Case Report

# Ileocolic Intussusception Secondary to Cecal Diverticulum Containing Heterotopic Gastric Mucosa in a 4 Month Old Boy: A Case Report

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## ABSTRACT

**A case report of a 04-month-old boy is reported, who presented to the Pediatric Surgical Emergency Department of Sheikh Zayed Hospital, Rahim Yar Khan, with a history of abdominal distension, vomiting, reluctance to feed, and per rectal bleeding for two days. He was provisionally diagnosed as Intussusception with the typical symptoms' triad (i.e. abdominal pain, palpable mass and currant jelly stools). There was no associated history of fever, sore throat or constipation. On examination, he had abdominal distention, visible peristalsis, and a right upper quadrant palpable mass. Abdominal X-rays and ultrasonography supported the provisional diagnosis of Intussusception. Laparotomy findings showed an ileocolic intussusception secondary to the cecal diverticulum. Intussusception was manually reduced, followed by right limited hemicolectomy and ileocolic anastomosis, as some parts of the gut (intussusceptum) were not viable. Postoperatively, there were no active complaints, and the patient was made oral-free following the third postoperative day and was sent home on the 5th day following surgery. On the follow-up visit (10th post-op day), the infant was all right and playful, with no active complaints.**
**The objective of this case report is to present a rare case of ileocolic Intussusception secondary to a cecal diverticulum containing heterotopic gastric mucosa in a 4-month-old boy, highlighting the clinical presentation, diagnostic challenges, surgical management, and the importance of recognizing uncommon etiologies in pediatric intussusception cases.**


**KEYWORDS: Intussusception, Cecal Diverticulum, Heterotopic gastric mucosa, Congenital diverticulum.**

## INTRODUCTION

Intussusception is when a part of the intestine (the intussusceptum) telescopes / invaginates into another part of the intestine (the intussuscipiens), causing intestinal obstruction. It usually involves the small intestine and rarely the large intestine. Symptoms include abdominal pain, vomiting, bloating, and red currant jelly stool (20% of patients). It may result in small bowel obstruction, peritonitis, or bowel perforation [1,2]. Intussusception is a leading cause of acute intestinal obstruction in children, with a global incidence of 1 to 4 cases per 2,000 pediatric patients. It is more common in boys and is the most frequent cause of intestinal obstruction in infants and toddlers. The condition affects boys twice as often as girls, with approximately 75% of cases occurring before the age of 2 years and over 40% between 3 and 9 months of age. The ileocolic type is the most prevalent, accounting for roughly 85% of cases. Other types include ileo-colic (10%), appendico-colic, ceco-colic, colo-colic (2.5%), jejuno-jejunal, and ileo-ileal (2.5%). Ileocolic Intussusception is the most common type, in which the midgut (ileum) telescopes into the colon near the ileocecal valve[7]. During this telescoping process, the mesentery accompanying the intussuscepted segment is dragged along, compressing the blood vessels. This compression restricts blood flow, leading to swelling, venous congestion, and fluid accumulation. Prolonged obstruction may progress to bowel ischemia and tissue death (necrosis) within 72 hours. Dehydration can result from vomiting and fluid loss. The child becomes inactive or unresponsive to stimuli. The sudden onset of severe colicky intermittent abdominal pain, which makes infants pull up their legs, is the most common classic symptom. This pain episode typically lasts only a few minutes, after which the infant is often quiet, pale, sweaty and returns to normal activity for a while. A sausage-shaped mass may be palpable in the right upper quadrant owing to intussuscepted bowel[7]. While the classic symptom triad includes abdominal pain, vomiting, and currant jelly stools, variations exist. In the ileo-colic Intussusception, a right upper quadrant sausage-shaped mass along with an empty right iliac fossa may be found on abdominal examination. Other symptoms can range from mild gastrointestinal discomforts, such as vomiting, constipation, or diarrhea, to more severe complications, including bowel prolapse, per rectal bleed, septicemia, and shock[3]. Most cases (90%) have no identifiable cause and are classified as idiopathic. However, several risk factors have been identified, including infections,

