Case Report

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Surgery Section

Duplication Cyst in an 11-Year-Old Presenting as Acute Intestinal Obstruction: A Case Report

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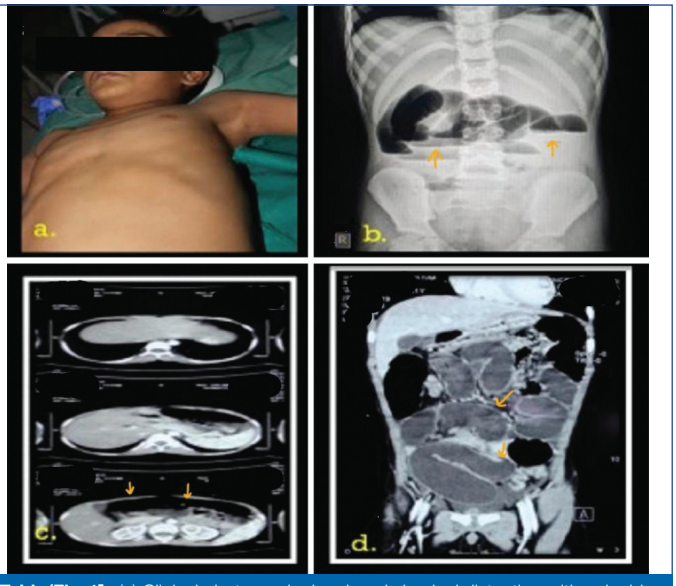
ABSTRACT

Gastrointestinal (GI) duplication cysts are uncommon congenital anomalies that may present with intestinal obstruction, GI bleeding, or malabsorption. Duplication cysts smaller than 1 cm are rarely reported and are seldom implicated in causing obstruction. We report the case of an 11-year-old boy who presented with acute intestinal obstruction, characterised by bilious vomiting, abdominal pain, and distension. Contrast-Enhanced Computed Tomography (CECT) revealed features of distal ileal obstruction, although the underlying aetiology was not visualised. Intraoperatively, a 6.5 mm cystic lesion was identified on the mesenteric border of the ileum, leading to kinking and obstruction due to surrounding adhesions. Wedge resection with end-to-end anastomosis was performed. Histopathological examination confirmed the lesion as an enteric duplication cyst. This appears to be the first documented case of such a small duplication cyst causing mechanical intestinal obstruction, in contrast to the typically larger lesions reported in the literature. The child was followed up for three months postoperatively, during which he remained asymptomatic and showed normal growth and development. This case highlights the diagnostic and therapeutic challenges posed by small, radiologically occult duplication cysts.

Keywords: Adhesions, Anastomosis, Embryology, Histopathology, Ileum, Laparotomy, Paediatrics, Radiography

CASE REPORT

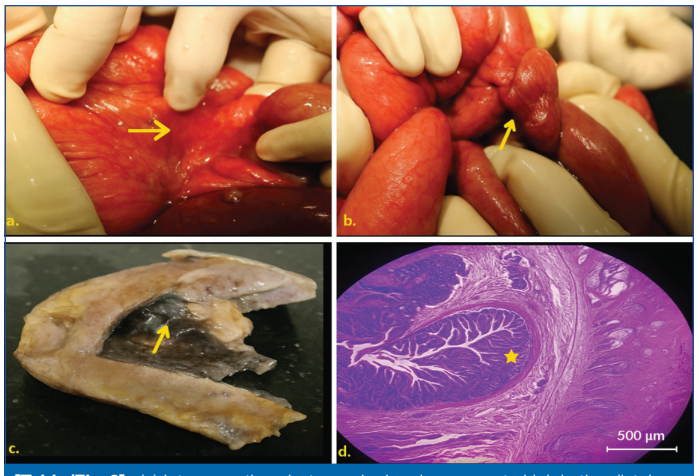
An 11-year-old boy presented with bilious vomiting for two days, a history of colicky abdominal pain for one day, abdominal distention for one day, and an absence of bowel movements for the past 24 hours, suggestive of acute intestinal obstruction. On physical examination, the patient had a distended abdomen with visible peristalsis and palpable bowel loops [Table/Fig-1a]. His vital signs were stable, and laboratory investigations showed an elevated White Blood Cell (WBC) count of 14,500/mm^3 and C-Reactive Protein (CRP) of 28 mg/L, suggestive of an inflammatory process. A plain abdominal radiograph revealed multiple asymmetric fluid levels [Table/Fig-1b]. A CECT scan demonstrated features of small bowel obstruction localised to the mid-distal ileum [Table/Fig-1c,d], though no specific obstructive lesion was visualised.



[Table/Fig-1]: (a) Clinical photograph showing abdominal distention with palpable loops; (b) Plain radiograph showing multiple asymmetric fluid levels. (yellow arrows); (c,d) Axial and Coronal CECT scan demonstrating features of intestinal obstruction with transition at the mid-distal ileum. (yellow arrows).

