



Proximal bowel obstruction caused by high-grade duodenal adenocarcinoma: A rare case

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Introduction: Duodenal adenocarcinoma is an exceptionally rare malignancy, constituting less than 0.5% of all gastrointestinal cancers. Its nonspecific symptoms often lead to delayed diagnosis and advanced disease at presentation.

Case presentation: A 64-year-old female presented with epigastric pain, nausea, and biliary vomiting. Imaging revealed a proximal small bowel obstruction, and endoscopy identified a high-grade duodenal adenocarcinoma. The patient underwent a successful duodenojejunectomy, side-to-side anastomosis, and lymphadenectomy.

Discussion: Post-operative recovery was uneventful, leading to discharge in stable condition. This case underscores the importance of considering duodenal adenocarcinoma in differential diagnoses for small bowel obstruction and highlights the effectiveness of surgical management.

Conclusion: Duodenal adenocarcinoma, though rare, should be considered in patients with small bowel obstruction. Early diagnosis and prompt surgical intervention are crucial for favorable outcomes.

Keywords: case report, duodenal adenocarcinoma, gastrointestinal cancer, small bowel obstruction, surgical resection

Introduction

Duodenal adenocarcinoma, a rare malignancy, comprises less than 0.5% of all gastrointestinal cancers^[1]. Predominantly affecting the fourth part of the duodenum (D4), this malignancy presents with a spectrum of symptoms, including abdominal pain, nausea, vomiting, and weight loss. Anemia, gastrointestinal obstruction, and jaundice are symptoms associated with advanced disease. Abdominal pain is the most common presenting symptom, associated with 56% of cases^[2]. Diagnosis is often delayed due to its infrequent occurrence and nonspecific symptoms, leading to advanced disease at the time of detection^[3].

Small bowel obstruction, while a common surgical emergency, is rarely caused by small bowel adenocarcinoma. This rarity contributes to diagnostic challenges, as malignancy-related strictures are often overlooked in the differential diagnosis, especially in the absence of a prior oncological history. In this case, the obstruction was caused by a high-grade duodenal adenocarcinoma at the ligament of Treitz, an unusual presentation that underscores the need for heightened clinical suspicion in similar scenarios.^[4,5,6]

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HIGHLIGHTS

- Duodenal adenocarcinoma is a rare form of gastrointestinal cancer, constituting less than 0.5% of cases.
- It presents with vague symptoms like abdominal pain and weight loss, often leading to delayed diagnosis.
- Surgical resection, especially the Whipple procedure, is the mainstay treatment for achieving tumor removal and assessing lymph node involvement.
- Postoperative care focuses on managing complications such as pancreatic fistula and initiating nutritional support through jejunostomy.
- The role of adjuvant chemotherapy in improving survival outcomes remains controversial, necessitating individualized treatment decisions based on tumor characteristics.

The evaluation of small bowel neoplasms involves several imaging modalities, each with specific strengths and limitations. CT scans, including enterography, are preferred for their ability to detect abnormalities, assess extramural spread, and aid in staging. Video capsule endoscopy and enteroscopy provide mucosal visualization and allow for biopsies, though the latter is invasive^[7]. Histopathologically, small bowel adenocarcinoma can be distinguished from colorectal cancers through specific immunohistochemical markers, which guide treatment strategies and influence prognosis^[8].

Surgical intervention remains the cornerstone of treatment for duodenal adenocarcinoma, focusing on achieving complete tumor resection. Procedures range from segmental resections to more extensive surgeries like the pancreaticoduodenectomy (Whipple procedure), depending on tumor location and extent^[9]. The decision-making process in this case favored a duodenojejunectomy due to the tumor's localized nature and proximity to critical structures, highlighting the importance of individualized surgical planning.

Adjuvant treatment for small bowel adenocarcinoma remains controversial due to limited randomized controlled trials^[10,11]. Chemotherapy, often extrapolated from colon cancer protocols, offers survival benefits, particularly in stage III disease with lymph node involvement. Stage I patients are generally observed post-surgery, while stage II patients may consider adjuvant chemotherapy based on specific risk factors. Chemoradiation is reserved for high-risk cases prone to local relapse, though survival advantages remain unsubstantiated in current studies^[7,12].

We present a rare case of high-grade duodenal adenocarcinoma causing proximal small bowel obstruction, managed through duodenojejunectomy and adjuvant care. This case illustrates the diagnostic and therapeutic challenges associated with this malignancy and emphasizes the role of tailored surgical intervention in achieving favorable outcomes.