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cystic fibrosis, and intestinal polyps. A cecal diverticulum is an uncommon cause of Intussusception and can act as a pathological lead point in infants and children. This diverticulum is usually asymptomatic and often found incidentally during abdominal surgery or laparotomy. This case report describes a 4-month-old infant diagnosed with ileocolic Intussusception secondary to a cecal diverticulum containing heterotopic gastric mucosa. The child was treated at the Pediatric Surgery Department of Sheikh Zayed Medical Complex, Rahim Yar Khan, Pakistan. Intussusception caused by a cecal diverticulum is extremely rare in infants. To our knowledge, only two similar cases have been reported in the English medical literature.

## CASE REPORT

A 4-month-old boy was brought to the Emergency Department of Sheikh Zayed Hospital with abdominal distension for 2 days, which gradually increased over time. There was an associated history of vomiting and per-rectal bleeding for 01 day. His mother denied any history of fever or sore throat. There was a history of two episodes of red currant jelly stool. There was no history of respiratory tract infections or any other illness. No urinary tract complaints were told. On physical examination, the patient had a weak, thready pulse at admission. On examination, he was toxic-looking and severely dehydrated. He had a distended abdomen, visible peristalsis, and a palpable tender mass in his right upper abdomen. On rectal examination, the syringe needle cap was blood-stained. The laboratory findings showed a normal TLC count (reference values, 4000–11,000/mm$^3$). Renal function tests were within normal range. X-ray abdomen (erect and supine) showed poor air distribution in the large gut with a paucity of air in the rectum, dilated intestinal loops, and multiple air-fluid levels depicting intestinal obstruction.

On abdomen ultrasound, concentric alternating echogenic and hypoechogenic bands were noted (target sign) in the right iliac fossa and left hypochondrium region; gut loops were also dilated, suggesting Intussusception. The patient was appropriately resuscitated and brought to the operating theatre. Right upper transverse incision exploratory laparotomy was performed, and Ileocolic Intussusception of about 10 cm was found, which was manually reduced, and a cecal diverticulum of about 2×1 inches as a pathological lead point was identified. We performed the right limited hemicolectomy as the part of the gut (intussusceptum) was not viable/ gangrenous. Excised tissue consisted of the terminal ileum, appendix, and part of the cecum containing the cecal diverticulum. The specimen was sent for histopathological examination, which revealed heterotopic gastric mucosa in the large gut and early acute appendicitis. The infant recovered, was allowed oral sips by the 3$^{rd}$ post-op day, made entirely oral-free on the 5$^{th}$ postoperative day and discharged.

