

Adult Ileo-ileal Intussusception by Meckel's Diverticulum with Heterotopic Pancreatic Tissue: A Case Report

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ABSTRACT

Adult intussusception is a clinically significant but uncommon cause of acute abdomen, and it tends to cause non-specific symptoms, which lead to late diagnosis. In adults, an organic lead point is the underlying cause in most cases, unlike in paediatric intussusception, where an idiopathic cause is predominant. Meckel's diverticulum with heterotopic pancreatic tissue is a very uncommon cause of intussusception. A 21-year-old male presenting with acute abdominal pain without associated other gastrointestinal or systemic symptoms was evaluated. Baseline laboratory investigations were within normal limits. Ultrasonography demonstrated a classical target sign suggestive of intussusception. Contrast-Enhanced CT (CECT) demonstrated an antegrade ileo-ileal intussusception containing invaginated mesenteric fat and vessels, along with a heterogeneously enhancing intraluminal polypoid lesion acting as a lead point. Laparoscopy verified a viable intussusception containing a Meckel's diverticulum with a polypoid mass at its tip. The intussusception was reduced, and resection of the lead point was performed. Histological examination demonstrated pancreatic acini, ducts, and islet cells consistent with Type I heterotopic pancreas. The postoperative phase was uneventful. This case demonstrates the diagnostic value of CECT in evaluating adult intussusception, particularly for detecting uncommon lead points, such as heterotopic pancreatic tissue in Meckel's diverticulum.

Keywords: Computed tomography, Polypoidal growth, Small bowel obstruction, Surgical correlation

CASE REPORT

A 21-year-old male arrived at the emergency department with right iliac fossa pain that began earlier that morning. He stated that he had been completely asymptomatic until that morning, when he suddenly developed acute, continuous, non-radiating pain in the right iliac fossa. He denied any associated symptoms such as vomiting, fever, diarrhoea, constipation, haematochezia, melena, or urinary complaints. His past medical and surgical history was unremarkable, and he reported no known comorbidities. He followed a mixed diet, maintained normal sleep patterns, and did not smoke, consume alcohol, or use recreational drugs. There was no relevant family history.

He was found to be alert, oriented, and haemodynamically stable. Abdominal examination showed localised tenderness in the right iliac fossa of the abdomen, but with no guarding or rigidity and normal bowel sounds. There was no abdominal distension, no palpable mass. There was no tachycardia, hypotension or pallor. Per rectal examination revealed a smooth, nontender rectal mucosa, normal anal sphincter tone, and a firm, smooth prostate gland without palpable nodules, masses, or abnormalities. The examination showed no signs of rectal masses, fissures, haemorrhoids, or significant prostate enlargement. Routine lab studies, such as complete blood count (haemoglobin 15.9 g/dL, total Red Blood Cell (RBC) count 5.7 million/cu.mm, total leucocyte count 8890 cells/cu.mm, renal tests (urea 19 mg/dL, creatinine 1.1 mg/dL), serum amylase (89 U/L), serum lipase (110 U/L), and liver tests (total bilirubin 0.8 mg/dL, Aspartate Transaminase (AST) 28 U/L, Alanine Transaminase (ALT) 32 U/L, Alkaline Phosphatase (ALP) 96 U/L, total protein 7.1 g/dL, albumin 4.2 g/dL), were normal.

An erect abdominal radiograph showed a small number of prominent small bowel loops that were mainly in the right iliac fossa. The peritoneal fat pads were preserved, and there was no evidence of free air under the diaphragm [Table/Fig-1].

Ultrasonography of the abdomen showed telescoping of a distal ileal loop into a terminal ileal loop, producing the classical "target



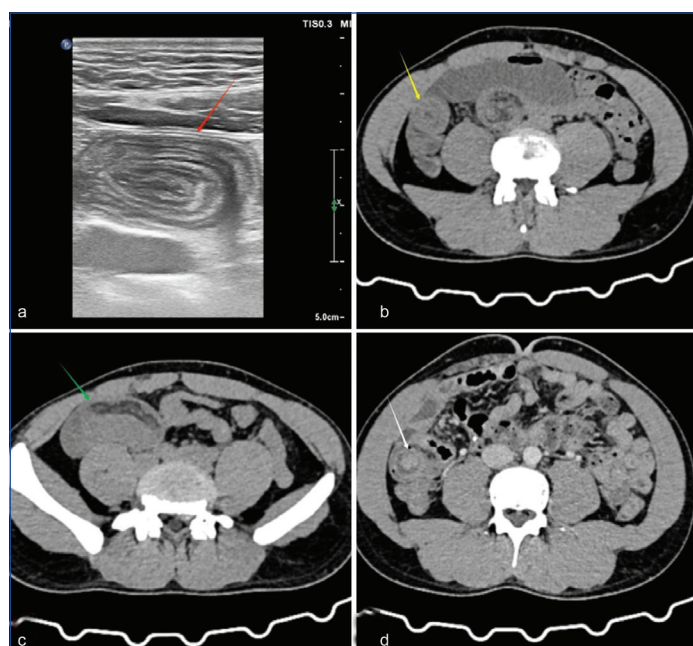
[Table/Fig-1]: The AP erect abdominal radiograph shows a small number of prominent small bowel loops (black arrow) mainly in the right iliac fossa. The peritoneal fat pads are preserved (red arrow), with no evidence of free air under the diaphragm (yellow arrow).

sign" as demonstrated in [Table/Fig-2a]. Viability of the bowel was indicated by normal vascularity and intact peristalsis.

