



Contents lists available at ScienceDirect

International Journal of Surgery Case Reports

journal homepage: www.casereports.com

A rare case report of patent vitellointestinal duct causing bowel obstruction in an adult

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ARTICLE INFO

Article history:

Received 30 May 2017

Received in revised form 12 August 2017

Accepted 13 August 2017

Available online 24 August 2017

Keywords:

Patent vitellointestinal duct
 Intestinal obstruction
 Adult patient
 Case report

ABSTRACT

INTRODUCTION: Patent vitellointestinal duct occurs in about 2% of the population which unusually leads to small intestinal obstruction associated with high morbidity and mortality. Here we are reporting an unusual case of patent vitellointestinal duct causing small intestinal obstruction in an adult patient.

PRESENTATION OF CASE: A 22-year-old male without any medical illness presented as an emergency with a 3 day history of abdominal pain, multiple episode of vomiting and abdominal distention. Distended abdomen and sign of peritonitis were found on abdominal examination. Abdominal X-rays revealed multiple small intestinal air-fluid levels. A patent vitellointestinal duct extending from distal ileum to the posterior wall of the umbilicus was found causing closed loop ileal obstruction during laparotomy. Resection of a vitellointestinal duct along with gangrenous distal ileum and cecum with ileocolostomy was performed. He was discharged on the 8th postoperative day.

DISCUSSION: Diagnosing and management of cause of intestinal obstruction in patients without history of abdominal surgery is very challenging. Early resuscitation and timely surgical intervention of intestinal obstruction due to a rare patent vitellointestinal duct can be life-saving measure.

CONCLUSION: The patent vitellointestinal duct is an uncommon entity in adults and moreover this disorder leading to intestinal obstruction is very rare. Surgeons should be aware of this infrequent cause of small bowel obstruction to allow for early diagnosis and to facilitate better patient outcomes.

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1. Introduction

Patent vitellointestinal or persistent omphalomesenteric duct is a very unusual congenital anomaly which occurs in 2% of population related with the embryonic yolk stalk [1,2]. A persistent vitellointestinal duct can induce abdominal pain, bowel obstruction, intestinal hemorrhage and umbilical sinus, fistula or hernia which commonly occurs in children [3,4]. Patent vitellointestinal duct causing intestinal obstruction is a very rare condition in an adult patient [5]. Intestinal obstruction is the main reason of morbidity and mortality everywhere in the world [6]. Intestinal obstruction due to patent vitellointestinal duct demands early, prompt diagnosis and effective operative management [7]. We have reported an extremely uncommon case of persistent vitellointestinal duct uncommonly causing small intestinal obstruction in an adult patient. This case was managed in medical college teaching hospital.

2. Case presentation

A 22-year-old male patient presented as an emergency case in our hospital with colicky abdominal pain, multiple episodes of vomiting and distention of abdomen for 3 days. Vomiting was bilious, 20–30 ml in each episode, mixed with food particles. He had not passed stool and flatus for the same duration. He denied any medical history and history of any previous abdominal surgery. There was no history of discharge from umbilicus. Family history was not significant. The patient was from countryside with no access to health center. Patient did not have any history of any medical treatment in the past 3 days.

On examination, the patient was ill looking, dehydrated. He had cold extremities and sunken eyes. Blood pressure was 100/70 mmHg, Pulse rate 110 per minute with low volume. Abdomen examination revealed gross distention, hyper-resonance with generalized tenderness. Bowel sounds were sluggish and per rectal examination revealed black tarry stool. No abnormality was detected in respiratory, cardiovascular and central nervous system. We did not find any other congenital anomalies. Patient was resuscitated with a bolus of intravenous fluid (normal saline) and antibiotics. On investigation, white blood cell count was 22000 cells/mm³, hemoglobin 12 gm/dL platelet count 110,000

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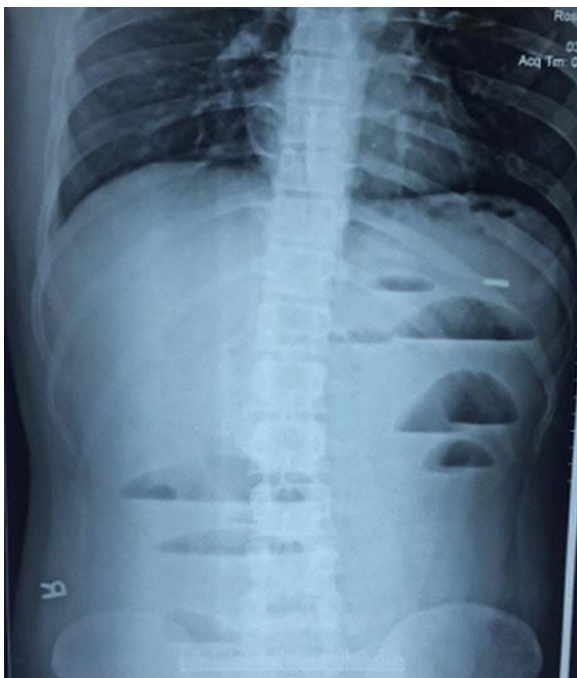


Fig. 1. Abdominal X-rays showing multiple air fluid level in small intestine.

