

Ileal Perforation and Cervical Nodal Metastasis in Small Bowel Adenocarcinoma: A Case Report

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Abstract

Small bowel adenocarcinoma (SBA) is a rare malignancy that typically presents late and is difficult to diagnose, particularly when arising in the ileum. We report an exceptional case of SBA presenting simultaneously with ileal perforation and cervical lymph node metastasis - two manifestations that are individually uncommon and exceedingly rare in combination. A 69-year-old woman presented with an acute abdomen and a newly enlarged cervical lymph node; laparoscopy revealed a 2-mm ileal perforation with peritoneal nodules, and subsequent cervical node excision confirmed metastatic carcinoma. Histopathology and immunohistochemistry demonstrated CK7 and EMA positivity with CK20 negativity, supporting the diagnosis of SBA and excluding colorectal, neuroendocrine, and stromal neoplasms. This unusual presentation highlights the diagnostic challenges posed by ileal tumors, underscores the critical role of timely surgical exploration, and emphasizes the importance of immunohistochemistry in establishing tumor origin when clinical and radiologic findings are ambiguous.

Keywords: Adenocarcinoma, Bowel perforation, Small intestine neoplasms

INTRODUCTION

Small bowel adenocarcinoma (SBA) is a rare gastrointestinal malignancy, accounting for fewer than 5% of all gastrointestinal cancers despite the small intestine comprising nearly 90% of the bowel's mucosal surface.¹ Despite advances in diagnosis and treatment, the prognosis of small bowel adenocarcinoma remains poor, with reported 5-year overall survival rates of approximately 20%–30%.²⁻⁴

Small bowel neoplasms comprise a heterogeneous group of tumors, including adenocarcinomas, neuroendocrine tumors, gastrointestinal stromal tumors (GISTs), and lymphomas.¹⁻³ Its clinical course is frequently indolent, and early symptoms, such as vague abdominal discomfort, occult bleeding, or anemia, are nonspecific, leading to

delay in diagnosis and resulting in presentation at more advanced stages.² Jejunal and ileal tumors are particularly difficult to detect because of their deep anatomical location and limited accessibility by standard endoscopic modalities.

While obstruction and bleeding are the most common initial manifestations, small bowel perforation is exceedingly uncommon, and cervical lymph node metastasis has been documented only rarely, even in large population-based cohorts.³

We report a case of SBA presenting simultaneously with ileal perforation and cervical lymph node involvement. This atypical and aggressive phenotype underscores the diagnostic challenges and biological heterogeneity of this already uncommon malignancy.

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CASE PRESENTATION

This case report was conducted in accordance with the Declaration of Helsinki. Written informed consent for publication of clinical details and images was obtained from the patient. All identifying information has been removed to preserve confidentiality.

A 69-year-old woman presented to the Emergency Department with 6 hours of progressively worsening right lower quadrant abdominal pain, accompanied by nausea without vomiting or fever. Her medical history was significant for well-controlled hypertension. On examination, the patient was hemodynamically stable. A firm, mobile, non-tender left cervical lymph node measuring approximately 1.5 cm was palpable at level III, while no supraclavicular lymph nodes were detected. The abdomen was non-distended, with localized tenderness in the lower abdomen. No other significant abnormalities were noted.

Laboratory investigations showed mild leukocytosis (WBC 11.5 k/ μ L) and elevated C-reactive protein (23.3 mg/L), while other parameters were within normal limits. Contrast-enhanced abdominal CT demonstrated an irregularly thickened segment of the small bowel in the right iliac fossa (approximately 12 mm in maximal wall thickness and 6 cm in length), with focal wall discontinuity, adjacent air bubbles, fat stranding, and a surrounding fluid collection, suggestive of a tumor-related small-bowel perforation. Several enlarged mesenteric lymph nodes were also observed. In addition, the CT scan revealed a suspicious lesion in the right lower lobe of the lung, suggestive of pulmonary metastasis. No CT imaging of the neck was performed at this stage.

