J Ped Surg Case Reports 3 (2015) 351–355

Contents lists available at ScienceDirect

Journal of Pediatric Surgery CASE REPORTS

journal homepage: www.jpscasereports.com

Congenital Treves' field transmesenteric hernia in children: A case series and literature review

Ryuta Saka [a,b,*], Takashi Sasaki [a], Keigo Nara [b], Toshimichi Hasegawa [b], Satoko Nose [a], Hiroomi Okuyama [a,c], Takaharu Oue [a]

[a] Department of Pediatric Surgery, Hyogo College of Medicine, Japan
[b] Department of Pediatric Surgery, National Hospital Organization, Fukuyama Medical Center, Japan
[c] Department of Pediatric Surgery, Graduate School of Medicine, Osaka University, Japan

ARTICLE INFO

Article history:
Received 2 June 2015
Received in revised form
26 June 2015
Accepted 30 June 2015

Key words:
Children
Transmesenteric hernia
Treves' field

ABSTRACT

Transmesenteric hernia is abdominal visceral herniation through a congenital or acquired mesenteric defect. Treves' field is the area of terminal ileal mesentery circumscribed by the ileocolic artery and its last ileal branch. It is very susceptible to congenital defects. To clarify the clinical course of congenital Treves' field transmesenteric hernia (cTFTH), we retrospectively reviewed pediatric cases and conducted a literature review. Five consecutive pediatric cTFTH cases (one male, four females) underwent emergency laparotomy at our institutions from April 2009 and December 2014. We analyzed their demographics, preoperative findings, surgical procedures, and outcomes, along with a literature review. Abdominal plain X-ray showed displaced intestinal gas with gas paucity in the center of the abdomen in two cases and diffusely increased intestinal gas in two others. Abdominal computed tomography (CT) in four cases showed intestinal loop clusters, mesenteric vessel changes, small-bowel obstruction, and ascites. All cases underwent emergency laparotomy for ileal resection with ileocecal valve preservation. Simultaneous anastomoses were performed in four cases; the remaining case underwent ileostomy because of prematurity. Although one case needed reoperation for postoperative bowel obstruction, all patients survived. Literature review of pediatric cTFTH showed a high frequency of necrosis (70.5%) and mortality (26.5%). Among pediatric cTFTH cases, 67.6% were aged <5 years. Mesenteric defect was <5 cm in 70% cases. We should be aware of the clinical importance and radiological features of pediatric cTFTH. Abdominal CT may provide useful information.

1. Introduction

Internal hernia is defined as a protrusion of the abdominal viscera into a normal or abnormal aperture within the abdominal cavity. Although the incidence of internal hernia has been reported to be <1% on autopsy [1], it may account for up to 5.8% of all small-bowel obstructions [2]. Transmesenteric hernia is a potentially lethal form of internal hernia, with 45% overall mortality associated with acute intestinal obstruction secondary to transmesenteric hernia [3]. Although it is difficult to make a preoperative diagnosis of internal hernia [4], any delay in diagnosis may increase patient morbidity and mortality.

Most congenital transmesenteric defects have been found near the ligament of Treitz or the ileocecal valve [1]. In 1885, Treves described an area of the mesentery near the terminal ileum circumscribed by the ileocolic artery and its last branch. Treves' field was noted to contain no fat, no blood vessels, and no lymph nodes, making it highly susceptible to injury during development. Therefore, Treves' field is considered to be highly susceptible to transmesenteric hernia. However, little is known about this rare entity in pediatric populations.

We herein report five consecutive cases of congenital Treves' field transmesenteric hernia (cTFTH). On the basis of the findings of these cases and an exhaustive literature review, we discuss preoperative diagnostic strategies for this condition.

2. Materials and methods

We treated five cTFTH cases in the Department of Pediatric Surgery of the National Hospital Organization Fukuyama Medical

* Corresponding author. Department of Pediatric Surgery, Hyogo College of Medicine, 1-1 Mukogawa-cho, Nishinomiya-shi, Hyogo 6638501, Japan. Tel.: +81 798 45 6582; fax: +81 798 45 6581.
E-mail address: saka@hyo-med.ac.jp (R. Saka).

http://dx.doi.org/10.1016/j.epsc.2015.06.013

Table 1
Demographics of patients with congenital Treves' field transmesenteric hernia.

