Colonic Leiomyoma Presenting as Sigmoid Volvulus in a Young Male

Reza Aditya Digambiro, Gerie Amarendra**, Florinda Ilona*, Julian Chendrasari*, Samuel Abiodun Kehinde****

*Department of Anatomical Pathology, Faculty of Medicine, Universitas Trisakti, Jakarta, Indonesia
**Department of Internal Medicine, Faculty of Medicine, Universitas Trisakti, Jakarta, Indonesia
***Faculty of Basic Medical Sciences - Ajayi Crowther University - Oyo- Nigeria

Corresponding author:
Reza Aditya Digambiro, Jl.KyaiTapa No.1, RT.5/RW.9, Tomang, Kec. Grogol petamburan, Kota Jakarta Barat, Daerah Khusus Ibukota Jakarta 11440, Indonesia. Phone (+62)82166509998, email : drdigambiro@trisakti.ac.id

ABSTRACT

Colonic leiomyomas are rare tumors that originate from the smooth muscle layer of the colon and are infrequently observed in young individuals. This case report represents a 21-year-old male who presented with a 2-month history of progressive abdominal distension, persistent vomiting, early satiety, and bloating. Computed tomography (CT) of the abdomen suggested sigmoid volvulus with associated bowel obstruction. However, exploratory laparotomy revealed a well-defined, firm intramural mass in the sigmoid colon, leading to segmental resection and primary anastomosis. Histopathological analysis showed intersecting fascicles of bland spindle cells with eosinophilic cytoplasm and cigar-shaped nuclei without atypia or mitotic activity. Immunohistochemistry confirmed positivity for smooth muscle actin (SMA) and negativity for CD117, supporting a diagnosis of colonic leiomyoma and excluding gastrointestinal stromal tumor (GIST). The patient's postoperative course was uneventful, with complete resolution of obstructive symptoms and restoration of normal bowel function. This case highlights the diagnostic challenge of differentiating colonic leiomyoma from other causes of bowel obstruction, particularly when presenting with features mimicking sigmoid volvulus. It also emphasizes the critical role of histopathology and immunohistochemistry in establishing a definitive diagnosis. Clinicians should consider rare benign tumors in the differential diagnosis of young patients with signs of bowel obstruction.

***Keywords**: Colonic Leiomyoma, Sigmoid Volvulus, Bowel Obstruction, Smooth Muscle Tumor*

ABSTRAK

Leiomioma kolon merupakan tumor jinak yang berasal dari lapisan otot polos dinding kolon. Tumor ini jarang dijumpai pada individu usia muda. Laporan kasus ini merepresentasikan seorang pria usia 21 tahun yang datang dengan keluhan distensi abdomen progresif selama dua bulan, muntah berulang, cepat kenyang, dan rasa kembung. Pemeriksaan pencitraan abdomen, termasuk CT-scan, menunjukkan dugaan volvulus sigmoid disertai obstruksi usus. Laparotomi eksploratif menemukan massa intramural yang terdefinisi baik dan bertekstur padat di kolon sigmoid, sehingga dilakukan reseksi segmenal dan anastomosis. Analisis histopatologis memperlihatkan berkas-berkas sel spindle jinak yang saling bersilangan, dengan sitoplasma eosinofilik dan inti berbentuk cerutu tanpa atipia atau aktivitas mitosis. Pewarnaan imunohistokimia menunjukkan hasil positif untuk smooth muscle actin (SMA) dan negatif untuk CD117, yang mendukung diagnosis leiomioma kolon dan menyingkirkan kemungkinan gastrointestinal stromal tumor (GIST). Pasien menjalani masa pascaoperasi tanpa komplikasi, dengan perbaikan gejala obstruksi dan fungsi usus yang kembali normal. Kasus ini menyoroti tantangan diagnostik dalam membedakan leiomioma kolon dari penyebab obstruksi usus lainnya, terutama bila

gejalanya menyerupai volvulus sigmoid. Temuan ini juga menekankan pentingnya pemeriksaan histopatologi dan imunohistokimia dalam menegakkan diagnosis pasti. Klinisi perlu mempertimbangkan kemungkinan tumor jinak langka dalam diagnosis banding pasien muda dengan tanda-tanda obstruksi usus.

