



Persistent Vitellointestinal Duct Causing Bowel Obstruction in an Adult Treated by Laparoscopic Assisted Surgery

Anushtup De^{1*} and Rukhsar Ahmed¹

¹QRG Central Hospital and Research Centre, Faridabad, India.

Authors' contributions

This work was carried out in collaboration between both authors. Author AD did concept, writing and final review of manuscript. Author RA did literature search, collection of data and writing of manuscript. Both authors read and approved the final manuscript.

Article Information

Editor(s):

(1) Dr. Georgios Tsoulfas, Associate Professor, Aristotle University of Thessaloniki, Thessaloniki, Greece.

Reviewers:

(1) Einar Arnbjörnsson, Lund University and Skane University Hospital, Sweden.

(2) Nicola Basso, Sapienza University of Rome, Italy.

Complete Peer review History: <https://sdiarticle4.com/review-history/52126>

Case Study

Received 03 August 2019

Accepted 18 October 2019

Published 24 October 2019

ABSTRACT

Aims: A persistent vitellointestinal duct is a rare finding, typically occurring in the pediatric population. Most commonly presenting as Meckel's diverticulum, it is extremely rare for it to present as intestinal obstruction in the adult population.

Presentation: The present case report describes a 20 years old male presenting with features of small bowel obstruction due to obliterated fibrous remnant of the duct extending from the umbilicus to the terminal part of the ileum. Early resuscitation and timely intervention ensured that the patient was managed by laparoscopic assisted resection of the vitellointestinal duct and involved ileal segment followed by quick recovery.

Discussion: Intestinal Obstruction due to persistent vitellointestinal duct is an uncommon and very challenging preoperative diagnosis. While in few such case reports they have been managed by laparotomy and sometimes requiring resection of gangrenous small bowel, very rarely it has been treated laparoscopically. The clinical presentation and investigation justified early diagnostic laparoscopy in our patient which enabled a laparoscopic assisted bowel resection with lower morbidity, decreased hospital stay and early return to work.

*Corresponding author: E-mail: anushtup.de@gmail.com;

Conclusion: Diagnosis and management of intestinal obstruction in an adult without history of previous surgery can be challenging. Surgeons must be aware of this uncommon cause of small bowel obstruction to ensure prompt management and better patient outcome.

Keywords: Vitellointestinal duct; Meckel's diverticulum; small bowel obstruction.

1. INTRODUCTION

Intestinal Obstruction is a common surgical emergency and a major cause of morbidity and hospital costs worldwide [1,2]. It usually requires quick and correct diagnosis followed by rational and effective surgical management in certain cases [2,3]. Although small bowel obstruction is common, persistent vitellointestinal duct as a cause of this condition is a rare and exceptional finding.

A vitellointestinal duct remnant is one of the rare congenital abnormalities associated with primitive yolk stalk. It commonly presents as Meckel's diverticulum and very infrequently as a persistent vitellointestinal duct [4,5]. The most frequent symptoms of a vitellointestinal duct remnant include abdominal pain, melena, umbilical hernia or discharge and intestinal obstruction and they presents usually in childhood [4,6].

We present a 21 years old male patient who was admitted with intestinal obstruction due to persistent vitellointestinal duct which was

managed by laparoscopic assisted segmental resection of the involved ileum in our institution.

2. CASE REPORT

A 21 years old male without any medical history or any previous abdominal surgery presented with complaints of severe abdominal pain and distension since 3–4 days. There was associated history of multiple episodes of vomiting and obstipation since 2 days. On examination, abdomen was distended with mild generalized tenderness, without any guarding or rigidity. Blood investigations showed hemoglobin – 12.0 g/dl, Total leucocyte count – 6.4×10^3 /microL , blood urea – 26 mg/dl , Serum creatine – 0.75 mg/dl. Coagulation parameters were normal. Abdominal X ray showed features of small bowel obstruction with multiple air fluid levels (Fig. 1). Ultrasonography abdomen showed well defines tubular blind-ended non peristaltic hypoechoic structure in right paraumbilical region with minimum free fluid in right iliac fossa and increased surrounding mesenteric echogenicity. CT scan abdomen with Intravenous contrast showed fluid filled mild



Fig. 1. X-ray abdomen erect: Showing multiple air fluid levels

prominent small bowel loops suggestive of subacute intestinal obstruction. Bulky appendix approx. 14 mm associated with adjacent mesenteric fat stranding and minimal free fluid in pelvis.