**Figure I: Cecal Diverticulum**

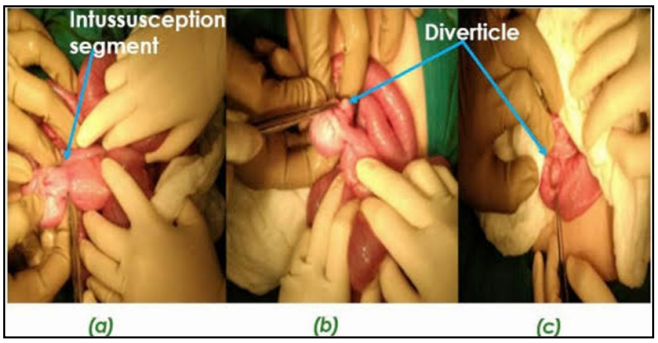



**Figure II: Heterotopic Gastric tissue is seen in cecal diverticulum**

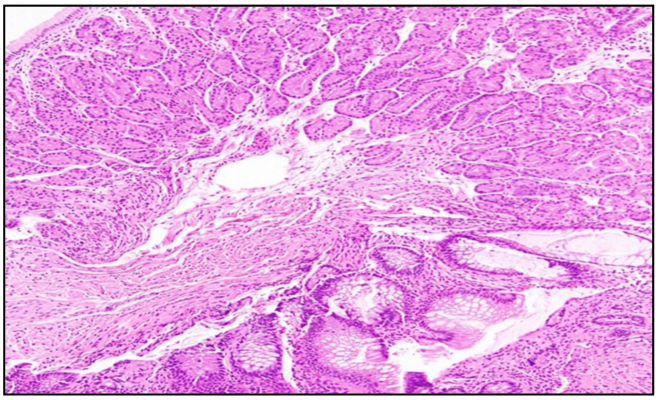
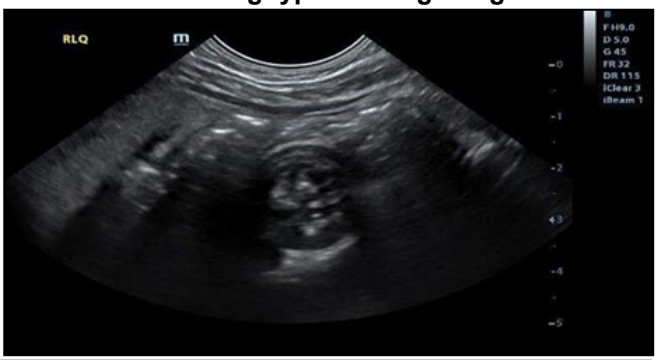
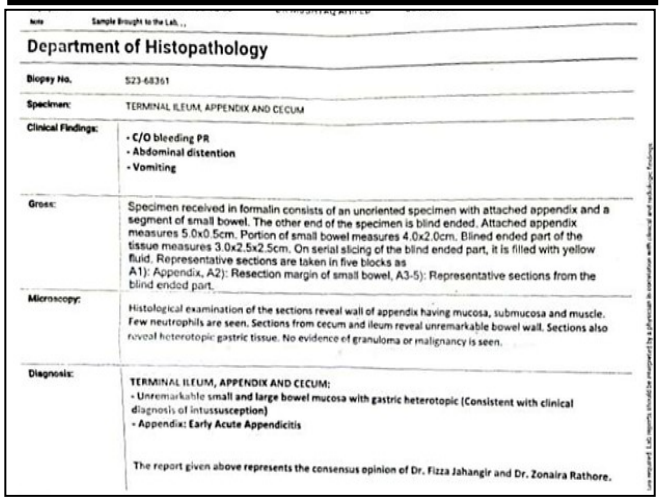


**Figure III:**
**Ultrasound showing typical "Target Sign"**



Department of Histopathology

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|---|---|
| Biopsy No. | S23-68361 |
| Specimen: | TERMINAL ILEUM, APPENDIX AND CECUM |
| Clinical Findings: | • C/O bleeding PR<br>• Abdominal distention<br>• Vomiting |
| Gross: | Specimen received in formalin consists of an unoriented specimen with attached appendix and a segment of small bowel. The other end of the specimen is blind ended. Attached appendix measures 5.0x0.5cm. Portion of small bowel measures 4.0x2.0cm. Blined ended part of the tissue measures 3.0x2.5x2.5cm. On serial slicing of the blind ended part, it is filled with yellow fluid. Representative sections are taken in five blocks as A1): Appendix, A2): Resection margin of small bowel, A3-5): Representative sections from the blind ended part. |
| Microscopy: | Histological examination of the sections reveal wall of appendix having mucosa, submucosa and muscle. Few neutrophils are seen. Sections from cecum and ileum reveal unremarkable bowel wall. Sections also reveal heterotopic gastric tissue. No evidence of granuloma or malignancy is seen. |
| Diagnosis: | TERMINAL ILEUM, APPENDIX AND CECUM:<br>• Unremarkable small and large bowel mucosa with gastric heterotopic (Consistent with clinical diagnosis of intussusception)<br>• Appendix: Early Acute Appendicitis |

The report given above represents the consensus opinion of Dr. Fizza Jahangir and Dr. Zonaira Rathore.

