

Intestinal Intussusception in Adults: A Diagnostic Challenge

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ABSTRACT

Intussusception, a rare cause of intestinal obstruction in adults, accounts for only 1% of obstruction cases and 5% of all intussusceptions. Its global incidence is 1-3 cases per million per year. Early identification is challenging, which can lead to significant morbidity and mortality. In adults, intussusception is often associated with benign or malignant lesions, with primary adenocarcinoma being the principal cause. Preoperative diagnosis can be complex, and computed tomography (CT) is considered the preferred imaging modality. Most cases require surgical intervention, and the decision on whether to reduce before resection depends on the type and location of the lesion. Both laparoscopic and open surgeries are valid options, depending on clinical conditions and the surgical team's experience. We present the case of a patient in their fourth decade of life with a 15-day history, who presented to the emergency room with symptoms of intestinal obstruction secondary to intussusception. An emergency laparotomy was performed, revealing intussusception from the ascending colon to the transverse colon with a neoplastic-looking lesion in the cecum. A right radical hemicolectomy with intestinal diversion was performed. Histopathological examination revealed a moderately differentiated grade 2 adenocarcinoma.

KEYWORDS: Intussusception, intestinal invagination, intestinal obstruction, adenocarcinoma, surgical resection.

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INTRODUCTION

Intussusception is defined as the telescopic extension of a proximal segment of the intestine (intussusceptum) into the lumen of the adjacent distal segment (intussusceptans). Although intussusception is one of the common causes of intestinal obstruction in children, in the adult population, it is a rare cause of abdominal pain, accounting for 1% of patients with intestinal obstruction and 5% of all intussusceptions (1). The global incidence in adults is 1-3 cases per million per year (2). Due to its rarity, the diagnosis is challenging, resulting in significant morbidity and mortality due to delayed diagnosis (1,3). Historically, intussusception was first proposed by Paul Barbette, Harald Hirschsprung introduced the hydraulic enema reduction technique, and Sir Jonathan Hutchinson was the first surgeon to perform surgery for a case of intestinal invagination (4,5).

Any segment of the gastrointestinal tract can be affected, but there are certain portions where a segment with greater freedom of movement can pass through a fixed one, due to

adhesions or its retroperitoneal location, with the ileum being the most frequent location and only approximately 10% occurring in extraintestinal locations (6). Four anatomical variants or classifications according to location and extent have been described: (I) enteroenteric, when it affects only the small intestine, (II) colocolic, affecting only the colon, (III) ileocolic, when the terminal ileum prolapses into the ascending colon, and (IV) ileocecal, when the ileocecal valve is the main point of intussusception (3,6,7).

In adults, intussusception is most commonly due to benign or malignant lesions, polyps, and stenoses, which are mostly diagnosed intraoperatively, with malignancy being the most common of the mentioned conditions (7). The causes of intestinal invagination in adults are summarized in Table 1 (7). Abdominal pain is the most common presenting symptom, followed by changes in regular bowel habits, nausea, vomiting, gastrointestinal bleeding (6,8), and a palpable mass in 5-62% of patients (1). If not diagnosed in time, intestinal invagination can lead to serious complications

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such as intestinal obstruction, strangulation, and ischemia (6). The preoperative diagnosis of intestinal invagination in adults is usually difficult, requiring a high index of clinical suspicion supported by non-invasive techniques (9). Plain and contrast radiography, abdominal ultrasound, computed tomography (CT), and magnetic resonance imaging (MRI) are appropriate imaging techniques for diagnosing intestinal invagination (9). Currently, CT is considered the gold standard for diagnosing intussusception (7,9), with a diagnostic accuracy of 58-100% (1). It provides information about its location, involvement of intestinal segments, and extent, as well as associated complications such as ischemia and intestinal wall perforation, helping to differentiate between incidental and transient forms and acute and irreversible forms (9). In CT images, Merine et al. described three different aspects of intussusception, including target pattern, reniform pattern, and sausage-shaped pattern, which reflect the severity and duration of the disease process. Thus, CT helps decide the most appropriate treatment and avoid unnecessary surgery (9).

Ultrasound has proven to be a rapid, non-invasive, easy-to-perform, and reproducible imaging technique for diagnosing intestinal invagination, especially in children, in whom it is idiopathic (9), with an accuracy of 60-83.3% (1). The typical appearances of intussusception in transverse sections include the so-called "donut" or "bull's-eye" sign. In longitudinal sections, a "pseudokidney" or "hayfork" sign is typically observed (1,9). However, thickening of the intestinal wall in other gastrointestinal conditions could simulate the ultrasound features of intussusception; therefore, a high index of suspicion and support from complementary studies is recommended (9).

The optimal treatment of intestinal invagination in adults is not universally accepted. Surgical resection without reduction is recommended due to the high possibility of malignancy and the inability to distinguish malignant from benign lesions before or during the operation (1,9).

