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Title	Internal Bowel Herniation into a Ruptured Mesenteric Cyst Mimicking Intussusception in a 15 week-old infant: A Case Report
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Abstract

Intestinal obstruction in all surgical age groups is a surgical emergency. Mesenteric cysts, are commonly asymptomatic, but may present with unspecific abdominal symptoms or with complications, however, they rarely present in infancy. We present a case of a 15-week-old male who presented with clinical and radiological features in keeping with intussusception but was found at surgery to have internal small bowel herniation into a ruptured mesenteric cyst sac. We aim to highlight the peculiarities and review the available literature on this subject.

Conclusion

Mesenteric cysts are rare intra-abdominal masses that can be seen at any age. Atypical presentations with complications could be the first presentation. Meticulous surgical technique to excise the entire wall of the cyst or deroof the cyst without compromising the blood supply in the mesentery is paramount to prevent further bowel ischaemia.

Keywords: Mesenteric cyst, intussusception, internal hernia, intestinal obstruction, infant

Introduction

Intestinal obstruction in all surgical age groups is a surgical emergency due to the attendant physiologic and anatomical consequences if such is not relieved. These consequences include dehydration, electrolyte derangement, pre-renal acute kidney injury, sepsis, bowel ischaemia, and intestinal perforation¹⁻³.

Common causes of intestinal obstruction in an infant beyond the neonatal include intussusception, intestinal malrotation with volvulus, obstructed inguinal or umbilical hernia, adhesive bowel obstruction and hirschsprung's disease^{4, 5}. Mesenteric cysts are consequences of congenital malformation of the lymphatic channels within the mesentery^{6, 7}. They are commonly asymptomatic or may present with abdominal symptoms or as an intra-abdominal mass. Rarely, they present as an acute abdomen with complications such as rupture, infection, and haemorrhage into cyst⁶⁻⁸. Presentation in infancy is rare^{8, 9}.

We present a case of a 15-week-old male who presented with clinical and radiological features in keeping with intussusception but was found at surgery to have internal bowel herniation into a ruptured mesenteric cyst sac. We aim to highlight the peculiarities and review the available literature on this subject.

Case Report

A 15-week-old male was brought by his parents on account of a five-day history of intermittent episodes of inconsolable crying, drawing up of lower limbs to the abdomen. He also presented with multiple episodes of non-projectile, non-bloody, bilious vomiting, having about 6-10 episodes per day with each episode being about 20-30ml. There was associated abdominal distension and constipation. No history of passage of mucoid bloody stool.

There was also a 2-day history of high-grade fever with chills and rigor and a reduction in urinary output. No jaundice. No prior history of intermittent vomiting, or poor weight gain. No prior abdominal surgeries. Review of other systems not contributory. On account of complaints, he was taken to two health facilities where he was given oral medications and intravenous fluids with no relief of symptoms, necessitating a referral to our hospital.

On examination, he was acutely ill-looking, not pale, anicteric, febrile, dehydrated (depressed anterior fontanelles, sunken eyes, dry buccal mucosa, capillary refill time of more than 2 secs), and no pedal oedema. Weight was 5.1kg (85% of expected). Temperature was 37.1°C, Heart Rate: 146bpm, Respiratory rate: 46/min, SPO2: 99% in room air. There was good air entry in all lung zones with vesicular breath sounds. The abdomen was distended, moved with respiration, and there was generalized abdominal tenderness. A firm mass was palpated in the supra-umbilical region, bowel sounds hyperactive. The rectum was empty and the examining finger was stained with brown coloured stool. A diagnosis of intussusception was made, to keep in view the suspicion of intestinal malrotation complicated by volvulus

A plain abdominal x-ray done before presentation at our hospital showed multiple air-fluid levels on the erect film and distended bowel loops of the supine film. Abdominal ultrasound showed a heterogeneous mass surrounded by a hypoechoic wall in the paraumbilical region. The doughnut sign was demonstrable on the transverse view and a pseudokidney sign was visible on the longitudinal view. An intervening anechoic fluid was seen between the echogenic centre and the wall. No colour flow was seen in the centre mass on doppler interrogation. The radiologist made a conclusion of ileocolic intussusception.

Serum electrolytes, urea and creatinine done at presentation showed features of evolving pre-renal acute kidney injury (K: 6.6mmol/l (3.5-5), Urea: 143mg/dl (15-45), Creatinine 1.8mg/dl (0.5-1.5)).

