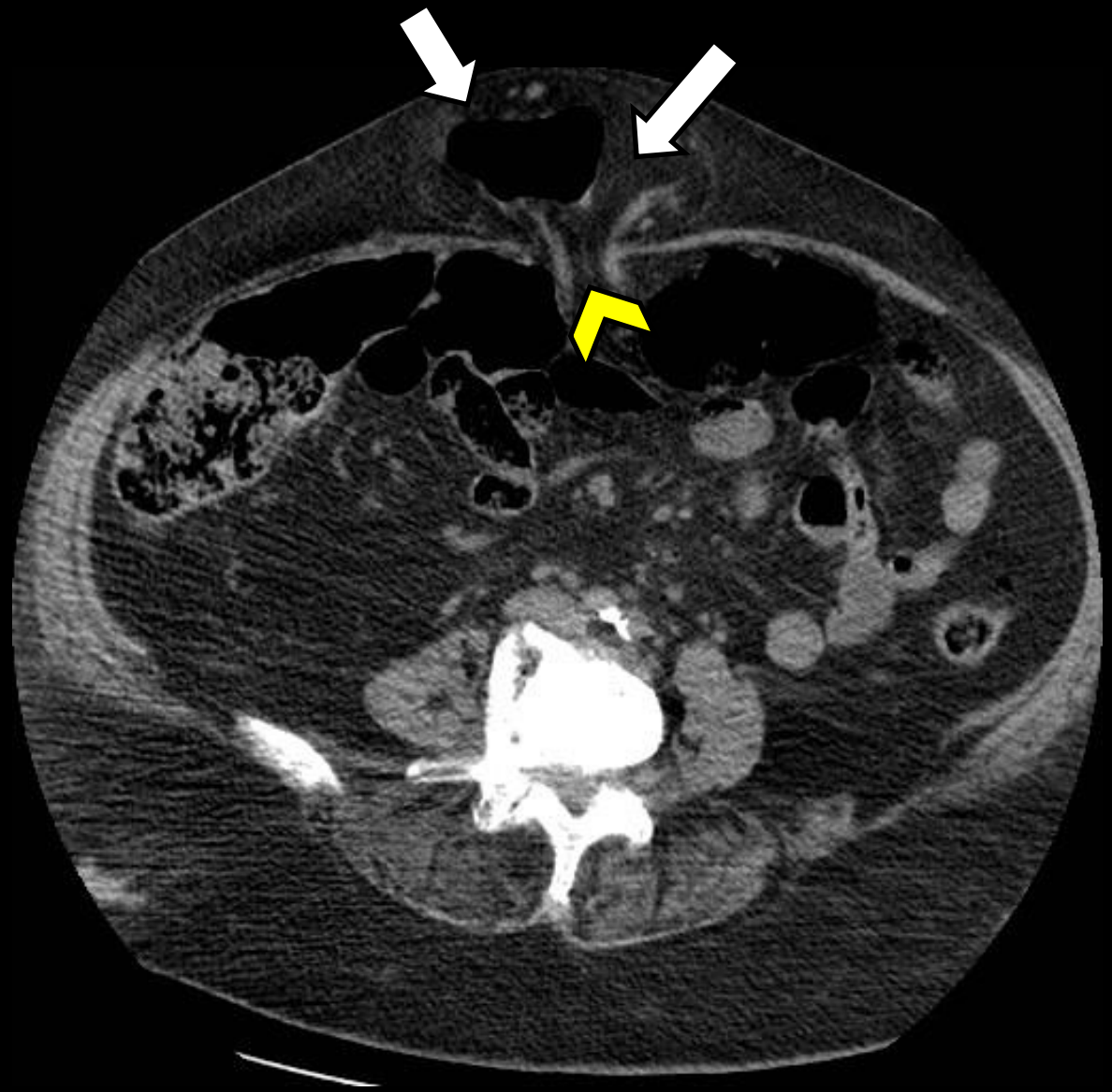
Anatomy: it occurs in the linea alba between the xiphoid process and the umbilicus. Typically, omentum and short segments of bowel protrude through the defect.

Clinical presentation: obesity and pregnancy are risk factors. Symptoms may be aspecific but strangulation or incarceration are common.

Imaging findings

US: shows the midline defect

CT: shows best the herniation of fat or bowel.



Epigastric hernia
CT scan : narrow midline abdominal wall defect (yellow arrowhead) with herniation of fat and bowel loop (white arrows)

F: Femoral

Definition: it's a type of groin herniation with a protrusion of a peritoneal sac into the femoral canal.

Anatomy: it occurs below the inguinal ligament and protrudes through the femoral ring into the femoral canal, medial to the common femoral vein and lateral to the lacunar ligament. Femoral hernias have a female predominance, probably secondary to dilatation of the femoral ring connective tissues due to the hormonal and physical changes of pregnancy.

Clinical presentation:

- it often has a narrow funnel-shaped neck and may compress the femoral vein, causing engorgement of distal collateral veins.
- High incidence of strangulation

Imaging findings

US: Valsalva maneuver can be performed to provoke herniation

CT: the neck of the femoral hernia sac can be seen as a narrow protrusion through the femoral ring just medial to the common femoral vein, which often appears indented and compressed by the hernia sac.

Femoral hernia
CT scan : fat content into the femoral hernia sac

F: Foramen of Winslow

Definition: protrusions of the viscera (usually small bowel) through the epiploic foramen of Winslow (point of communication between lesser sac and greater peritoneal cavity). They are 8% of all internal hernias.

Anatomy: This foramen is located anterior to the inferior vena cava and posterior to the hepatoduodenal ligament, including the portal vein, common bile duct, and hepatic artery.

Clinical presentation: they are silent if they are easily reducible, but the majority often cause epigastric discomfort, periumbilical pain, and recurrent episodes of intestinal obstruction

Imaging features

X-Rays: gas-containing intestinal loops high in the abdomen and medial and posterior to the stomach.

CT: presence of mesentery between the inferior vena cava and main portal vein, air-fluid collection in the lesser sac with a beak directed toward the foramen of Winslow, absence of the ascending colon in the right gutter, two or more bowel loops in the high subhepatic spaces

H: Hiatal

Definition: herniation of abdominal contents through the esophageal hiatus of the diaphragm into the thoracic cavity.

Anatomy: Four types of hiatal hernia have been described

1)sliding hiatal hernia

2)para-esophageal hiatal hernia with the gastro-esophageal junction in a normal position

3)mixed or compound type, para-esophageal hiatal hernia with displaced gastro-esophageal junction

4)mixed or compound type hiatal hernia with additional herniation of viscera

H: Hiatal

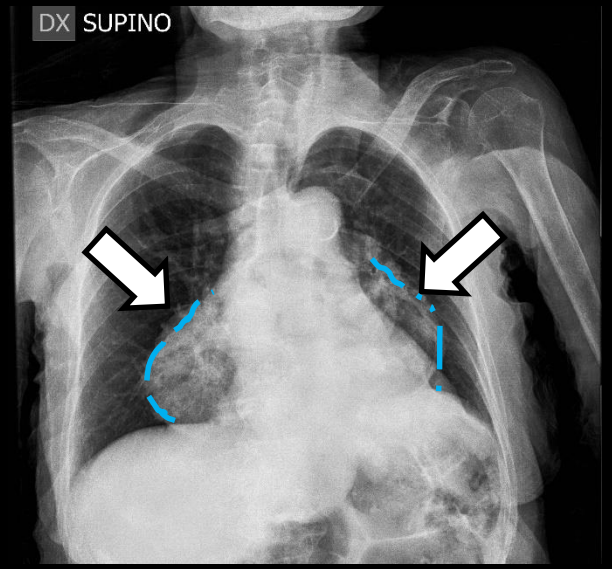
Clinical presentation: epigastric or chest pain, postprandial fullness, nausea and vomiting. Sometimes it may be asymptomatic, discovered as an incidental finding. Hiatus hernia containing the stomach may result in a gastric volvulus.

Imaging findings

X-ray: retrocardiac opacity with air-fluid level.