The objective of this study is to present a case of intestinal intussusception in an adult patient, highlighting the importance of early diagnosis and appropriate management of this uncommon condition. Clinical features, diagnostic tools, and treatment options are discussed to improve the understanding and approach to intussusception in adults.

CASE PRESENTATION

A 35-year-old female with no significant medical history began experiencing symptoms 15 days prior, including postprandial fullness, generalized colicky abdominal pain, distension, and scant, foul-smelling, mucous diarrhea. Her symptoms exacerbated three days before admission, presenting with oral intolerance, vomiting of gastrointestinal contents, and absence of bowel movements, prompting her to seek emergency care. She was admitted as a probable case of intestinal obstruction versus complicated diverticular disease.

Table 1. Causes of Intestinal Intussusception in Adults

Category	Benign Causes	Malignant Causes
Enteric	Adhesions, Celiac Disease, Crohn's Disease, Endometriosis, Hamartoma, Infections, Kaposi Sarcoma, Lipoma, Meckel's Diverticulum, Neurofibroma, Polyps (Inflammatory, Adenomatous), Stromal Tumor, Tuberculosis.	Adenocarcinoma, Carcinoid Tumors, Leiomyosarcoma, Lymphoma, Malignant Gastrointestinal Stromal Tumor, Metastatic Carcinoma, Neuroendocrine Tumor.
Colonic	Adhesions, Inflammatory Pseudopolyp, Lipoma, Polyps (Inflammatory, Adenomatous)	Adenocarcinoma, Lymphoma, Sarcoma

On physical examination, the patient was afebrile, tachycardic, poorly hydrated, with an anguished facial expression, abdominal distension, decreased peristalsis, generalized tympanism, and tenderness upon palpation in all four quadrants. A nasogastric tube was placed, draining 1000 ml of gastrointestinal content. Laboratory findings were: hemoglobin 12.2 g/dL, hematocrit 36.1%, leukocytes $9.4 \times 10^3/\text{mL}$, lymphocytes $5 \times 10^3/\text{mL}$, segmented neutrophils 86.6%, platelets $296 \times 10^3/\text{mL}$, glucose 121 mg/dL, urea 27.8 mg/dL, blood urea nitrogen 13 mg/dL, creatinine 0.6 mg/dL, sodium 139 mEq/L, potassium 4.3 mEq/L, chloride 102 mEq/L.

An abdominopelvic computed tomography (CT) scan revealed a suggestive image of intestinal intussusception from the ascending to the transverse colon, with regional lymphadenopathy and marked distension of small bowel loops (Images 1,2). The patient underwent exploratory laparotomy, which revealed intussusception of the ascending colon into the transverse colon, extending to the cecum. A poorly defined, exophytic, ulcerated tumor measuring 8x5 cm was found in the cecum, obstructing 90% of the lumen (Image 3), along with multiple 1-1.5 cm lymph nodes in the mesocolon, and no macroscopic changes in the right colic artery and vein. A radical extended right hemicolectomy was performed, with ileotransverse end-to-end anastomosis using 2-0 Prolene, Connell-Mayo in 2 layers, followed by a second seromuscular layer with 2-0 Vicryl Lembert stitches. A passive Saratoga drain was placed via a counter-opening in the left flank, positioned at the anastomosis site. The patient was transferred to the hospitalization area for postoperative

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care, progressing well clinically and discharged after 4 days, with follow-up in the oncology outpatient clinic.

At a one-month follow-up visit post-intervention, the patient showed no complications, no signs of infection at the surgical wound, and tolerated oral intake well with normal bowel movements. She was scheduled to start her first cycle of adjuvant chemotherapy with FOLFOX regimen, including oxaliplatin 130 mg, folinic acid 300 mg, and 5-fluorouracil 640 mg + 3800 mg. Pathology reported a moderately differentiated grade 2 adenocarcinoma, with proximal and distal margins free of tumor, and 0/12 lymph nodes negative for metastasis.

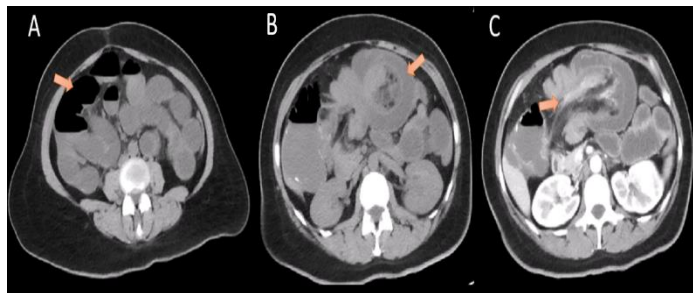


Image 1. Abdomen and Pelvis CT Scan, Axial Section.

A. Dilatation of proximal small bowel loops due to ileocecal intussusception, indicative of intestinal obstruction secondary to cecal tumor. B. "Target" sign characteristic of intussusception. C. Ascending colon intussusception over transverse colon (telescoping of intussusceptum within intussuscipiens).

