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Case Report

A Mysterious Presentation of Small Bowel Stricture

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Abstract

Small bowel adenocarcinoma is a rare malignancy that accounts for a small percentage of gastrointestinal cancers. Diagnosis and management of small bowel adenocarcinoma can be challenging due to its rarity and nonspecific presentation. We present a case of a 51-year-old male with a history of intravenous drug use who presented with worsening abdominal pain and was found to have a small bowel obstruction. Exploratory laparotomy revealed a stricture in the jejunum caused by an intraluminal mass, which was resected. Pathological examination confirmed the diagnosis of intestinal type, moderately differentiated adenocarcinoma. This case highlights the importance of considering small bowel adenocarcinoma as a possible etiology in patients presenting with small bowel obstruction, particularly in high-risk individuals. Early diagnosis and complete resection remain the mainstays of treatment for improved outcomes in small bowel adenocarcinoma.

Keywords: small bowel adenocarcinoma, bowel surgery, small bowel stricture management

Introduction

Even though the small intestine makes up approximately 75% length and over 90% of the absorptive surface area of the entire gastrointestinal tract, malignancies of the small bowel are rare compared to other locations. Metastatic disease of the small bowel, most commonly from ovarian or colon cancer, is more likely to occur than primary malignancy. Adenocarcinoma used to be the most frequent de novo cancer of the small bowel, accounting for 45% before 1987, followed by neuroendocrine tumors (NET), lymphoma, and sarcoma. From 1985 to 2005, new studies showed that NET surpassed adenocarcinoma, accounting for 44% and 33%, respectively. The most common location of primary adenocarcinoma in the small bowel is the duodenum (59%), followed by jejunum (42%), and ileum (15%).[1]

There are many hypotheses as to why de novo small bowel neoplasms are less common than colon cancer. One hypothesis is the presence of Peyer patches found in the small bowel (SB), which secrete a large amount of IgA, providing a protective mechanism. In addition, the intestinal content is more diluted, and transit time is shorter, reducing the amount of time the SB is exposed to irritants. The colon also harbors more bacteria, which increases the amount of toxins secreted, exposing the mucosa to carcinogens. However, despite these environmental protective mechanisms, there are genetic mutations that potentially lead to SB adenocarcinoma, following a stepwise mutation process similar to the adenoma-carcinoma sequence in colon cancer. Specifically, familial adenomatous polyposis (FAP) mutation increases the risk for adenoma, and any sporadic mutations could transform the adenoma into adenocarcinoma. Some of the common genetic mutations include adenomatous polyposis coli (APC) (26.8%), cyclin-dependent kinase inhibitor 2A (CDKN2A) (14.5%), KRAS (53.6%) [2], mothers against decapentaplegic homolog 4 (SMAD4) (17.4%), and hereditary non-polyposis colorectal cancer (HPNCC) (10%)[3]. Chronic inflammation of the GI tract also increases the risk for cancer development. Inflammatory diseases such as Crohn's disease and Celiac disease can lead to higher cellular turnover of the gastrointestinal tract and result in a higher mutation rate. There are documented risk factors, including alcohol, smoking, frequent consumption of refined sugar, red meat, and smoked food. [4,5]

Case Presentation

Our case is a 51-year-old male with pertinent surgical history of multiple umbilical hernia repairs with mesh and active intravenous drug use. He presented to the Emergency Department (ED) with worsening abdominal pain for two weeks. The patient described his pain as constant and cramping in nature. He endorsed nausea and vomiting foul-smelling thick content. Meanwhile, the patient continued to use heroin and cocaine, with his last use within the past 24 hours. A nasogastric tube was placed in the ED, and 750cc of feculent material was immediately collected. The initial abdominal exam revealed abdominal distension and diffuse tenderness. The computed tomography scan of the abdomen showed a dilated proximal small bowel with air-fluid level compatible with obstruction and intraluminal contrast in the distal small bowel and colon, suggesting a partial obstruction (Figure 1). The patient was aggressively resuscitated; however, due to worsening clinical examination, he was taken to the operating room (OR) for an exploratory laparotomy. Upon entry, the jejunum was found to be dilated to 9cm in size, with a stricture approximately 30cm away from the ligament of Treitz. There was no sign of any external obstruction or adhesive band. Both the duodenum and the distal jejunum diameter appeared to be normal and collapsed. A small bowel resection of approximately 14cm was performed with primary anastomosis. The stricture appeared to be caused by an intraluminal mass measuring 1.5 x 2cm in size. The midline incision was closed primarily, and the patient was transferred to the intensive care unit intubated.

