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Case Report

Colo-colic intussusception in an adult caused by lipoma: Case report of a rare condition ☆

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ABSTRACT

This report describes the case of a 56-year-old woman who presented at the emergency room with a 3-week history of severe, intermittent abdominal pain. A CT scan revealed colo-colic intussusception caused by a large, substenosing mass with predominant adipose density. Subsequent endoscopic examination with biopsy revealed a necrotic tissue covering the mass, without definitive histological characterization. A second biopsy led to the extremely rare diagnosis of colo-colic lipoma. While intussusception is rare in adults, it's important to consider it as a differential diagnosis, especially when presenting with abdominal pain and signs of bowel obstruction. Timely diagnosis and appropriate treatment are essential to prevent complications.

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Introduction

Paul Barbette in 1674 recorded the first cases of intussusception [1].

Adult intussusception is a rare condition, accounting for only 5% of bowel obstructions, with an identifiable cause in 90% of symptomatic cases and an idiopathic cause in 10% of cases [2].

Its occurrence is exceedingly rare in the literature, as also reported by Manouras, with a rate of 2-3 cases per 1,000,000 population per year [3]. Two-thirds of cases with a lead point are caused by benign or malignant neoplasms; the remaining cases are caused by infections, postoperative adhesions, inflammatory and autoimmune conditions.

In most reported case series, colo-colic intussusception occurs less frequently than small bowel intussusception, representing only 20%-25% of all intussusceptions. Studies suggest

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that colo-colic intussusception is more likely to have a malignant lead point due to the higher prevalence of malignancies in the colon compared to the small bowel. Ileocolic intussusception in adults is a unique variant, with nearly 100% of cases having a malignant lead point [2].

According to multiple studies, in cases caused by neoplasms, 50% are malignant, with adenocarcinoma being the most common malignant cause (accounting for 66% of colo-colic intussusception cases). Colonic lipoma is the most common benign mass cause as seen in our case [9,11].

They are often silent due to their location, and only with a colonoscopic examination or CT scan they be documented.

Case

A 56-year-old woman presented herself to the emergency department with diffuse abdominal pain that had been ongoing for approximately 3 weeks. Her bowel was open to feces and gas, her abdomen was treatable, and she denied experiencing nausea and vomiting. She was hemodynamically stable and showed no neurological deficits. Initial laboratory tests revealed elevated levels of C-reactive protein (CRP), fibrinogen, hematocrit, gamma GT, and a significant drop in hemoglobin over 24–36 hours. On clinical evaluation both surgical and gastroenterological, the abdomen was diffusely painful and tender on superficial and deep palpation especially in the upper quadrants with reduced peristalsis, Enterocolic tympanism normal, and a positive Blumberg sign.

An initial abdominal contrast-enhanced CT scan was therefore performed, which documented wall thickening of the right colon and the middle-proximal third of the transverse colon, with stretching of the mesentery and adjacent vascular structures, surrounding lymphadenopathy and the typical target image (Fig. 1). These radiological findings confirmed a case of colo-colic intussusception consistent with the patient's symptoms and allowed us to diagnose the cause of the intussusception which was a large, substenosing mass of the ascending colon with mixed density predominantly adipose and maximum axial dimensions of 44×43 mm.

Given the clinical and imaging findings, the patient was admitted to the emergency surgical ward, but an urgent endoscopic examination was not indicated. Instead, a thorough re-evaluation was recommended. An abdominal CT scan with oral iodinated contrast media (Gastrografin) confirmed the intussusception and the presence of a large lipomatous mass (Fig. 2).

One week later, a colonoscopy was conducted, within the proximal ascending colon, a considerable mass covered with ulcerated mucosa was observed. This mass nearly obstructed the colonic lumen and was successfully removed during the procedure. Biopsy sampling of the ascending colon formation was performed, with a diagnosis of substenosing neoformation of the ascending colon in the context of sigmoid diverticulosis. We specify that the anatomopathological study of the neoformation of the ascending colon was conducted by biopsy of multiple fragments, macroscopically from 0.2 cm to 0.1 cm, and microscopically, minute superficial fragments consisting almost exclusively of ulcer-like material was documented, as-

