

Patent Vitellointestinal Duct causing bowel obstruction in an Adolescent patient- A rare case report

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Abstract: The omphalomesenteric duct (OMD) more commonly referred as vitelline duct/ vitellointestinal duct is a remnant of the embryonic yolk sac and is considered a very unusual congenital anomaly occurring in less than 2% of population where it persists as embryonic yolk stalk. Patent vitellointestinal duct causing intestinal obstruction is a very rare condition in an adolescent patient. We have reported an extremely uncommon case of persistent vitellointestinal duct uncommonly causing small intestinal obstruction in an adolescent age group where exploratory laparotomy was performed which showed dilated jejunum and proximal ileum with collapsed distal ileum because of a presence of a unobliterated vitelline duct extending from the anti-mesenteric border of the ileum around 95 cms from ileocolic junction to the posterior wall of the umbilicus was noted with twisting of distal loop. Omphalomesenteric duct remnants being congenital are associated with the primitive yolk stalk which normally becomes a thin fibrous band, and eventually disintegrates and is absorbed spontaneously by 5th -9th week of gestation. Any failure in disintegration and absorption may lead to growing of the duct resulting in various anomalies as: Meckel's diverticulum (most common), patent omphalomesenteric duct or umbilicoileal fistula, umbilical sinus, umbilical cyst, umbilical mucosal polyp or a fibrous cord connecting the ileum to the umbilicus. In the reported case, since there was no history of previous abdominal operation and no resolution of the obstruction or improvement of the clinical picture of the patient was observed after a trail of conservative management, an operative intervention was decided. It should be kept in mind as a possible cause, in young patients presenting with acute mechanical small bowel obstruction without any previous history of surgery. Immediate intervention is to be implemented in order to reduce the mortality and morbidity.

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I. Introduction

The omphalomesenteric duct (OMD) more commonly referred as vitelline duct/ vitellointestinal duct is a remnant of the embryonic yolk sac and is considered a very unusual congenital anomaly occurring in less than 2% of population where it persists as embryonic yolk stalk^{1,2}. Most omphalomesenteric duct remnants tend to be Meckel's diverticulum while the occurrence of a persistent omphalomesenteric duct is infrequent. A persistent vitellointestinal duct can induce abdominal pain, bowel obstruction, intestinal hemorrhage and umbilical sinus, fistula or hernia which commonly occurs in infants^{3,4}. Patent vitellointestinal duct causing intestinal obstruction is a very rare condition in an adolescent patient⁵. We have reported an extremely uncommon case of persistent vitellointestinal duct uncommonly causing small intestinal obstruction in an adolescent age group.

II. Keywords

Vitellointestinal {omphalo-mesenteric (OMD)} duct, Meckel's diverticulum, small bowel obstruction

III. Case Presentation

A 15yr old male presented with complaints of generalized pain abdomen along with bilious vomiting for the last 5 days, associated with abdominal distension and obstipation since last 4 days. He did not give any history of previous hospital admission or any operative/ medical history. He even denied any complain of discharge from umbilicus. Family and personal history was insignificant. On examination the patient was ill, dehydrated with blood pressure measuring 110/70mm Hg and pulse rate being 116 per min with low volume. On Per Abdomen examination- abdomen was distended but soft, with tenderness in central part of the abdomen. There was no guarding/ rigidity, hyperdynamic bowel sounds were present (Fig 1). On per-rectal (p/r) examination fecal staining was observed. Patient was resuscitated with wide bore IV lines, using crystalloids, nasogastric tube and foley's catheter inserted. After a conservative treatment for 24 hours abdominal distension increased with tenderness and guarding all over the abdomen with absent bowel sounds, p/r being empty with ballooning. On routine Blood investigations hemoglobin was 12.2gm% with white blood cell count of