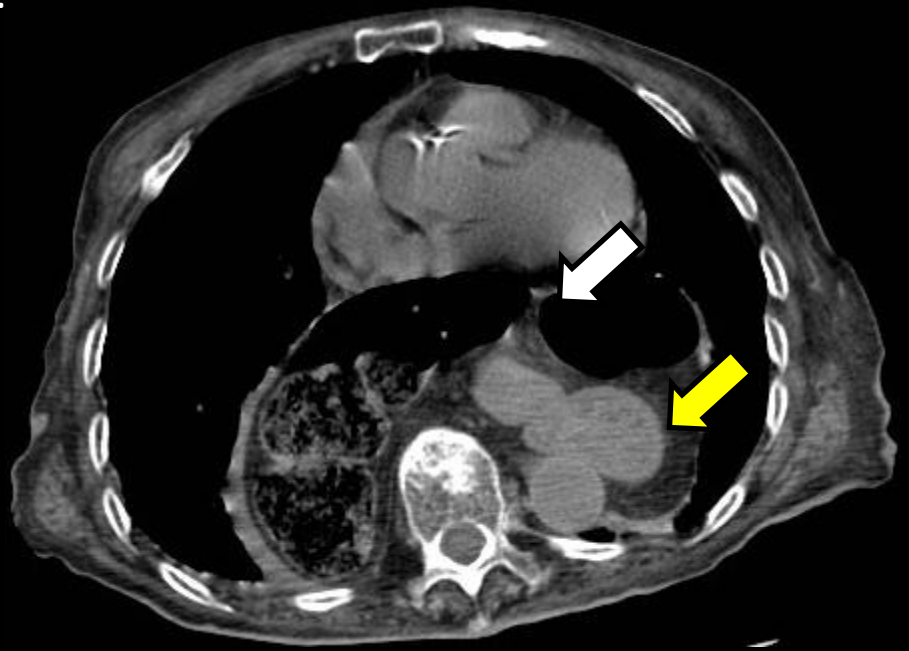
CT:

- Herniation of omentum through the phrenico-esophageal ligament.
- Visualization of contents, size and orientation of herniated stomach.
- Widening of esophageal hiatus.
- Useful to detect complications.

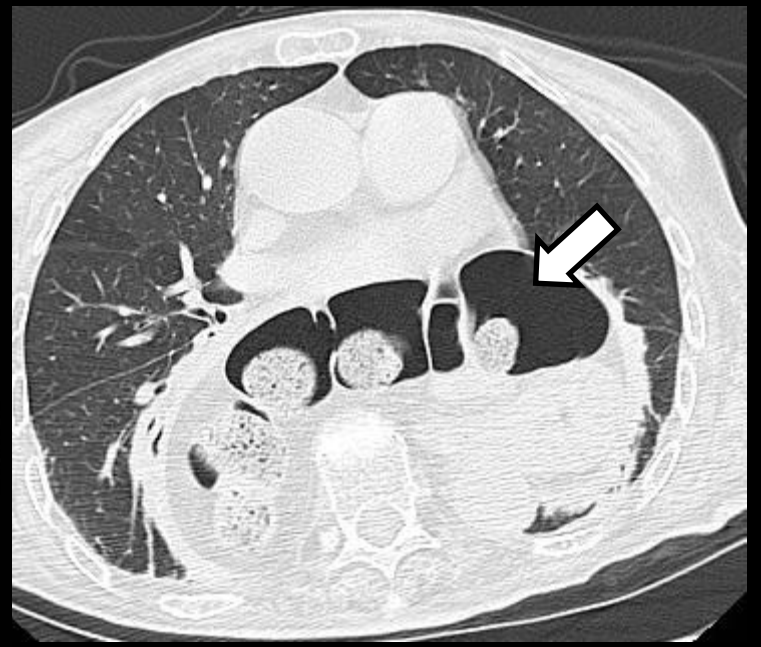


X-ray Paracardiac inhomogeneous opacity with air content (blue lines)

Hiatal hernia IV type



CT scan: Herniation of stomach (yellow arrow) and transverse colon (white arrow)



H: Hypogastric

Definition: it is a ventral hernia of the abdominal wall.

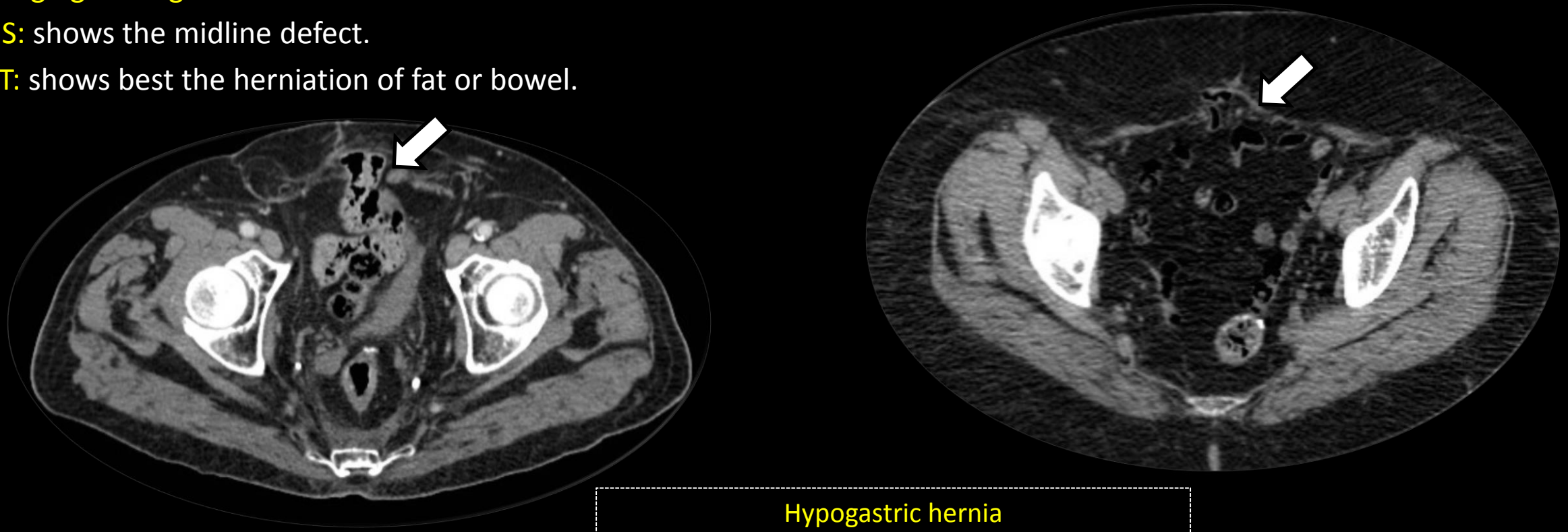
Anatomy: it occurs in the linea alba below the umbilicus. Generally, properitoneal fat, vessels and sometimes solid viscera protrude through the hernial defect.

Clinical presentation: obesity and pregnancy are risk factors. Symptoms may be aspecific but strangulation or incarceration are common.

Imaging findings

US: shows the midline defect.

CT: shows best the herniation of fat or bowel.



Hypogastric hernia
CT axial: herniation of fat and bowel loops.

I: Incarceration

Definition: it's an irreducible hernia and it occurs when hernia cannot be reduced or pushed back manually.

Clinical presentation: abdominal pain, bloating, nausea, vomiting, and intestinal obstruction such as absence of bowel movements. It predisposes to complications such as obstruction, inflammation, or ischemia. Incarcerated bowel requires urgent surgical reduction to prevent bowel necrosis and subsequent resection of the affected bowel loop.

