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PARADUODENAL HERNIA

General Surgery

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ABSTRACT

Paraduodenal hernia is the most common form of congenital internal hernia and is defined as protrusion of bowel into the retro- peritoneal space through peritoneal defects near the third and fourth portion of the duodenum.(1) There is a lifetime risk of obstruction and bowel strangulation is around 50% with a mortality of 20% and higher. Despite the rarity of the disease, it poses a serious surgical problem. (1) The high risk of obstruction and the associated mortality mandate repair once the diagnosis is established. We present the interesting case of a 32-year-old man with a left para-duodenal hernia who presented with abdominal pain and vomiting and underwent subsequent emergency exploratory laparotomy with hernia repair. The purpose of this paper is to review the etiology, pathology, diagnosis and treatment of para-duodenal hernia and to heighten the awareness of this rare but significant disease.

KEYWORDS

internal hernia , paraduodenal hernia

CASE

A 32 year old male came with complaints of pain in abdomen since morning with three episodes of vomiting containing food particles since afternoon of 25/8/2014. He gives a history of tobacco chewing 4-5 times a day since teenage. He was admitted from the casualty. On Admission, Pulse 110/min ,Bp 120/70 mm hg. Per Abdominal examination revealed- soft abdomen with severe tenderness in left ilio-lumbar region with voluntary guarding. There was no distension and rigidity. Peristalsis were hyper in upper quadrant.

Following which patient was investigated , Hb 13.4, Tlc – 9800, N 92, L - 06, M 02. Pcv - 37.5, Platelet - 3.23, Sr. Billi - 1.5 (total).

USG (A+P) showed Clumped Small Bowel Loops in left hypochondriac region with marked probe tenderness however no obvious bowel dilatation or sluggish peristalsis noted. **CT(A+P)** – patient was diagnosed with a rare entity called left paraduodenal hernia. An emergency exploratory laparotomy was conducted after informed and written consent. The hernia was identified repaired and patient was shifted to ICU for a day with a 32 no abdominal drain in situ. The drain was removed on post operative day4 and patient was dischaged on post operative day 7.

Figure 1- CECT (A+P)- There is abnormal clustering of proximal jejunal loops noted in the left hypochondriac and lumbar region adjacent to the duodeno-jejunal junction.

Figure 2- The clumped bowel is related to body and tail of pancreas posteriorly, descending colon left laterally.

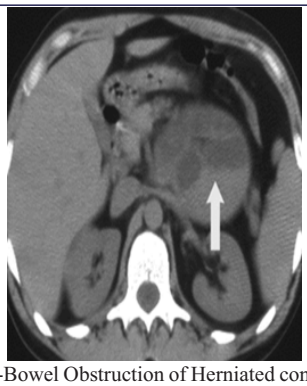

Figure- 3 Small-Bowel Obstruction of Herniated contents as multiple loops of dilated small bowel (*arrow*) with fluid-fluid levels noted.

A B C

Figure -4 Intraoperative image showing A- Internal small bowel hernia, B- Hernia site after reducing the content, C- Mesentry sutured

DISCUSSION:

Paraduodenal hernia is a rare congenital anomaly which arises from an error of rotation of the midgut. It may be discovered as an incidental finding at laparotomy or may be the cause of acute small bowel obstruction which can go on to strangulation and perforation. (1) Its presence may also lead to confusion and errors in the performance of other abdominal operations, although itself not the cause of any symptoms. Much attention had been given in the earlier surgical literature to internal hernia involving the various intra-abdominal fossae, but it was not until the report of Andrews, 1 in 1923, that the true embryological abnormality involved in the production of paraduodenal hernia was clearly recognized. ((2) He added 60 cases from the literature and one of his own to the 74 previously collected by Moynihan (3) in 1906. Zimmerman and Laufman5 added 4 cases in 1953, again giving an excellent descrip tion of the condition. (5) Five cases from the Massachusetts General Hospital since 1941 have been mentioned in a previous report.

