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A rare case of small bowel obstruction secondary to mesenteric ring accompanying an umbilical hernia and intestinal leiomyoma

Nazlıcan Yalçın [1], Anıl Can Yalçın [1], Gökhan Demiral [2], Recep Bedir [1]

[1] Department of Pathology, Recep Tayyip Erdogan University, Medical Faculty, Rize, Turkey
[2] Department of General Surgery, Recep Tayyip Erdogan University, Medical Faculty, Rize, Turkey

ORCID of the author(s)

NY: https://orcid.org/0009-0002-3537-614X
ACY: https://orcid.org/0009-0000-6474-2474
GD: https://orcid.org/0000-0003-2807-5437
RB: https://orcid.org/0000-0001-8247-3781

Corresponding Author
Recep Bedir
Department of Pathology, Recep Tayyip Erdogan University of Medical Faculty, Rize, Turkey
E-mail: bedirrecep@gmail.com

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The authors stated that the written consent was obtained from the patient presented with images in the study.

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Abstract

Small bowel obstruction is a surgical emergency that can be caused by many pathological processes even though the leading cause of such an obstruction is an adhesion/adhesions that have occurred following a previous surgery. The second most common cause is an incarcerated hernia. We present an interesting medical case involving a 72-year-old male patient who had a history of compensated cirrhosis, diabetes mellitus, and hypertension. He presented to the emergency room with a chief complaint of persistent vomiting, constipation, and an unreducible bulge in his anterior abdominal region, all of which had been troubling him for the past three days. The patient had an umbilical hernia, and an intraabdominal solid mass was palpated. During surgical intervention, a mesenteric band in a ring-shaped fashion entrapping the small bowel was discovered and determined to be the main cause of the obstruction. Moreover, a 7.5 cm solid mass located 20 cm distal to this obstruction was enveloping the bowel. Following the excision of the mesenteric band and the mass, side-to-side anastomosis of the intestine was performed. The solid mass was later diagnosed as an intestinal leiomyoma, which is a rare cause of small bowel obstruction. This case presents a rare occurrence due to its three possible and distinct causes of obstruction in the same patient.

Keywords: small bowel, umbilical hernia, intestinal leiomyoma

Introduction

Small bowel obstruction is a surgical emergency that can be caused by many pathological processes. Although the leading cause of such an obstruction is the adhesion/adhesions following a previous surgery, the second most common cause is incarcerated hernias [1,2]. Nearly all patients with intestinal obstructions present with distressing symptoms, including nausea, vomiting, and severe constipation, which necessitate immediate medical intervention. In this article, we present a case of small bowel obstruction secondary to a mesenteric ring-like structure with an accompanying incarcerated umbilical hernia and intestinal leiomyoma. Since three possible causes that may be the underlying reason for the small bowel obstruction are present, this case highlights the importance of a differential diagnosis for an intestinal obstruction.

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Case presentation

We present an intriguing medical case involving a 72-year-old male patient with a history of compensated cirrhosis, diabetes mellitus, and hypertension. He presented to the emergency room with complaints of persistent vomiting, constipation, and an unreducible bulge in his anterior abdominal region, all of which had been troubling him for the past three days.

After conducting a thorough physical examination, the emergency room physician identified a 5 cm incarcerated hernia pouch in the patient's umbilical region. In addition, palpation of the abdominal region led to discovery of a solid mass, which may have also caused a small bowel obstruction. Importantly, no signs of rebound tenderness or defensive guarding, which typically indicate a more severe condition, were found. To further investigate the case, a non-contrast computed tomography (CT) scan was performed, which revealed a midline umbilical hernia containing segments of the small bowel with free fluid accumulation between the intestinal loops and perihepatic, perisplenic, and pelvic areas. The scan also showed a 7.5 cm mass situated in the lower right abdominal quadrant, approximately 100 cm distal to the Treitz ligament (Figure 1).

Figure 1: Non-contrast Computed Tomography scan findings

The patient was taken to the operating room since the umbilical hernia and solid mass suggested two possible and distinct causes for mechanical obstruction of the intestine. During surgical intervention, a third possible cause for an obstruction was observed in addition to a cirrhotic liver. A mesenteric band in a ring-shaped fashion entrapping the small bowel was detected and determined to be the main cause of the obstruction. Moreover, a 7.5 cm solid mass 20 cm distal to this obstruction that enveloped the small bowel was discovered (Figure 2). The mesenteric band was excised to relieve the obstruction, and the mass was excised with 10 cm margins both distally and proximally. After side-to-side anastomosis of the intestine with stapler placement, a drain was placed into the Douglas pouch before the primary closure of the surgical side was performed.