During exploratory laparotomy, grossly dilated proximal small bowel loops were noted, with a sharp transition and acute kink in the distal ileum caused by adhesions involving the non-mesenteric border and a small red lesion on the mesenteric side [Table/Fig-2a,b]. The lesion, measuring 6.5 mm, was solitary, cystic, and firmly adherent to the mesenteric border. Due to the lesion's location and involvement with adjacent bowel, wedge resection with end-to-end anastomosis was performed.

Gross examination of the resected specimen confirmed a small cystic lesion [Table/Fig-2c]. Histopathological analysis revealed the presence of all three intestinal layers-mucosa, submucosa, and muscularis propria-confirming the diagnosis of an enteric duplication cyst [Table/Fig-2d]. The postoperative period was notable for paralytic ileus lasting seven days, which was managed conservatively. The child was discharged in stable condition and remained asymptomatic at the three-month follow-up, with normal growth parameters and no recurrence of symptoms.



[Table/Fig-2]: (a) Intraoperative photograph showing an acute kink in the distal ileum. (yellow arrow); (b) Intraoperative photograph of the tiny red lesion at the mesenteric border; (c) Gross specimen showing the small cystic lesion; (d) Histopathological examination revealing features of an enteric duplication cyst (asterisk sign).

DISCUSSION

GI duplication cysts are rare congenital anomalies, with an estimated incidence of 1 in 4,500 live births, predominantly occurring in the paediatric population [1]. These cysts can arise anywhere along the alimentary tract but are most commonly seen in the ileum. Theories proposed to explain their embryological origin include the split notochord theory, which suggests a failure of separation between the notochord and endoderm during embryogenesis, resulting in duplicated structures; and the abortive twinning theory, which posits that incomplete or asymmetrical division of embryonic tissues during early development may give rise to duplicated segments of bowel [2,3]. Such anomalies typically form on the mesenteric border and share a common blood supply with the native bowel, often complicating their surgical excision.

Although duplication cysts may present as palpable masses, GI bleeding, or bowel obstruction, most documented cases involve cysts larger than 1 cm in size [3-5]. In contrast, this case highlights a unique clinical scenario involving a 6.5 mm cyst, contributing to obstruction through localised inflammation and adhesion formation. The minute size of the lesion posed significant diagnostic challenges, as it eluded detection on preoperative CECT imaging. This case underscores the critical role of high clinical suspicion and intraoperative assessment in resolving otherwise unexplained intestinal obstruction in children.

Arslan MS et al., documented ileal duplication cysts causing neonatal or infantile obstruction; however, their reported cyst sizes were 2.5 cm- several times larger than the lesion in this case [3]. The absence of a preoperative tissue diagnosis is a limitation inherent to such cases, especially since sub-centimetric cysts are generally below the resolution of conventional imaging. This raises the importance of considering enteric duplication cysts in the differential diagnosis of paediatric bowel obstruction, even when no discrete lesion is seen radiologically. Potential misdiagnoses, such as Meckel's diverticulum, mesenteric cysts, or lymphadenitis, may lead to inappropriate surgical approaches or delayed treatment [6]. Histopathology remains the gold standard for confirming the presence of all three intestinal layers-mucosa, submucosa, and muscularis propria-thereby definitively identifying duplication cysts [7,8].

This case also reinforces the rationale behind opting for wedge resection over enucleation. Given the cyst's position on the mesenteric border and its involvement with the bowel wall, enucleation posed a risk of incomplete removal or mucosal breach. This approach ensured complete excision of the lesion while maintaining bowel integrity, as enucleation is less suitable for cysts embedded in or inseparable from the intestinal wall [1,2]. Literature supports wedge resection as a definitive approach when cysts are inseparable from the native bowel or closely associated with shared vasculature [9].

In summary, this report documents an exceedingly rare and clinically impactful presentation of a sub-centimetric duplication cyst. It contributes to the growing body of evidence on the variability of clinical presentations and highlights the need for surgical vigilance in paediatric intestinal obstruction cases of uncertain origin.

CONCLUSION(S)

This is the first documented case of a tiny duplication cyst causing acute intestinal obstruction. The case highlights the potential of even minute lesions to result in significant clinical outcomes, underscoring the importance of careful intraoperative exploration and histopathological analysis. The lesion's inflammatory nature and resulting adhesions contributed to the kinking and obstruction, emphasising the need for heightened awareness among paediatric surgeons for atypical presentations of duplication cysts. Such cases demonstrate that even lesions below the detection threshold of imaging modalities can lead to critical conditions, warranting thorough investigation during surgical intervention. Recognition of these rare presentations can aid in accurate diagnosis, prompt surgical management, and prevention of potential complications.

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