The patient was taken up for surgery—Diagnostic laparoscopy and proceed under general anaesthesia. Intraoperative findings showed distended small bowel loops with rotated bowel on the patent vitellointestinal duct from the antimesenteric border of the terminal ileum to the posterior wall of umbilicus causing rotation of

bowel and intestinal obstruction. (Fig. 2). However the small bowel was viable. The duct was separated from umbilicus on laparoscopy. The small bowel was untwisted and the involved ileal segment was delivered outside through a right iliac fossa skin crease incision. The segment of ileum and persistent Vitellointestinal duct examined. There was induration at its base and therefore it was excised with a segment of ileum (Fig. 3) .A hand sewn double layer anastomosis was then done for primary closure. Postoperative period was uneventful. The patient was discharged on 6 th postoperative day.

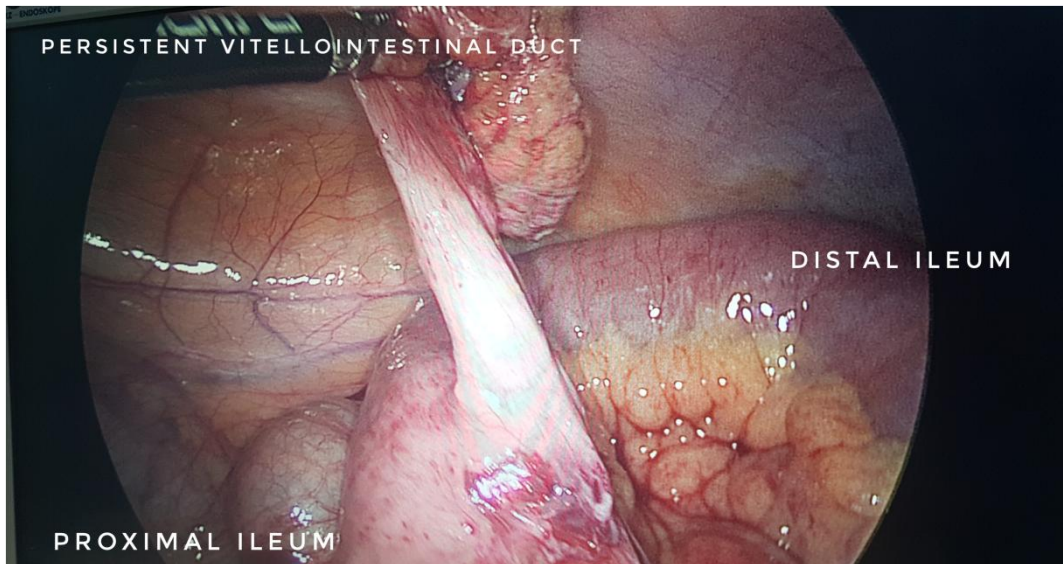


Fig. 2. Laparoscopic finding of persistent vitellointestinal duct

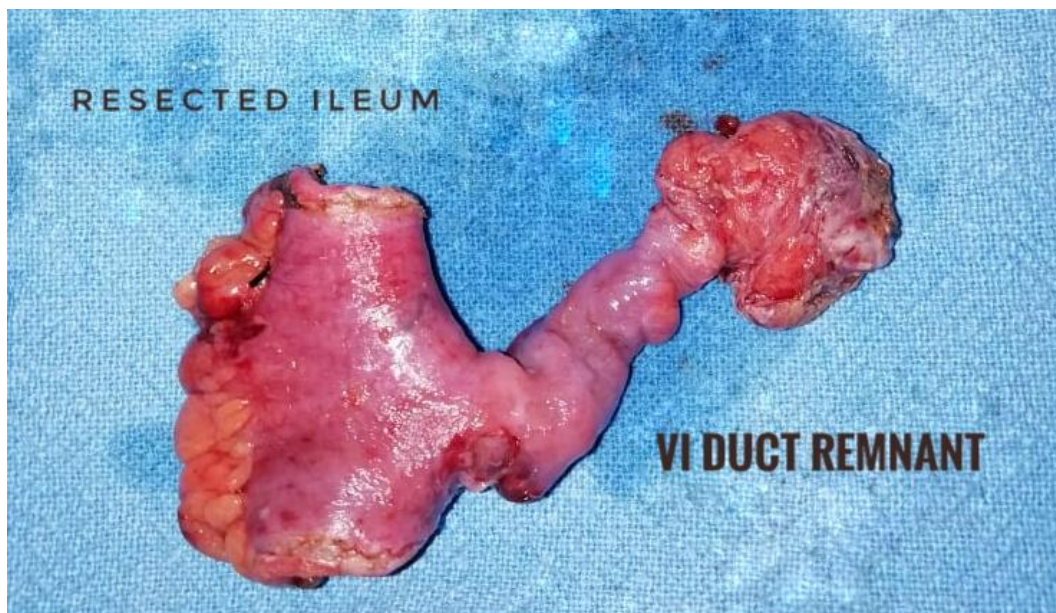


Fig. 3. Resected specimen of vitellointestinal duct with ileum

3. DISCUSSION

Acute mechanical small bowel obstruction is a common surgical emergency. Early and proper diagnosis of intestinal obstruction and its causes is important for prompt and proper treatment with quick recovery. The initial resuscitation part is independent of etiology and includes fluid and electrolyte replacement, naso-gastric drainage and broad spectrum antibiotics as a vital part of supportive care in such patients. Conservative or non-surgical treatment is effective and safe mainly for postoperative adhesive intestinal obstruction [2].

In patients with no previous history of abdominal surgery, greater attention is mandatory for early identification of cause. Incarcerated hernia, neoplasms, tuberculosis and inflammatory bowel diseases are frequent causes in such patients. Rare causes include gallstone ileus, bowel volvulus and intussusception accounting for 2–14% of causes of small bowel obstruction. Intestinal obstruction due to persistent vitellointestinal duct, particularly in adult patients is extremely rare with few cases reported sporadically in literature.