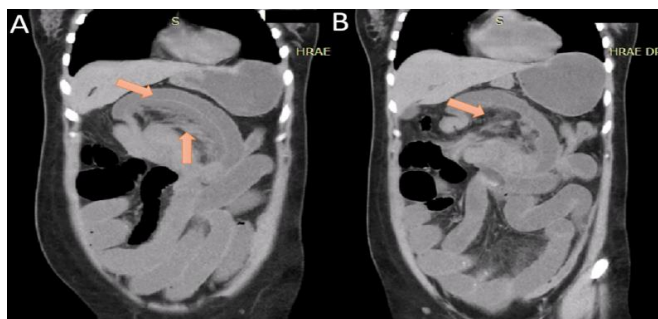


Image 2. Abdomen and Pelvis CT Scan, Coronal Section.

A,B. "Sausage-shaped" image observed due to thickened segment of intestine with crescent-shaped fat area, representing the intussusception and invaginated mesentery.



Image 3. A. Ascending colon intussusception into transverse colon involving up to the cecum. B, C. Surgical specimen showing 90% obstruction of the intestinal lumen.

DISCUSSION

Intussusception as a cause of intestinal obstruction in adults remains rare, making diagnosis challenging and resulting in significant morbidity and mortality due to delays in diagnosis (1,3). In contrast to pediatric intussusception, 70-90% of adult cases have a demonstrable etiology (1,3,6).

Understanding the common causes in this age group, such as carcinoma, polyps, Meckel's diverticulum, or mesenteric cysts (6), is crucial for establishing differential diagnoses that consider risk factors and the clinical presentation of each patient individually. This approach allows us to utilize the available diagnostic tools effectively to manage the obstruction promptly and adequately. In our patient's case, the prompt performance of the abdominopelvic CT scan enabled timely resolution of the obstruction, with surgery being the most effective option.

Intussusception in adults is most commonly due to malignant lesions, with primary adenocarcinoma being the leading cause. The clinical presentation often involves nonspecific obstructive symptoms of varying duration, including acute, subacute, or chronic symptoms (1,7,9). Predictive symptoms of malignancy include those persisting for more than 14 days, colonic intussusception, and the presence of anemia, often without clear acute abdominal symptoms (6). Our patient was diagnosed with moderately differentiated grade 2 adenocarcinoma as the cause of intussusception. Despite this, she did not present with chronic symptoms or anemia, as reported in the literature. It is important to note that the absence of these symptoms does not rule out the possibility of this pathology causing the obstruction in our case.

CT remains the most used diagnostic tool, playing a crucial role in the preoperative diagnosis of intussusception and the characterization of its causes. All cases of transient intussusception have a characteristic short segment of intussusception (2-4 cm) and can be managed conservatively without surgery and without sequelae (10). All other forms of intussusception in adults require surgical treatment, a different approach than recommended in the pediatric population. If there is diagnostic uncertainty or unclear presence of a lead point based on imaging, sigmoidoscopy or colonoscopy has been used as a diagnostic tool, typically before definitive surgical treatment, to confirm the presence of pathology and/or cancer. However, surgical resection with en bloc removal is recommended for patients with chronic symptoms or colonic intussusception, following the oncologic principle of resection as a precaution to provide the best chance for a cure (8,9,10,11). Furthermore, reduction before resection increases the risk of intestinal perforation, intraluminal seeding, and venous embolization of malignant cells during manipulation. However, small bowel lesions should be reduced in patients strongly suggested to have a benign diagnosis before the operation or in patients where resection may result in short bowel syndrome (9,11). In the present case, early surgery was decided based on imaging findings suggestive of intussusception previously reported in

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the literature. The extensive involvement of a specific intestinal segment and the location at a site with a high probability of oncologic diagnosis led to opting for more radical surgery to improve prognosis in case malignancy was confirmed.

Laparotomy has been the traditional treatment strategy for these patients (6). However, it carries risks of postoperative wound infections, adhesions, and incisional hernia. Laparoscopic approaches have been increasingly employed, as patients typically present with chronic symptoms and do not usually have acute intestinal obstruction with significant abdominal distension. Laparoscopic surgery has been demonstrated to be safe and feasible, offering the benefits of minimally invasive surgery, with better outcomes in terms of lower morbidity and improved aesthetics (6).

The decision to perform open surgery was based on the need to effectively address significant intestinal distension, which posed a challenge for the laparoscopic technique. Additionally, the surgeon's skills and experience were considered, ensuring a safe and appropriate procedure for the suspected oncologic diagnosis.

CONCLUSIONS

Comprehensive understanding of the causes of intestinal obstruction, the early and appropriate use of CT as a diagnostic tool, and the prudent consideration of the surgical modality according to the case significantly contribute to improved clinical outcomes in these patients.

ETHICAL CONSIDERATIONS

Regarding ethical aspects, authorization was obtained to use the relevant information and images after obtaining the patient's informed consent, ensuring confidentiality. It is clarified that there were no financial ties that could influence the study, ensuring transparency in the process. These ethical considerations support the integrity of this report.

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