19000cells/mm³ and platelet count of 160,000cells/mm³. His renal functions were mildly deranged. Abdominal erect skiagram was suggestive of dilated small bowel loops with significant air fluid levels giving an impression of acute small bowel obstruction. Ultrasound of abdomen was done which revealed dilated bowel loops with minimal inter-bowel free fluid suggestive of intestinal obstruction. Emergency exploratory laparotomy was performed which showed dilated jejunum and proximal ileum with collapsed distal ileum because of a presence of a unobliterated vitelline duct extending from the anti-mesenteric border of the ileum around 95 cms from ileocolic junction to the posterior wall of the umbilicus was noted with twisting of distal loop (Fig 2). The persistent vitello-intestinal duct was separated from the anterior abdominal wall and small gut was untwisted and duct was excised with anastomosis of the remaining bowel in two layers. Enlarged mesenteric lymph nodes were present and was excised (Fig 3) and sent for histopathological examination with the remaining specimen (Fig 4). Drain was placed and abdomen was closed in layers. Post-operative period was uneventful. Patient was discharged on 12th post-op day after suture removal. Histopathology reports confirmed the finding of persistent vitello-intestinal duct with reactive hyperplastic lymph nodes.

IV. Discussion

Incidence of small bowel obstruction is quite common in surgical practice^{7,9}. Prompt and accurate diagnosis of such a condition is of utmost importance in decreasing the morbidity and mortality⁽⁸⁾. The clinical picture is very decisive as many patients present with variable etiology of obstruction for which appropriate management remains controversial^{1,6,9,16}. Large number of patients with small bowel obstruction presents with abdominal pain, nausea and vomiting, constipation, abdominal distention and tenderness of variable degree. About 45-80% population presenting with intestinal obstructions were observed to have adhesions^{6,7,10,11} whereas the rest have either adhesions, incarcerated hernias, and large bowel tumours. Crohn's disease, bowel volvulus, and intussusception constitutes about 2-14% of the other known causes of small bowel obstruction especially in children^{6,10,11}. Small bowel obstruction, however, due to persistent omphalomesenteric duct, particularly in an adolescent age group, is extremely rare with very few cases reported in world literature^{12,13,14,15}. Omphalomesenteric duct remnants (vitelline duct anomalies) have been reported to be congenital anomalies associated with the primitive yolk stalk^{2,3}. It is the embryonic structure connecting the primary yolk sac to the embryonic midgut which normally becomes a thin fibrous band, and eventually disintegrates and is absorbed spontaneously by 5th -9th week of gestation^{2,3}. Any failure in disintegration and absorption may lead to growing of the duct resulting in various anomalies as: Meckel's diverticulum, patent omphalomesenteric duct or umbilicoileal fistula, omphalomesenteric duct/umbilical sinus, omphalomesenteric duct/umbilical cyst, umbilical mucosal polyp or a fibrous cord connecting the ileum to the umbilicus^{8,14,15}. Out of the above mentioned anomalies Meckel's diverticulum remains the most common and may persist in approximately 2% of the infants with a higher male preponderance whose exact reason is unknown. Even though they may be asymptomatic, however 85% of infants younger than 1 month and 77% of children aged 1 month to 2 years have a symptomatic presentation which includes abdominal pain, rectal bleeding, intestinal obstruction, umbilical drainage, and umbilical hernia. Some of the well known theories for the mechanism of obstruction in cases with persistent OMD includes intussusception, in case of a patent omphalomesenteric duct, volvulus or internal hernia (closed loop obstruction) from a patent omphalomesenteric duct or a fibrous connection between the umbilicus and the ileum^{1,2,3}. A fibrous cord connecting the umbilicus to the ileum, such as in the presented case, results from an atrophic omphalomesenteric duct that is not completely obliterated and absorbed^{10,12,14,15}. In a nutshell, appropriate management of small bowel obstruction as well as timing of surgery still remains controversial^{6,7,9,10,16}. Conservative strategies are effective and safe methods especially for adhesive small bowel obstructions^{17,18}. However, if there is no history of an abdominal operation and no resolution of the obstruction findings, greater caution is required. Early diagnosis is especially important for the dangerous form of the obstruction, mainly the closed loop type obstruction, in which a segment of intestine obstructed both distally and proximally leads to rapid rise in the luminal pressure, and progresses to strangulation. In the reported case, since there was no history of previous abdominal operation and no resolution of the obstruction or improvement of the clinical picture of the patient was observed after a trial of conservative management, an operative intervention was decided. Operative findings and following management did very well justice to our patient.