***Kata kunci**: Leiomioma Kolon, Volvulus Sigmoid, Obstruksi Usus, Tumor Otot Polos*

INTRODUCTION

Leiomyomas most commonly originate in the uterus but may also develop within the intestinal tract. Colonic leiomyomas are rare, accounting for less than 3% of all gastrointestinal mesenchymal tumors. Due to their rarity and nonspecific clinical presentations, colonic leiomyomas are frequently misdiagnosed preoperatively. When located in the sigmoid colon, these lesions may present with symptoms mimicking sigmoid volvulus, including progressive abdominal distension, nausea, vomiting, and signs of bowel obstruction. [1,2] Although sigmoid volvulus typically presents as an acute surgical emergency, this case showed a more subacute clinical course. This atypical progression may be explained by the presence of the underlying leiomyoma, which likely acted as a lead point for intermittent or partial torsion of the sigmoid colon. Such recurrent or progressive twisting may have resulted in gradually worsening obstruction over time, rather than an abrupt onset of complete luminal compromise.

Sigmoid volvulus itself is a surgical emergency characterized by torsion of the sigmoid colon that can cause luminal obstruction and potential ischemia. The clinical overlap between sigmoid volvulus and other causes of colonic distension can complicate early diagnosis and delay definitive management. Although cross-sectional imaging, particularly CT, is valuable in identifying the underlying pathology, histopathological examination remains the definitive gold standard for diagnosis. [3,4]

This case represents a 21-year-old male with progressive abdominal distension, vomiting, and signs of bowel obstruction. Imaging studies initially suggested sigmoid volvulus with paralytic ileus. However, surgical exploration and histopathological analysis showed a rare leiomyoma of the sigmoid colon. Early recognition and appropriate surgical management are crucial to prevent complications and optimize outcomes. This case report aims to describe an unusual presentation of colonic leiomyoma in a young male mimicking sigmoid volvulus and to emphasize the importance of histopathological and immunohistochemical examination in establishing a definitive diagnosis.

CASE ILLUSTRATION

A 21-year-old male presented to the emergency department with a 2-month history of rapidly progressive abdominal distension accompanied by persistent nausea and vomiting. The vomiting occurred more than three times per day and contained fluid material. The patient reported early satiety, reduced appetite, and discomfort due to bloating, but denied any history of fever, diarrhea, hematemesis, or melena. The patient past medical history was unremarkable, with no known comorbidities or history of abdominal surgery.

On physical examination, the patient appeared moderately ill with stable vital signs (BP 117/62 mmHg, HR 103 bpm, Temp 38°C, RR 20/min, SpO_2 98%). Abdominal inspection showed generalized distension with tympanic percussion and tenderness in the epigastrium. Laboratory investigations were within normal limits, except for mild hyperbilirubinemia (total bilirubin 1.42 mg/dL) and hypokalemia (serum potassium 2.8 mEq/L). A nasogastric tube was inserted for decompression.

Initial abdominal radiographs showed dilated bowel loops suggestive of obstruction, as seen in **Figure 1.** CT scan of the abdomen with contrast showed a sigmoid volvulus with marked colonic and small bowel dilatation without evidence of pneumoperitoneum or free fluid, as seen in **Figure 2.** The patient underwent exploratory laparotomy, and a well-circumscribed, firm intramural mass was identified in the sigmoid colon.

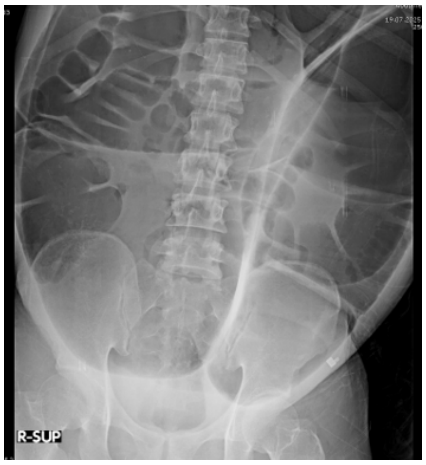

Figure 1. Supine abdominal plain radiograph showing markedly dilated colonic loops with air-fluid levels, predominantly in the left lower quadrant. The configuration suggests a twisted sigmoid colon consistent with sigmoid volvulus