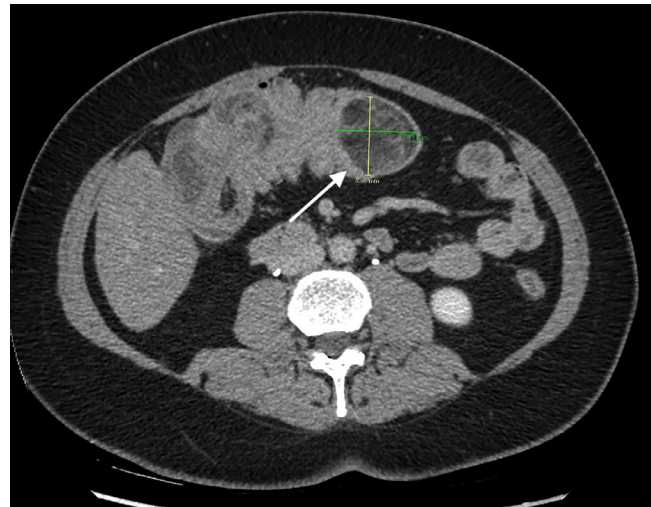


Fig. 1 – In this axial delayed contrast-enhanced phase, we can observe (white arrow), a round endoluminal formation with maximum axial dimensions of 44×43 mm, featuring a predominantly adipose mixed density.

sociated with colic mucosa with marked edema, slight fibrosis and granulation tissue in the lamina propria and without further relevant changes. These features could be potentially associated with an underlying ab-extrinsec pushing lesion, damaging the overlying mucosa. Immunohistochemical evaluation with cytokeratins AE1/AE3 was performed, which showed no further alterations, excluding a poorly differentiated carcinoma (Fig. 3). In relation to the clinical suspicion, however, the material was not fully adequate for a correct diagnostic evaluation. Therefore, re-evaluation with possible further and more extensive sampling of the lesion was deemed necessary to exclude a deeper lesion. The patient underwent a second colonoscopy with biopsy: in this case, the fragments collected allowed us to make a diagnosis of benign intestinal lipoma.

A follow-up CT scan revealed the resolution of the acute symptoms, and the patient was discharged from our hospital (Fig. 4). In agreement with the patient, who refused to undergo the surgical resection of the lipoma, an indication was made by the multidisciplinary team to wait and see.

Discussion

Intussusception involves the invagination of one segment of the bowel into an immediately adjacent segment. It is most common abdominal emergency encountered in children. In emergency, adult intussusception is a rare condition. The most common types include:

- Ileocolic intussusception involving the ileum (the last part of small intestine) and the cecum (the first part of the colon). It is the most common form in children, accounting for approximately 60%–70% of cases.

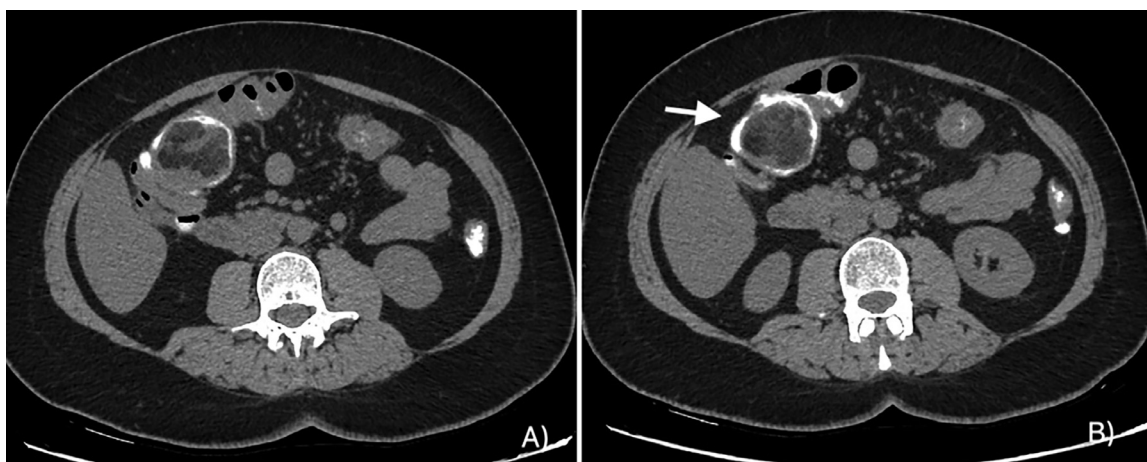


Fig. 2 – In both images (A) and (B), we can observe the oral contrast media dispersing around the mass, pointed by the white arrow in B, which is partially obstructing the lumen.