Full blood count was in keeping with sepsis (WBC: 23,510 (Neutrophils: 63.1%), HCT: 31.5%, Platelet count: 418,000). He was adequately resuscitated and worked up for an emergency laparotomy. Findings at laparotomy included 150mls of haemoserous peritoneal fluid, a ruptured mesenteric cyst cavity extending from around the ligament of treitz to the ileocecal valve, ruptured close to the proximal jejunum and containing about 200mls of serous fluid and small bowel loops (figure 1). About 100cm of adjacent small bowel loops and a portion of the terminal ileum were herniated into the ruptured mesenteric cyst cavity (Figure 2). A gangrenous segment of the terminal ileum herniated into the mesenteric cavity, about 6cm in length (10cm from the ileocecal valve) was seen when the bowel loops were reduced (figure 3 and 4). There were also multiple enlarged mesenteric lymph nodes.

The wall of the ruptured cyst was peeled off between the leaves of the mesentery and it was excised. The gangrenous segment of the ileum was resected and end-to-end ileo-ileal anastomosis was done. The post-operative period was satisfactory. He commenced oral intake on the 4th post-operative day and this was well tolerated. He was subsequently discharged home on the sixth postoperative day. Histology revealed endothelial lined tissue infiltrated by inflammatory cells. He has been seen at the surgical out-patient clinic and has no complaints.

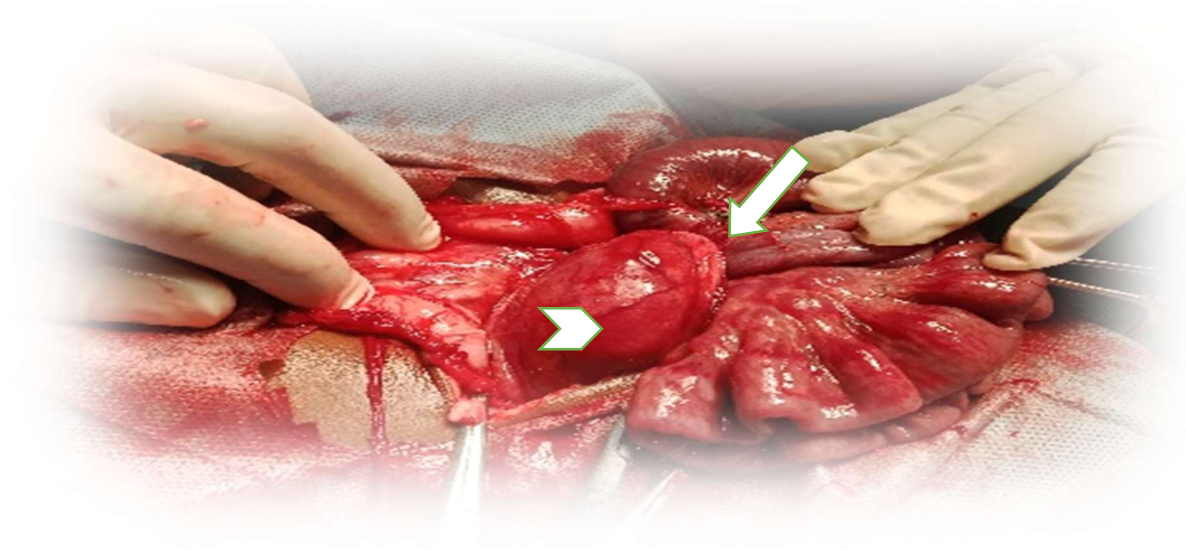


Figure 1: Point of entry of the herniated bowel loops (bold arrow) into the ruptured mesenteric cyst cavity (arrowhead)

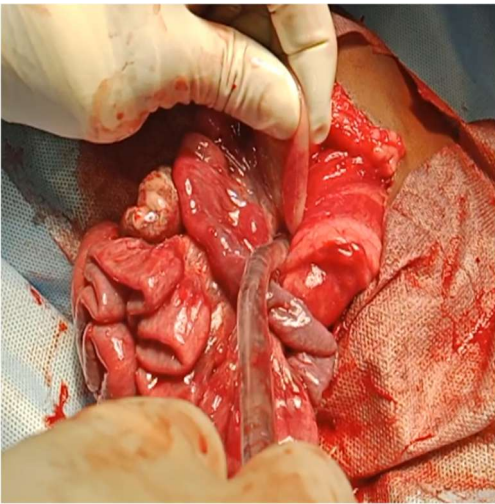


Figure 2: Bowel loops being reduced from the mesenteric cyst cavity and fluid contents being suctioned

