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# Ileal Duplication: A Rare Entity Uncovered through Clinical Vigilance - A Case Study

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## ORIGINAL

### Abstract

Ileal duplication is a rare condition seen which is a rare congenital anatomical abnormality of alimentary tract. It has an incidence of 1 in 4500 births. This disease can exhibit diverse manifestation but the exact etiologies still unclear. Hereby, we reported a 5-year-old boy who was mistakenly diagnosed with perforated appendicitis and he presented with 5 days history of right sided abdominal pain with gastrointestinal losses symptoms. He was scheduled for open appendicectomy with Lanz incision. Intra-operatively, noted gangrenous ileal duplication with blinded end and he underwent right hemicolectomy. Post-operatively, he is improving well he was successfully discharged from ward. Histopathology report showed gangrenous tubular small bowel duplication with extensive area of haemorrhagic necrosis. Gastrointestinal duplication cysts are uncommon congenital anomalies, 80% of which are diagnosed before 2-years of age. Clinical presentation depend upon the location, type, size and mucosal lining of the duplication. Most of the duplications are diagnosed incidentally. The treatment of choice is complete surgical excision with anastomosis. The resection of adjacent bowel is often recommended due to potential complications like ulceration, hemorrhage and malignant changes. Ileal duplication presented with diverse manifestations which can misleading diagnosis and management. More accurate diagnostic tools are needed to improve our care with early intervention.

### Key messages

**What is already known on this topic:** Ileal duplication is a rare condition frequently encountered in children, often presenting similarly to appendicitis.

**What this study adds:** The pre-operative diagnosis of duplicated cysts remains challenging for pediatric surgeons. The optimal surgical approach—whether simple cyst excision is sufficient or if a more invasive procedure like right hemicolectomy is necessary to minimize the risk of reoperation and ensure adequate margins for potential malignancy—is still not standardized.

**How this study might affect research, practice, and policy:** Based on the findings, right hemicolectomy is recommended due to the uncertainty surrounding the disease. Standardized diagnostic tools should be implemented to improve patient care and establish optimal treatment protocols.

## OPEN ACCESS

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## Introduction

Ileal duplication, a rare congenital anomaly of the alimentary tract, occurs with an incidence of 1 in 4500 births, showing a slight male predominance.(1; 2; 3) This condition manifests in various ways, such as bleeding, perforation, and intestinal obstruction, although its precise etiology remains elusive.(4) Despite its rarity, it poses significant diagnostic challenges, as highlighted in the case of a 5-year-old boy initially misdiagnosed with perforated appendicitis. The complexities of accurate diagnosis underscore the importance of a thorough understanding of gastrointestinal anomalies,

particularly in pediatric patients, where prompt and precise identification can greatly impact treatment outcomes and prevent potential complications. Further research into the underlying mechanisms of ileal duplication is warranted to enhance diagnostic accuracy and inform optimal management strategies for affected individuals.

## Case presentation

We present the case of a 5-year-old boy who presented with a 5-day history of right-sided abdominal pain accompanied by symptoms of gastrointestinal losses. On clinical examination, he exhibited signs of sepsis with tenderness over the right side of his abdomen. Laboratory investigations revealed elevated white blood cell count and serum lactate levels. Consequently, the decision was made to perform an open appendicectomy with a Lanz incision. Intraoperatively, gangrenous ileal duplication with a blind end was noted. Following consultation with a pediatric surgeon, it was determined that a right hemicolectomy was necessary. The patient showed significant improvement postoperatively and was discharged from the ward on the sixth day following surgery. Histopathological analysis revealed gangrenous tubular small bowel duplication with an extensive area of hemorrhagic necrosis. This case underscores the importance of prompt diagnosis and appropriate surgical intervention in the management of gastrointestinal duplications, particularly in pediatric patients presenting with acute abdominal symptoms.



**Figure 1.** Gangrenous duplicated ileal with blinded-end



**Figure 2.** Presence of 3 lumens within the caecum

## Discussion

Gastrointestinal duplication cysts, though uncommon, represent congenital anomalies typically diagnosed before the age of two.<sup>(4)</sup> The hallmark of diagnosis lies in the presence of a well-developed smooth muscle coat and mucosal lining within some segment of the alimentary tract, often contiguous to any part of it. According to a comprehensive study by Pulgandla et al., the ileum emerges as the most prevalent site for such duplications, comprising 33.4% of cases, while colonic, rectal, and pyloroduodenal locations remain exceedingly rare.<sup>(4; 5; 6; 7; 2)</sup>

Clinical presentations vary depending on factors such as location, type, size, and mucosal lining of the duplication. Symptoms often include abdominal pain, nausea, vomiting, bleeding, distension, the presence of an abdominal mass, obstruction, and intussusceptions. Notably, some duplication cysts can remain asymptomatic until adulthood.<sup>(4; 7; 2)</sup> The diagnostic challenge is compounded by the fact that many duplications are incidentally discovered, while others present with a combination of pain and obstructive symptoms, often mimicking acute appendicitis, as seen in the case above.

Preoperative diagnosis remains challenging and often imprecise. Although various imaging modalities such as barium studies, ultrasound, and CT scans are employed, ultrasound is particularly useful in neonates for identifying the origins of abdominal masses. Antenatal scans play a vital role, with approximately 30% detection rate of duplication cysts, enabling early intervention to mitigate potential complications. CT scans offer detailed anatomical insights, while MRI and endoscopic ultrasonography serve as additional diagnostic tools, although recent research suggests that ultrasound and CT scans may suffice for preoperative diagnosis.<sup>(4; 6; 8)</sup>

Upon confirmation of the diagnosis and determination of precise anatomical positioning, urgent surgical intervention may be warranted due to the risk of complications such as ulceration, hemorrhage, or bowel perforation from ectopic mucosal secretions.<sup>(4; 9)</sup> The decision to operate on asymptomatic patients remains controversial, considering the unknown risk of malignant transformation and potential complications of bowel resection, such as short bowel syndrome or anastomotic leak.<sup>(9)</sup>

Complete surgical excision with anastomosis is the treatment of choice, often necessitating resection of adjacent bowel to mitigate potential complications like ulceration, hemorrhage, or malignant changes.<sup>(10; 8; 2; 11)</sup> Histopathological examination is crucial for definitive diagnosis and ruling out other close differentials, ensuring optimal management and patient outcomes.<sup>(3)</sup>

## Conclusion

Ileal duplication presents a rare pathology with diverse manifestations, often leading to diagnostic and management challenges. The varied clinical presentations can confound accurate diagnosis and appropriate management strategies. Early surgical intervention is imperative for patients presenting with complications such as bleeding, perforation, or obstruction, as prompt treatment can mitigate potential adverse outcomes. However, the complexity of diagnosing ileal duplication underscores the need for more accurate diagnostic tools to enhance patient care through timely intervention. Advancements in diagnostic imaging modalities and surgical techniques hold promise for improving the detection and management of ileal duplication, ultimately optimizing patient outcomes and reducing the risk of complications.

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