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Vitellointestinal Duct Remnant Inducing Small Bowel Obstruction in an Adult: An Unusual Entity

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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Case Report

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ABSTRACT

Introduction: Vitellointestinal Duct is an embryonic communication between the primitive yolk sac and the developing midgut which normally obliterates by weeks 5–10 of intrauterine life. Persistent duct can present as varied anatomical entities. Here, we report a case of small bowel obstruction due to Vitellointestinal duct remnant in an adult patient.
Presentation of Case: An adult male patient presented to the emergency room with features suggestive of acute intestinal obstruction which upon laparotomy was found to be due to volvulus around Vitellointestinal duct cyst.
Discussion: Vitellointestinal duct remnants can present as Meckel's diverticulum, Patent vitellointestinal duct, Vitellointestinal sinus, Vitellointestinal cyst, Vitellointestinal mucosal polyp, Vitellointestinal fibrous band. Usually Asymptomatic in adults, when symptomatic can cause abdominal pain, rectal bleeding, small bowel obstruction, umbilical discharge which commonly occurs in children.
Conclusion: Although small bowel obstruction is a common surgical diagnosis, its aetiology never fails to surprise the operating surgeon. Persistent vitellointestinal duct can be considered as a possible etiology in patients with no past history of surgery and non-specific radiological findings for early diagnosis and better patient outcome.

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Keywords: Small Bowel obstruction; persistent vitellointestinal duct; vitellointestinal cyst.

1. INTRODUCTION

Intestinal obstruction can be defined as non-occurrence of normal propulsion and passage of its contents due to various reasons [1]. Small intestinal obstruction is a common intra-abdominal emergency and a vital cause of morbidity [2,3]. Morbidity and mortality due to small bowel obstruction increases when there is an undue delay between onset of symptoms to definitive surgery [4]. Adhesion disease is the most common cause of mechanical small bowel obstruction in developed countries [5]. Common causes of small bowel obstruction in a virgin abdomen are hernia, large bowel cancer, small bowel tumor, inflammatory bowel disease [5,6]. A persistent vitellointestinal duct can induce abdominal pain, bowel obstruction, intestinal hemorrhage, umbilical discharge or hernia which commonly occurs in children [7,8]. Here, we report a case of vitellointestinal duct cyst causing small intestinal obstruction in an adult patient.

2. PRESENTATION OF CASE

A 24 years old male patient, mason by occupation presented to the emergency room with the history of pain abdomen and vomiting for 1 day. Pain was sudden in onset, colicky type, more around the umbilicus, non-radiating, associated with 15-20 episodes of non-bilious vomiting. There was no history of discharge from umbilicus. No history of previous abdominal surgeries.

History of similar complaints was present 1 year ago but conservatively managed. Patient did not have any other co morbidities. On examination, pulse rate was 86 beats/minute, Blood pressure - 110/72 mmhg and Respiratory rate – 12 per minute. Abdomen was tense on palpation, tenderness and guarding were present around the umbilicus. On Per rectal examination, non-blood-stained stool staining was present. Abdominal plain radiograph in erect position (Fig-1) showed multiple air fluid levels and dilated small bowel loops.

Following which a diagnosis of small bowel obstruction was made. Patient was started on Intravenous fluids and kept nil by mouth. Nasogastric tube was inserted and continuous aspiration of contents done. Patient's vital parameters such as pulse rate, blood pressure, respiratory rate, and urine output were monitored.

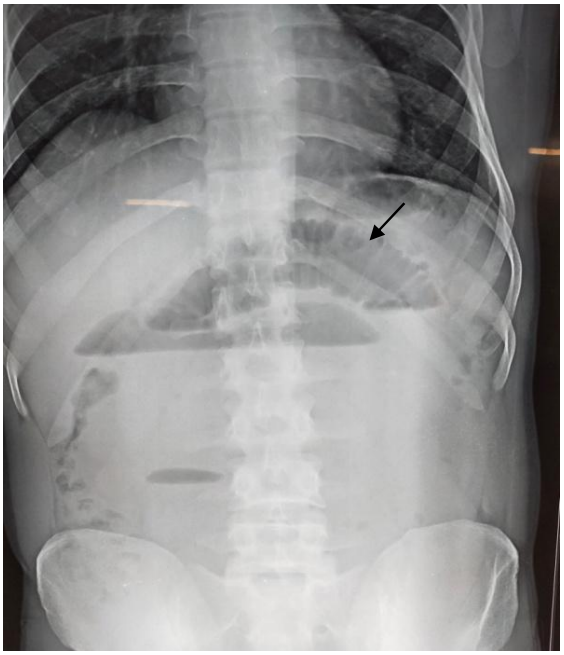

Fig. 1. Erect X-ray abdomen showing multiple air fluid levels and dilated small bowel loops (Black arrow)