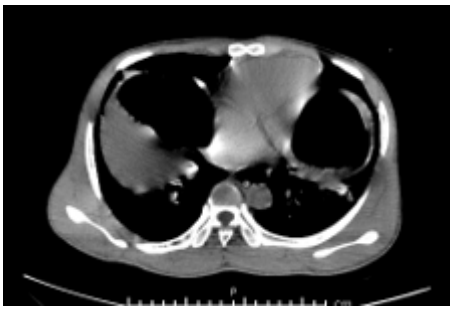

Figure 2. Axial contrast-enhanced CT scan of the abdomen showing marked dilatation of the colonic lumen with twisted mesenteric vessels creating a "whirl sign," indicative of sigmoid volvulus

Surgical resection with primary anastomosis was performed. Gross examination of the resected sigmoid colon specimen revealed distinct morphological differences between its segments. The distal segment showed a dilated, thickened wall with an unremarkable mucosal surface, whereas the proximal segment exhibited a twisted configuration with luminal narrowing and congested mucosa, findings consistent with volvulus-related changes **(Figures 3A and 3B).** Histopathological examination of the resected sigmoid colon specimen showed a well-circumscribed, unencapsulated, intramural lesion composed of intersecting bundles of bland spindle cells with elongated nuclei and eosinophilic cytoplasm. These cells were arranged in fascicles and whorled patterns within the muscularis propria, without evidence of atypia, mitotic activity, or necrosis. The overlying mucosa appeared preserved and non-ulcerated. There were no features suggestive of malignancy, such as nuclear pleomorphism, hyperchromasia, or abnormal mitotic figures. The tumor margins were pushing but non-infiltrative, supporting a benign smooth muscle tumor, and the histological features were consistent with leiomyoma of the colon. Further confirmation was obtained through immunohistochemical staining. The tumor cells exhibited diffuse and strong cytoplasmic positivity for Smooth Muscle Actin (SMA), supporting a smooth muscle origin, while showing negative expression for CD117 (c-KIT) as seen in **Figure 4A-C**, thereby ruling out gastrointestinal stromal tumor (GIST) as a differential diagnosis. These histological and immunophenotypic findings collectively confirmed the diagnosis of colonic leiomyoma.

The patient's postoperative course was uneventful, with resolution of symptoms and normalization of bowel function.

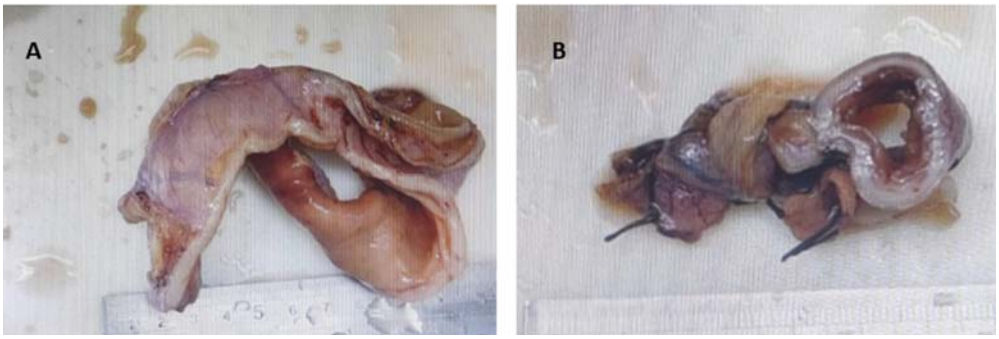

Figure 3. Gross appearance of the resected sigmoid colon. (A). The distal colonic segment shows a dilated and thickened wall with an unremarkable mucosal surface. (B). Proximal colonic segment showing twisted morphology with evidence of luminal narrowing and congestion consistent with volvulus-related changes