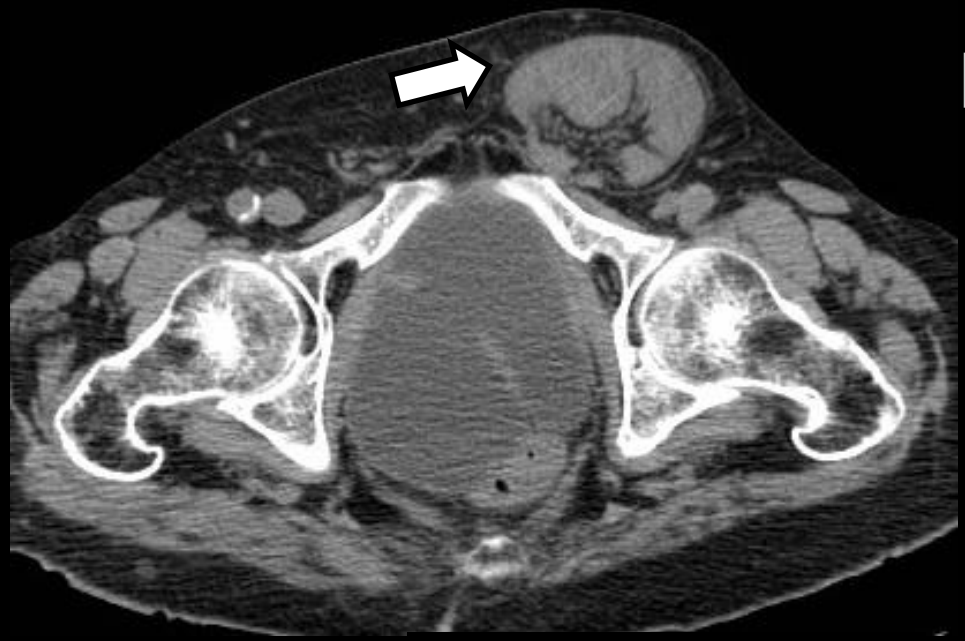
Imaging findings

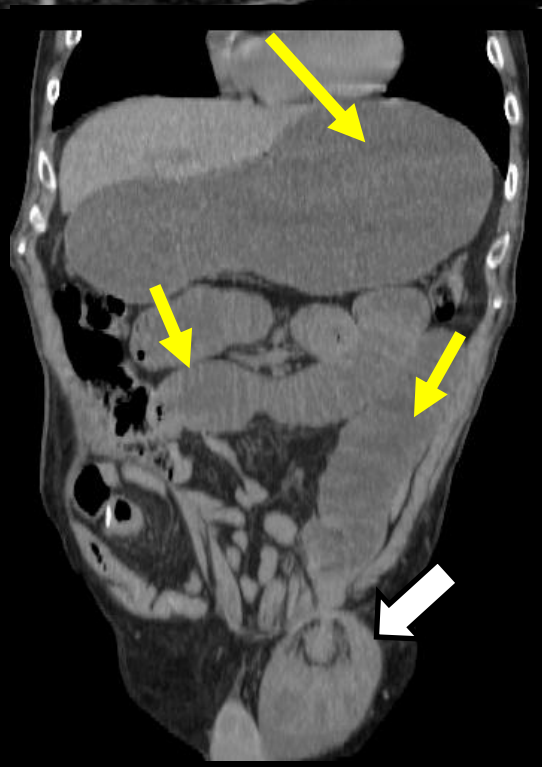
CT:

- Free fluid in the hernia sac may suggest incarceration.
- Wall thickening and fluid in the herniated bowel loop.
- Dilated bowel loops in the abdomen.

US:

- Expansion of the intestines with reverse peristalsis.
- Fixed masses without peristalsis.
- Expansion of a fluid-filled bowel.
- Thickening and edema intestinal wall can be observed.
- Evaluation of the blood supply in the hernia contents with color Doppler ultrasound.





Inguinal hernia
CT axial and coronal reconstruction: incarcerated small bowel loops. (white arrows).
Dilated stomach and bowel loops in abdomen (yellow arrows, sign of bowel obstruction)

I: Incisional

Definition: protrusion of intra-abdominal contents through dehiscence of the laparatomic scar.

Anatomy: they are located in the vicinity of previous surgical scar (more often along the linea alba).

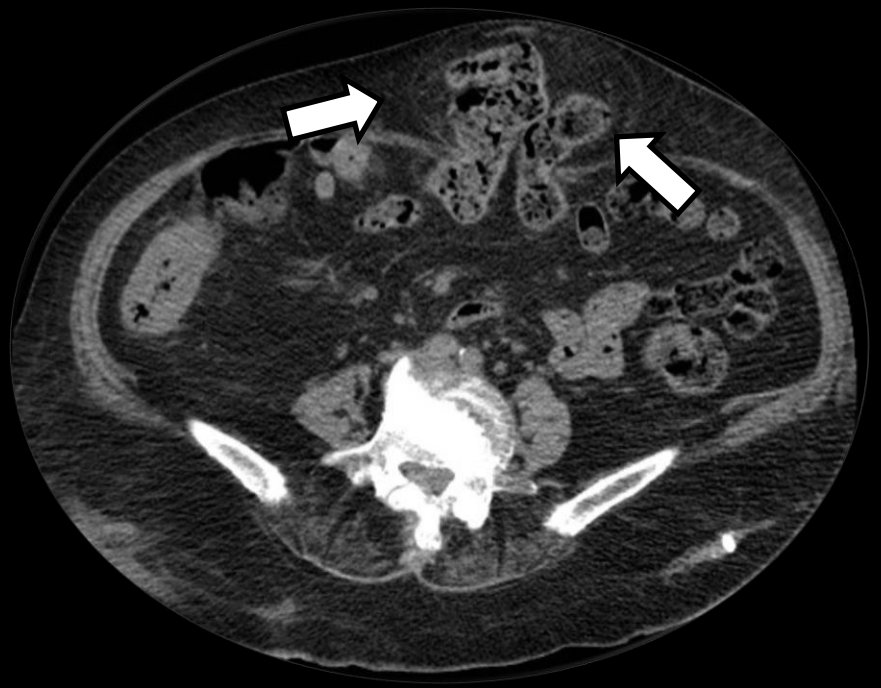
Clinical presentation:

- Asymptomatic
- It may complicates with incarceration, strangulation and intestinal obstruction.

Imaging findings

US/ CT: show the exact size, location, and content of each incisional hernia.

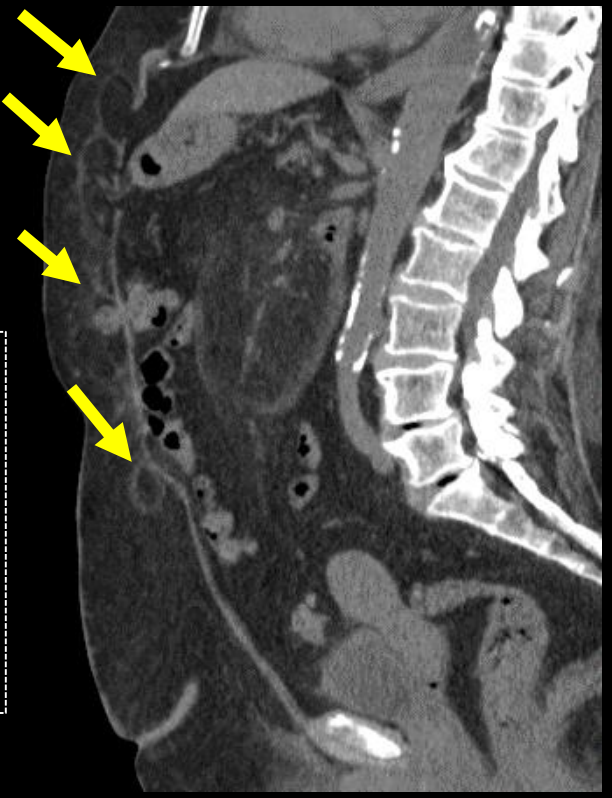
Inhomogeneity of subcutaneous fat and irregularity of the cutaneous profile may suggest the location of previous laparotomic scars.



Incisional hernia

CT axial scan: central quadrant incisional hernia containing fat and transverse colon.

CT coronal: patient with multiple incisional hernias along the linea alba (yellow arrows)

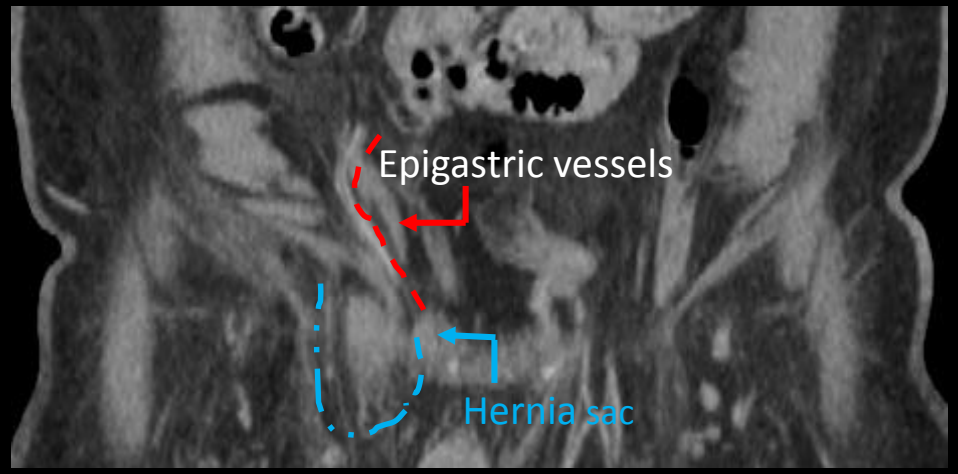


I: Inguinal

Definition: they are the most common type of abdominal wall hernia, they can be congenital but most often they are acquired. There is a recognized male predilection.