The vitellointestinal duct, embryologically, consists of three structures: The vitelline duct, artery and vein. The yolk sac acts as a primary source of nutrition for the quickly growing foetus in the early phases of development. The vitellointestinal duct is the developing structure joining the primary yolk sac to the developing midgut during fetal enlargement. Usually, 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.

Small bowel obstruction due to persistent vitellointestinal duct can be caused by many mechanisms that include intussusception, internal herniation or volvulus [7-11]. It can be very challenging to diagnose such cases without diagnostic laparoscopy or laparotomy. X ray abdomen and ultrasonography is usually nonspecific in such patients with small bowel obstruction [12]. On a CT scan, a diagnosis can only be possible with certainty when the Meckel's diverticulum is visualized. In cases where

Meckel's diverticulum is not visualized but the obstructive processes are visualized in the lower abdomen or pelvis, particularly near the midline, intestinal obstruction caused by Meckel's diverticulum should be kept in mind [13].

In our patient, ultrasonography was done, which it did not give proper clue to the diagnosis. However, as there was no history of previous surgery and no resolution of obstructive symptoms and in view of CT scan findings suggesting the possibility, an early diagnostic laparoscopy was justified. The diagnosis was confirmed on laparoscopy. The small intestines, though dilated, were viable. This enabled a laparoscopic assisted bowel resection with lower morbidity, decreased hospital stay and early return to work.

The sporadic cases of intestinal obstruction due to persistent vitellointestinal duct reported in literature have been managed usually with exploratory laparotomy occasional requiring resection of gangrenous bowel. [8,10,14,15] However in rare instances, diagnostic laparoscopy have been proved useful for a safe and effective management in such patients. [6,16]. Therefore, appropriate management of intestinal obstruction requires careful assessment and appropriate treatment depending on the cause to prevent complications.

