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Case Report

Atypical Causes for Vague Abdominal Pain: Para Duodenal Hernias (Case Report and Review of Literature)

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Abstract

Introduction: Internal hernia is a relatively uncommon condition and is a rare type of intestinal obstruction. Paraduodenal hernia is considered the most common type of internal hernias. The rare prevalence and the variable symptoms make the clinical diagnosis of paraduodenal hernia a diagnostic challenge. They represent 1% of syndromes that can cause intestinal obstruction.

Material and Methods: Retrospective case series of four patients diagnosed and operated in Hamad General Hospital, Doha, Qatar with a follow up period of one year.

Results and Discussion: Three patients had left-sided paraduodenal hernia and one patient had right-sided paraduodenal hernia. Three patients were diagnosed using CT scan and one pregnant female was diagnosed with an MRI. Two patients were operated laparoscopically and the other two had open exploration and repair of the hernia. Average hospital stay was 4.75 $\pm$1.2 days. All patients recovered well with an average follow up period of 13$\pm$ 5.3 months. Due to the nonspecific clinical picture; diagnosing paraduodneal hernia requires high index of suspicion. Laparoscopic repair of Para duodenal hernia is safe and can be carried out on elective basis for non-obstructed patients. Surgical intervention is the treatment of choice, also in asymptomatic cases, because it reduces the urgent surgery and hence reducing the morbidity and mortality associated with emergency laparotomy.

Keywords: Internal hernia; Intestinal obstruction; Landzert fossa; Minimally invasive hernia repair; Paraduodenal hernia; Waldeyer Fossa

Introduction

Internal Hernias (IH) are abnormal protrusion of intra-abdominal contents mostly small intestine or omentum through a defect that maybe congenital or acquired. Internal hernia is relatively an infrequent condition accounting for less than 1% of abdominal hernia and is a very rare cause for intestinal obstruction [1]. The types of internal hernia (in decreasing order) are paraduodenal, pericecal, foramen of Winslow, transmesenteric and transmesocolic, pelvic, intersigmoid, retroanastomotic, and transomental hernia. [1,2] In the classic literature Paraduodenal Hernias (PDH) account for approximately 53% of all cases of internal hernias [2]. Internal hernias are rare and the diagnosis is most often carried out intraoperatively. However, knowledge of the different varieties of internal hernias is fundamental to consider a preoperative diagnosis [2]. Although uncommon; they can potentially represent a surgical emergency since the bowel entrapment in one of those defects can

result in intestinal obstruction that can further progress to bowel strangulation and ischemia. The clinical manifestation can range from vague epigastric pain, to abdominal distention with nausea and vomiting leading to sepsis or septic shock in presence of bowel strangulation and ischemia [3]. We present case series of four patients diagnosed with paraduodneal hernia and treated in Hamad General Hospital, Doha-Qatar the main tertiary hospital in the country.

Material and Methods

Retrospective chart review and analysis of all elective and emergency cases admitted and operated in Hamad General Hospital in Doha-Qatar; the main tertiary hospital in the country from Jan-2020 until Jan- 2022. We included the cases with diagnosis of paraduodernal hernia and identified 4 patients. Two researchers reviewed the literature separately including research engines like PubMed and google scholar. The studies included in the literature review are displayed in Tables 1,2.

Case	Age/ gender	presentation	Surgical history	Diagnostic modality	Right/Left	open/ laparoscopy	Length of stay	Complication	Follow up
1	24/ male	Colicky abdominal pain, sharp pain with abdominal distention and bilious vomiting	Open appendectomy	CT abdomen with contrast	Left	Laparoscopic converted to open	6 days	Recurrent attack of adhesive intestinal obstruction, managed conservatively	7 months
2	68/ female	Recurrent attacks of upper abdominal pain, radiating the back	Laparoscopic cholecystectomy.Knee arthroplasty	CT abdomen with contrast	Left	Laparoscopic	5 days	none	12 months
3	38/ female	Abdominal pai, with vomiting,	Laparoscopic cholecystectomy	MRI	Left	Laparoscopic	3 days	none	18 months
4	23/ male	Abdominal pain, vomiting, and obstipation		CT abdomen with contrast	Right	Laparoscopic converted to open	5 days	none	16 months

Table 1: Clinical presentation and demographics of patient population.