Anatomy: they are subdivided into two different types:

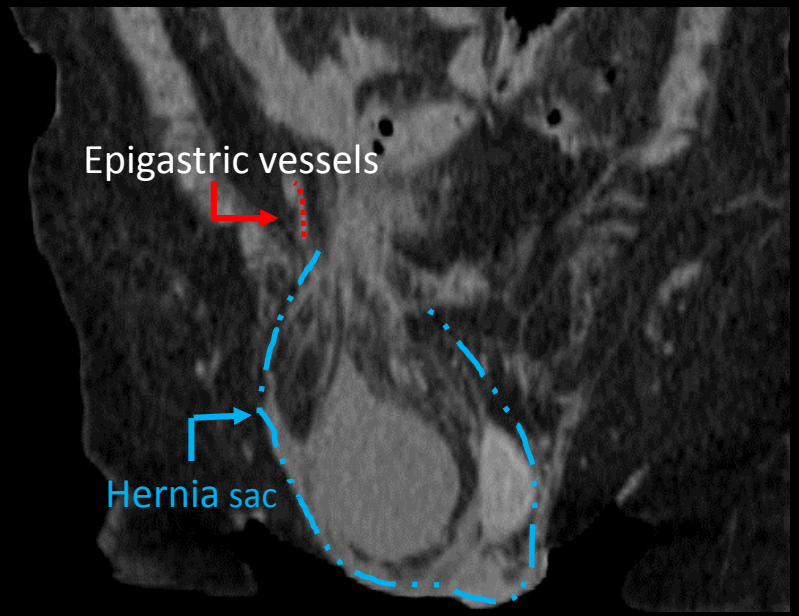
Indirect type: lateral to the inferior hepigastric vessels. They are the most common type.



Inguinal indirect hernia

Particular of CT coronal reconstruction: hernia sac (blue line) arises lateral to the inferior epigastric vessels (red line).

Direct type (see above at “D” letter): medial to the inferior epigastric vessels.



Direct hernia

CT scan : Hernia sac (blue line) arises medial to the epigastric vessels (red line).

I: Indirect

Anatomy: it arises lateral and superior to the inferior epigastric vessels, lateral to the Hesselbach triangle, and protrudes through the deep inguinal ring to enter the inguinal canal. In the male, it enters the canal anterior to the spermatic cord and may extend through the external inguinal ring into the scrotum. In the female, it follows the round ligament into the labia majora.

Clinical presentation:

- longstanding and asymptomatic
- Bulging, pain or discomfort in the groin area, more prominent when coughing, straining, or standing up
- Complications include intestinal obstruction, incarceration and strangulation.

Imaging findings

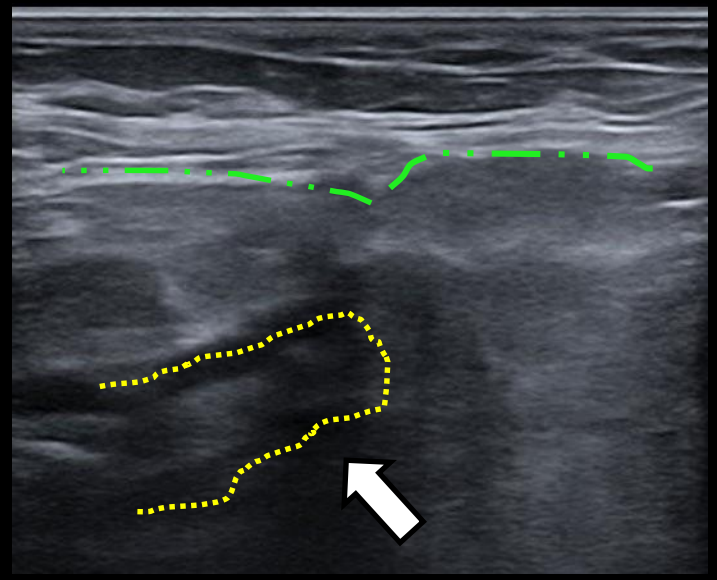
US: Valsalva maneuver can be performed to provoke herniation.

CT:

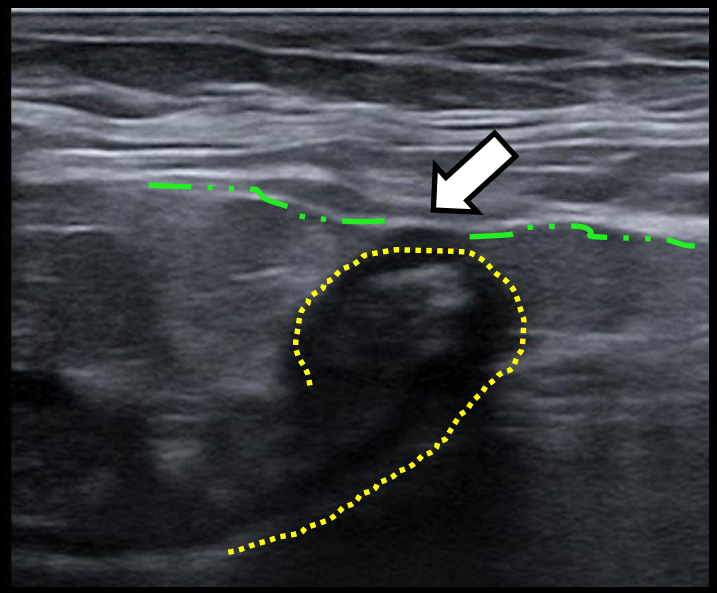
- Visualization of the hepigastric vessels to differentiate the indirect from direct type.
- Evaluation of hernia size and content
- Enhanced CT scan is useful to identify presence of strangulation.

Indirect inguinal hernia

US: after Valsalva manoeuver bowel loop (yellow line) herniates into the sac.



PRE-VALSALVA



POST-VALSALVA

I: Internal

Definition: they are protrusions of the viscera through the peritoneum or mesentery but remaining within the abdominal cavity.

Anatomy: the viscera usually herniate through preexisting foramina, recesses, and fossae, but also pathologic defects of the mesentery and visceral peritoneum, due to congenital mechanisms, surgery or trauma, are also potential herniation orifices.

The most common types are :

1) Paraduodenal right and left (see below at P letter)
2) Lesser sac (foramen Winslow), see above at the F letter.
3) Small Bowel mesentery hernia: transmesenteric, intramesenteric

Clinical presentation: they are silent if they are easily reducible, but the majority often cause epigastric discomfort, periumbilical pain, and recurrent episodes of intestinal obstruction. Because of the propensity of these hernias to spontaneously reduce, patients are best imaged when they are symptomatic.

L: Lumbar

Definition: it is a posterior abdominal hernia. It may be congenital or acquired (spontaneous or secondary to trauma or surgery.

Anatomy: it occurs through defects in the lumbar muscles or the posterior fascia, below the 12th rib and above the iliac crest.

Two types are described, according to the anatomical location of the hernial neck:

- superior lumbar hernia (Grynfeltt-Lesshaft hernia): occurs through the superior lumbar triangle.
- inferior lumbar hernia (Petit hernia): occurs through the inferior lumbar triangle.

Clinical presentation: posterolateral mass, back pain, bowel obstruction (if contents contain bowel), or urinary obstruction (if contents are kidney/ureter).

Imaging findings

CT: it shows which fascial or muscular layers are involved and the content of the hernial sac.

Lumbar hernia
CT scan: Herniation of fat and right colon

M: Maydl

Definition: it is a rare condition defined as the presence of two loops in the hernia sac and an intra-abdominal loop between them.

Clinical presentation: It is more prone to strangulation and necrosis. The intra-abdominal loop is also at risk of a closed loop obstruction.

Imaging findings

CT: double loop hernia forming W shape.

M: Morgagni

Definition: it's a congenital diaphragmatic hernias , due to herniation through the foramen of Morgagni.

