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**Case Report**

# Colonic intussusception caused by a giant colonic lipoma: case report and literature review

**Heron Kairo Sabóia Sant'Anna Lima[1]*, Gustavo Salmeron Takahashi[1], Matheus Naufal Santelo[1], Gemima Prates Sousa[2], Stephanie Souza Firmo[2], Enzo Stella de Carvalho[2]**

[1]Department of Surgery, Complexo Hospitalar do Mandaqui, São Paulo, Brazil
[2]Department of Medical Sciences, Universidade Nove de Julho, São Paulo, Brazil

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***Correspondence:**
Heron Kairo Sabóia Sant'Anna Lima,
E-mail: heronsaboia@gmail.com

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## ABSTRACT

Colonic lipomas are rare benign tumours that frequently remain asymptomatic. However, when large in size, they may cause serious complications such as intussusception and bowel obstruction, challenging differentiation from malignant neoplasms. This paper reports the case of a 54-year-old male patient admitted to the emergency department with intermittent abdominal pain and progressive constipation over two months. Computed tomography revealed colo-colonic intussusception involving the descending and sigmoid colon with a 4.2 cm endoluminal lesion suggestive of neoplasia. Colonoscopy confirmed a pedunculated stenotic mass, enabling intussusception reduction, but diagnostic biopsy was not feasible. Due to persistent obstructive symptoms, inability to exclude malignancy, and risk of recurrent intussusception, left colectomy via laparotomy was performed. Pathological examination confirmed a benign submucosal lipoma measuring 4.2×3.5×3.5 cm without signs of malignancy. Postoperative course was uneventful with progressive bowel recovery and hospital discharge in good clinical condition. This report emphasizes the importance of accurate differential diagnosis of colonic lipomas, judicious indication for surgical resection in complicated giant lipomas, and minimally invasive techniques available for management of this condition.

**Keywords:** Colonic lipoma, Intussusception, Bowel obstruction, Colectomy, Colorectal surgery

## INTRODUCTION

Lipomas, by definition, are rare benign non-epithelial tumors composed of adipose tissue, which can be found throughout the gastrointestinal tract, with predominance in the colon.[1,2] In general, they present as polypoid masses with a sessile base, with the pedunculated form being less common, and can vary widely in size, from small lesions of approximately 2 mm to large formations reaching 30 cm.[3] Macroscopically, lipomas appear as yellowish, soft, lobulated, well-circumscribed masses that may be sessile or pedunculated.[4] Microscopically, they are composed of mature adipocytes organized in lobules separated by delicate fibrous septa, frequently associated with thick-walled blood vessels.[5] Approximately 90% of colonic lipomas originate in the submucosa, while the remainder are distributed between subserosal and intramucosal locations. The incidence of these tumors in the colon ranges from 0.2% to 4.4%.[1] This condition is more frequent in women than in men, with women showing a predilection for the right colon and men for the left colon. The mean age of affected patients is in the sixth decade of life.[1] In most cases, this condition remains clinically silent and is discovered incidentally during colonoscopy, computed tomography, surgical procedures, or necropsy studies. However, when symptomatic,

particularly those with diameter greater than 2 cm, they may manifest with abdominal pain, changes in bowel habits, gastrointestinal bleeding, and in more severe cases, intestinal obstruction or intussusception.[1] Giant lipomas, defined as those with diameter greater than 4 cm, present symptoms in 75% to 100% of patients.[6] The occurrence of colonic lipoma is uncommon, and its differential diagnosis with other causes of intestinal obstruction can be challenging. Familiarity with this condition is essential to avoid diagnostic delays and ensure timely treatment.

## CASE REPORT

A 54-year-old male patient, previously healthy, was admitted to the emergency department with complaints of recurrent abdominal pain, intermittent in character, associated with progressive reduction in bowel habit. Symptoms had evolved over approximately two months, with gradual worsening, culminating in complete interruption of flatus and fecal elimination in the hours preceding admission.