	Case				
	1	2	3	4	5
Age	5 years	11 years	8 years	5 years	39 days
Gender	Female	Female	Female	Female	Male
Symptoms	Abdominal pain, vomiting	Abdominal pain, vomiting	Abdominal pain, vomiting	Abdominal pain, vomiting	Abdominal distention, rectal bleeding
Time from symptom onset to admission	2 days	2 days	1 day	1 day	–
Diagnosis at previous hospital	Gastroenteritis	Postoperative ileus	Bowel obstruction	Intussusception	–
Past history	None	Appendectomy	None	None	ELBW,[a] Premature delivery

[a] ELBW: extremely-low-birth-weight infant.

Center and Hyogo College of Medicine between April 2009 and December 2014. Patient demographic data, clinical presentation, radiological findings, laboratory findings, operative findings, surgical procedures, postoperative complications, and duration of postoperative hospitalization were collected from medical and operative records. Written informed consent was obtained from the parents of each patient.

A search of published literature pertaining to *(trans-)mesenteric hernia in children* was performed using the PubMed online database, using the keywords individually: *mesenteric hernia*, *transmesenteric hernia*, and *Treves' field*. The language was limited to English, but no restriction was placed on the year of publication. From the pooled search results, we selected well-described pediatric reports (patients aged <15 years), and limited them to cases with a congenital mesenteric defect localized to the *terminal ileum* or *Treves' field*. When the distance from the ileocecal valve to the defect was described, cases with lesion within <15 cm from the valve were considered to be in the terminal ileum. In addition, we excluded cases of mesenteric pouch hernia, which may be considered a separate entity from transmesenteric hernia.

3. Results

Patient demographics are presented in Table 1. Our series of patients included four females and one male. Four patients had been admitted to another hospital before referral to our hospital. Although the remaining patient (Case 4) was diagnosed with bowel obstruction and advised admission at another hospital, the family refused it because the abdominal pain was relieved spontaneously. The other three patients were diagnosed with gastroenteritis, postoperative ileus, and intussusception. In these four patients, the time from symptom onset to referral to our hospital was 1–2 days. The remaining patient (Case 5) had been hospitalized in the neonatal intensive care unit of our hospital because of prematurity.

Preoperative findings are presented in Table 2. Although four patients exhibited leukocytosis, all patients had creatinine kinase levels within normal limits and had no specific changes in any other measured parameters. Plain abdominal X-ray showed diffuse dilated bowel in two patients, and displaced intestinal gas with a gas defect in the center of the abdomen in two others. The remaining case showed only a few dilated intestinal loops on plain abdominal X-ray. Computed tomography (CT) with or without contrast enhancement was performed for the first four patients. In each case, the small bowel was dilated and clustered, and the intestinal wall was thickened. Mesenteric vessels were evaluated with CT in three cases, except in one case that had undergone barium enema at another hospital. The mesenteric vessels could be seen without contrast medium and appeared stretched, crowded, or engorged in all evaluated cases. The transition between the dilated and nondilated bowel segments was obvious in only one patient.

All cases underwent emergency operations. The duration from admission to operation was 3 h for three patients (Cases 2, 3, and 4) and 1 day for one patient (Case 1). In Case 5, the operation was

Table 2
Preoperative laboratory and radiological findings.

	Case				
	1	2	3	4	5
Laboratory findings					
WBC (/μl)	17,200	4800	26,410	14,680	14,080
Hb (g/dl)	17.0	12.2	8.5	11.4	11.6
Ht (%)	47.5	36.1	24.7	32.5	34.8
CK (IU/l)	115	131	67	116	78
CRP (mg/dl)	0.0	1.9	0.6	3.5	0.0
Plain X-ray findings	Displaced intestinal loop	Diffuse dilatation of the intestinal loop	Displaced intestinal loop	A few niveau	Diffuse dilatation of the intestinal loop
CT findings					
Cluster of intestinal loops	+	+	+	+	
Changes to the mesenteric vessels (stretching/crowding/engorgement)	+	+	+	NA[a]	
Transition between dilated and nondilated bowel	±	+	–	NA[a]	
Small-bowel obstruction	+	+	+	+	
Ascites	+	+	+	+	

WBC: white blood cell; Hb: hemoglobin; Ht: hematocrit; CK: creatinine kinase; CRP: C-reactive protein; CT: computed tomography.
[a] These findings could not be evaluated because of residual barium from a procedure at another hospital.