Postoperatively, the patient recovered well, was extubated on postoperative day 1, and experienced a return of bowel function on postoperative day 2. The following day, the patient tolerated a regular diet but left against medical advice. The patient failed to follow up in the clinic postoperatively.

The final pathology report of the small bowel stricture showed intestinal type, moderately differentiated adenocarcinoma. The tumor had invaded through the bowel wall and into the adjacent bowel segment and serosa, with presence of lymphovascular and perineural invasion. The margins were negative, but one of the lymph nodes was positive for metastatic adenocarcinoma, resulting in a pathological staging pT4N1.

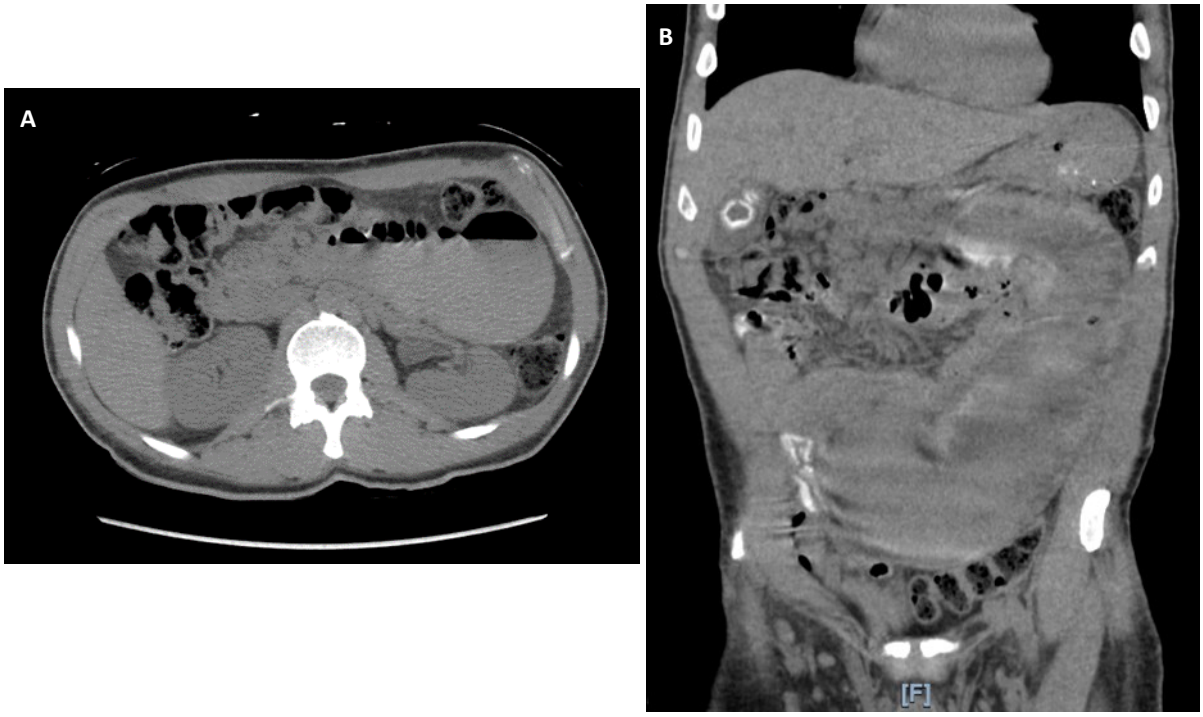

Figure 1. *Computed tomography (CT) scan of the abdomen and pelvis with and without IV contrast.* ***(A).*** *Transverse - presence of air-fluid level, SBO* ***(B).*** *Coronal- dilated proximal jejunum.*

Discussion

Primary malignancy of the small bowel is rare compared to other locations in the gastrointestinal tract. In general, adhesive bands are the most common cause of small bowel obstruction.[6] The diagnosis of small bowel adenocarcinoma is often difficult, and it most commonly occurs in the duodenum. Obstruction due to primary small bowel neoplasms is rare and can cause nonspecific complaints, leading to adenocarcinoma of the small bowel often being diagnosed at an advanced stage. Talamonti et al. showed that in 129 confirmed cases, 38% had tumors with lymph node invasion, and 38% had synchronous metastases.[7] However, there are very few available case reports documenting primary small bowel adenocarcinomas presenting as small bowel obstructions. Due to the rarity of this cancer, there is a paucity of research evaluating available diagnostic tools and treatment efficiency.