Author/Year	N of cases	M/F	Right/Left	Diagnostic modality	Elective/ emergency	Open/laparoscopy	repair	Length of stay	Complications
Erdas et al. (2013)	1	34/F	Right	CT scan	Emergency	Laparoscopic	Interrupted slowly absorbable sutures	4	Conversion for bowel distension
Hussein et al. (2012)	1	59/F	Left	CT scan	Emergency	Laparoscopic	2-0 prolene continuous	2	None
Parmar et al. (2010)	1	38/M	Left	CT scan	Elective	Laparoscopic	Sac neck was widened	3	None
Khalaileh et al. (2010)	1	53/F	Left	CT scan	Emergency	Laparoscopic	Nonabsorbable sutures	3	None
Bittner et al. (2009)	1	26/F	Right	CT scan	Emergency	Laparoscopic	Reduction of contents and widening of mesenteric defect	1	None
Uchiyama et al. (2009)	1	80/F	Left	CT scan	Elective	Laparoscopic	Hernia defect widened	7	None
Jeong et al. (2008)	5	52,58,22,58,71, 3M 2F	3-Left 2-right	CT scan	Emergency	Laparoscopic	Interrupted slowly absorbable sutures	2 pts- 5 days 1 pt- 7 day1 pt- 10 days 1 pt- 14 days	2 ileus

Palanivelu et al. (2008)	4		3 left/ 1 right	CT scan	1 case: Emergency (right PDH) 3: elective (left PDH)	2-laparoscopic 3- open	3 Interrupted Vicryl sutures+ GORE-TEX® permanent, nonabsorbable mesh secured with 2–0 propylene sutures	3	1 IMV injury repaired via ligation of IMV branch of IMA. 1 Recurrence at 18 months; repair with GoreTex mesh
Shoji ae al. (2007)	1	60/M	Left	CT+ MRI scan	Elective	Laparoscopic	Non-absorbable interrupted sutures	2	None
Moon et al. (2006)	1	18/M	Left	CT scan	Emergency	Laparoscopic	3 interrupted 3-0 silk sutures	1	None
Rollins et al. (2004)	1	21/M	Left	CT scan	Elective	Laparoscopic	Non-absorbable sutures	3	None
Antedomenico et al. (2003)	1	24/F	Right	CT scan	Emergency	Laparoscopic	Opened widely	3	none
Shadhu et al. (2018)	5	68,34,68,40,75/M	1 Right 4 left	CT scan	2 pt- emergency 3 pt- semi urgent paroxysmal symptoms	1 Laparoscopic converted to open 4-laparoscopic	1 pt- hernia opened widely 4 pt- closed defect with interrupted non absorbable sutures	3 pts-7 days 1 pt- 9 days 1 pt – 14 days (open case)	None
Kulkarnia et al (2016)	2	36&42/M	Left	CT scan	Elective	Laparoscopic	Interrupted 2-0 polyester	3 days	None
Rajput et al (2021)	1	20/F	left	CT scan	Emergency	Laparotomy	PDH neck widened+ closed with interrupted non absorbable silk sutures	4 days	none
Al Otaibi et al (2019)	1	24/F	Left	CT scan	Emergency	Laparotomy	PDH neck widened and sac excised	4 days	none
Kozman & Fisher (2017)	1	15/F	Left	None Acute abdomen post appendectomy	Emergency	Laparotomy	Hernia sac excised and defect closed with 2-0 vicryl and sac used as patch	5 days	None
Assenza et al (2014)	1	67/M	Left	CT scan	Emergency	Laparoscopic	Incision of the neck of the sac	4 days	None
Kwan et al (2020)	1	18/F	Right	CT scan	Semi-urgent recurrent attacks	Laparoscopic	Running non-absorbable V-lock+ Gore® BIO-A® Hiatal Tissue Reinforcement Biosynthetic absorbable mesh	2 days	None

Table 2: literature review of reported cases of Para duodenal hernia.

Results and Discussion

This is a retrospective case series conducted in a tertiary health centre, Hamad General Hospital, Doha, Qatar.