Since intussusception is usually due to a lead point in adults, CT was done to identify the lead point. Non-contrast CT showed concentric layers of the bowel wall and a typical target sign, which could be related to intussusception, as shown in [Table/Fig-2b,c]. The intussuscepted segment measured approximately 9cm. Intussusception with a length greater than 4 cm, particularly in adults, is a significant radiological finding strongly associated with a

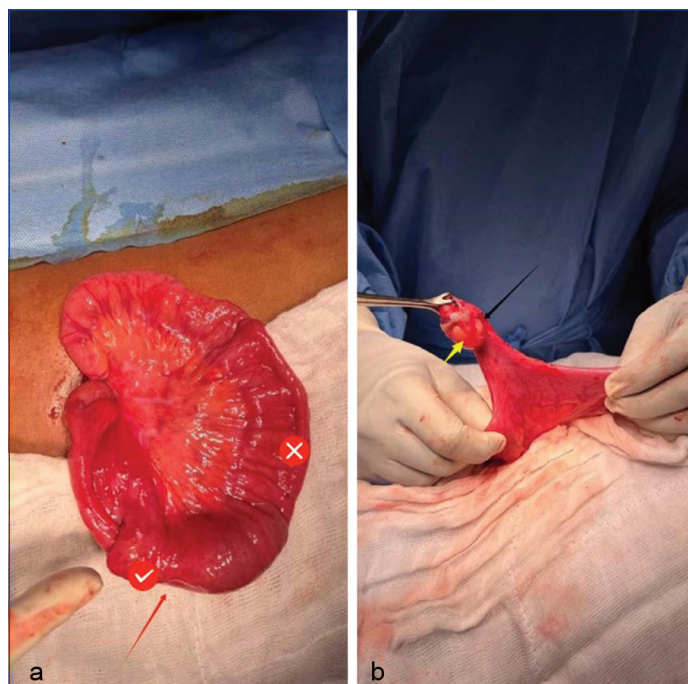
pathological lead point requiring surgical intervention [1]. The distal end of the intussusception complex was located approximately 60 cm proximal to the ileocecal junction, as measured on a reformatted CT image using callipers. Proximal ileal loops appeared dilated, with air-fluid levels measuring up to 3 cm signifying low-grade small bowel obstruction. The appendix was normal in calibre (approximately 4.2 mm) with no surrounding inflammatory changes, but contained an appendicolith. The right paracolic gutter and pelvis had minimal free fluid.

A CECT scan confirmed antegrade ileo-ileal intussusception. Axial CT images showed normal wall enhancement, indicating bowel viability. Mesenteric fat and vessels were visibly invaginating into the intussusception complex. Sequential images also demonstrated a well-defined, heterogeneously enhancing, isodense soft-tissue polypoidal mass measuring approximately 2×1.8 cm, with +35 HU, projecting into the lumen of the intussusception, representing a pathological lead point, as seen in [Table/Fig-2d].



[Table/Fig-2]: a) Longitudinal high-resolution ultrasound of the right iliac fossa shows ileo-ileal intussusception with a classic "target sign," produced by alternating hypoechoic and hyperechoic concentric layers (red arrow); b) Axial non-contrast CT image shows ileo-ileal intussusception characterised by a bowel-within-bowel configuration (yellow arrow), producing the classic "target" appearance; c) Axial non-contrast CT of the abdomen shows antegrade ileo-ileal intussusception, formed by the distal ileal loop telescoping into the terminal ileal loop (green arrow); d) Axial Contrast-Enhanced CT (CECT) image demonstrates ileo-ileal intussusception with invagination of mesenteric fat and vessels into the intussusception complex. A well-defined, heterogeneously enhancing soft-tissue polypoidal lesion is seen arising from the ileal wall and projecting into the lumen of the intussusceptum, representing the pathological lead point (white arrow).

In view of these radiological features and the potential risk of bowel ischaemia, the patient was taken up for diagnostic laparoscopy. Intraoperatively, an ileo-ileal intussusception was confirmed, as seen in [Table/Fig-3a]. Reduction can be attempted in small bowel intussusception if the involved segment is viable or malignancy is not suspected; however, a more careful approach is recommended in colonic intussusception because of a significantly higher risk of malignancy [2]. Since, it was an ileo-ileal intussusception with viable bowel, reduction was attempted. Gentle traction resulted in the successful reduction of the intussusception. The exteriorised ileal segment appeared congested following reduction. Additional examination showed a Meckel's diverticulum with a polypoid lesion in its distal part, which corresponded with the lead point identified on the CT, as shown in [Table/Fig-3b]. Wedge resection of the Meckel's segment was performed, and closure was achieved with a hand-sewn technique in a single seromuscular layer. The distal bowel was irrigated with Ringer's lactate, then returned to the peritoneum. Surgery was completed without complications.