V. Conclusion

Persistent omphalomesenteric duct constitutes an extremely infrequent cause of small bowel obstruction in adolescent age group, with very few cases reported in the literature. It should be kept in mind as a possible cause, in young patients presenting with acute mechanical small bowel obstruction without any previous history of surgery. Immediate intervention is to be implemented in order to reduce the mortality and morbidity.

References

- [1]. F. Sawada, R. Yoshimura, K. Ito, K. Nakamura, H. Nawata, K. Mizumoto, et al., Adult case of an omphalomesenteric cyst resected by laparoscopic-assisted surgery, *World J. Gastroenterol.* 12 (5) (2006) 825.
- [2]. T.C. Moore, Omphalomesenteric duct malformations, *Seminars in Pediatric Surgery* [Internet] (1996) 116–123 [cited 2017 May 22].
- [3]. D.W. Vane, K.W. West, J.L. Grosfeld, Vitelline duct anomalies: experience with 217 childhood cases, *Arch. Surg.* 122 (5) (1987) 542–547.
- [4]. O. Jalil, R. Radwan, A. Rasheed, M.R. Nutt, 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.* 3 (6) (2012) 207–208.
- [5]. H. Markogiannakis, D. Theodorou, K.G. Toutouzas, P. Drimousis, S.G. Panoussopoulos, S. Katsaragakis, Persistent omphalomesenteric duct causing small bowel obstruction in an adult, *World J. Gastroenterol.* 13 (15) (2007) 2258.
- [6]. Miller G., Boman J., Shrier I., Gordon P.H. — Etiology of small bowel obstruction. *Am J Surg.* 180: 33-36, 2000.
- [7]. Mucha P. Jr. — Small intestine obstruction. *Surg Clin North Am.* 67:597-620, 1987
- [8]. Cheadle W.G., Garr E.E., Richardson J.D. — The importance of early diagnosis of small bowel obstruction. *Am Surg.* 54: 565-569, 1988.
- [9]. Miller G., Boman J., Shrier I., Gordon P.H. — Natural history of patients with adhesive small bowel obstruction. *Br J Surg.* 87:1240-1247, 2000.
- [10]. Bizer L.S., Liebling R.W., Delany H.M., Gliedman M.L. — Small bowel obstruction: the role of nonoperative treatment in simple intestinal obstruction and predictive criteria for strangulation obstruction. *Surgery.* 89: 407-413, 1981.
- [11]. McEntee G., Pender D., Mulvin D., McCullough M., Naeeder S., Farah S., Badurdeen M.S., Ferraro V., Cham C., Gillham N. — Current spectrum of intestinal obstruction. *Br J Surg.* 74: 976-980, 1987.
- [12]. Amendolara M., Pasquale S., Perri S., Carpentiere L., Errante D., Biasiato R. — Intestinal occlusion caused by persistent omphalomesenteric duct and Meckel's diverticulum: report of 2 cases. *Chir Ital.* 55: 591-595, 2003.
- [13]. Bueno Lledo J., Serralta Serra A., PlaneisRoig M., Dobon Gimenez F., Ibanez Palacin F., Rodero R. — Intestinal obstruction caused by omphalomesenteric duct remnant: usefulness of laparoscopy. *Rev Esp Enferm Dig.* 95: 736-738, 2003.
- [14]. Gumpert S.L., Aronson S.G. — Acute intestinal obstruction secondary to Meckel's diverticulum with persistent obliterated omphalomesenteric duct. *Am J Surg.* 97: 225-228, 1959.
- [15]. Herman M., Gryspeerdt S., Kerckhove D., Matthijs I., Lefere P. — Small bowel obstruction due to a persistent omphalomesenteric duct. *JBR-BTR.* 88: 175- 177, 2005.
- [16]. Williams S.B., Greenspon J., Young H.A., Orkin B.A. — Small bowel obstruction: conservative vs. surgical management. *Dis Colon Rectum.* 48: 1140-1146, 2005.
- [17]. Sarraf-Yazdi S, Shapiro ML. Small bowel obstruction: the eternal dilemma of when to intervene. *Scand J Surg* 2010;99:78-80
- [18]. Markogiannakis H, Theodorou D, Toutouzas KG, Drimousis P, Panoussopoulos SG, Katsaragakis S. Persistent omphalomesenteric duct causing small bowel obstruction in an adult. *World J Gastroenterol* 2007;13:2258-60