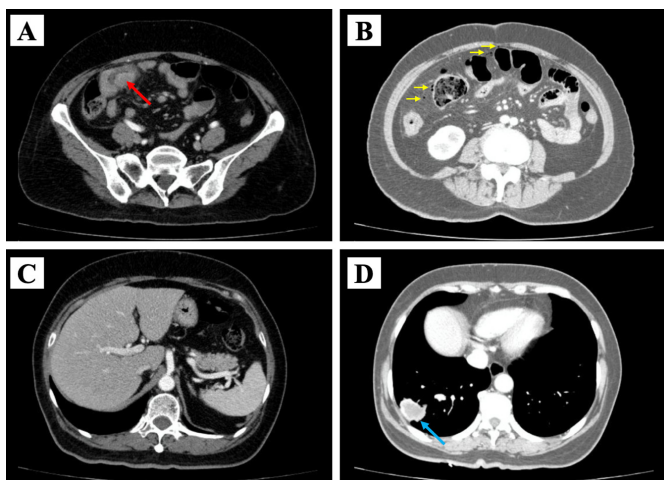


Figure 1 Preoperative contrast-enhanced abdominal CT scan showing: (A) Irregularly thickened small bowel segment (red arrow), (B) free intraperitoneal air bubbles (yellow arrows), (C) no evidence of hepatic metastasis, (D) a suspicious mass in the right lung suggestive of metastasis (blue arrow).

The patient was placed in the supine position. Laparoscopic access was established using three trocars: a 10-mm port at the umbilicus, a 5-mm port in the left iliac fossa, and a 5-mm port in the suprapubic region. Pneumoperitoneum was maintained at an intra-abdominal pressure of 12 mmHg. Initial exploration revealed a small amount of turbid fluid distributed around the liver, along the right paracolic gutter, and in the pouch of Douglas, while the left abdomen appeared clean. Fibrinous exudate was predominantly adherent to small bowel loops in the mid-abdomen. Multiple peritoneal nodules were identified in the right iliac fossa and lower abdomen; a representative nodule on the right lower abdominal wall was biopsied. Microbiological culture of the intraperitoneal fluid was performed, but showed no bacterial growth. The liver surface was smooth, with no visible metastases. A single inflamed ileal segment was identified, harboring a small perforation with enteric leakage, and no additional lesions were observed along the remaining small bowel, stomach, colon, or appendix (**Figure 1**).

The affected small-bowel segment was exteriorized via an approximately 5-cm extension of the umbilical port site, which was protected with a wound protector to minimize contamination. Intraoperative assessment confirmed a tumor-bearing ileal loop without evidence of mesenteric ischemia. Segmental resection was performed with proximal and distal margins of approximately 7 cm from the lesion. A functional end-to-end anastomosis was constructed using linear staplers, resulting in a well-perfused, widely patent anastomosis approximately 3 cm in diameter. The abdominal cavity was irrigated with approximately 2 L of normal saline, followed by thorough suction. After careful inspection and gauze-assisted drying, no drain was placed.

Gross examination of the surgical specimen revealed a 20-cm segment of small intestine. Approximately 7 cm from one resection margin, there was an ulcerated, indurated lesion measuring 4 × 4 × 1.5 cm, with a firm, whitish cut surface. The mesenteric adipose tissue adjacent to the lesion contained three firm nodules ranging from 0.5 to 0.7 cm in diameter. A separate peritoneal nodule, measuring 1 × 1 × 0.4 cm, was also identified.

A total of eight tissue blocks were submitted for Hematoxylin and Eosin staining. Microscopic evaluation showed atypical epithelial cells arranged in solid nests, sheets, and gland-like structures. The tumor cells exhibited enlarged pleomorphic nuclei, prominent nucleoli, abundant eosinophilic cytoplasm, and frequent mitotic figures,

