

Study on Role of Computed Tomography in Internal Hernias

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Abstract: Background: An internal hernia (IH) is defined as the protrusion of abdominal viscera, most commonly small bowel loops, through a peritoneal or mesenteric aperture into a compartment in the abdominal and pelvic cavity. Cross-sectional imaging (MRI, CT and US) techniques, gained large application in gastrointestinal radiology in the emergency department; they are indicated as first line techniques in the diagnosis, staging and follow-up. Hernial orifices can be congenital, including both normal foramina or recesses and unusual apertures resulting from anomalies of peritoneal attachment and internal rotation, or acquired if caused by inflammation, trauma and previous surgery, like gastric by-pass for bariatric treatment and liver transplantation. Due to the growing popularity of these surgical procedures, the overall incidence of internal hernias has been recently increasing. **Materials and methods:** A cross sectional observational study in the department of Radiodiagnosis at Tertiary care Teaching Hospital over a period of 1 year. Ethical permission was taken from the Institutional committee. Informed consent was taken from all the patients included in the study. Twelve patients with small intestinal obstruction were selected. Patients willing to participate in the study Both males and females Patient age between 30 to 60 years Patients presenting with small intestinal obstruction and internal hernias on CT scan History of post-surgery. **Result:** Among the 90 cases, 50% were reported as Paraduodenal hernias, 11.1% as Pericecal hernia, and 8.9% as hernia through foramen of Winslow. On CT scan abdomen, the Paraduodenal hernias were seen as encapsulated cluster of dilated bowel loops with a saclike appearance. **Conclusion:** The clinical diagnosis of an internal hernia being most often unknown, cross-sectional imaging methods with multiplanar reformatting, particularly computed tomography, are essential in the management of this pathology.

Keywords: Paraduodenal hernia, TC scan, abdominal mass.

INTRODUCTION

An internal hernia (IH) is defined as the protrusion of abdominal viscera, most commonly small bowel loops, through a peritoneal or mesenteric aperture into a compartment in the abdominal and pelvic cavity. [1] Cross-sectional imaging (MRI, CT and US) (4-7) techniques, gained large application in gastrointestinal radiology in the emergency department; they are indicated as first line techniques in the diagnosis, staging and follow-up. [2].

Hernial orifices can be congenital, including both normal foramina or recesses and unusual apertures resulting from anomalies of peritoneal attachment and internal rotation, or acquired if caused by inflammation, trauma and previous surgery, like gastric by-pass for bariatric treatment and liver transplantation. Due to the growing popularity of these surgical procedures, the overall incidence of internal hernias has been recently increasing. [3] Although relatively uncommon, they represent a potentially life-threatening condition and a surgical emergency since the bowel entrapment in one

of the defects can lead to acute intestinal obstruction with rapid evolution, if left untreated, into strangulation and ischemia. According to various investigators, internal hernias cause up to 5,8% of all small bowel obstruction (SBO), with a high overall mortality rate that can exceed 50%. [4]

The most common manifestation of an internal hernia is strangulating SBO, that occurs after a closedloop obstruction. [5] However, the clinical manifestations range from mild digestive symptoms to

acute abdomen, as symptom severity relates to duration and reducibility of the hernia and the presence or absence of strangulation and incarceration. [6] IHs may remain clinically silent if easily reducible, but the larger ones often cause mild discomfort ranging from constant vague epigastric pain to intermittent periumbilical pain as they occasionally show spontaneous reduction, abdominal distention, nausea and vomiting. Physical examination may reveal a palpable mass of herniated loops with localized tenderness. [7]

This non-specific clinical presentation often leads to a delay in diagnosis, in most cases made at the time of laparotomy, and consequently in proper treatment, carrying risk of serious complications; therefore, when the possibility of internal hernia is considered, a rapid imaging evaluation is necessary to aid an early diagnosis and a prompt intervention. Multidetector Computed Tomography (MDCT), with its wide availability, has become the first line imaging technique in these patients and play an important role in the preoperative diagnosis and planning of surgical intervention. [8]

MATERIALS AND METHODS

A cross sectional observational study in the department of Radiodiagnosis at Tertiary care Teaching Hospital over a period of 1 year. Ethical permission was taken from the Institutional committee. Informed consent was taken from all the patients included in the study.

RESULTS

Table 1: Showing age distribution of the cases

Age (in years)	No. of cases	Percent (%)
30-40	25	27.8%
41-50	14	15.6%
51-60	51	56.6%
Total	90	100%

In the present study, age group distribution was from 30 years to 60 years. Majority of patients were among 51-60 years ie, 56.6% and 15.6% were among 41-50 years.

Table 2: Showing CT diagnosis of internal hernias

CT Diagnosis	No. of cases	Percent (%)
Paraduodenal hernias	45	50%
Pericecal hernia	10	11.1%
Through foramen of Winslow	8	8.9%
Transmesentric	8	8.9%
Intersigmoid	10	11.1%
Transomental	9	10%
Total	90	100%

In the present study, among the 90 cases, 50% were reported as Paraduodenal hernias, 11.1% as Pericecal hernia, and 8.9% as hernia through foramen of Winslow. On CT scan abdomen, the Paraduodenal

Sample size: Twelve patients with small intestinal obstruction were selected.