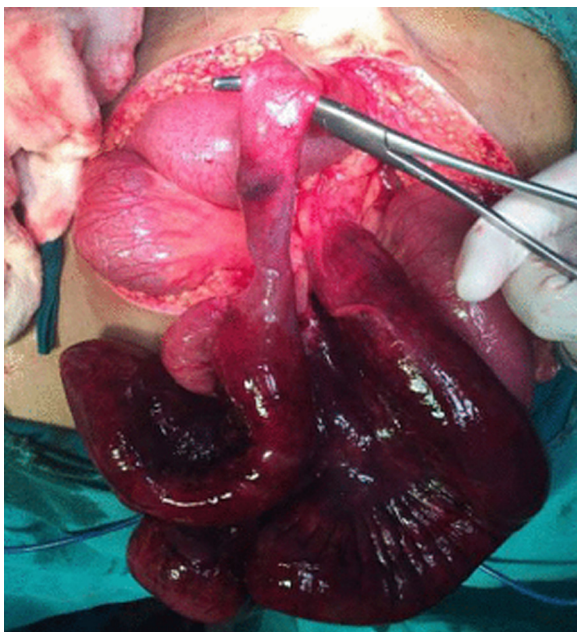


Fig. 2. Intraoperative finding showing patent omphalomesenteric duct joining umbilicus to small intestine with gangrenous ileum.

cells/mm³, serum sodium 136 mEq/L and potassium 4.8 mEq/L. Plain X-ray abdomen showed multiple small bowel air-fluid levels suggesting small intestinal obstruction (Fig. 1). Ultrasound of the abdomen revealed dilated small bowel loops. Abdominal computed tomography (CT) could not be performed due to poor economic condition of the patient. The patient was taken for laparotomy with the diagnosis of complete intestinal obstruction. During laparotomy, a patent vitellointestinal duct extending from the anti-mesenteric border of the distal ileum to the posterior wall of the umbilicus was noted causing closed loop intestinal obstruction (Figs. 2 and 3). The patent vitellointestinal duct was separated from umbilicus and the distal one-third of ileum and cecum had become

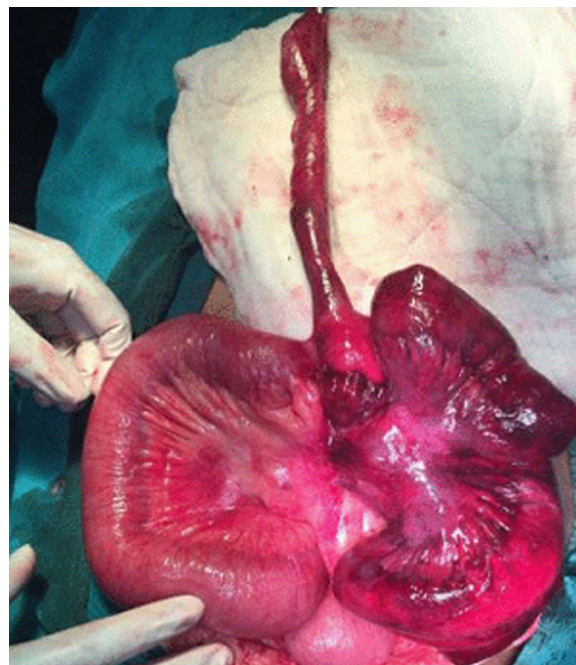


Fig. 3. Intraoperative finding showing patent omphalomesenteric duct at distal ileum which is disconnected from umbilicus.

gangrenous which was resected and ileocolostomy was performed. Post-operative period was uneventful. The patient was discharged from hospital on 8th postoperative day. Histopathology of patent vitellointestinal duct was negative for ectopic gastric and pancreatic mucosa. Ileocolostomy closure was done after six weeks on an elective basis.

3. Discussion

This case report describes an unusual presentation of persistent vitellointestinal duct causing small intestinal obstruction in an adult patient. Small intestinal obstruction is the most commonly found surgical problem of the intestine [6]. Generally patients with small bowel obstruction present with variable clinical symptoms and signs such as pain in abdomen, vomiting, constipation, abdominal distension and tenderness. Bowel adhesions associated with previous abdominal surgery is the commonest cause of mechanical small bowel obstruction [8]. Other causes of intestinal obstruction are hernia, neoplasm, malrotation, tuberculosis and inflammatory bowel diseases. Similarly, it is very tough to diagnose and manage those patients with no history of abdominal surgery.