Patient A presented with 2 days history of colicky abdominal pain, nausea, and bilious emesis. Examination was positive for a palpable bulge in the left upper quadrant, hyperactive bowel sounds, and empty rectum. CT scan showed features of small bowel obstruction due to internal hernia a shown in Figure 1. He underwent diagnostic laparoscopy revealed left PDH. Through midline laparotomy the hernia sac was excised with closure of the defect and he was discharged in a good condition. Post operative course was complicated by recurrent attacks of adhesive bowel obstruction that were managed conservatively. Patient B presented 1 month post laparoscopic cholecystectomy with repeated bouts of abdominal pain for which she was investigated with CT scan which showed left PDH. The bouts of abdominal pain were exacerbated by laparoscopic surgery. She was sent home after diagnostic laparoscopy and reduction of the hernia. She has no complications on 3 months follow up.

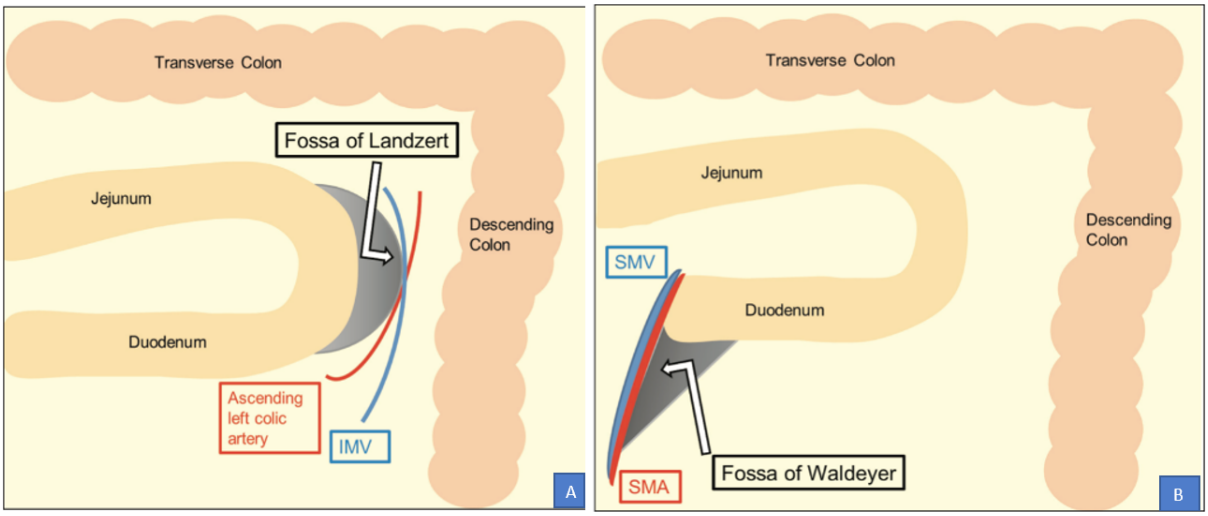

Figure 1: A: graphic illustration of boundaries of fossa of Landzert (left PDH), B: graphic illustration of boundaries of fossa of Waldeyer (right PDH).

Patient C is 38-year-old pregnant lady in her 5th month of pregnancy came to the emergency department with abdominal pain and vomiting. MRI showed left para duodenal hernia. Diagnostic laparoscopy confirmed the presence of left PDH, laparoscopic repair of the hernia done. She was discharged in a good condition with good post operative course. Patient D is a 22-year-old healthy male patient with severe abdominal pain, bilious emesis, and obstipation. Diagnostic laparoscopy showed severe bowel distension with right PDH. Conversion to open surgery to avoid bowel surgery, the hernia sac excised and the defect was repaired. Patient discharged home in a good condition as well and satisfactory follow up outcome. PDH hernias are the most frequent internal hernias, they affect men three times more often than women [2]. Despite classically paraduodenal hernia has been described as the most common type of IH, recently transmesenteric hernias have reached a higher incidence, in relation to the increasing frequency of surgical procedures in which a Roux-en-Y loop is constructed [3]. Their diagnosis is usually made intraoperatively; however, with the development of medical imaging and in particular of CT and magnetic resonance imaging, preoperative diagnosis is nowadays possible [3].