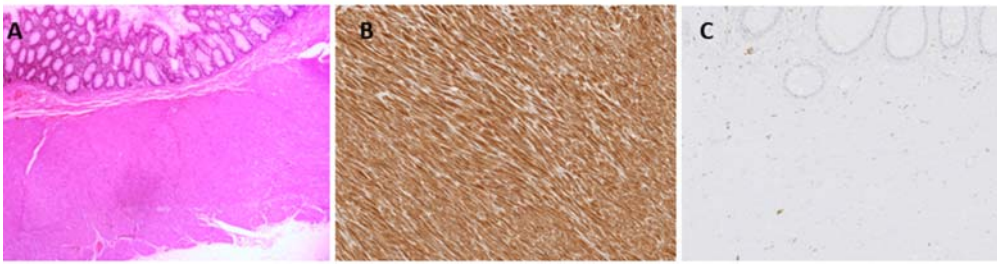

Figure 4. Histopathological and immunohistochemical features of the sigmoid colon lesion. (A). Hematoxylin and eosin (H&E) staining showing a well-circumscribed intramural tumor composed of interlacing fascicles of spindle cells beneath intact colonic mucosa (magnification 40×). (B). Immunohistochemical staining for SMA showing diffuse strong cytoplasmic positivity in the tumor cells, supporting smooth muscle origin (magnification 100×). (C). Immunohistochemical staining for CD117 (c-KIT) showing negative expression in tumor cells, helping to rule out GIST (magnification 100×)

DISCUSSION

Colonic leiomyomas are rare benign tumors derived from smooth muscle cells within the muscularis propria or muscularis mucosae of the colon. In contrast to their uterine counterparts, which are relatively common, colonic leiomyomas are uncommon, accounting for less than 3% of gastrointestinal mesenchymal tumors, and are particularly infrequent in a young male.[5] Most cases are discovered incidentally during colonoscopy, surgery, or autopsy, as these lesions are typically asymptomatic unless they attain a considerable size or result in complications such as obstruction, bleeding, or intussusception.[6,7]

In this case, a 21-year-old male presented with a two-month history of progressive abdominal distension, daily non-bilious vomiting, early satiety, and discomfort from bloating. The rapid onset and worsening of symptoms prompted evaluation in the emergency department. Despite the absence of constitutional symptoms such as weight loss or fever, the clinical presentation was significant for gastrointestinal obstruction. Initial physical examination showed a distended abdomen with epigastric tenderness, and the patient appeared moderately ill but hemodynamically stable.

Laboratory evaluations showed normocytic, normochromic blood indices, with no signs of anemia or systemic inflammation. Liver and kidney function tests were within normal limits, except for a mild elevation in total bilirubin and a notable hypokalemia (serum K^+ 2.8 mEq/L). Electrolyte imbalance was managed conservatively while further diagnostics were undertaken.

Radiological studies included plain abdominal radiographs and computed tomography (CT) of the abdomen with contrast. The abdominal X-rays in three positions showed paralytic ileus without clear evidence of pneumoperitoneum at the time. However, the CT scan showed a twisted, dilated sigmoid colon consistent with sigmoid volvulus, accompanied by prominent bowel loop dilatation suggestive of obstruction. There were no signs of ischemia, perforation, or intraperitoneal fluid. These radiologic findings raised a strong suspicion for mechanical obstruction due to sigmoid volvulus, a rare but recognized cause of acute abdomen requiring surgical intervention.

Volvulus refers to the torsion of a bowel segment around its mesenteric axis, leading to vascular compromise and luminal obstruction.[8] Sigmoid volvulus typically presents in elderly or chronically constipated patients, and is uncommon in young, healthy adults.[9,10] In contrast to the usual abrupt presentation of volvulus, this patient had a subacute two-month course of progressive abdominal distension and vomiting, which may reflect intermittent twisting or gradually worsening partial obstruction caused by the intramural tumor.

Surgical exploration through exploratory laparotomy was performed, showing a well-circumscribed mass arising from the muscular wall of the sigmoid colon. The lesion was firm, intramural, and non-invasive. Segmental sigmoidectomy with primary anastomosis was performed, and the specimen was submitted for histopathological examination.

