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## Postoperative intussusception in 10-year-old presenting as decreased intestinal motility



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### ABSTRACT

Postoperative intussusception is a rare surgical complication. It typically presents as bilious emesis with abdominal pain following a symptom-free period within two weeks of either intra or extra-abdominal surgery. We present the case of a 10-year-old boy who had undergone uncomplicated open appendectomy. He developed abdominal pain, bilious vomiting and tenesmus at one week post-operatively, and postoperative intussusception was suspected. At laparotomy, he was noted to have an ileal–ileal intussusception.

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Postoperative intussusception (POI) is a rare surgical complication. It is found in 0.01–0.25% of laparotomies and accounts for 5–10% of all early postoperative intestinal obstructions [1]. As the disease course does not follow the classic presentation of intussusception, it can easily be overlooked. The risks of delayed identification of POI include intestinal ischemia and necrosis. Therefore, a high index of suspicion in any patient presenting with obstructive symptoms in the early postoperative period is critical in order to appropriately intervene.

### 1. Case report

A 10-year-old boy underwent open appendectomy at an outside hospital (OSH) for uncomplicated appendicitis and was discharged home on post-operative day (POD) #1 without complications. On POD#2 he was evaluated at the OSH for severe abdominal pain and three episodes of non-bilious emesis. He underwent a CT scan and was found to have excessive stool on abdominal computed tomography (CT). No intussusception was noted and the small bowel was not dilated. His pain resolved after administration of an enema, and he passed a large bowel movement. Over the next two days he experienced no abdominal pain or vomiting and tolerated oral feeds. On the evening of POD#5, the patient experienced severe

abdominal pain, tenesmus, and six episodes of non-bilious emesis. On POD#6, he presented to the ED for evaluation.

He was afebrile and he had mild left sided abdominal tenderness without distention. An abdominal ultrasound showed a small amount of free fluid in the abdomen without abscess, with actively peristalsing bowel loops. No intussusception was detected. Abdominal radiographs revealed some small bowel dilatation (Fig. 1). His labs were significant for a mildly elevated white blood cell count of 12,500 WBC/mcL. He was administered intravenous fluids, acetaminophen, and ondansetron and was admitted for observation.

On POD#7 he continued to have abdominal pain and was unable to tolerate a clear liquid diet, although he continued to pass flatus and his abdominal exam remained benign. On POD#8 he was febrile. His abdomen was mildly distended but without rebound or guarding. His bowel sounds were not hypoactive. Supportive care was continued.

On the morning of POD#10, he experienced acute escalation of abdominal pain and distention with 250 cc bilious emesis. On exam, his abdomen was distended and tympanitic with voluntary guarding but without rigidity, and he had hypoactive bowel sounds. A nasogastric tube was placed to suction and drained 1 L bilious fluid. POI was suspected. An abdominal X-ray confirmed suspected obstruction (Fig. 2). He was urgently taken to the operating room (OR) for an exploratory laparotomy.

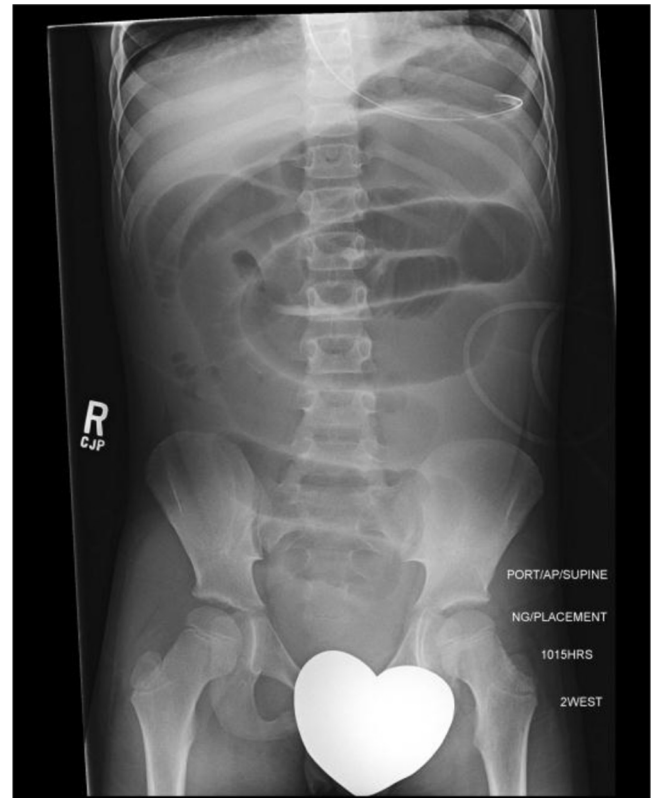
At laparotomy, an ileal–ileal intussusception was identified and manually reduced. The region of the previous appendectomy was

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**Fig. 1.** Initial obstruction series in AP view on POD#6 revealing some loops of distended small bowel. Not diagnostic of obstruction.