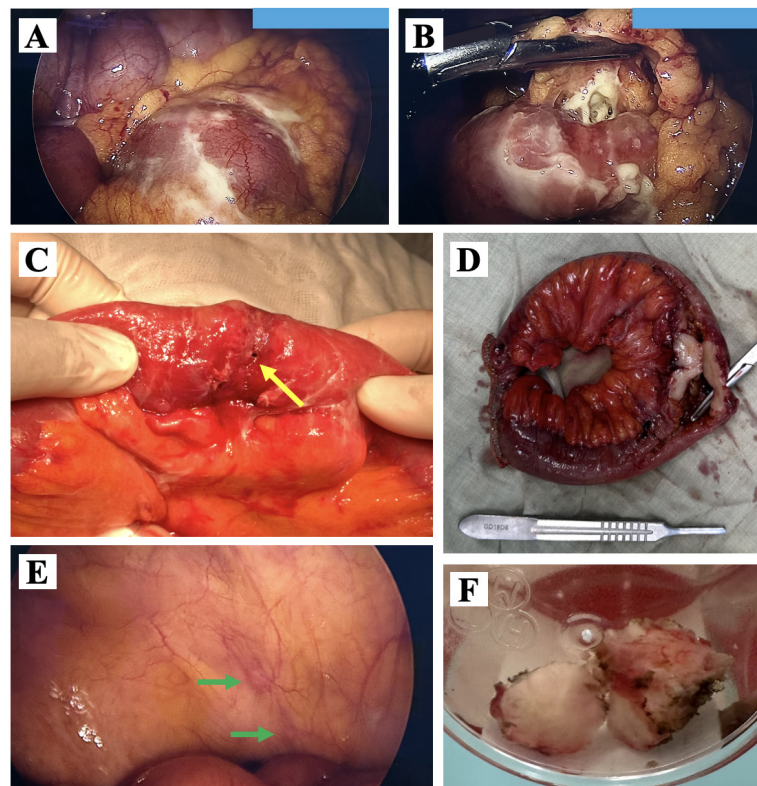


Figure 2 Intraoperative findings: (A) a mid-abdominal small bowel loop covered with fibrinous exudate; (B) a small bowel lesion walled off by the omentum; (C) tumor-associated small bowel perforation, with the yellow arrow indicating the perforation site; (D) resected small bowel segment containing the tumor; (E) peritoneal metastatic nodules on the lower anterior abdominal wall, with green arrows indicating peritoneal metastatic nodules; and (F) metastatic left level III cervical lymph node.

with focal areas of necrosis. The carcinoma infiltrated through the muscularis propria and extended into the surrounding mesenteric fat. Five metastatic lymph nodes were identified; however, the total number of examined lymph nodes was not reported. Both proximal and distal resection margins were free of tumor. The peritoneal nodule demonstrated histopathological features like those of the primary small bowel tumor; however, immunohistochemical staining was performed only on the primary lesion.

Based on the histomorphology, the differential diagnosis included poorly differentiated adenocarcinoma, gastrointestinal stromal tumor (GIST), neuroendocrine carcinoma, or a carcinoma of other origin. Given the deep mural invasion, peritoneal extension, and nodal metastases, an immunohistochemical panel was performed on the primary tumor, including CK7, CK20, EMA, Chromogranin, Synaptophysin, Ki-67, Vimentin, and CD117 (**Figure 3 and Table 1**). The Ki-67 index was approximately 30%, indicating moderate-to-high proliferative activity of tumor cells.

The tumor was staged as pT3N2M1c (Stage IVB). The T3 category indicates invasion through the muscularis propria into the mesenteric fat. The N2 classification reflects metastasis to three or more regional lymph nodes, with all five examined nodes involved. The M1c designation denotes peritoneal metastasis, supported by peritoneal nodules and further reinforced by metastatic disease in a cervical lymph node, indicating systemic dissemination. Collectively, these findings are consistent with advanced-stage disease characterized by deep local invasion, extensive nodal involvement, and distant metastasis.

After surgery, the patient remained stable, with no abdominal pain or fever. Oral intake was well tolerated, bowel movements were normal with yellow stool, and the surgical incision healed appropriately without signs of infection. The patient was discharged on postoperative day 5. During follow-up, the left cervical lymph node persisted after two weeks despite antibiotic therapy. Excisional biopsy of a level III lymph node, measuring ap-