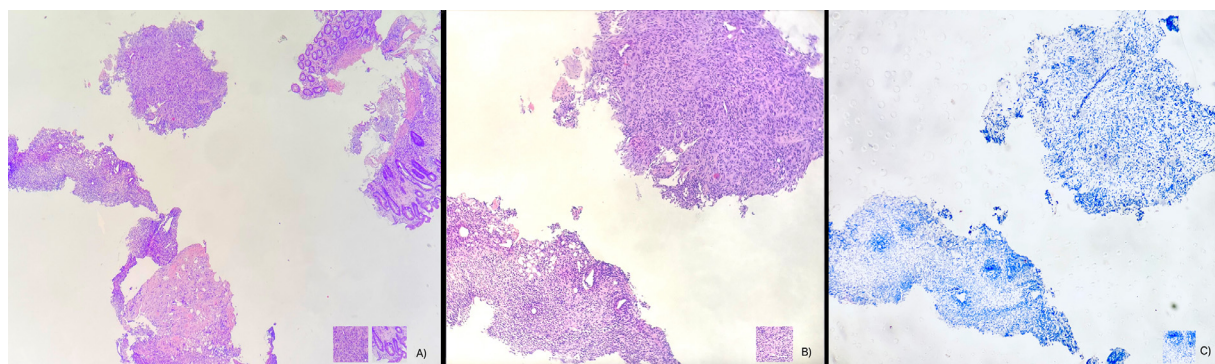


Fig. 3 – Histological preparations of sections from multiple pre-evoked fragments are presented. Images in order: (A) Normal intestinal mucosa interspersed with granulation tissue (original magnification 10x). (B) The intestinal mucosa appears inflamed and necrotic (original magnification 4x). (C) Immunohistochemistry with cytokeratins, revealing the absence of epithelial cells with dysplastic features (original magnification 4x).

- Enteric intussusception involving the small intestine and accounting for about 20%-30% of cases.
- Colocolic intussusception involving the colon and representing approximately 5%-10% of cases.

Intussusception is triggered by a lead point, which creates a focal area of traction that pulls the proximal bowel into the distal bowel, due to peristaltic contractions. Symptoms occur due to continued peristaltic contractions of the intussuscepted segment against the obstruction. Eventually, the vascular flow to the bowel becomes compromised, resulting in ischemia to the affected segment, which leads to complications such as necrosis and perforation. The classic clinical triad of abdominal pain, palpable abdominal mass, and bloody stool is quite rare. Although there is an increasing appreciation of cases of transient, asymptomatic intussusception within the era of abdominal CT scans [4]. If the presentation is late in the course of the disease, the patient may present with signs of peritonitis or bowel ischemia. Labora-

tory values typically reveal an elevated white blood cell count and nonspecific inflammatory markers such as thrombocytosis and elevated PCR.

In our case, the first hypothesis based on radiological features, site of onset, size, and morphology suggested a colonic lipoma, a diagnosis that was later confirmed. Lipomas are benign fatty tumors and while they can occur in the colon, they are an uncommon cause of intussusception. As far as possible differential diagnoses are concerned, adenocarcinoma is the most frequent determinant of a lead point of colonic intussusception. It's worth noting that masses resulting from metastases are more frequently found in the small bowel [7].

Intestinal lipomas are rare and have a reported incidence of 0.2%-4.4% [8], making them a rare cause of adult intussusception, documented only in a few cases worldwide.

The site of onset in the transverse colon is among the least common, and we found a useful case for comparison reported by Xangliang et al. [9]. Lipomas are benign masses, not of