The midgut is that portion of the intestinal tract receiving its blood supply from the superior mesenteric artery and includes the distal duodenum, jejunum, ileum, ce-cum, ascending colon and the proximal half of the transverse colon. It is divided into two segments. The portion cephalic to the vitello-mesenteric duct is called the pre-arterial segment and that caudal is called the post-arterial segment.(4) The

former comprises the distal duodenum and all of the small bowel to the distal ileum, and the latter the distal ileum, ascending and transverse colon. In the normal sequence of events the midgut, suspended in the midline by its dorsal mesentery, passes through an orderly pattern of rotation. This process is arbitrarily divided into 3 stages. The first stage begins at about the fifth week of life of the embryo. Rapid growth of the abdominal viscera forces a great portion of the elongating midgut out of the abdominal cavity into the umbilical or yolk sac. By about the tenth week the abdominal cavity has increased in size and the midgut has gradually returned within it, beginning the second stage of rotation. The midgut has now rotated 90 degrees in a counterclockwise direction on the axis of the superior mesenteric artery. The pre-arterial segment occupies the right side, and the post-arterial segment the left side of the abdominal cavity. Arrest at this point of rotation produces the relatively common picture of "non-rotation of the intestine," where the small bowel, including the duodenum, lies entirely to the right, and the colon to the left of the midline of the abdominal cavity. (5) Normally, the pre-arterial segment continues to rotate through an additional arc of 180 degrees counterclockwise, first be- hind and then to the left of the superior mesenteric artery, so that it comes to lie to the left of the midline in the abdominal cavity. The postarterial segment also rotates, led by the ceacum, which passes counterclockwise anterior to the superior mesenteric artery into the right upper quad- rant, where it remains for a time. The entire second stage is a rapid process and takes place between the tenth and eleventh week, but the ceacum may not complete its descent to its normal position in the right lower quadrant until about the end of the fifth month of the life of the embryo. This second stage is a very important one in which many of the anomalies of rotation arise. The third stage is one of fusion of the mesenteries and fixation of the midgut. The leaf of the mesentery of the colonic portion of the midgut, which has come to be in a posterior position, fuses with the peritoneum of the posterior abdominal wall and the space between them is obliterated. The mesentery of the small bowel remains fixed to the posterior abdominal wall and the mesentery of the duodenum fuses with the posterior parietal peritoneum. If the prearterial segment fails to rotate properly, it may become trapped under the mesentery of the rotating colon forming an internal hernia which, because of its proximity to the duodenum, has been called a paraduodenal hernia. This then consists of a sac lined by peritoneum containing small intestine with a small opening through which the distal ileum passes into the free peritoneal cavity to join the ceacum. This may occur on either the right or left side of the abdomen, depending on the exact nature of the error of rotation. The mechanism of production of the right paraduodenal hernia is quite simple. As the midgut returns from the yolk sac to the abdominal cavity, the small bowel has rotated 90 degrees counterclockwise and lies on the right side of the abdomen. It does not participate further, however, in the second stage of rotation, remaining on the right side, so that as the terminal ileum, ceacum and colon proceed with their nor- mal course of rotation across to the right they come to lie anterior to the distal duodenum and small bowel of the prearterial segment. Fixation of the cecum and colon to the posterior parietal peritoneum occurs but leaves the small bowel trapped in a sac, lined by the peritoneum, which lies behind the mesentery of the postarterial segment, in the anterior wall of which are the ileocolic, right and midcolic vessels. The terminal ileum emerges from the sac through a small opening into the free peritoneal cavity to reach the ceacum . The process of formation of a left para- duodenal hernia is somewhat more complicated. As the prearterial segment of the midgut rotates in the normal pattern, first behind and then to the left of the superior mesenteric artery, and comes to lie in the left side of the abdomen, it invaginates into an unsupported area of descending mesocolon, the anterior margin of which is formed by the ascending branch of the inferior mesenteric artery and the inferior mesenteric vein as it ascends to join the splenic vein (vascular arch of Treitz). The small bowel thus comes to lie in a sac, lined by peritoneum, behind the mesentery of the descending colon as this structure under- goes its normal posterior fixation. (5)The inferior mesenteric artery, with its ascending branch, and the inferior mesenteric vein are in the margin of the neck of this sac, and the blood supply of the descending colon is in the wall of the sac. The terminal ileum comes into the free peritoneal cavity through the neck of the sac to reach the ceacum.

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