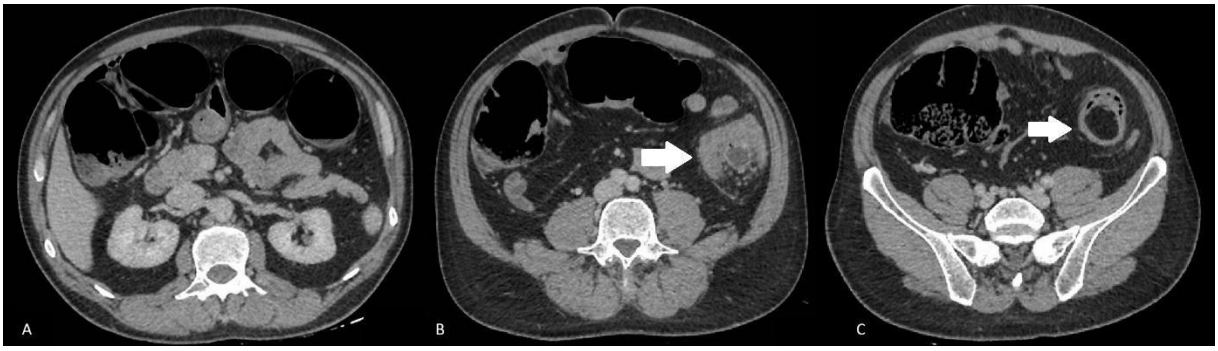


**Figure 1: Axial computed tomography image showing: (A) significant intestinal distension, (B) signs suggestive of colo-colonic intussusception in the descending colon and (C) endoluminal hypodense structure in the descending colon below the intussusception point causing mechanical obstruction upstream.**

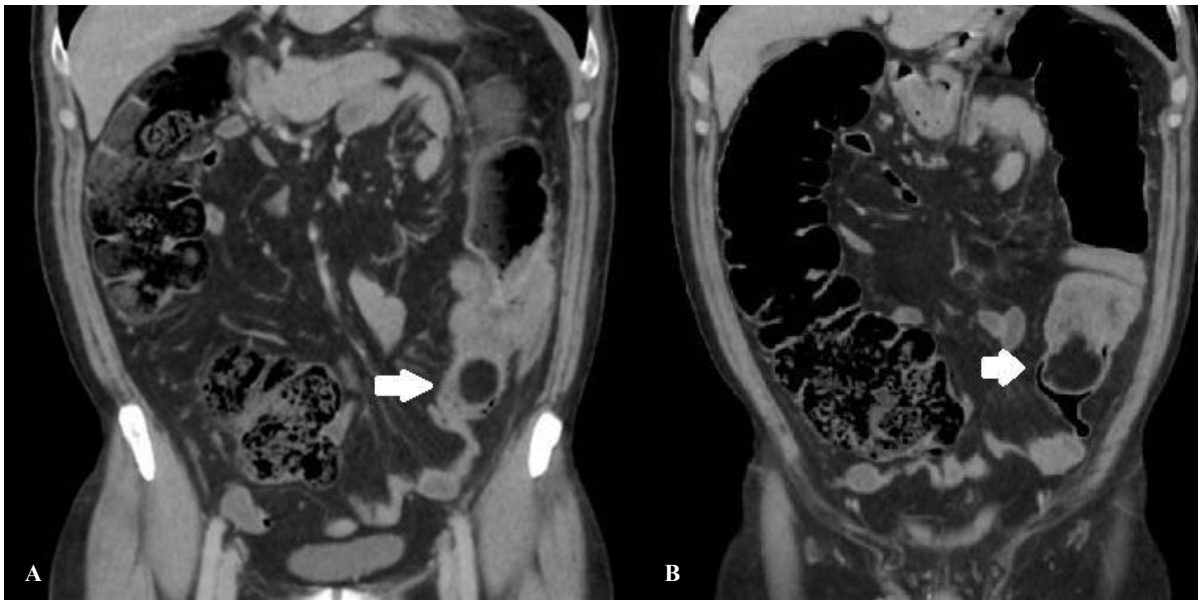


**Figure 2 (A and B): Coronal computed tomography image showing endoluminal structure mechanically obstructing the descending colon lumen associated with intussusception.**