Figure 2: Surgical findings of the mass and mesentery

A macroscopic examination of the excised specimen revealed sections displaying a uniformly gray-white solid lesion that was primarily confined to the outer wall of the small bowel (Figure 3). Further microscopic analysis revealed a submucosal location of the lesion that was formed by bundles of spindled cells characterized with eosinophilic cytoplasm, blunt-ended nuclei, indistinct nucleoli, and a few mitotic structures (Figures 4 and 5). Notably, coagulative tumor necrosis, pleomorphism, and atypical mitosis were absent. Although the initial macroscopic and microscopic findings bore a resemblance to a gastrointestinal stromal tumor (GIST), immunohistochemical markers provided a definitive diagnosis of leiomyoma. The tumor displayed diffuse positivity for Desmin but tested negative for CD117, CD34, and S100 (Figures 6). The Ki-67 proliferation index of the lesion was low and ranged from 1% to 2% (Figure 7).

Figure 3: Macroscopic appearance of the tumor

Figure 4: Submucosal location of the tumor (H&E, x100)

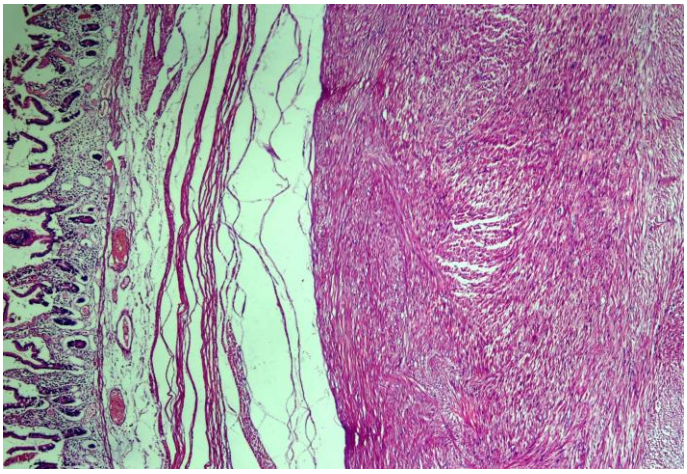


Figure 5: Tumor comprising benign spindle cells arranged in bundles (H&E, x400)

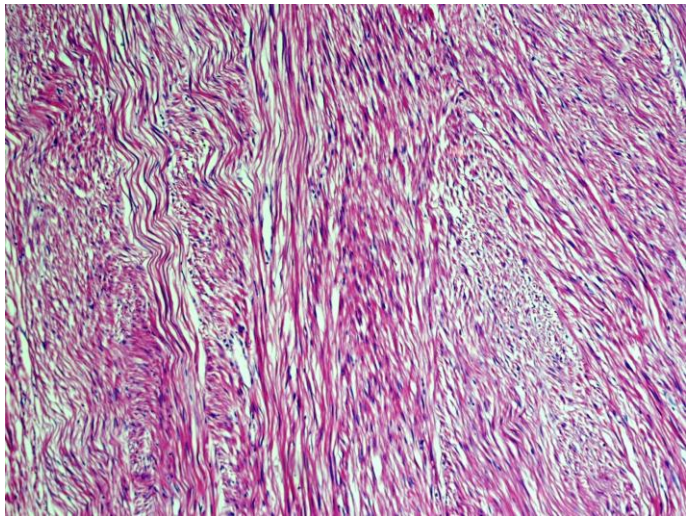


Figure 6: Diffuse positive staining with Desmin observed in the tumor (x200)

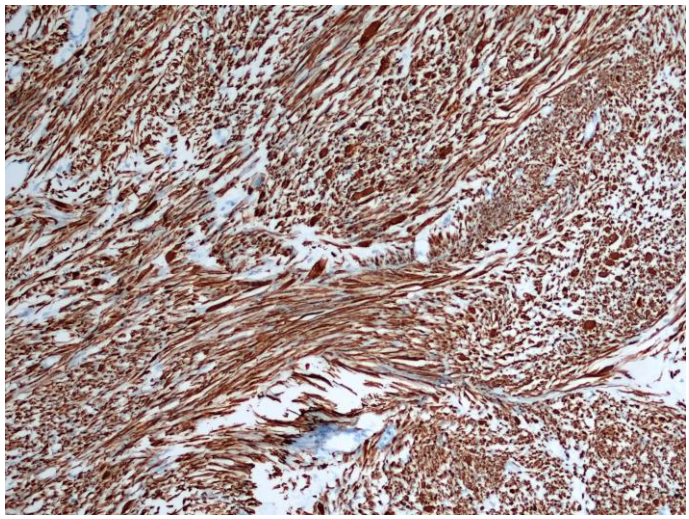
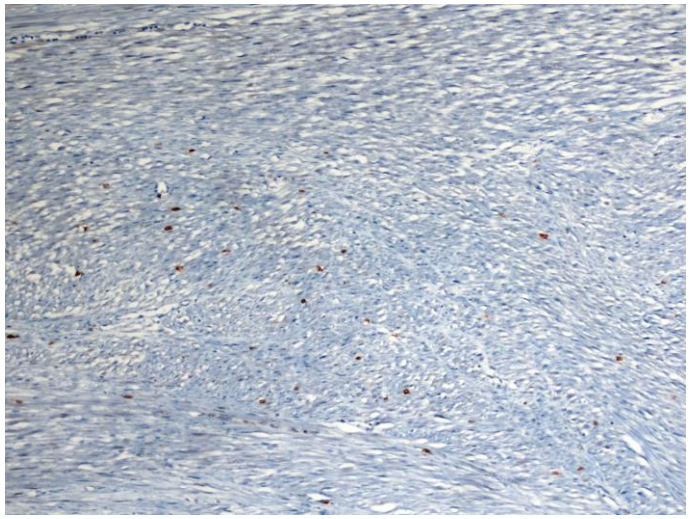