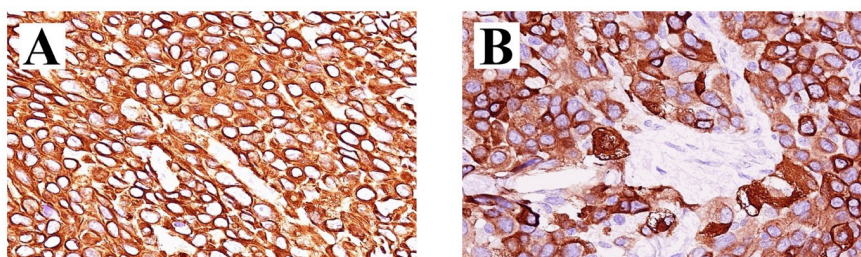


Figure 3 Postoperative histopathological examination with immunohistochemical staining. (A) CK7-positive immunostaining. (B) EMA-positive immunostaining.

proximately 1.5 cm with a firm consistency, well-defined capsule, whitish cut surface, and preserved mobility, was performed (**Figure 2F**). Histopathological examination using Hematoxylin and Eosin (H&E) staining revealed poorly differentiated carcinoma, consistent with metastatic disease; no immunohistochemical staining was performed on the cervical lymph node specimen.

The patient was later confirmed to have small bowel adenocarcinoma with carcinomatosis and was transferred to an oncology referral center for continuation of systemic chemotherapy. Postoperative CT evaluation of the chest and neck did not reveal any additional pulmonary lesions or cervical/supraclavicular lymphadenopathy.

DISCUSSION

The clinical presentation in this patient is remarkable for two scarce features: ileal perforation and concurrent cervical lymph node metastasis. Small bowel perforation is an exceedingly uncommon initial manifestation of SBA, as these tumors more frequently present with bowel obstruction or occult gastrointestinal bleeding.² Furthermore, cervical or supraclavicular lymph node involvement is also rarely documented even in large patient cohorts; SBA more typically metastasizes to mesenteric lymph nodes, the liver, lungs, and the peritoneum.³ In this context, the present patient had small bowel cancer with carcinoma-

tosis, indicating that the tumor had already disseminated systemically, with metastatic spread involving the lungs, peritoneum, and lymph nodes, including cervical lymph nodes. The coexistence of these rare features in a single patient suggests an unusually aggressive tumor phenotype and underscores the diagnostic challenges associated with this malignancy.

Furthermore, ileal tumors, such as in our patient, tend to be detected later than duodenal primaries due to their deeper anatomical position and the limited accessibility of this segment to conventional endoscopy.⁴ Epidemiologic analyses demonstrate that jejunal and ileal tumors are more frequently associated with obstruction, bleeding, and peritoneal dissemination, findings which correlate closely with our intraoperative observations.²

Cross-sectional imaging, particularly contrast-enhanced CT, remains the cornerstone for evaluating suspected small bowel pathology in the emergency setting. Nevertheless, differentiating SBA from Crohn's disease or infectious enteritis can be challenging, leading to delayed or incorrect diagnoses in several reported cases.² In our patient, CT evidence of pneumoperitoneum and peritonitis mandated urgent surgical intervention, which remains the standard of care in perforated SBA.

Surgical resection is the primary therapeutic modality, with more than 80% of patients undergoing operative

Table 1 Immunohistochemical staining results.

Immunohistochemical staining	Result	Interpretation
CK7 and EMA	Strong and diffuse Positivity*	Confirming the epithelial nature and supporting a diagnosis of small bowel adenocarcinoma
Ki-67	30%	The tumor exhibited a proliferative index of approximately 30%
CK20	Negative	Differentiate this lesion from colorectal adenocarcinoma
Chromogranin and Synaptophysin	Negative	Effectively excluding neuroendocrine carcinoma
Vimentin and CD117	Negative	Ruling out sarcoma and gastrointestinal stromal tumor (GIST)

*Postoperative histopathological examination with immunohistochemical staining demonstrated CK7-positive and EMA-positive tumor cells, showing characteristic brown cytoplasmic and membranous staining.

management - often on an emergent basis rather than as a planned oncologic procedure.³ Because SBA typically exhibits an infiltrative pattern of growth, segmental resection with margins of at least 5-10 cm is recommended to ensure oncologic safety, particularly when local inflammation or perforation obscures the true extent of disease.² The operative strategy in this case, involving emergency laparotomy with segmental resection and peritoneal lavage, aligns with established surgical principles.