Early and meticulous diagnosis of intestinal obstruction and its causes is essential for proper treatment. The precise treatment and timing of the surgery remains debatable. Though, the initial resuscitation part of the bowel obstruction is standard and independent of the etiology, fluid and electrolyte replacement, restriction of oral intake, and free nasogastric drainage is the vital parts of supportive care of patients with intestinal obstruction. Broad-spectrum antibiotics should be prescribed in all patients because of concerns that bacterial translocation may occur or as a prophylaxis for possible resection.

Conservative or nonsurgical treatment is effective and safe method, mainly for adhesive small intestinal obstruction [5,9]. Though there is no history of an abdominal surgery and no resolution of the obstruction findings, greater attention is mandatory. Early and prompt diagnosis is especially important for the hazardous closed loop type obstruction in which a segment of intestine is obstructed both distally and proximally. This increases the lumi-

nal pressure and leads to bowel ischemia [10]. Small bowel volvulus is one of the usual causes of closed loop obstruction. Thus, early surgery prevents the strangulation of the intestinal loops. The literature on persistent vitellointestinal duct causing intestinal obstruction is extremely rare disorder in adults with very few reports reported sporadically [11]. Ali Guner et al. recently reported persistent vitellointestinal duct as a rare cause of intestinal obstruction in an adult [12].

Embryologically vitellointestinal tract comprises of three structures: the vitelline duct, artery, and vein. During early phases of development, the yolk sac acts as a prime source of nutrition for the quickly growing fetus. The vitellointestinal duct is the developing structure joining the primary yolk sac to the developing midgut during fetal enlargement. Typically, at the 5th-10th wk of gestation, it turns out to be a thin fibrous band that spontaneously obliterates and separates from the intestine. Partial or complete failure of abolition of vitellointestinal duct may lead to diverse type of congenital intestinal malformations comprising; Meckel's diverticulum, vitelline cord, umbilical sinus, enteric fistula and haemorrhagic umbilical granuloma. Whereas Meckel's diverticulum is the most common of these residual structures (2% of the population), existence of a fibrous cord from the small intestine to the surface of the umbilicus. This disorder remains asymptomatic in adults, unlike to children [3].

Though rare, Intestinal obstruction is one of the complications of vitellointestinal duct, occurs due to numerous mechanisms including intussusception of the diverticulum, internal herniation or volvulus from a patent band as in our patient. It is very challenging to know the reasons of the intestinal obstruction without diagnostic laparotomy or laparoscopy. Plain X-ray abdomen and ultrasonography are non-specific for small bowel obstruction [13]. Computerized tomography can correctly diagnose patent vitellointestinal duct showing the band between umbilicus and the small bowel. But the accessibility in a resource poor setting and its application in unaffordable patients is quiet challenging [14]. In our study, we did not perform computerized tomography. Both the plain radiographs and the abdominal ultrasonography did not give proper clue for diagnosis. However, diagnosis was made during laparotomy. Generally, surgical excision of the fibrotic band may be satisfactory. If intestine is gangrenous, intestinal resection should be considered like in our case. Many studies have mentioned different approaches for symptomatic persistent vitellointestinal duct such as open surgical excision or laparoscopic excision [15,16].

Laparoscopic surgery is evolving as a favorable management for uncomplicated persistent vitellointestinal duct causing lower morbidity and less hospital stay, however, open laparotomy is also a well-known treatment [17,18]. Our patient had undergone exploratory laparotomy and resection of persistent omphalomesenteric duct along with gangrenous ileum and cecum with ileocolostomy.

4. Conclusion

Patent vitellointestinal duct is an uncommon entity in adults and moreover this disorder leading to intestinal obstruction as a complication is very unusual. However, it is very tough to diagnose clinically. Surgeons should be aware of this infrequent cause of small bowel obstruction to facilitate better patient outcomes. This case has been reported according to SCARE criteria for case reports [19].

Competing interests

All authors declare that they have no competing interests.

Funding

There are no sponsors involved in the study.

Ethical approval

As this is a case report, informed consent has been taken from the patient.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

Authors' contributions

Tika Ram Bhandari- Study concept or design, data collection, literature search, writing paper, final decision to publish.

Sudha Shahi- Literature search, writing paper, final decision to publish.

Manish Gautam – Study concept or design, data collection, literature search, final decision to publish.

Sanjay Pandey – Study concept or design, data collection, literature search, final decision to publish.

Guarantor

Tika Ram Bhandari.

Acknowledgements

We would like to thank our patient for allowing permission to publish the case.

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