On initial evaluation, the patient was in good general condition, clinically and hemodynamically stable. Abdominal physical examination revealed moderate distension, with diffuse pain on deep palpation, more evident in the left flank, without signs of peritoneal irritation. Initial laboratory exams showed no relevant alterations, with no signs of infection, anemia, or hydroelectrolytic disturbances. Computed tomography of the abdomen and pelvis demonstrated findings compatible with colocolonic intussusception involving the descending and sigmoid colon segments, associated with intestinal distension upstream. An endoluminal lesion with regular contours, measuring approximately 4.2×4.1 cm, was identified, suggesting it acts as the lead point of the intussusception process (Figures 1 and 2). Given the sub occlusive status, emergency colonoscopy was performed to evaluate intussusception and characterize the endoluminal lesion, which revealed a

pedunculated and stenotic lesion in the descending colon with regular surface. Using the colonoscope, it was possible to reduce the intussusception; however, progression of the device beyond the endoluminal lesion was not possible, nor was endoscopic biopsy feasible (Figure 3).

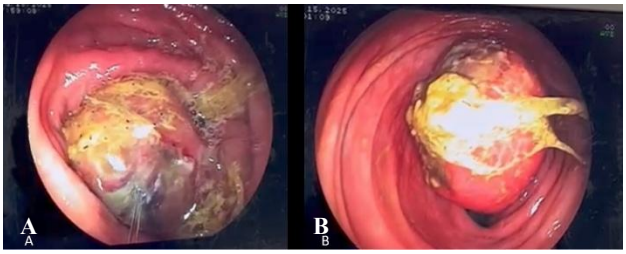


**Figure 3: Colonoscopy showing endoluminal mass before: (A) and after (B) intussusception reduction.**

Considering the persistence of obstructive symptoms, imaging findings suggestive of mechanical complication, and the impossibility of excluding malignancy preoperatively, surgical approach via exploratory laparotomy was chosen. Intraoperatively, a hardened mass was observed located in the descending colon, associated with the segment involved by intussusception, without macroscopic evidence of tumor dissemination (Figure 4).

Left colectomy with primary termino-lateral anastomosis was performed (Figure 5). Histopathological examination of the surgical specimen confirmed the diagnosis of submucosal colonic lipoma measuring 4.2×3.5×3.5 cm without signs of malignancy. Postoperative course was favorable without intercurrences. The patient showed progressive recovery of intestinal transit and was discharged from hospital in good clinical conditions, returning to outpatient care without complaints.