Ultrasonography of abdomen showed dilated small bowel loops with maximum diameter of 3.4cms with increased peristalsis, features suggestive of small bowel obstruction. Biochemical and hematological blood investigations were within normal limits. CECT of abdomen and pelvis could not be done due patient's financial constraints and obstruction on X-ray prompted early intervention, although CECT abdomen and pelvis would have been a valuable adjunct. Patient was taken up for surgery, exploratory laparotomy was done under general anaesthesia.

Intra-operative findings revealed Vitelloinstetinal duct cyst from the antimesenteric border of the terminal ileum within 2 feet of ileocecal junction to the posterior wall of umbilicus causing rotation of bowel. Dilated jejunum and ileum seen with good vascularity (Fig. 2).

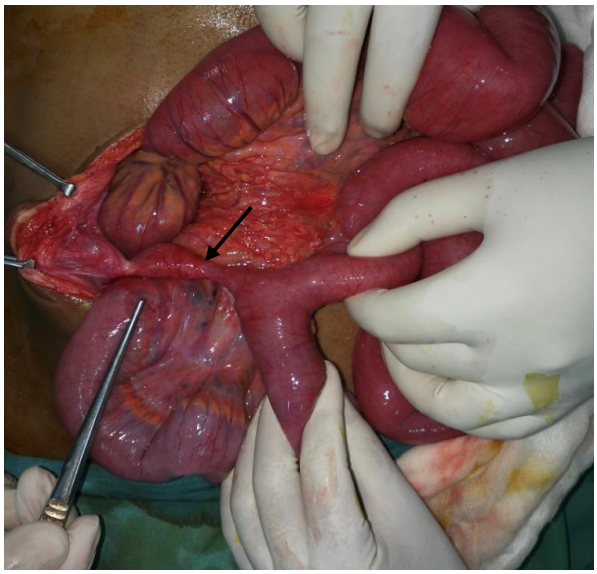

Fig. 2. Showing dilated small bowel with Vitelloinstetinal cyst from ileum to umbilicus (Black arrow)

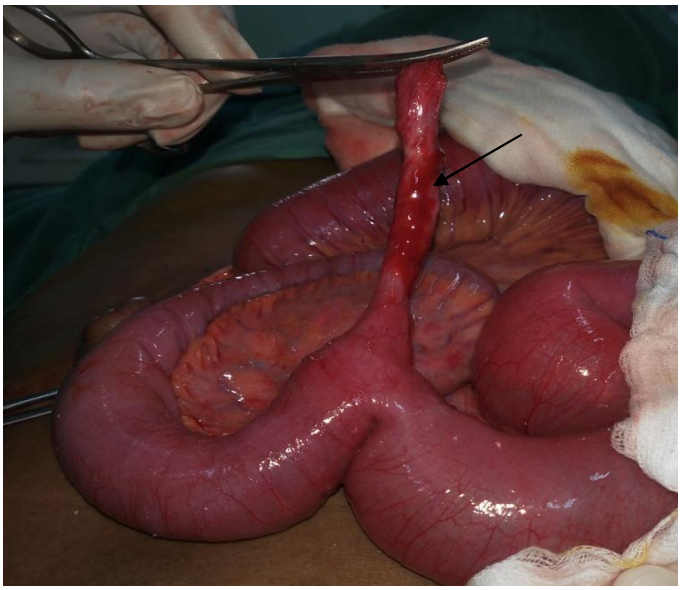

Fig. 3. Showing Vitelloinstetinal cyst after detaching from umbilicus (black arrow)

Vitelloinstetinal duct cyst was excised (Fig. 3) and enterotomy in the ileum was closed in two layers. The resected specimen (Fig. 4) was sent for histopathological examination. Incidentally detected Bands in the right lumbar region were released. Abdomen was closed in layers after placing pelvic drain.

Histopathological examination (Fig-5) was consistent with Vitelloinstetinal cyst. It was negative for ectopic gastric and pancreatic mucosa. Patient developed superficial surgical site infection which was managed and patient was discharged later.