**Fig. 2.** AP image obtained in am on POD#10 with obvious small bowel obstruction.

intact without surrounding adhesions. No pathologic lead point was identified. The small bowel was manually decompressed. The bowel adjacent to the intussusciens was noted to be pink and viable (Fig. 3).

Post-operatively the patient experienced no further abdominal pain. He regained gastrointestinal function on POD#5 and was discharged home.

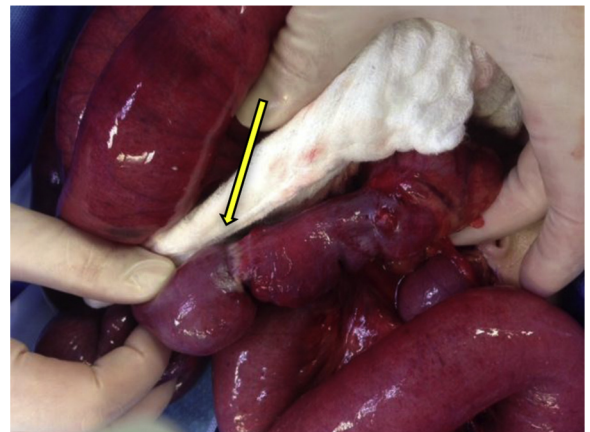
## 2. Discussion

Postoperative intussusception (POI) is a rare but serious complication in surgical patients; a high index of suspicion is critical for diagnosis. POI does not follow the typical presentation of pediatric intussusception. The classic ileocolic intussusception symptoms are bilious emesis, intermittent abdominal pain, current jelly stools, and an abdominal mass. On the other hand, POI presents as abdominal distension, bilious emesis or persistent high nasogastric tube output, or abdominal cramping. There is a slight male predominance [2]. The presentation can be as subtle as decreased gastrointestinal motility. Significant abdominal distension may take days to develop. Therefore, it can be difficult to distinguish between a postoperative ileus and POI. It is crucial to include POI in the differential diagnosis for any patient with postoperative obstructive symptoms [3]. POI typically presents after a short symptom-free interval within the first two weeks following an operation, with a median time of presentation on POD#6 [1].

POI can occur after any surgery, and is not limited to abdominal surgery. In a systematic review of 127 patients with POI, only 51.2% of the cases followed gastrointestinal surgeries, while the rest of the cases occurred after non-gastrointestinal procedures [1]. In addition, based on retrospective case series, minimally invasive abdominal approaches may protect against POI [4]. These findings

are consistent with our patient, who had undergone an open appendectomy. Possible theories explaining this phenomenon suggest that decreased bowel manipulation and less evaporative loss of fluid from bowel tissue may be protective. However, this does not explain why a significant portion of patients with POI never had any bowel manipulation during their prior surgeries. The pathophysiology of the disease process remains unclear.

Patients with POI classically present with small bowel dilatation on plain film [2]. In general, POI presents as a small bowel-small bowel intussusception, however, up to 5% of postoperative intussusceptions are ileocolic and can be reduced non-operatively [1]. In all cases, symptoms resolve after reduction of the



**Fig. 3.** Intraoperative image showing small bowel after reduction of ileal-ileal intussusception. Arrow indicates junction of intussusceptum and intussusciens. No pathologic lead point was identified.

intussusception, and the risk for post-operative re-intussusception is miniscule. A lead point is not typically identified in POI.

Patients who are not diagnosed early incur a greater risk of intestinal ischemia, necrosis, and a need for operative bowel resection [2].

The incidence of POI following appendectomy is largely unknown and quoted at 0.01–0.25% [1]. However, in a review of 22 cases of POI at a single center, 4 followed appendectomies, and in a systematic review of 127 published cases of POI, 3 followed appendectomies [1,4]. Our patient's presentation was unique. First, most POI patients described in the literature were infants or toddlers, while our patient was 10 years old. Second, reported cases of POI following appendectomy typically involve the appendiceal stump, which was not the case with our patient who uniquely had an ileal–ileal intussusception post appendectomy [5,6].

### 3. Conclusion

POI is a rare surgical complication. In any patient with post-operative abdominal distension and bilious emesis, a high index of suspicion should be maintained. Careful clinical evaluation should

be the first step. Abdominal ultrasound or CT can confirm the target sign of intussusception. An abdominal X-ray showing stacked dilated small bowel loops can render other imaging irrelevant. In any patient with dilated small bowel that does not resolve with bowel rest and nasogastric decompression, bowel obstruction should be suspected. Timely surgical exploration is the key intervention that will preserve intestinal viability.

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