[Table/Fig-3]: a) Intraoperative photograph shows the exteriorised ileal segment demonstrating intussusception (red arrow), and the involved segment appeared viable. The proximal bowel is marked by x and the distal bowel by ✓; b) The intraoperative photograph demonstrates a Meckel's diverticulum with a base marked by a black arrow and having a polypoid intraluminal mass at the tip (yellow arrow) that represents the lead point seen on CT images.

The resected specimen was grossly examined, and a small, blind-ending segment measuring 5×1.8 cm was found. The resected blind ending segment measured 1.8 cm in diameter at the base and had a 1.5 cm polypoid yellowish growth at the tip, with adjacent congested mucosa was seen. Microscopic analysis revealed a group of pancreatic acini, interspersed with ducts and occasional nests of islet cells. This validated pancreatic tissue with focal ulceration of the epithelium at the tip of Meckel's diverticulum. No sign of malignancy was found.

The final histopathological impression was consistent with Meckel's diverticulum with heterotopic pancreatic tissue, which explained the polypoid intraluminal growth, which served as a pathological lead point for intussusception.

The patient recovered without complication. Oral intake was gradually resumed, and he was discharged in stable condition after one week. On follow-up after one month, he exhibited no symptoms, and no abdominal pain or bowel abnormalities were recorded.

DISCUSSION

Intussusception accounts for 1% of bowel obstructions in adults, representing 5-10% of all intussusceptions. The average age of affected individuals is 50 years [3].

The most common congenital gastrointestinal tract anomaly, the Meckel diverticulum, is a familiar but uncommon cause of adult intussusception [4]. With a diverticulum, there is an increased risk of symptomatic presentation when it contains ectopic tissue, is inflamed, or invades the bowel lumen [5]. In particular, inversion of Meckel's diverticulum can create a polypoid configuration, predisposing it to act as a lead point [5]. However, even in these cases, heterotopic pancreatic tissue is extremely uncommon and contributes to their distinctiveness [6].

Ectopic pancreatic tissue is an uncommon developmental abnormality characterised by pancreatic tissue without anatomical and vascular connection with the original pancreas [7]. Its presence within a Meckel's diverticulum is exceptional and is seldom diagnosed preoperatively [6]. A heterotopic pancreas can have acini, ducts, and islet cells, and can sometimes appear indistinguishable from neoplastic lesions on radiography [8].

Radiological imaging plays a vital role in diagnosis. The classic target sign can be seen on ultrasonography, though it is operator-dependent [9]. The imaging modality of choice in adults is CECT, which enables accurate delineation of intussusception, determination of the lead point, and evaluation of bowel viability and related complications. In addition to basic identification, CT also provides valuable prognostic data, such as the length of the intussuscepted part, bowel obstruction, and ischaemia/perforation [10].

Muneeb A et al., described an adult case of ileo-ileal intussusception secondary to Meckel's diverticulum presenting with features of bowel obstruction, in which preoperative diagnosis was challenging and required correlation of cross-sectional imaging with intraoperative findings [11]. In contrast, Ying L and Yahng JJ highlighted the utility of CT in clearly identifying the transition point in small bowel obstruction due to Meckel's diverticulum, thereby facilitating timely surgical decision-making [12]. In the present case, similar reliance on cross-sectional imaging was observed. Furthermore, as emphasised by Vergara Torrente JA et al., Meckel's diverticulum can act as a pathological lead point for adult intussusception requiring surgical resection [13]. This is similar to the present case, in which Meckel's diverticulum served as a pathological lead point.

CONCLUSION(S)

This case points out a rare but clinically significant aetiology of adult intussusception in which a Meckel's diverticulum with heterotopic pancreatic tissue served as the lead point. CECT was very valuable for diagnosing intussusception and associated pathology, as well as for guiding the surgical procedure.

Acknowledgement

The authors acknowledge the patient as a great source of learning. The authors would like to thank the technicians, faculty and colleagues in the department of radiology and surgery for their assistance in acquiring high quality images.

Authors' contributions: All the authors contributed equally to this article.

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AUTHOR DECLARATION:

- Financial or Other Competing Interests: None
- Was informed consent obtained from the subjects involved in the study? Yes
- For any images presented appropriate consent has been obtained from the subjects. Yes

PLAGIARISM CHECKING METHODS: [Jain H et al.]

- Plagiarism X-checker: Apr 18, 2026
- Manual Googling: May 07, 2026
- iThenticate Software: May 09, 2026 (1%)

ETYMOLOGY: Author Origin

EMENDATIONS: 6

Date of Submission: Apr 02, 2026

Date of Peer Review: Apr 20, 2026

Date of Acceptance: May 11, 2026

Date of Publishing: Jun 01, 2026