Figure 7: Low Ki-67 proliferation index observed in the tumor (x200)



The day after the operation, a mild discharge of serous fluid from the drain site, which was coherent to the ascites secondary to the liver cirrhosis, was observed. After retrieval of the drain and healing of the incision site, the patient who had been hospitalized for 12 days, was discharged.

Following his discharge patient was followed by general surgery outpatient clinic. Sixteen days after the initial surgery, the patient came to the emergency room because his intestines were protruding from the surgery site. Prompt reduction and suturing were done in a second operation. After nine days of inpatient follow-up, the patient was discharged with a clean surgery site, no fluid leakage, and well-healing sutures.

Ten days after discharge following the second surgery patient returned to the emergency department with a complaint of dehiscence at the surgery site. The site was re-sutured, and patient was discharged. One week later patient returned again with a 3 cm opening in the surgical site. No evisceration was found. Since primary wound healing could not be achieved due to patient's chronic conditions, secondary intention of wound healing was chosen. For the past two months, the patient has been followed at outpatient visits. He is receiving treatment for his chronic conditions and has not had any complaints about the surgical site.

Written informed consent was obtained from patient who agreed to participate in this study.

Discussion

An incarcerated umbilical hernia and a solid mass in the abdomen were two possible reasons for the small bowel obstruction in our patient. Interestingly, the third and actual cause for the intestinal obstruction was the band-like structure created by mesentery, which had been discovered during surgery. After the excision of this band, the obstruction was resolved, but even though it was not the reason for the current obstruction, the solid mass still required further investigation.

Leiomyomas are benign mesenchymal tumors originating from smooth muscle cells. While small bowel leiomyomas are exceedingly rare, they represent the most common benign tumors affecting the small intestine. Typically, these tumors are found in the jejunum. Intestinal leiomyomas also have the potential to lead to ileus with resulting symptoms, such as nausea, vomiting, and severe constipation. These symptoms necessitate immediate medical intervention; however, they may be mistaken for small bowel obstruction [3,4].

Given their similar locations and microscopic appearances, it is not uncommon for leiomyomas and GISTs to be mistaken for one another. GISTs are the most prevalent mesenchymal tumors that can impact the GI tract and originate from the interstitial cells of Cajal. The small bowel ranks as the second most common site for GISTs. Small intestinal GISTs often exhibit a spindled appearance, which can be misinterpreted as a leiomyoma. However, distinctive differences exist in that GISTs typically present lightly eosinophilic to pale cytoplasm and vesicular chromatin within uniformly ovoid or round nuclei, whereas leiomyomas manifest with eosinophilic cytoplasm and blunt-ended, cigar-shaped nuclei. Thus, the differentiation between leiomyomas and GISTs relies heavily on the use of immunohistochemical markers to ensure an accurate diagnosis in challenging cases [5].

Another differential diagnosis for this solid mass was GI schwannoma (GIS), which is a rare, slow-growing benign tumor of the GI tract. Most GISs are located submucosally since they originate from the Auerbach nerve plexus. GIS are solid, single lesions formed by Antoni A and B structures composed of spindle cells. Microscopically, short spindle cells of the GIS show slightly eosinophilic cytoplasm with deep round or oval nuclei [6]. These similarities with leiomyomas created the need for the differential diagnosis. Even though our lesion was composed of eosinophilic spindle cells no Antoni A or B areas were found, and the cigar shaped nuclei of the cells were different from the spindle cells expected in a GIS. We used S100 immunohistochemistry stain to

completely differentiate these two entities. Almost all Schwannomas are expected to show S100 immunohistochemistry positivity, but our case was negative; hence, a GIS diagnosis was excluded.

Conclusion

In conclusion, this case underscores the significance of thorough physical, radiological surgical and pathological examinations of each individual patient. In our case, three possible causes of intestinal obstruction were present in a patient who also had several comorbidities. This situation created excellent educational material for differential diagnosis of an intestinal obstruction. Interestingly, the primary reason for the obstruction was discovered intra-operatively. This finding also indicates that although many technological advancements (such as imaging) have been developed in the field of medicine, surgery is still a great tool for diagnosis in addition to its use as a treatment.

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