In patients with no history of previous surgery and no resolution of obstructive symptoms, laparoscopic surgery may prove to be useful with lower morbidity, decreased hospital stay and early return to work.

4. CONCLUSION

Persistent vitellointestinal duct is an uncommon finding in adult and very rarely does it present with intestinal obstruction. It is difficult to diagnose both clinically and radiologically. However in a patient with no history of previous surgery and an uncertain diagnosis on radiology, this possibility must be kept in mind as early intervention and laparoscopic management can facilitate better patient outcome.

CONSENT

As per international standard or university standard, patient's written consent has been collected and preserved by the authors.

ETHICAL APPROVAL

As per international standard written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Mucha P. Jr. Small intestinal obstruction. *Surg Clin North Am.* 1987;67(2):597-620.
2. Miller G, Boman J, Shrier I, Gordon PH. Natural history of patients with adhesive small bowel obstruction. *Br. J. Surg.* 2000; 87(9):1240–1247.
3. Miller G, Boman J, Shrier I, Gordon PH. Etiology of small bowel obstruction. *Am J Surg.* 2000;180:33-36
4. Vane DW, West KW, Grosfeld JL. Vitelline duct anomalies: experience with 217 childhood cases. *Arch. Surg.* 1987;122(5): 542–547.
5. Moore TC. Omphalomesenteric duct malformations. *Semin Pediatr Surg.* 1996; 5:116-123
6. Jalil O, Radwan R, Rasheed A, Nutt MR. Congenital band of the vitelline artery remnant as a cause of chronic lower abdominal pain in an adult: case report. *Int. J. Surg. Case Rep.* 2012;3(6): 207–208.
7. Herman M, Gryspeerdt S, Kerckhove D, Matthijs I, Lefere P. Small bowel obstruction due to a persistent omphalomesenteric duct. *JBR-BTR.* 2005; 88:175-177
8. Amendolara M, Pasquale S, Perri S, Carpentieri L, Errante D, Biasiato R. Intestinal occlusion caused by persistent omphalomesenteric duct and Meckel's diverticulum: report of 2 cases. *Chir Ital.* 2003;55:591-595.
9. Armstrong O, Karayuba R. A rare cause of intestinal obstruction revealed during pregnancy (Kamege University Hospital Center, Bujumbura, Burundi). *Med Trop (Mars).* 1993;53:93-99.
10. Bedard CK, Ramirez A, Holsinger D. Ascending colon volvulus due to a vitelline duct remnant in an elderly patient. *Am J Gastroenterol.* 1979;71:617-620.
11. Gumport SL, Aronson SG. Acute intestinal obstruction secondary to Meckel's diverticulum with persistent obliterated omphalomesenteric duct. *Am J Surg.* 1959;97:225-228.
12. Dames EL, Hamouda ESM. Radiologic Imaging in Meckel Diverticulum Complications. *J. Med. Ultrasound.* 2015; 23(3):133–141.
13. Won Y, Lee HW, Ku YM, Lee SL, Seo KJ, Lee JI. Multidetector-row Computed Tomography (MDCT) features of Small Bowel Obstruction (SBO) caused by Meckel's diverticulum. *Diagn. Interv. Imaging.* 2016;97(2):227–232.
14. Maheshwari V, Ramakrishnan TS, Trehan V. Persistent omphalomesenteric duct causing small bowel obstruction in an adult. *Indian J Surg.* 2013;75(Suppl 1):86-7.
15. Tika Ram Bhandari, Sudha Shahi, Manish Gautam and Sanjay Pandeya. A rare case report of patent vitellointestinal duct causing bowel obstruction in an adult. *Int J Surg Case Rep.* 2017;39:231–234.
16. Bueno Lledó J1, Serralta Serra A, Planeís Roig M, Dobón Giménez F, Ibáñez Palacín F, Rodero Rodero R. Intestinal obstruction caused by omphalomesenteric duct remnant: Usefulness of laparoscopy. *Rev Esp Enferm Dig.* 2003;95(10):736-8,733-5.

© 2019 De and Ahmed; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:

The peer review history for this paper can be accessed here:

<https://sdiarticle4.com/review-history/52126>