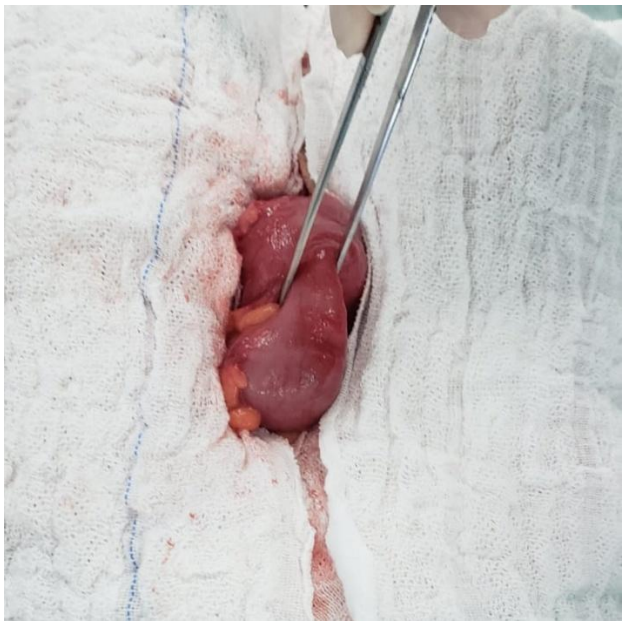

**Figure 4: Hardened intraluminal bulging evidenced during intraoperative period.**

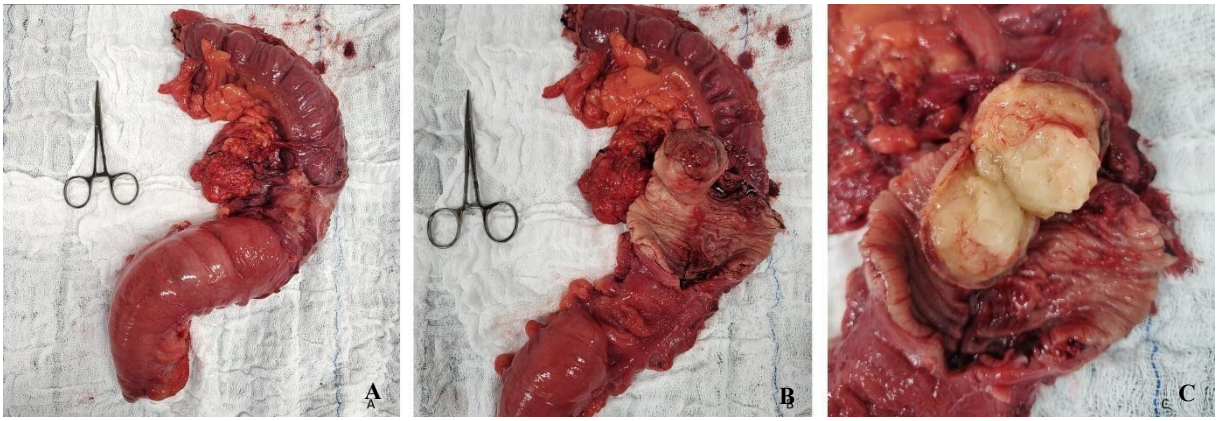


**Figure 5: Surgical specimen showing left colectomy: (A) in image, (B) the intraluminal bulging is identified. In image (C) the lipomatous aspect of the lesion is visible.**

## DISCUSSION

The incidence of colonic lipomas shows wide variation in studies reported in medical literature. Necropsy series demonstrate incidence between 0.2% and 4.4%, while colonoscopic studies report frequency between 0.11% and 0.15%.[6] This discrepancy reflects, in part, the frequently asymptomatic nature of these lesions and their incidental discovery.[1] Colonic lipomas predominantly affect individuals between the fifth and seventh decades of life, with mean age at diagnosis around 60 to 70 years.[7] Some studies demonstrate slight female predominance.[1] In the present case, the patient was male, aged 54 years, falling slightly below the mean age described in the literature. The most common clinical manifestations include abdominal pain (42.8% to 55%), alterations in bowel habits (64% to 71.3%), gastrointestinal bleeding (28.5% to 40%), and anemia.[8] Serious complications, such as intestinal obstruction, intussusception (5% to 7% of cases), and intestinal perforation, occur predominantly in lipomas of large dimensions.[9] The clinical presentation of our patient, with recurrent abdominal pain, progressive

constipation, and evolution to intestinal subocclusion associated with colic intussusception, fits precisely within the spectrum described for giant lipomas.

Colonoscopy constitutes the primary diagnostic method for colonic lipomas, allowing direct visualization of the lesion and performance of specific diagnostic maneuvers. Endoscopically, lipomas present as rounded, yellowish, sessile or pedunculated submucosal masses, covered by intact or occasionally ulcerated mucosa.[5-10] Three classic endoscopic signs aid in colonoscopic diagnosis of lipomas: the pillow sign (cushion sign), characterized by depression or indentation of the lesion surface when pressed with closed biopsy forceps, returning to original shape after pressure removal, reflecting the soft and compressible nature of adipose tissue; the tent sign, observed by elevation of mucosa over the lipoma when tractioned with biopsy forceps, demonstrating the mobility of overlying mucosa in relation to the submucosal lesion; and the naked fat sign, characterized by extrusion of yellowish fatty material through the biopsy site after multiple biopsies at the same point, possessing high diagnostic specificity.[11-13] Although such classic signs may strongly suggest the diagnosis of lipoma, in our patient the hardened consistency of the lesion, associated with the context of intussusception, increased suspicion of malignancy, justifying the choice for surgical resection without prior histological confirmation. It is important to emphasize that single endoscopic biopsy is generally inconclusive, reaching only normal superficial mucosa without sampling of underlying adipose tissue, since lipomas are predominantly located in the submucosa. Repeated biopsies at the same site or in ulcerated lesions may reveal lipomatous tissue; however, they increase the risk of bleeding and perforation.[5-10] In our case, the patient, despite intussusception reduction by colonoscopy, was unable to undergo biopsy due to the atypical consistency of the lipoma.