3. DISCUSSION

The vitellointestinal duct is an embryonic communication between the primitive yolk sac and the developing midgut which obliterates spontaneously by 5th -10th week of gestation [7,9]. It may provide nutrition to the developing embryo prior to the establishment of placenta [10]. During the 6th week of normal development, the midgut loop grows rapidly and protrudes into the umbilical cord [10]. The midgut rotates 90° counter clockwise around the axis of the superior mesenteric artery within this 'physiological umbilical hernia'. At the same time, as the midgut elongates, the lumen of the vitellointestinal duct begins a process of obliteration. By the 10th week of gestation, the midgut returns to the abdominal cavity and the vitellointestinal duct becomes a thin fibrous band and undergoes resorption. Persistence of this duct leads to a variety of anomalies that can present clinically in the newborn period, infancy or later childhood years [11]

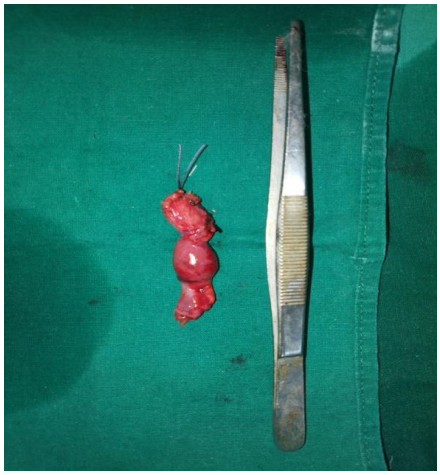

Fig. 4. Showing resected specimen of Vitelloinstetinal cyst

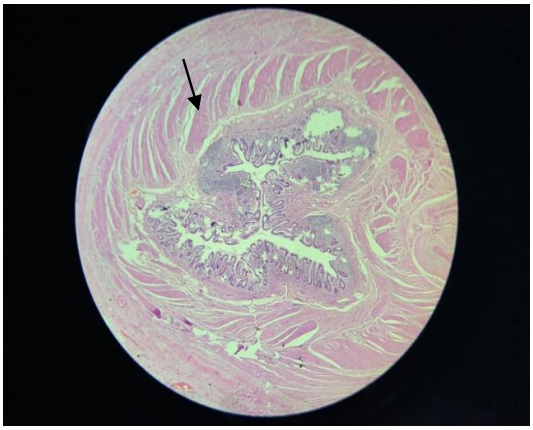

Fig. 5. Histopathological examination of specimen showing layers of intestine (black arrow)

Vitellointestinal duct remnants can be classified as – 1. Meckel's diverticulum, 2. Patent vitellointestinal duct, 3. Vitellointestinal sinus, 4. Vitellointestinal cyst, 5. Vitellointestinal mucosal polyp, 6. Vitellointestinal fibrous band, 7. Intestinal prolapse and 8. Appendico-umbilical fistula [12].

Meckel's diverticulum is the most common [7,9] presentation of a persistent duct (67%), followed by Patent vitellointestinal Duct; other anomalies are rare and recorded as case reports or cases series [12].

Although these malformations are found with equal frequency in both the sexes, a significantly greater incidence of symptoms is encountered in males [9].

Most of the symptoms usually appear before the age of 4 years. Eighty-five percent of infants younger than 1 month and 77% of children aged 1 month to 2 years have a symptomatic presentation. It has also been reported that 40% of the children with this anomaly have symptomatic lesions, while this anomaly is usually asymptomatic in adults [7].

Small bowel obstruction due to persistent vitellointestinal duct can be caused by many mechanisms such as intussusception, internal herniation or volvulus [13-18]. In the presented case, intestinal obstruction was caused by volvulus of the bowel around the vitellointestinal duct cyst.

Bands in the right lumbar region was incidentally detected. This was not the cause of intestinal obstruction in our case.

Accumulation of mucus in a portion of a persistent vitellointestinal duct may result in the formation of a cyst, which may be associated with the intestine or umbilicus by a fibrous band [19]. They range from 0.4 to 6.0 cm in diameter and are lined by columnar epithelium resembling that of the gastric, small intestinal or colonic mucosa; islands of pancreatic tissue may be associated with the cyst lining [12].

Vitellointestinal duct remnants can also be managed by laparoscopic approach [20,21]. It is minimally invasive and provides good view around the umbilicus [21]. It can be excised through traditional laparotomy approach as done in our case.

4. CONCLUSION

Small bowel obstruction due to Vitellointestinal duct cyst is very unusual in adults with few case reports in the world. However, it should be kept in the back of mind as a possible cause in patients with no previous history of surgery for early diagnosis and 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 or university standard written ethical approval has been collected and preserved by the author(s).

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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