Small bowel neoplasms are often incidental finding during work up for obscure bleeding. Although computed tomography scans and small bowel barium studies are often the first line radiographic tools for evaluation, their sensitivity and accuracy are poor.[8,9] New investigational tools, such as computed tomography enteroclysis, magnetic resonance enteroclysis, capsule endoscopy, and enteroscopy, provide more extensive explorations of the gastrointestinal tract and aid in greater accuracy and early diagnosis of the small bowel neoplasms.[10,11] In addition to the radiological tools, laboratory and genetic testing also play a role in diagnosis. Carcinoembryonic antigen (CEA) and cancer antigen 19-9 (CA 19-9) are adjuvant tumor markers and have prognostic value in treatment. Genetic testing is often used after the diagnosis is made, rather than as a screening test, unless there is a strong family history.[12]

Small bowel adenocarcinoma has a poor prognosis at all stages, with a 5-year overall survival rate of 14-33%.[13,14,15,16,17] According to a study by Halfdanarson and et al., the prognosis of small bowel adenocarcinoma is poor, and complete resection provides the only means of cure. Furthermore, adjuvant therapy treatment may not provide any benefits.[18] Other than local invasion, the number of involved lymph nodes and the levels of CEA and CA19-9 play a critical role in the prognosis of disease. If the cancer invades more than 3 out of 10 lymph nodes, the overall survival rate decreases to 37% compared to 1-2 lymph nodes invasion, which has a survival rate of 57%. The standard treatment for primary small bowel adenocarcinoma with locoregional lymph node invasion is complete (R0) resection and chemotherapy. In stages 0/1, chemotherapy does not improve overall survival. However, for unresectable tumors, resection is only indicated if it causes obstruction, uncontrollable bleeding, or perforation.[19] The use of neoadjuvant and adjuvant chemotherapy in addition to surgery has shown mixed results. In a single-center retrospective study, R0 resection with adjuvant therapy did not improve overall survival rate for 54 patients between 1990-2008.[20] Another study by Czakowski and Hui showed that chemotherapy may provide minimal benefits to patients with diagnosed SB adenocarcinoma, with a median overall survival 38.6 months.[21] A cohort study conducted between 1998 and 2011 by the National Cancer Database showed that patients who underwent resection and adjuvant chemotherapy had a higher survival rate than those who had surgery alone, with median survival of 63 vs. 45 months, respectively. When stratified to stage III (with positive lymph nodes), the median survival decreased to 42 vs. 26 months, respectively.[22] Due to the low incidence of small bowel adenocarcinoma, very few studies have been conducted to evaluate the best chemotherapy combination for advanced diseases. Some retrospective studies have shown that the first-line chemotherapy (FOLFOX- oxaliplatin, 5 fluorouracil, and leucovorin) has a higher overall recurrent rate and longer median progression- free survival than other chemotherapy regimens, 46% vs. 16% and 8.7 months vs. 3.9 months, respectively.[23] If patients fail first line chemotherapy, the second line chemotherapy is FOLFIRI (irinotecan, 5-fluorouracil and leucovorin).[24]

Conclusion

Although some studies have been conducted on SB adenocarcinoma treatment and prognosis, the sample size is small due to its rarity. The prognosis of the cancer depends on the number of metastatic lymph nodes and the margin of the resection specimen. According to existing guidelines from the National Comprehensive Cancer Network, at least eight lymph nodes should be retrieved during resection.[12,25] In a systematic review, the 5-year overall survival rate for positive lymph node disease is poorer than for node negative, 21% vs. 65%, respectively.[26]

There are studies that have shown that radical resection of SB tumors is not associated with improved disease-specific or overall survival. The only difference is that radical resection could retrieve more lymph nodes for staging. According to the National Cancer Database between 1985 and 1995, the 5-year disease-specific survival rates for all SB adenocarcinoma are stage I (65%), stage II (48%), stage III (35%) and stage IV (4%).[27]

Given that our patient is T4 with 1 lymph node involvement (without enough lymph node biopsy), this patient is currently stage III (at the greatest), and he could benefit from chemotherapy after surgical resection. In addition, he should receive a complete workup including CT scan of the chest, abdomen, and pelvis, and laboratory studies. However, the patient failed to follow up in the outpatient setting due to socioeconomic reasons.

Conflict of Interest

The authors declare no conflict of interest.

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