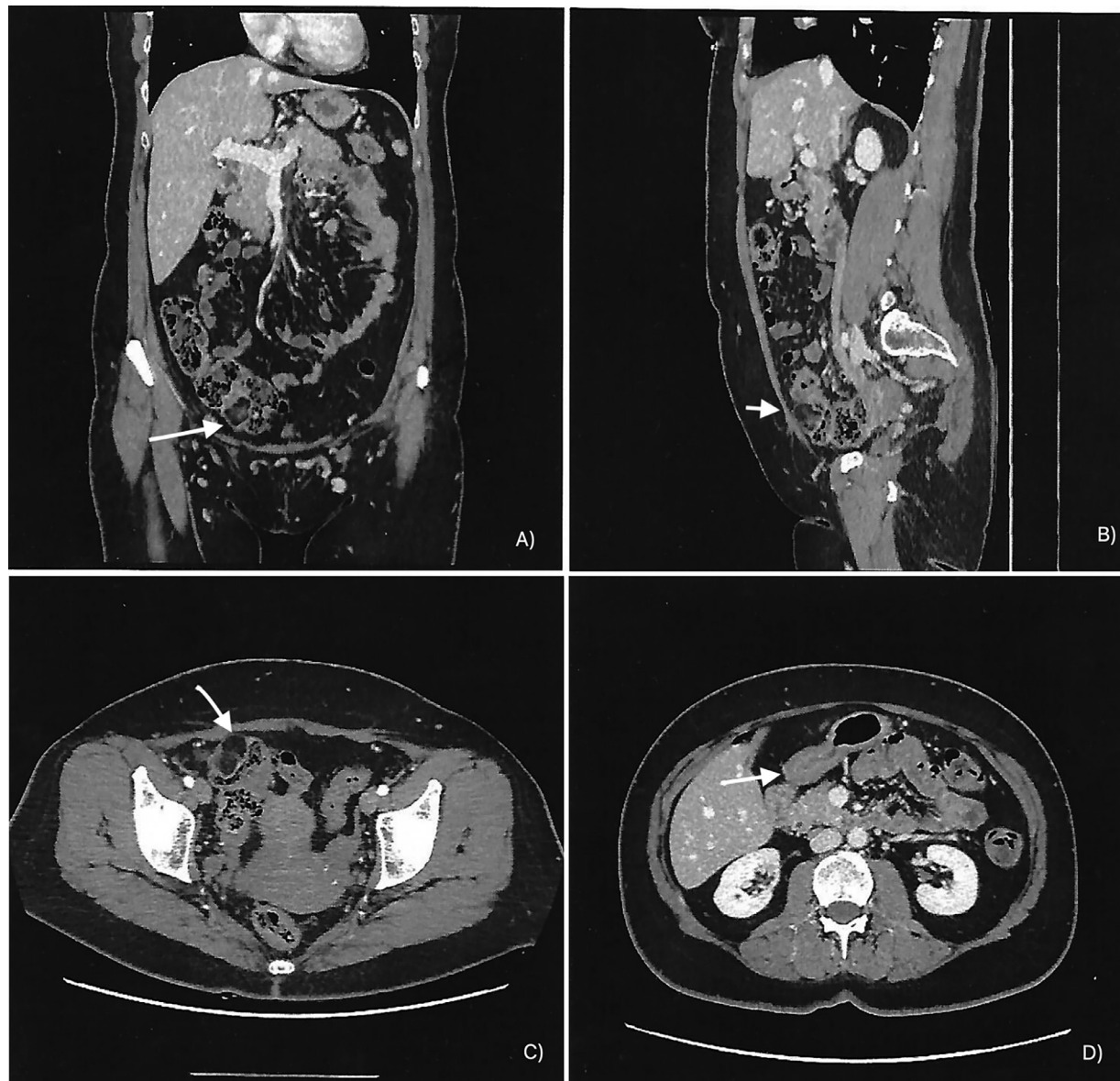


Fig. 4 – Postdischarge CT images confirmed the resolution of the intussusception. In images (A–C), you can see the lipoma (pointed by arrows in each figure), located in the proximal part of the ascending colon in coronal, sagittal, and axial scans. In image (D), there is a residual segmental concentric thickening of the wall (white arrow) in the proximal part of the transverse colon, which raises the initial suspicion of a reactive inflammatory process.

epithelial origin, formed from adipocytes. Since they are often incidental and not related to symptoms, the incidence in the population may be higher than reported in the literature. They usually become symptomatic if they exceed 2 cm in diameter, however in some rare cases even with a diameter < 4 cm, they may be asymptomatic [10].

In our case, the mass displayed characteristics of heterogeneity, substenosing, and subocclusion. Lipomas may cause intestinal blockage and bleeding. Our patient's hemoglobin values consistently decreased over 24–48 hours, indicating progressive anemia. Also, in the case reported in the literature, the PCR values and inflammatory indices were elevated, the intussusceptum was the colon at the hepatic flexure, and the intussusciens was the transverse colon.

The histopathological analysis also confirmed features very similar to our case, important as a common aspect with our case was the presence of necrotic tissue and ischemic signs of the mucous membrane surrounding the mass, that is, necrosis of the fat, without obvious malignant features. Radiologically, the barium enema demonstrated a round filling defect in the proximal transverse colon corresponding to the lipomatous lesion with complete obstruction. At the same time, the CT with administration of oral contrast media can be useful because the level of intussusception, with opacification in our exam at the level of the colic frame, up to the passage of the sigma and rectum, as it's reported in Figure 2.