Anatomy: it arises from **anterior** medial septum transversum defect due to failure of closure of the pars sternalis with the seventh condrochostal arch. Morgagni hernias most often contains omental fat, but transverse colon (60%) or stomach (12%) may be included within the hernia.

Clinical presentation:

- usually asymptomatic
- respiratory distress at birth
- recurrent chest infections
- gastrointestinal symptoms

M: Morgagni

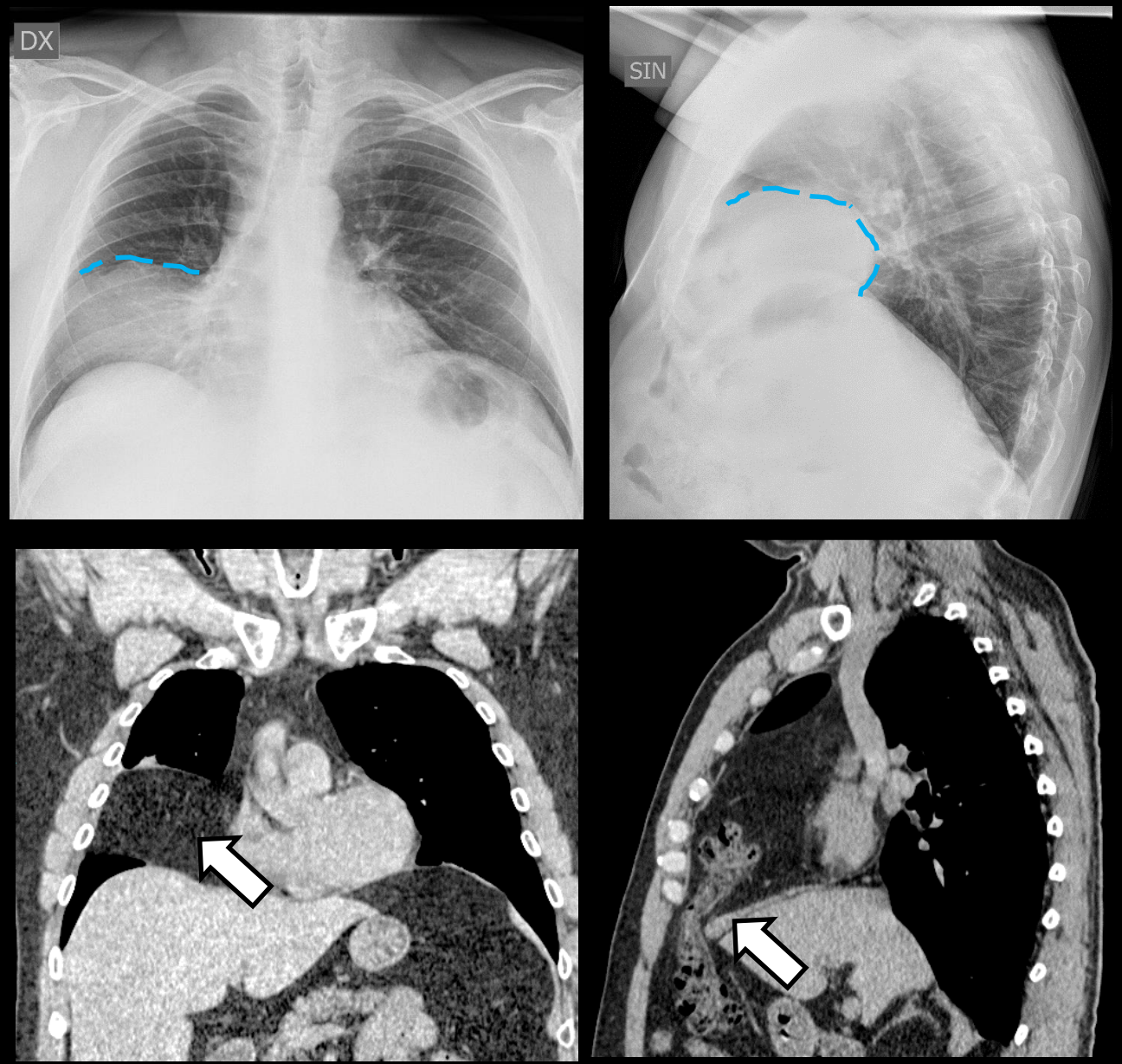
Imaging findings

X-ray

- homogeneous soft tissue opacity in the right cardiophrenic angle (PA projection)
- Retrosternal opacity (L-L projection).

CT: visualization of

- diaphragmatic discontinuity
- intrathoracic abdominal contents.



Morgani hernia

X-ray: paracardiac opacity (blue lines). CT scan multiplanar reconstructions: Herniation of fat and right colon (white arrows)

O: Obturator

Definition: rare type of abdominal hernia in which viscera herniates between the obturator and the pectineus muscles.

Anatomy: the obturator foramen is covered by the obturator membrane, except anterosuperiorly where it is perforated by the obturator neurovascular bundle which travel along the obturator canal (formed by the internal and external obturator muscles). It is through this defect that hernia develops by first increasing the separation of the muscular bands of the internal obturator muscle , and later separating the external obturator muscle, with the herniated sac finally lying on top of the external obturator muscle, but below on posterior to the pectineus muscle outside of the obturator canal.

The content may include: fluid, small bowel, uterus, colon, appendix, omentum.

Clinical presentation:

- Usually asymptomatic
- Howship-Romberg sign: pain and paraesthesia along the inner aspect of the thigh, down to the knee, due to compression of the obturator nerve.
- Signs of incarceration/obstruction/strangulation

Imaging findings

CT: direct visualization of herniated fat, fluid or viscera into the obturator space.

Early diagnosis can be done by early CT scanning.

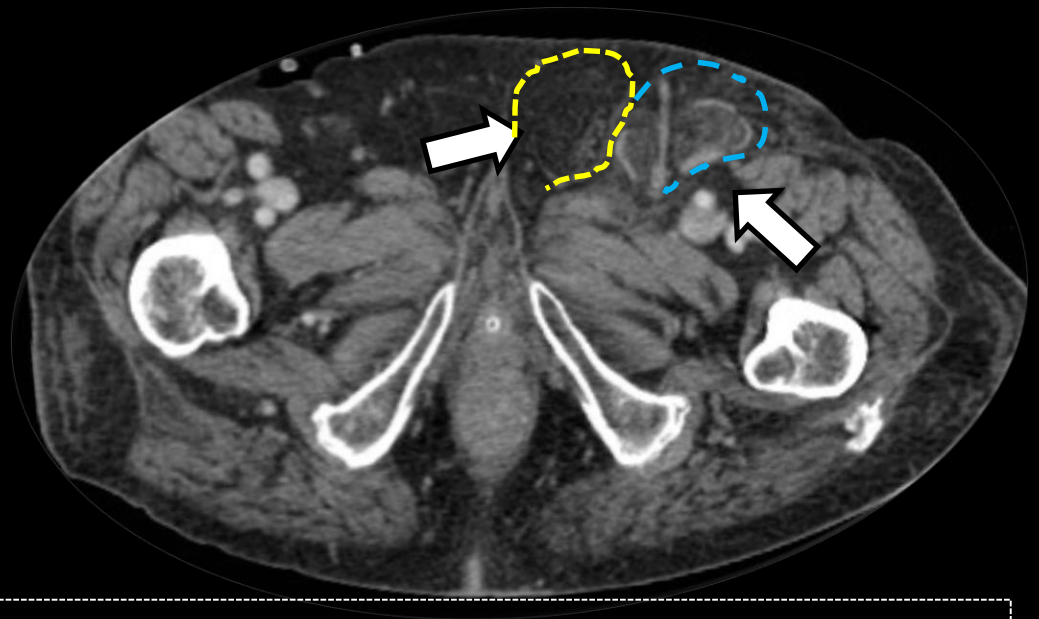
P: Pantaloon

Definition: cuncurrent presence of direct and indirect inguinal hernia.

Anatomy: Hernial sacs are present on both sides of the inferior epigastric vessels, and separated by the posterior wall of the inguinal canal brought down by the direct hernia.

Imaging findings

CT: allows to differentiate direct and indirect hernia by the identification of epigastric vessels.



Pantaloon hernia
CT scan: direct (yellow line) and indirect hernia (blue line)

P: Paraduodenal

Definition: 53% of all internal hernias. 3/4 of these hernias occur on the left and are more predominant in men than in women, with a ratio of about 3:1 .