Inclusion criteria

Patients willing to participate in the study Both males and females Patient age between 30 to 60 years Patients presenting with small intestinal obstruction and internal hernias on CT scan History of post-surgery.

Exclusion criteria

Patients not willing to participate in the study Children were excluded Age below 30 years and above 60 years were excluded Pregnant women Other causes of small intestinal obstruction All the cases included in the study were patients presenting with small intestinal obstruction to the department of General Surgery and were referred to department of Radiodiagnosis for imaging studies. A thorough clinical examination was done including history taking, onset of symptoms, past history of similar complaints, history of any previous surgeries. All the patients with small intestinal obstruction were subjected to CT scan to assess paraduodenal hernias, pericecal hernias and small intestinal loops.

Equipment used: CT machine Toshiba Aquilion (160 slices) was used. The contrast used was water soluble and nonionic (Omnipaque) administered at 300 mg/ml through intravenous injection. The procedure was explained to the patients before hand.

hernias were seen as encapsulated cluster of dilated bowel loops with a saclike appearance.

DISCUSSION

An internal abdominal hernia differs from both an external abdominal hernia, in which the protrusion occurs through an opening in the abdominal wall, and a diaphragmatic hernia, which involves weakness of the diaphragm. [9]

The orifice may be either acquired, such as a post-surgical, traumatic, or post-inflammatory defect, or congenital, including both normal openings, such as the Foramen of Winslow, and abnormal openings resulting from internal rotation abnormalities and peritoneal attachment. [10] No traumatic or surgical history was found in our patient.

In the literature, several types of internal hernia are described: para-duodenal hernias, transmesocolic hernias, trans-omental hernias, transmesosigmoid hernias, Winslow's hiatus hernias and perihernias caecal. Internal paraduodenal hernias are the most common, at 50-55%. [11] About 80% of these paraduodenal hernias are observed on the left side. [12] They interest men three times more often than women. [13] The case reported here by the authors was a boy.

Anatomically, paraduodenal hernias correspond to slowly developing processes of detachment of the left or right fascia of Toldt from initiating zones corresponding to localized adhesion defects of the duodenopancreatic block or fascia of Treitz. Left anterior para-duodenal hernias are the most common. They alone account for 53% of internal hernias and 75% of paraduodenal hernias. They develop from the Landzert fossa, located at the level of the duodenojejunal angle, in the descending and transverse mesocolons by detaching the left fascia of Toldt which contributes to constitute the hernial sac. The arrangement of the intra-hernial loops reflects their inclusion in a bag of large volume placed in the left hypochondrium. On CT, the intrahernial small bowel loops are grouped together in a more or less typically circular or oval fashion in the left hypochondrium between the pancreas behind, the stomach in front and to the left of the angle of Treitz in general. It is essential to seek to identify the vascular landmarks of the anterior wall of the hernial sac, which are the trunk of the inferior mesenteric vein displaced forwards and upwards, as well as that of the left superior colonic artery, which is less easy to specify. This landmark is an essential element of the diagnosis, simple and little cited in the literature. [14]

Right anterior paraduodenal hernias are 2 times less frequent than their left counterparts, they develop from Waldeyer's fossa and are very easy to diagnose on CT because their neck passes under the proximal truncal segment of the superior mesenteric artery which is neatly stretched both forward and to the right. When the hernial neck is located lower than in the typical form, the positional changes of the proximal

segment of the superior mesenteric artery may be less obvious and the multiplanar reformations are then invaluable to analyze precisely the herniated intestinal structures. [15]

In our patient, we observed circular agglutination of the small intestinal loops with his mesentery and the mesenteric vessels in an extended left paramedian location from the hypochondrium to the left flank suggesting a left anterior para-duodenal hernia.

The presentation of internal hernias depends on their mode of constitution. Internal hernias developed in a peritoneal detachment are characterized by their inclusion in a spherical sac (para duodenal and intersigmoid hernias). Internal hernias by incarceration of loops in an orifice of a mobile peritoneal segment simulate a flanged volvulus. It is the seat of the point of convergence of the distended loops which makes it possible to differentiate transmesenteric hernias from transomental hernias or hernias of the falciform ligament. The identification of vascular structures is an indispensable guide for the characterization of internal hernias [16].

Symptoms of internal abdominal hernias are nonspecific and consist of mild abdominal discomfort alternating with episodes of intense periumbilical pain and nausea. [17] Internal hernias can be revealed by an acute picture of intestinal obstruction. Most often with an ischemic component by vascular strangulation, and they are responsible for 0.2 to 5.8% of small bowel obstructions in published series [2]. Our patient was seen for abdominal pain on a palpable mass. Computed tomography facilitates the diagnosis of internal abdominal hernias and helps to avoid clinical diagnostic errors, particularly in subtle trans-mesenteric hernias [18].

CONCLUSION

The clinical diagnosis of an internal hernia being most often unknown, cross-sectional imaging methods with multiplanar reformatting, particularly computed tomography, are essential in the management of this pathology.

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