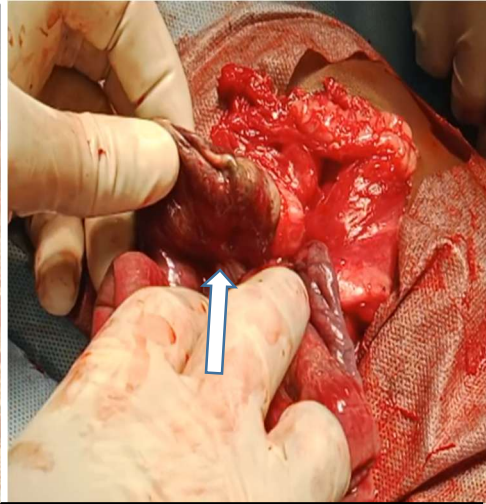


Figure 3: Gangrenous segment of bowel (bold arrow) reduced from the cavity

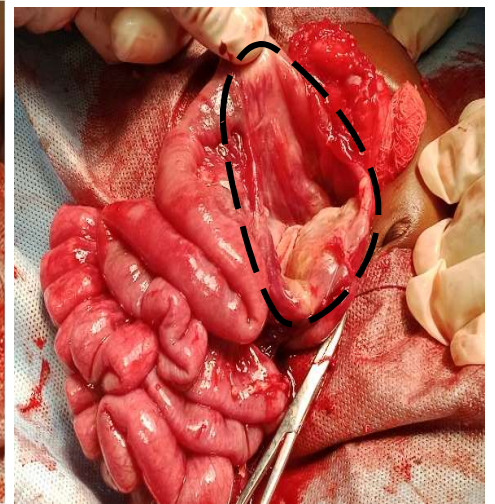


Figure 4: The cavity of the ruptured mesenteric cyst after complete reduction of the herniated bowel loops (edges shown by dashed lines)

Discussion

Mesenteric cysts are consequences of congenital malformation of the lymphatic channels within the mesentery^{6, 7}. They occur in 1:20,000 to 1:105,000 live births^{7, 10}. Incidence reduces with age⁷ and there is a female preponderance (F:M=1.7-2:1)^{6, 8, 11}. About a third of presentations occur in children less than 16 years with a mean age of about five years¹⁰. Presentation in infancy is rare, although prenatal diagnosis confirmed postnatal has been reported⁹.

Belhassen and colleagues had reported a 10-day old child who had prenatal diagnosis of the cyst and had excision in the neonatal period⁹. We reported a case of a 15-week-old infant with a ruptured mesenteric cyst, complicated by intestinal obstruction from internal bowel herniation into the ruptured sac, and gangrene of a portion of the herniated bowel.

They commonly occur in the small bowel mesentery but can be located along the mesentery of the small and large bowel^{6, 10}. They are commonly asymptomatic and may be incidental findings at laparotomy for other conditions⁶⁻⁸. They may also present as intra-abdominal masses and rarely, they present with complications such as rupture, infection, necrosis, haemorrhage, volvulus, and malignant transformation^{8, 10-13}. Rare complications include internal herniation into the ruptured cyst^{9, 14} as seen in this index patient.

The pre-operative diagnosis can be made based on unspecific abdominal symptoms, palpation of intra-abdominal mass, demonstration of tillaux triad on examination^{6, 8, 15} supported with detailed anatomic description by abdominal ultrasound, computed tomography scan or magnetic resonance imaging^{8, 12}. In this patient, this diagnosis was not anticipated as clinical and radiological findings were in keeping with intussusception. However, we were able to identify the pathology intra-operatively.

Treatment of choice is complete excision which can be done via laparotomy or laparoscopy^{7, 8, 12, 15}. In our patient, a laparotomy was used to access the abdomen, and after reducing the herniated bowel loops, the wall of the mesenteric cyst and the gangrenous ileal segment were resected and an ileo-ileal anastomosis was done.

Fasiku et al in Ilorin, Kwara state Nigeria had reported a similar case of a mesenteric cyst causing a strangulated internal hernia in a 17year old male¹⁴. In the patient they reported intra-operative findings were that of a cystic mass in the umbilical region of the abdomen with an opening through which parts of the jejunum and ileum had herniated into the cyst and a volvulus also occurred at point of entry into the cyst with consequent gangrene of the terminal ileum. The cyst and the gangrenous part of the ileum were resected and an ileo–ileal anastomosis done¹⁴. Makhija and colleagues also reported 3 patients including a 5-day old child presenting with unruptured mesenteric cysts causing intestinal obstruction¹⁶. The cysts were managed with de-roofing or complete excision¹⁶.

Diagnosis is confirmed by histological demonstration of a single layer of flattened mesothelial in the wall of the cyst^{7, 8, 13}, as was demonstrated in our patient. Prognosis is excellent and recurrence is avoidable with complete excision of the wall of the cyst^{7, 8, 13}.

Conclusion

Mesenteric cysts are rare intra-abdominal masses that can be seen at any age. Atypical presentations with complications could be the first presentation. Meticulous surgical technique to excise the entire wall of the cyst or deroof the cyst without compromising the blood supply in the mesentery is paramount to prevent further bowel ischaemia. Post-operative prognosis is excellent.

Conflict of Interest

The authors have no conflict of interest to declare

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