IMAGES



Fig 1. Plain film shows multiple loops of dilated small bowel and air-fluid levels.



Fig 2. Intraoperative image showing patent vitellointestinal duct

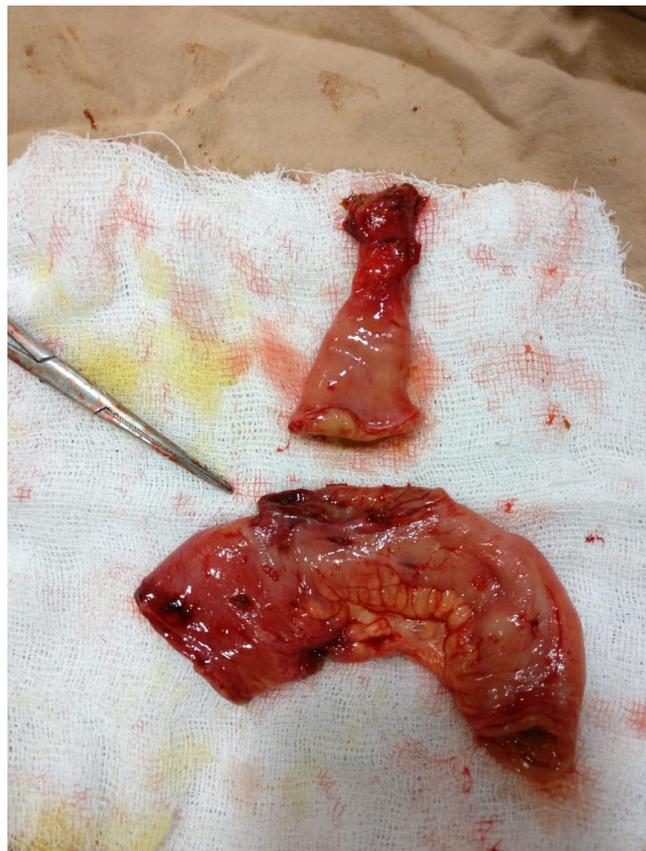


Fig 3. Excised specimen of the vitelline duct with the ileal segment with ischemic changes

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Histopathology Report

Specimen: EXCISED VITELLO-INTESTINAL DUCT & LYMPH NODE

Details: Vitello intestinal duct with strictures

Gross: (All specimens received in single container)

EXCISED DUCT - The specimen received in two fragments one measuring 8 cms, other measuring 3 cms with separately lying single lymph node measuring 0.8 cms. Outer surface is congested. On opening, mucosa unremarkable. Representative pieces taken for embedding (A1 & A2) Random section - 2C, (B) Lymph node - 1C.

LYMPH NODE - The specimen consists of single lymph node measuring 0.8 x 0.8 cms. Entire pieces taken for embedding in 1 cassette (C).

Specimen Grossed by: Dr. Ankit Aggarwal

Microscopic: 1) Multiple sections from duct examined.
These are lined by ileal mucosa. Submucosa show edema, congestion and chronic inflammation.
Serosal layer show congestion.
Lymph node shows reactive hyperplasia.
There is no evidence of granulomatous pathology or malignancy.

2) Lymph node shows features of reactive hyperplasia.

Impression: I) Excised duct - Histology is consistent with inflamed Vitellointestinal duct.
II) Lymph node - Reactive Hyperplasia.

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These reports are opinions. These should be correlated with clinical findings.

Fig 4. Histopathological report of the patient suggestive of vitelline duct with reactive hyperplasia , without any evidence of meckels diverticulum

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