Microscopically, the resected lesion showed characteristic features of a leiomyoma. Hematoxylin and eosin (H&E) stained sections at low magnification (40×) showed a sharply delineated, non-encapsulated nodule arising from the muscularis propria. The overlying colonic mucosa was intact, with no signs of ulceration or surface erosion. At higher magnification (100×), the lesion consisted of interlacing bundles of uniform spindle-shaped smooth muscle cells with blunt-ended nuclei, eosinophilic cytoplasm, and minimal mitotic activity. There was no evidence of necrosis, atypia, or nuclear pleomorphism. These features supported the diagnosis of benign colonic leiomyoma. [11,12]

Leiomyomas of the colon can present in a variety of ways depending on their size and location. Small, mucosal-based lesions may cause occult bleeding or be discovered during routine endoscopy, while larger intramural or subserosal lesions may cause obstruction, as in this case.[13–15] The clinical mimicry of sigmoid volvulus by a large colonic leiomyoma is exceedingly rare but has been reported in isolated case reports. In the present case, the leiomyoma may have acted as a lead point for sigmoid torsion by altering the local bowel configuration and motility; alternatively, its intramural mass effect may have accentuated luminal narrowing and produced the radiologic appearance of a twist, including the CT "whirl sign." This mechanism may also explain the subacute presentation, in which intermittent or progressive torsion preceded the eventual operative diagnosis. [16,17]

The definitive diagnosis of colonic leiomyoma hinges on histopathological evaluation. Grossly, which appear as firm, white-gray nodules with a whorled appearance on the cut surface, similar to uterine leiomyomas. Microscopically, the absence of mitoses, necrosis, and nuclear atypia distinguishes leiomyoma from its malignant counterpart, leiomyosarcoma. Immunohistochemistry in this case showed diffuse positive staining for SMA and negative staining for

CD117, supporting the diagnosis of leiomyoma and effectively excluding GIST, which typically shows strong CD117 positivity. [18–21]

This case shows the diagnostic challenge posed by unusual presentations of benign colonic tumors. The patient's age, lack of risk factors, and the presence of a volvulus-mimicking clinical syndrome initially directed the clinical team toward a diagnosis of sigmoid volvulus. This was only upon surgical exploration and histological examination that the true etiology, a colonic leiomyoma, was shown. This underscores the importance of maintaining a broad differential diagnosis in young patients with bowel obstruction and highlights the role of histopathology in establishing definitive diagnoses. [5,17,22]

The postoperative course of the patient was uneventful. Symptoms of abdominal distension and vomiting resolved completely following tumor resection. Electrolyte disturbances were corrected, and normal bowel function was restored. The patient was discharged with advice for routine follow-up and monitoring. Considering the benign nature of the lesion and complete surgical excision, the prognosis is excellent, with minimal risk of recurrence or malignant transformation.[6,23]

From a broader perspective, this case contributes to the limited literature on colonic leiomyomas, particularly in a young male. It underscores the importance of careful clinical, radiological, and histopathological correlation in cases of gastrointestinal obstruction with atypical features. The rarity of leiomyomas in the colon, specifically with a presentation mimicking volvulus, should prompt clinicians to consider this diagnosis when evaluating patients with unexplained bowel obstruction.[11]

This case reinforces the utility of CT imaging in evaluating suspected mechanical obstruction and guiding surgical decision-making. While endoscopy remains useful for intraluminal lesions, imaging is indispensable in assessing extrinsic masses and the structural integrity of the bowel in suspected volvulus. The absence of signs of ischemia or perforation on CT in this case justified a timely but controlled surgical approach, avoiding emergency resection under duress.[5,6]

CONCLUSION

In conclusion, this case of a young male presented with clinical features of sigmoid volvulus due to an underlying colonic leiomyoma emphasizes the need for vigilance in diagnosing rare causes of bowel obstruction. The integration of clinical suspicion, radiologic findings, and definitive histopathology was essential in guiding appropriate surgical management and ensuring optimal patient outcome. While colonic leiomyoma is rare, specifically in this age group, it should be considered in the differential diagnosis of obstructive colonic masses.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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AUTHOR CONTRIBUTIONS

Conceptualization, data collection, histopathological evaluation, manuscript drafting, manuscript review, and final approval were contributed by the authors according to their respective roles.

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DATA AVAILABILITY

Data supporting the findings of this case report are available from the corresponding author upon reasonable request, with patient confidentiality maintained.

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