Kozman and fisher have reported the first case of left PDH that is exacerbated by laparoscopy, and we are reporting the second case (patient B) who had an exacerbation of her left PDH following laparoscopic cholecystectomy. There are only occasional reports of PDH in young females. Al Otaibi et al reported LPDH in young female patient [4]. Kozman and Fisher reported a case of LPDH post laparoscopic appendectomy in a 15-yearold female patient [5]. We also report an unusual case of left PDH in a young pregnant female as well as in an elderly female post laparoscopic cholecystectomy. Abdominal CT is a gold standard to provide the correct diagnosis: left hernia have a characteristic appearance of clustering of small bowel loops in a saclike mass with encapsulation at the ligament of Treitz, engorgement and crowding of the mesentery vessels with frequent right displacement of the main mesenteric trunk, anterior and upward displacement of the inferior mesenteric vein that lie in the ventral circumference of the hernia orifice and depression of the transverse colon [6-8]. While right PDH have an appearance of saclike mass in the right upper quadrant and the jejunum appeared posterior to the Superior Mesenteric Artery (SMA) and inferior

to the third portion of the duodenum [6,8]. Incidence of left PDH (Lanzert's hernia) is three times higher than of the right subtype (Waldayer's hernia). Lanzert's fossa is an area of mesenteric sac between the mesocolon and posterior abdominal wall where small bowel loops may herniate and get trapped. It lies to the left of the fourth part of the duodenum and posterior to the inferior mesenteric vein and the ascending branch of the left colic artery [9,10].

About 10-15% of cases are discovered preoperatively. The abdomen radiography can give information regarding the intestinal segment involved and the extension of the intestinal obstruction; a gastrointestinal series with barium may show dilated loops of small bowel in the upper quadrant, delay of contrast or the point of obstruction [7,10].

Regardless of the approach, basic principles of hernia repair are adopted, namely, reduction of hernia contents and repair of hernia defect. Excision of the hernia sac has been described but is not mandatory given the potential for injury to the colic vessels [3]. Correct identification and preservation of the vascular structures that constitute the hernia neck is essential. The majority of cases of left PDH the neck of the sac is wide and reduction of the small bowel is fairly straightforward in the absence of small bowel obstruction and dilatation. Closure of the hernia defect is recommended when feasible with non-absorbable sutures [3,9,10,11]. Palanivela et al. used a GORE-TEX® permanent, nonabsorbable mesh secured with 2–0 propylene sutures for recurrence of a left PDH [12]. The authors suggested mesh could be used for large defects and recommended decision based on surgeon experience. Other authors suggested the used of slowly absorbable sutures [13]. Rarely, widening of the hernia neck is required to reduce the contents and even division of the inferior mesenteric vein in more difficult cases [14]. Kwan et al reported using biosynthetic absorbable mesh during initial repair of paraduodenal hernias to reinforce suture line where the defect is large or there is concern over adequacy of suture repair mainly in wide neck hernias [15-19]. This is suggested to reduce the rate of hernia recurrence as well as avoid complications from permanent implants like mesh erosion. Laparoscopic repair is expected to reduce post operative pain, morbidity and length of hospital stay. Moreover, laparoscopic approach provides the added benefit of verification of the diagnosis as well as simultaneous repair of the hernia in cases that could not be diagnosed with radiological methods. During urgent intervention the laparoscopic approach might be difficult due to bowel distention that reduces the operative space and increases the risk for iatrogenic bowel injuries [6,15,16,20].

Conclusion

Due to the nonspecific clinical picture, PDHs require a high index of suspicion and relevant imaging for establishing a correct diagnosis and early intervention. CT scan is the gold standard for establishing the diagnosis. The patients' profile in most published case reports are elderly age group and males; however, our case series showed presence of PDH in young females as well as young males. Potentially, prior laparoscopic surgeries can accentuate the symptoms of PDH leading to intestinal obstruction. Laparoscopic approach should be considered in hemodynamically stable patients when expertise in advanced laparoscopy is present. The surgical intervention is the treatment of choice, also in asymptomatic cases, because it reduces the urgent surgery and complications related to hernia, that appear in almost half of cases.

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