The assessment of intussusception often starts with plain films of the abdomen that will typically reveal signs of intesti-

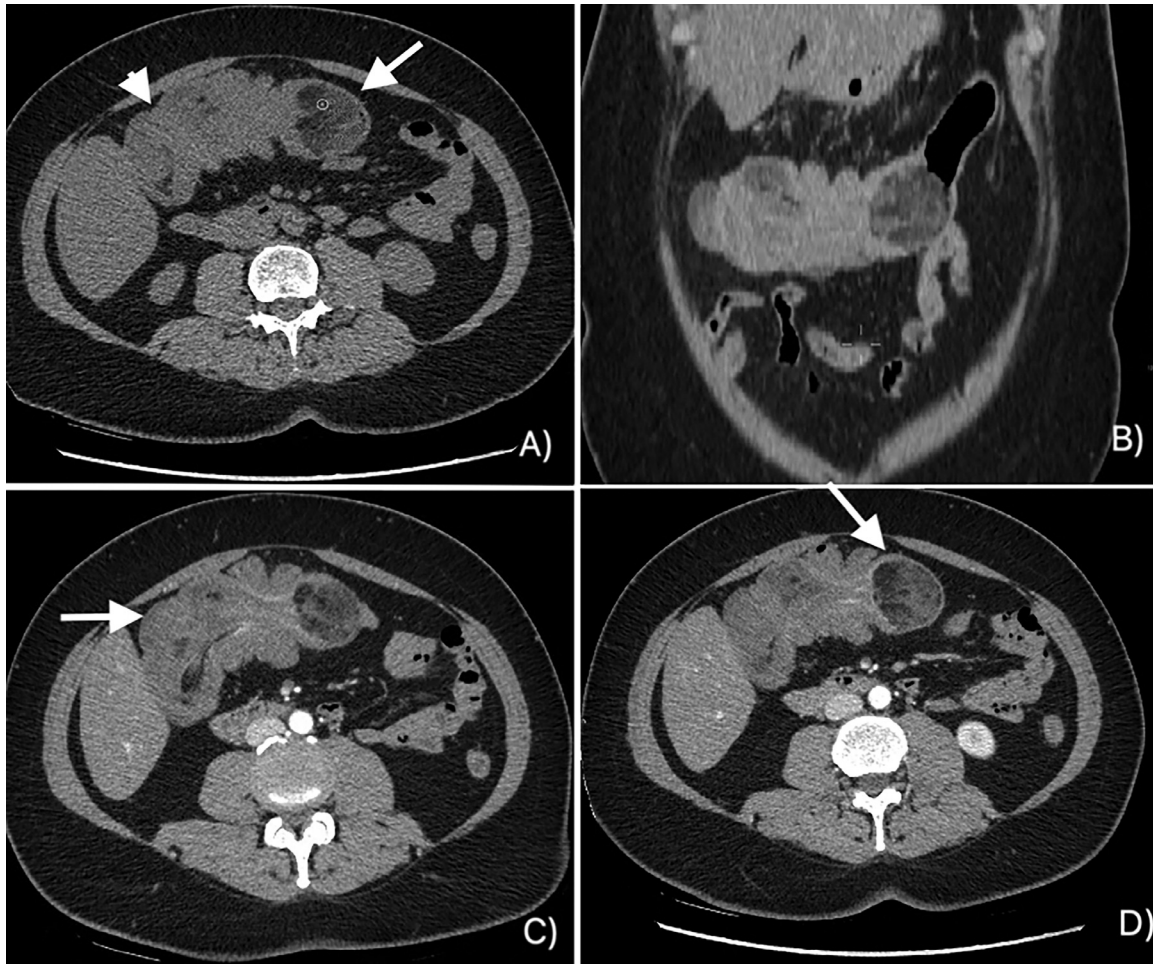


Fig. 5 – CT images in order: (A) Axial image without contrast media, typical elements of intussusception (arrowhead); the mass of heterogeneous density resulting in subocclusion is pointed by the white arrow. (B) In coronal image without contrast media, the obstruction, and edematous imbibition are more pronounced. (C and D) Axial images with contrast media, vessel stretching, whirlpool sign, and peripheral impregnation of the mass are observed (white arrows).

nal obstruction or perforation, and information on the location of the obstruction.