Abdominal CT represents the most useful imaging method for confirming diagnosis of colonic lipomas, especially in voluminous lesions. The characteristic finding consists of a well-delimited colonic parietal mass with fat density.[14] CT demonstrates sensitivity superior to colonoscopy for detecting smaller lipomas.[15] The "squeeze sign," observed on CT, is characterized by changes in shape and size of the lesion in response to peristaltic intestinal movements or external compression, reflecting the malleable nature of adipose tissue.[11-16] Additionally, CT is essential for identifying associated complications, such as intussusception and intestinal obstruction.[17,18] In the reported case, computed tomography showed colo-colonic intussusception from descending to sigmoid colon with an endoluminal lesion of approximately 4.2 cm, a finding compatible with giant lipoma described in the literature as a typical lead point of intussusception in adults. Although less commonly used today, barium enema may demonstrate intraluminal filling defect; however, this finding is nonspecific and can be observed in other colonic neoplasms.[1] The "squeeze sign" can occasionally be identified during fluoroscopy, with change in lesion shape during palpation.[19] MRI offers excellent tissue characterization of colonic lipomas. T1weighted sequences demonstrate characteristic hyperintensity of adipose tissue, while fat-suppression sequences confirm the lipomatous nature by signal loss.[16] MRI is particularly useful in cases of uncertain diagnosis or suspicion of malignant transformation.[17] Our patient underwent colonoscopy and abdominal CT. The care team considered performing magnetic resonance imaging for differential diagnosis; however, due to clinical worsening, surgical resection was chosen after the aforementioned exams.

The differential diagnosis of colonic lipomas is broad and includes mainly:

***Epithelial neoplasms***

Adenomas and adenocarcinomas can mimic lipomas, especially when lipomas present with superficial ulceration, inflammatory changes, or necrosis.

***Mesenchymal tumors***

Gastrointestinal stromal tumors (GIST), leiomyomas, and liposarcomas should be considered in the differential diagnosis. The unequivocal demonstration of fat density on CT favors the diagnosis of benign lipoma.[8]

***Colonic pseudolipomatosis***

A benign condition characterized by gas infiltration from the intestinal lumen into the mucosa during colonoscopy, simulating intramucosal lipomas. Differentiation is based on the morphology of vacuolizations (small and irregular in pseudolipomatosis versus large and regular in lipomas) and on immunohistochemistry with S-100, positive in lipomas and negative in pseudolipomatosis.[20]

***Intramucosal lipomas associated with cowden syndrome***

Truly intramucosal lipomas (located in the lamina propria, not submucosa) are highly suggestive of Cowden syndrome (hamartomatous syndrome due to PTEN mutation), and should trigger appropriate genetic and oncological investigation.[21] The therapeutic approach to colonic lipomas is individualized, based on lesion size, presence of symptoms, anatomical location, preoperative diagnostic certainty, and availability of technical resources.[22]

Asymptomatic lipomas smaller than 2 cm generally do not require treatment and can be monitored with endoscopic surveillance. This conservative approach is based on the benign nature of these lesions and absence of significant potential for malignant transformation. However, recent studies suggest that lipomas may demonstrate progressive growth over time, eventually

becoming symptomatic, which supports consideration of preventive resection in selected cases.[23] Small lipomas (smaller than 2 cm), particularly pedunculated ones, can be resected via conventional polypectomy with diathermic snare.[10] However, endoscopic resection using electrocautery is associated with elevated risk of complications, including bleeding and perforation, due to low electrical conductivity of adipose tissue and consequent need for greater energy for complete transection.[24,25] Endoscopic mucosal resection preceded by submucosal injection of expansile solution (saline, glycerol, or dilute epinephrine) can be employed for resection of intermediate-sized lipomas.[26] Submucosal injection creates a protective cushion, theoretically reducing risk of perforation. Studies demonstrate efficacy of EMR in lipomas up to 3-4 cm, with acceptable complication rates when performed by experienced endoscopists.[27] Endoscopic submucosal dissection allows en bloc resection of large colonic lipomas, preserving intact specimens for complete histopathological analysis. Studies report successful resection of lipomas between 5 and 7 cm in diameter via ESD, with procedural time ranging from 28 to 40 minutes and absence of significant complications. The main advantage of ESD consists of obtaining complete specimens, facilitating definitive histopathological evaluation and excluding malignancy.[5] Despite the availability of advanced endoscopic techniques, the clinical scenario of our patient, subocclusive status, established intussusception, and lesion with hardened consistency, made endoscopic treatment less safe. Surgical resection remains indicated in specific situations (Table 1). All these indications were present in the case under discussion: giant lipoma larger than 4 cm, associated with intussusception and intestinal obstruction, with inability to exclude malignancy preoperatively. Thus, the choice for left colectomy with primary anastomosis is in full concordance with current recommendations.[22]