## DISCUSSION

A cecal diverticulum is one of the rare causes that act as a pathological lead point for childhood intussusception[3]. This diverticulum is usually asymptomatic and often found incidentally during abdominal surgery or laparotomy. Cecal diverticulum is an embryonic remnant of the omphalo-mesenteric duct, which generally disappears during early fetal development. Its incidence is nearly 22%, but only 4% of the people may have complications in their lifetime[5]. A cecal diverticulum consists of the three layers of the bowel wall: mucosa, submucosa, and muscular mucosae. Commonly, it can contain gastric or pancreatic tissue. But usually, it contains heterotopic gastric mucosa. Most patients with the cecal diverticulum are asymptomatic[6]. Most commonly, patients present with signs and symptoms of intestinal obstruction (40%). If a child presents with painless lower gastrointestinal bleeding without any evidence of infectious acute gastroenteritis or inflammatory bowel disease, then diverticulitis should be suspected. The most common site of the diverticulum is within 30-60 cm (2 feet) of the ileocecal valve, measuring approximately 2 inches in length; this follows the "rule of twos": 2% incidence, 2 feet from the ileocecal junction, 2 inches in length, a 2:1 male-to-female ratio, and two types of ectopic tissue (gastric and pancreatic). Although the diverticulum is typically found in the ileum, it may rarely appear in the cecum, as observed in this case[6]. Surgical intervention is the preferred treatment when complications arise. Procedures such as diverticulectomy or bowel resection with primary anastomosis are generally low-risk, with favorable outcomes[6,8]. In our case, the patient displayed the typical symptoms triad of Intussusception.

The diagnosis was made on clinical examination, supported by radiological investigations. Abdominal X-rays are often the first step, revealing signs like the absence of air in the colon and soft tissue masses in the upper abdomen, with other indicators such as target or meniscus signs. However, abdominal ultrasound is the preferred diagnostic tool, often showing the target or doughnut sign, confirming the presence of Intussusception. CT scans are typically avoided in pediatric patients due to radiation risks and the potential need for sedation[3]. Once identified on ultrasound, immediate treatment is crucial. Management begins with fluid resuscitation through IV resuscitation and decompression with a nasogastric tube. Early intervention is essential to address dehydration and prevent further complications. Surgical consultation is recommended to rule out ischemia or gangrene, which may necessitate emergency surgery. Any delay in treatment increases the risk of bowel necrosis[7]. Although the cause of Intussusception is often unknown, older children are more likely to have underlying pathological triggers. Pathological lead points can be found in 4% of infants and children who have one recurrence and up to 19% in those having multiple recurrences. The most common causes of pathological lead points are inverted Meckel's diverticulum, intestinal polyps and duplications. Cecal diverticulum is one of the rarest causes of intussusception.

## CONCLUSION

Intussusception is usually idiopathic. Cecal diverticulum containing heterotopic gastric mucosa is a pathological lead point of Intussusception, a rare condition in infants and children. The recommended treatment is surgical resection of the diverticulum in young children because of the potential risk of complications. Surgical complications are very low.

### Patient consent

Consent to publish the case report was obtained from parents, although it does not contain any personal information that could lead to the identification of the patient.

**Conflict of Interest:** No conflicts of interest, as stated by authors.

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**Data Sharing Statement:** The corresponding author can provide the data proving the findings of this study on request. Privacy or ethical restrictions bound us from sharing the data publicly.

## AUTHOR CONTRIBUTION

Manzoor H: Prepared the article, Introduction, and Discussion
Ahmed M: Conceived & supervised the project
Shah SA: Proof Reading
Rehman U: Literature Review, Critical Revisions

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