The sensitivity and specificity of ultrasound in diagnosing intussusception approaches nearly 100% in experienced hands. The classic feature is the target or doughnut sign on the transverse view caused by the edematous intussusciens forming an external ring around the centrally based intussusceptum, and pseudo-kidney on the longitudinal view. In adults, however, ultrasound tends to be less accurate than in children, other limitations are massive air in cases of bowel distension or morbid obesity. However, ultrasound is often the initial choice for imaging intussusceptions in both pediatric and adult populations. Ultrasound has advantages such as providing rapid, inexpensive imaging with real-time examination. However, ultrasound imaging depends on operator performance, and its efficacy may be reduced by bowel distention [9].

The gold standard for intussusception diagnosis is abdominal CT, with an accuracy of 83% as explained by Wilson et alia

[11]. Classic findings on CT include “target,” “bulls-eye,” or sausage-shaped lesions characterized by a hyperdense double ring, features owing to the anatomic configuration of the outer intussusciens and the central intussusceptum creating a bowel-within-bowel appearance (Figs. 5 and 6). Additionally, CT can show impaired perfusion in terms of venous stasis, edema, and air in the bowel wall due to necrosis or gangrene.

Barium or water-soluble contrast (Gastrografin) enema may be useful in adult patients with colonic or ileocolic intussusception, revealing a characteristic “cup-shaped” filling defect, while also having a therapeutic effect. Barium studies are contraindicated if there is a possibility of bowel perforation or ischemia due to the risk of “barium peritonitis.”

Colonoscopy is another useful tool in evaluating intussusception, notably when the presenting symptoms include a large bowel obstruction; it allows the lesion to be diagnosed and biopsied.

MRI is not routinely used for diagnosing intussusception in pediatric or adult populations, but it may have similar sensi-



Fig. 6 – Sagittal scan: the mass is covered by evidence of stretching and imbibition in the surrounding tissue (white arrow).

tivity to CT, especially when an enterography protocol is employed.

Regardless of the type of intussusception, surgery is indicated when enema reduction or close observation are unsuccessful, or when signs of bowel necrosis or a lead point mass are appreciated on imaging studies [5,6].

Patient consent

The authors declare that this report does not contain any personal information that could lead to the identification of the patient. Informed consent was obtained from the patient.

REFERENCES

- [1] De Moulin D, Paul Barbette MD. A seventeenth-century Amsterdam author of best-selling textbooks. *Bull Hist Med* 1985;59:506–14.
- [2] Marsicovetere P, Ivatury SJ, White B, Holubar SD. Intestinal intussusception: etiology, diagnosis, and treatment. *Clin Colon Rectal Surg* 2017;30:30–9.
- [3] Manouras A, Lagoudianakis EE, Dardamanis D, Tsekouras DK, Markogiannakis H, Genetzakis M, et al. Lipoma induced jejunojejunal intussusception. *World J Gastroenterol* 2007;13:3641–4.
- [4] Haidaran I, Haidaran AID. Adult intussusception: a case report. *J Surg Case Rep* 2023;105:107977.
- [5] Frazão J, Silva C, Almeida F, Calado J, Paulo M. Adult colocolic intussusception: a rare case of intestinal obstruction. *Cureus* 2023;15(5):e39526.
- [6] Brill A, Lopez RA. Intussusception in adults, Treasure Island (FL): StatPearls Publishing; 2023. StatPearls [Internet].
- [7] Chen EY, Vaccaro GM. Small bowel adenocarcinoma. *Clin Colon Rectal Surg* 2018;31:267–77. doi:10.1055/s- 0038-1660482.
- [8] Vecchio R, Ferrara M, Mosca F, Ignoto A, Latteri F. Lipomas of the large bowel. *Eur J Surg* 1996;162:915–19.
- [9] Sui X, Tao JQ, Min J. Lipoma-associated intussusception of the transverse colon. *Cureus* 2023;15(5):e38671. doi:10.7759/cureus.38671.
- [10] Jiang RD, Zhi XT, Zhang B, Chen ZQ, Li T. Submucosal lipoma: a rare cause of recurrent intestinal obstruction and intestinal intussusception. *J Gastrointest Surg* 2015;19:1733–5. doi:10.1007/s11605-015-2824-1.
- [11] Wilson A, Elias G, Dupiton R. Adult colocolic intussusception and literature review. *Case Rep Gastroenterol* 2013;7(3):381–7. doi:10.1159/000355155.