**Table 1: Main surgical indications for colonic lipoma diagnosis.**

| |
|---|
| Giant lipomas (larger than 4 cm) |
| Preoperative diagnosis uncertain with suspicion of malignancy |
| Complicated lipomas (intussusception, intestinal obstruction, massive bleeding) |
| Sessile lesions with broad base not suitable for safe endoscopic resection |
| Lipoma extension to muscularis propria or serosa |
| Failure of previous endoscopic treatment |

Bouzid et al; Erginoz et al; Lee et al.[10,12,21]

Surgical intervention has long been the standard treatment for intussusception in adults. The traditional operation for colo-colonic intussusception caused by a giant colonic lipoma has been segmental colectomy or formal hemicolectomy. These techniques allow adequate resection of the colon and associated lymphatic tissue while ensuring adequate margins are obtained when concerned for underlying malignancy. With the development of minimally invasive techniques, incorporation of laparoscopic and robotic approaches has become increasingly common. However, alternative approaches to consider include colotomy with enucleation and laparoscopic-assisted submucosal excision.[23] The postoperative period following surgical resection follows general principles of colonic surgery. Studies demonstrate that patients undergoing laparoscopic resection are discharged 4 to 11 days after the procedure, depending on the extent of resection and associated comorbidities.[22-28] In the reported case, the patient showed progressive recovery of intestinal transit and was discharged from hospital in good clinical conditions, an evolution consistent with favorable outcomes described in the literature for resection of benign colonic lipomas. Unlike colorectal cancer, there are no universally established guidelines for follow-up of patients treated for colonic lipomas. The literature suggests that, due to excellent evolution and absence of malignant potential, routine prolonged endoscopic surveillance generally is not necessary after complete resection confirmed histologically.[29] The prognosis of treated colonic lipomas is excellent. Studies demonstrate a 99% survival rate at 10 years after surgical resection.[30] Mortality related to colonic lipomas is virtually nil when appropriately diagnosed and treated.[11]

The present case illustrates, in a single patient, several critical aspects described in the literature on giant colonic lipomas: presentation with intussusception in adults, limitation of endoscopic biopsy for diagnostic confirmation, central role of CT in identifying the lipomatous lesion, and necessity for segmental resection when unable to exclude malignancy. Thus, the case reinforces the importance of considering giant lipoma in the differential diagnosis of colonic obstructions in adults and of individualizing the choice between endoscopic and surgical approach according to available clinical and structural context.

## CONCLUSION

Giant colonic lipomas represent a rare entity of great clinical relevance when they cause obstructive complications. This case illustrates a frequent diagnostic-therapeutic challenge: the distinction between benign lipoma and malignant neoplasm in the context of acute colonic obstruction with intussusception. A multimodal diagnostic approach, integrating colonoscopy, high-resolution CT, and when indicated, MRI, allows consolidation of benign lipoma diagnosis, guiding subsequent therapeutic strategy. Lipomas smaller than 2

cm can be observed with endoscopic surveillance, while lesions of intermediate size (2-4 cm) are amenable to endoscopic resection when local expertise permits.

However, giant lipomas (larger than 4 cm) complicated by intussusception, intestinal obstruction, or preoperative diagnostic impossibility of excluding malignancy constitute robust indications for surgical resection. The laparoscopic approach should be preferred when viable, offering reduced morbidity without compromising oncological results. Adequate segmental resection, with safety margins, ensures definitive cure and excellent prognosis. General surgeons should maintain high clinical suspicion for this condition, particularly in patients with subacute presentation of colonic obstruction and endoluminal lesion on imaging studies. Individualized management, considering size, symptomatology, comorbidities, and availability of technical resources, results in excellent clinical outcomes and patient satisfaction.

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