Clinical Presentation: symptoms of small bowel obstruction: abdominal pain, nausea, vomiting

Left PDH

Anatomy: it develops through the fossa of Landzert into the descending mesocolon and left of the transverse mesocolon and results from failure of fusion of the inferior mesentery to the parietal peritoneum.

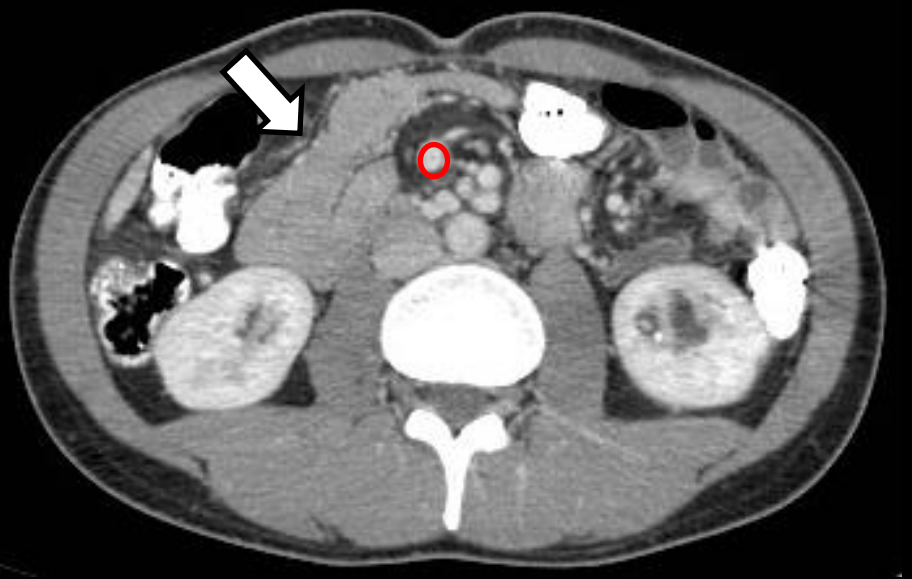
Imaging findings

CT: abnormal cluster of dilated small bowel loops (behind IMV and the ascending left colic artery) lying between the pancreas and stomach to the left of the ligament of Treitz .

Mesenteric vessels that supply the herniated small bowel segments are crowded, engorged, and stretched at the entrance of the hernial sac.

P: Paraduodenal

CT scan: presence of cluster of small bowel loops (white arrows) behind the SMV (red circle).



Right PDH

Anatomy: it involves the fossa of Waldeyer, which is located immediately behind the superior mesenteric artery and inferior to the transverse segment of the duodenum with or without rotation anomaly. It occurs most frequently in cases of a nonrotated small intestine and a normally or incompletely rotated colon. According to the extent of malrotation, right PDH is associated with location of the superior mesenteric vein to the left of, and ventral to, the superior mesenteric artery and with absence of the normal horizontal duodenum. Because the fossa of Waldeyer extends to the right and downward, directly in front of the posterior parietal peritoneum, right PDH develops into the ascending mesocolon with a right colic vein anteriorly.

Imaging findings

CT: the cluster of small bowel loops is behind the superior mesenteric vein (SMV), the superior mesenteric artery (SMA), and the right colic vein.

P: Parastomal

Definition: protrusion of abdominal contents through an abdominal wall defect in the vicinity of the stoma.

Anatomy: the stoma may be ileostomy or colostomy. The stomal hernia or paracolostomy is most common late colostomy complication.

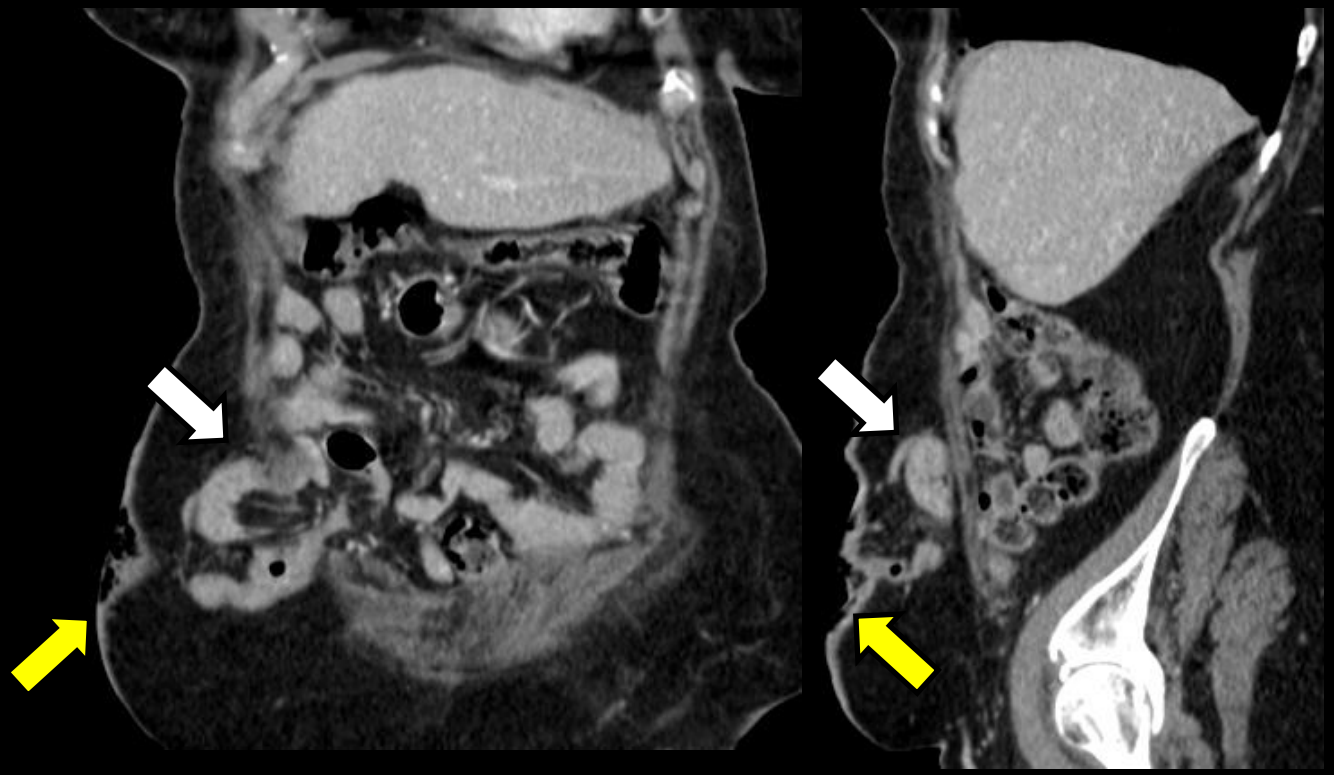
The sac will contain a loop of bowel forming the stoma itself, omentum, and/or intestinal loops different from those forming the stoma.

Clinical presentation:

- Progressive growth of the sac.
- Bowel obstruction.

Imaging findings

CT: best shows the presence of the hernia sac next to the stoma, allowing differentiation between bowel loops forming the stoma and those herniated in to the parastomal sac.