The laparoscopic approach in this emergency setting provided both diagnostic and therapeutic advantages, allowing rapid identification of the perforation site and comprehensive assessment of intra-abdominal pathology with minimal invasiveness. In addition, it facilitated targeted biopsy of peritoneal nodules and guided appropriate surgical management. However, its application should be carefully selected, as certain conditions, such as hemodynamic instability, diffuse fecal peritonitis, or extensive intra-abdominal carcinomatosis, may compromise visualization and operative control, making open surgery a more appropriate option.

Adequate lymph node evaluation is essential for accurate staging of small bowel adenocarcinoma, with current evidence suggesting that examination of at least 8 lymph nodes is desirable to ensure reliable staging.⁵ In the present case, the total number of examined lymph nodes was not documented, which limits the assessment of lymph node harvest adequacy. Nevertheless, five metastatic lymph nodes were identified, fulfilling the criteria for N2 disease and indicating a substantial nodal tumor burden. This finding reflects aggressive tumor biology despite incomplete nodal evaluation.

Histopathology and immunohistochemistry (IHC) remain essential for distinguishing SBA from mimickers such as lymphoma or Crohn-related carcinoma. Standard IHC markers, including CK7, CK20, and CDX2, aid in confirming the tumor's intestinal origin and guiding systemic therapy. Increasingly, molecular profiling plays a crucial role in treatment planning, as MSI-high or dMMR SBA, reported in approximately 1-16% of cases, may benefit from immune checkpoint inhibitors.² MSI-H/dMMR analysis could not be performed in our patient because this diagnostic modality was not available at the time of evaluation.

Given the advanced stage of disease in this patient, systemic therapy remains the cornerstone of management. Fluoropyrimidine-based chemotherapy regimens, such as

FOLFOX or CAPOX, are commonly used and are largely extrapolated from colorectal cancer treatment strategies.²⁻⁵ In recent years, molecular profiling has become increasingly important, as tumors exhibiting microsatellite instability or mismatch repair deficiency may benefit from immune checkpoint inhibitors.²⁻⁵ However, molecular testing was not performed in our case, representing a limitation. Despite ongoing advances, the prognosis of metastatic small bowel adenocarcinoma remains poor.^{1-3,5}

Despite incremental advances in imaging, surgical technique, and systemic therapy, long-term outcomes for SBA remain poor. Contemporary estimates place the 5-year overall survival rate at roughly 30%, substantially worse than survival outcomes for colorectal cancer, even when stratified by stage.¹ Several factors contribute to this disparity: the disease's rarity, the paucity of prospective trials, the extrapolation of treatment paradigms from colorectal cancer, and persistent difficulties in achieving early diagnosis. Recent bibliometric analyses indicate that SBA remains an under-researched malignancy, despite a rapid increase in scientific output over the past decade.⁶

In summary, this case represents an exceptionally rare and biologically aggressive manifestation of SBA, marked by the combination of ileal perforation and cervical lymph node metastasis. These features highlight the importance of maintaining a high index of suspicion when evaluating acute abdomen with unexplained lymphadenopathy and underscore the necessity for multidisciplinary collaboration to optimize diagnostic accuracy and therapeutic decision-making in this challenging and understudied disease.

Given the limited data available in the current literature, certain atypical presentations of small bowel adenocarcinoma, such as perforation or distant lymph node involvement, may reflect a more advanced or biologically aggressive disease course. Although these features are individually uncommon, their presence should prompt careful evaluation for underlying malignancy. This case highlights the need for heightened clinical awareness when encountering such findings. Further studies may help to better clarify their clinical significance.

CONCLUSION

This case highlights an exceptionally aggressive form of small bowel adenocarcinoma, presenting with both ileal perforation and cervical nodal metastasis - a scarce combination. Clinicians should suspect SBA when an

acute abdomen is accompanied by unexplained lymphadenopathy. Importantly, immunohistochemistry remains essential for confirming intestinal origin and distinguishing SBA from colorectal carcinoma, neuroendocrine tumors, lymphoma, and GIST, thereby ensuring accurate diagnosis and appropriate oncologic management.

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