Parastomal hernia
CT multiplanar reconstruction: presence of hernia sac containing small bowel loops (white arrows), next to the stoma (yellow arrows)

R: Richter

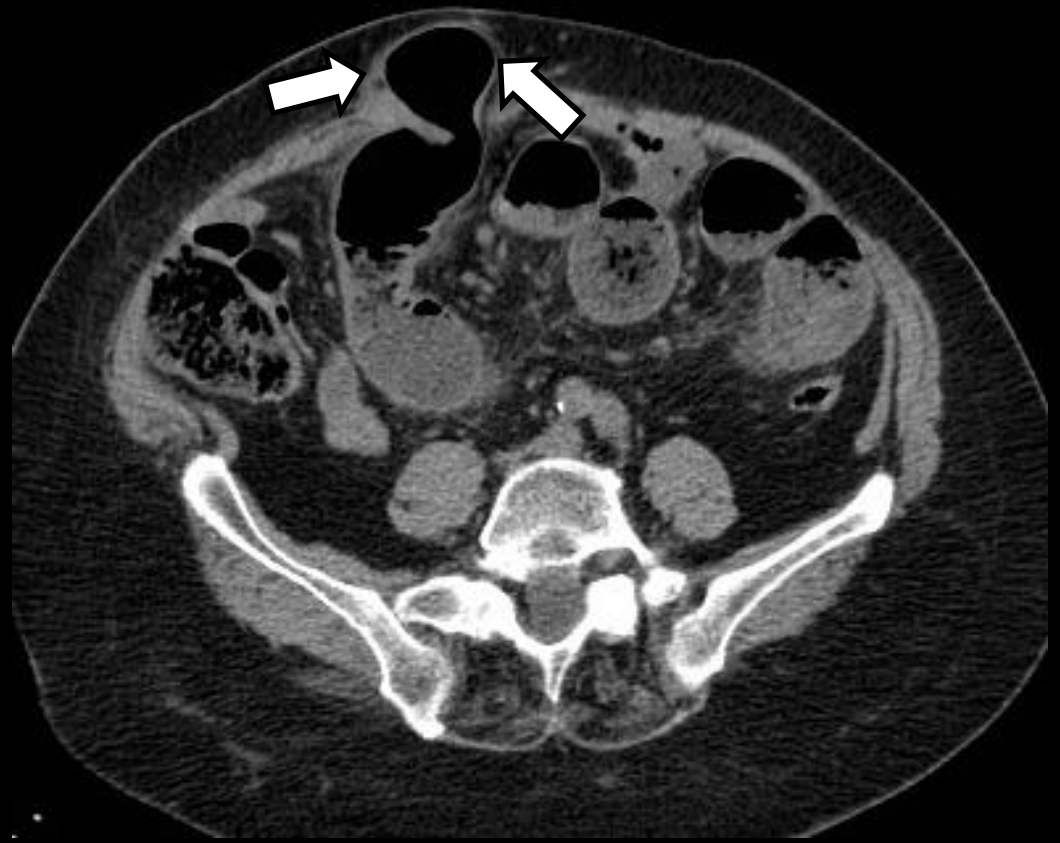
Definition: it is an abdominal hernia where only a portion of the bowel wall is herniated.

Anatomy: only the antimesenteric wall of the bowel herniates without compromising the entire lumen. It is usually through a small, firm defect in the abdominal wall.

Clinical presentation: may lead to bowel infarction and gangrene because of impairment of venous circulation of the incarcerated hernia.

Imaging findings

CT: shows a focal protrusion of the antimesenteric wall of a bowel loop into a small defect in the abdominal wall.



Richter hernia

CT scan: Herniation of the antimesenteric wall of a small bowel loop.

S: Spigelian

Definition:also called “spontaneous lateral ventral hernia” or “hernia of semilunar line”. It is a type of abdominal hernia along the semilunar line, resulting in herniation between the muscles of the abdominal wall.

Anatomy: it occurs through a defect in the linea semilunaris, a fibrous union of the rectus sheath with the aponeuroses of the transverse and oblique abdominal muscles that extends from the level of the ninth costal cartilage to the symphysis pubis.

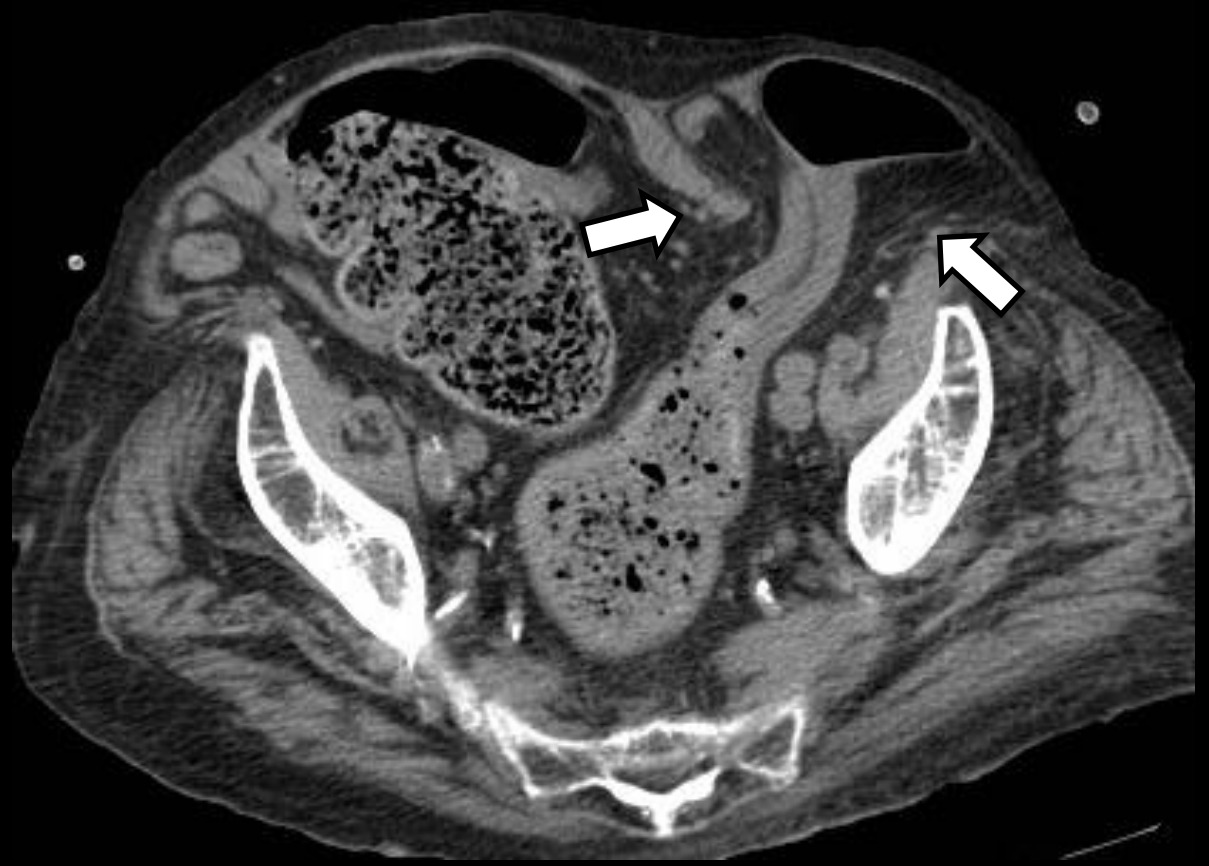
Clinical presentation:

- No typical pain of spigelian hernia.
- Hernial orifices are often overlooked because they are masked by the subcutaneous fat and an intact external aponeurosis

Imaging findings

Identification of:

- ernial orifice and sac,
- contents of the sac.



Spigelian hernia
CT scan pre/post-contrast: herniation of sigmoid colon.

S: Strangulation

Definition: ischemia caused by a compromised blood supply.

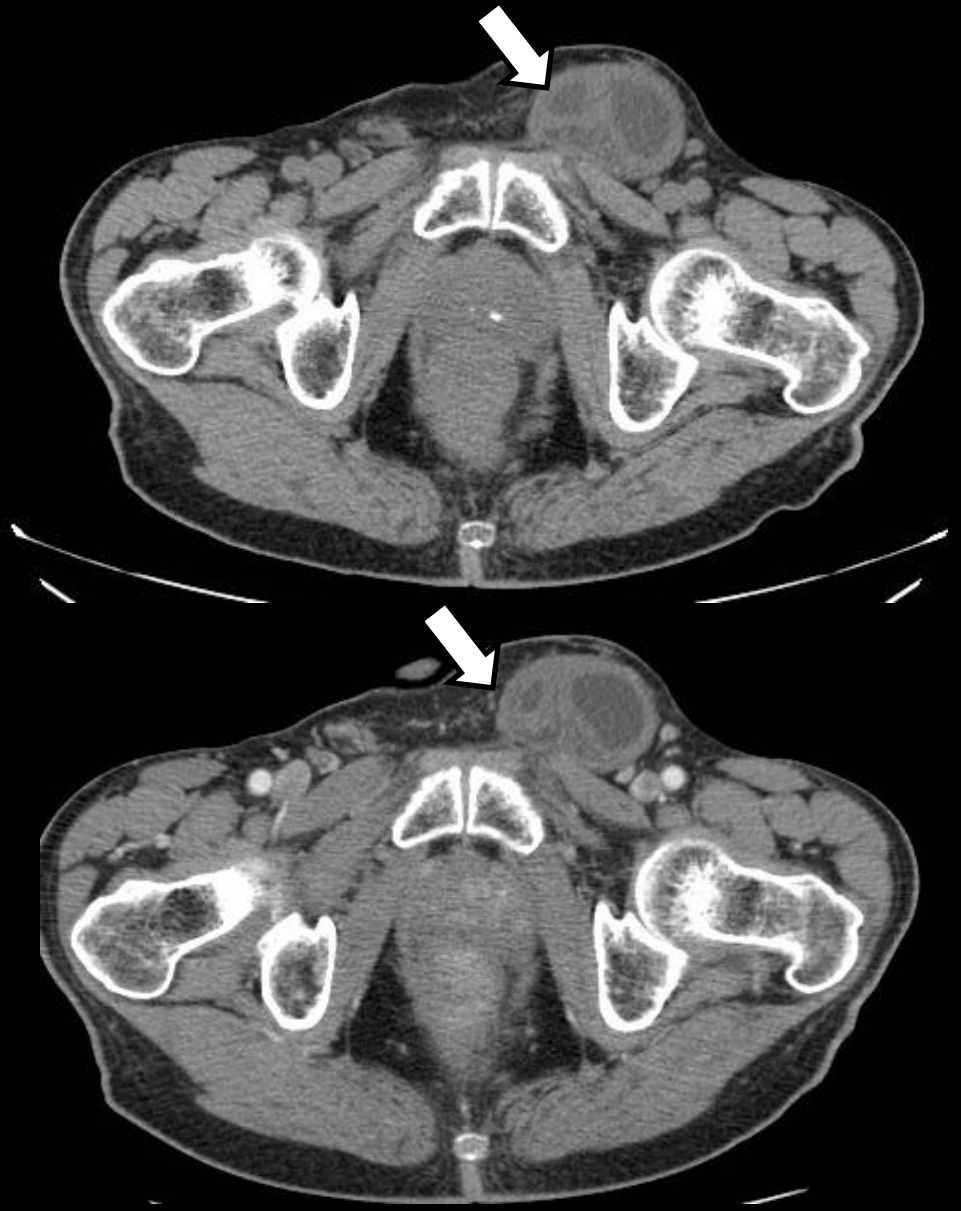
Anatomy: It usually occurs when the hernia defect obstructs the afferent and efferent bowel loops, creating a closed loop within the herniated bowel.

Clinical presentation: a life-threatening condition which requires urgent surgical intervention.

- irreducible mass and localized pain,
- symptoms of mechanical bowel obstruction (constipation, diarrhea, vomiting and inability for gas exit).

Imaging findings:

- Wall thickening.
- Abnormal mural hypo- or hyperattenuation and enhancement.
- Mesenteric vessel engorgement.
- Ascites.
- The afferent and efferent limbs may have a "serrated beak" appearance at the transition point.



Strangulated inguinal hernia:
CT scan pre/post-contrast: bowel wall thickening with abnormal enhancement

T: Transmesenteric

Definition: protrusions of viscera through defects through a bowel mesentery defect.

Anatomy: Mesenteric defects usually arise near the terminal ileum or the ligament of Treitz

Clinical presentation:

- Mild symptoms: nausea and epigastric discomfort .
- Small bowel obstruction.

Imaging findings

CT:

- small bowel dilatation and an abrupt change in caliber at the level of the mesenteric defect.
- Mesenterial stranding sign with vascular mesenteric vascular engorgement.
- displacement of the main mesenteric trunk to the right

U: Umbilical

Definition: the most common ventral hernia. It may be congenital (due to incomplete closure of the anterior abdominal wall after the gut returns to the abdominal cavity) or acquired (associated with obesity, multiparity, ascites, large intra-abdominal mass).

Anatomy: they are usually small and particularly common in women. Typically, omentum and short segments of bowel protrude through the defect.

Clinical presentation: Asymptomatic or painful mass. Complications: strangulation and incarceration, bowel obstruction

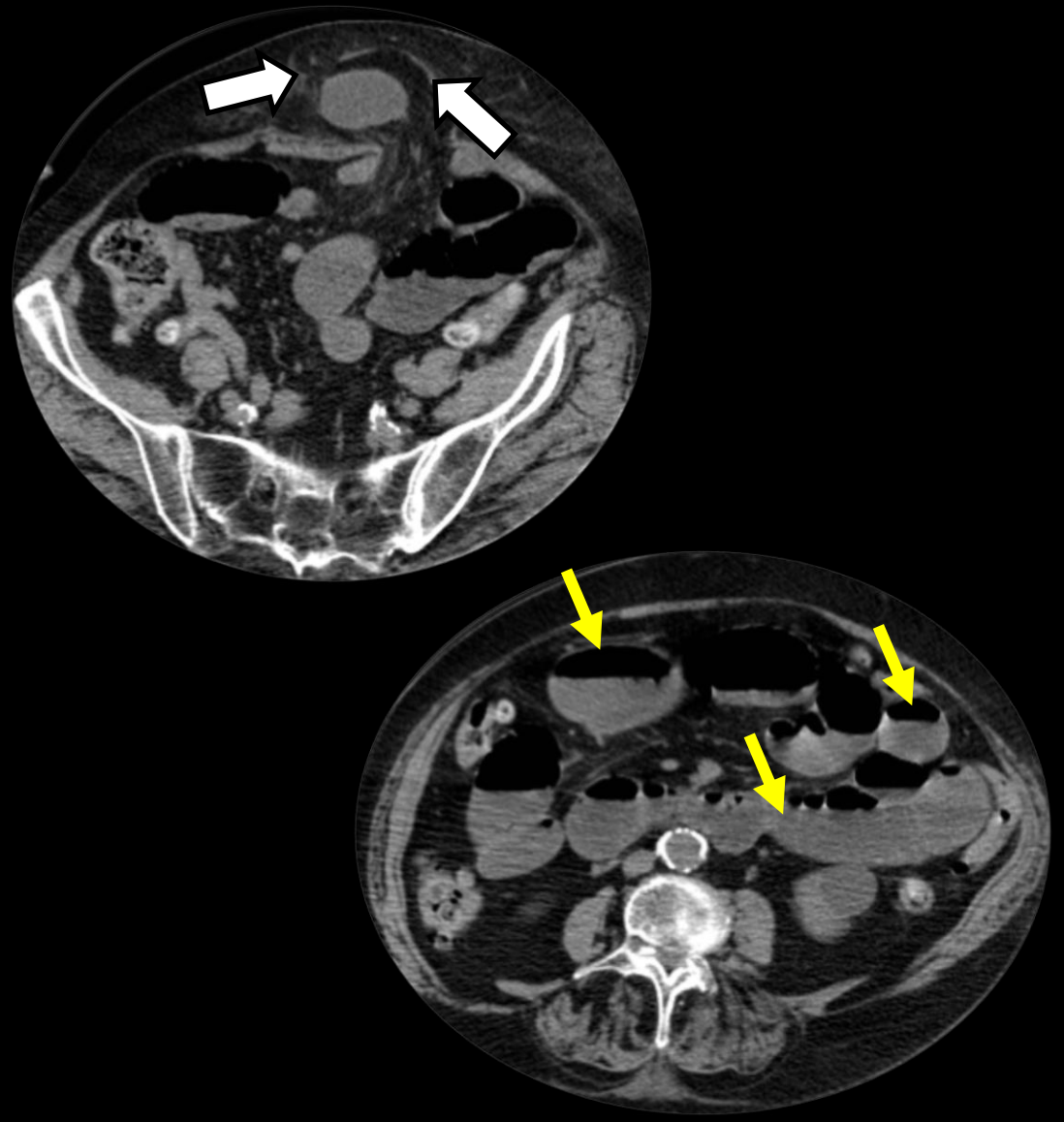
U: Umbilical

Imaging findings

CT:

- midline abdominal defect, in the umbilical region.
- Shows the sac content and signs of complications.

Umbilical hernia
CT axial scan: omental herniation with marked fat stranding suggesting strangulation.



Umbilical hernia
CT axial scan: bowel loop and omental herniation. Dilated bowel loops with air fluid-level in abdomen suggesting bowel obstruction due to incarcerated hernia.

CONCLUSIONS

- An alphabetic guide, describing the different radiographic and pathologic appearances of abdominal hernias may be very helpful for the radiologist to correctly approach the reporting of each kind of abdominal hernia, with particular attention on the differential diagnosis and their complications.

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