Case presentation

A 64-year-old female with no significant past medical history presented to the emergency department with complaints of epigastric pain, nausea, and intermittent biliary vomiting persisting for the past month. On physical examination, she exhibited epigastric tenderness, a soft abdomen without signs of diffuse peritonitis, and a negative Murphy sign. Laboratory results revealed a creatinine level of 3.7 mg/dL, indicating acute renal failure likely secondary to decreased oral intake, vomiting, and dehydration. Additional laboratory findings included a white blood cell (WBC) count of 12 000/ μ L, normal C-reactive protein (CRP), and normal electrolytes.

A non-contrast CT scan of the abdomen and pelvis revealed a proximal small bowel obstruction with a transitional zone at the ligament of Treitz. Associated findings included gastric and duodenal distension, collapsed small and large bowel, and no

evidence of intra-abdominal fluid, ascites, peritonitis, gallstones, or cholecystitis (Figs. 1 and 2).

Initial management focused on aggressive hydration to improve renal function. A nasogastric tube was inserted, yielding 1000 cc of output over 24 hours. Laboratory parameters were closely monitored. The creatinine level improved to 2.1 mg/dL within 48 hours, and a diagnostic gastroscopy and duodenoscopy were performed. These revealed an ulcerated mass at the duodenojejunal junction, from which multiple biopsies were taken.

The patient was prepared for surgery after stabilization of renal function. A laparotomy was performed, revealing a mass involving the duodenojejunal junction. The surgical procedure included a duodenojejunectomy, side-to-side anastomosis, lymphadenectomy, and placement of a feeding jejunostomy (Figs. 3, 4, and 5). This approach was chosen due to the localized nature of the tumor and its proximity to critical structures, making more extensive procedures like a pancreaticoduodenectomy (PD) unnecessary. Alternative non-surgical management options, such as palliative care or stenting, were considered but deemed inappropriate due to the patient's operable condition and curative potential.

Histopathological examination of the resected specimen revealed a high-grade adenocarcinoma. The tumor measured 4 × 3 × 2 cm and infiltrated all layers of the intestinal wall, extending to the mesothelial lining but sparing the nearest surgical margin (3.8 cm away). The resected segment measured 15 × 4 × 4 cm. Immunohistochemistry confirmed the diagnosis of primary small bowel adenocarcinoma, with markers including CK7-positive, CK20-negative, and CDX2-positive, ruling out colorectal origin. Pathological staging according to the TNM classification was T3N2M0, indicating tumor invasion through the muscularis propria with metastasis to regional lymph nodes (8/15 positive nodes) but no distant metastasis.

Postoperatively, the patient's recovery was closely monitored. Her vital signs remained stable, and drainage from Douglas and

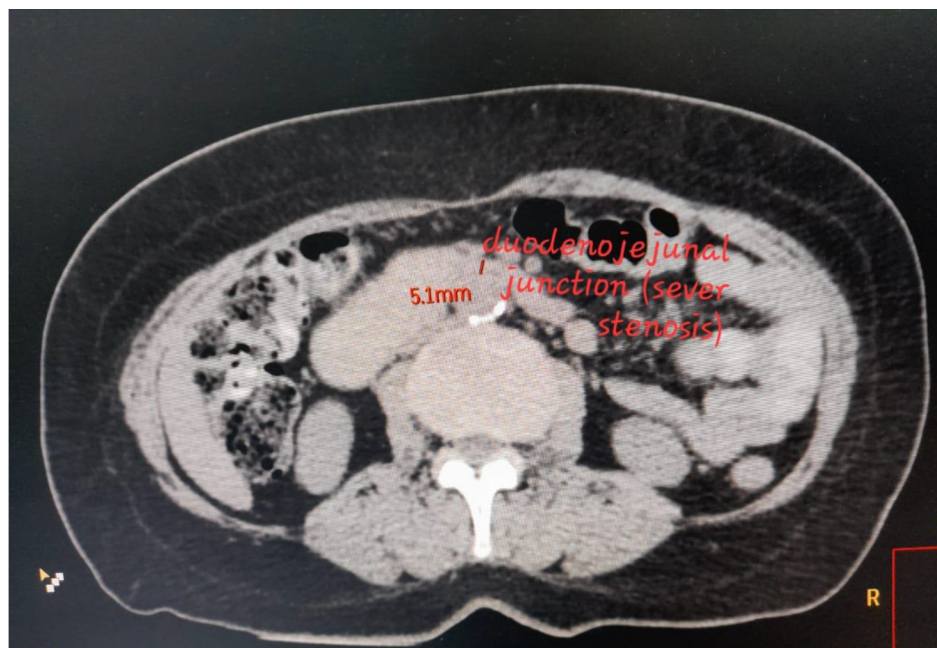


Figure 1. Dilated stomach and duodenum D1d2d3.

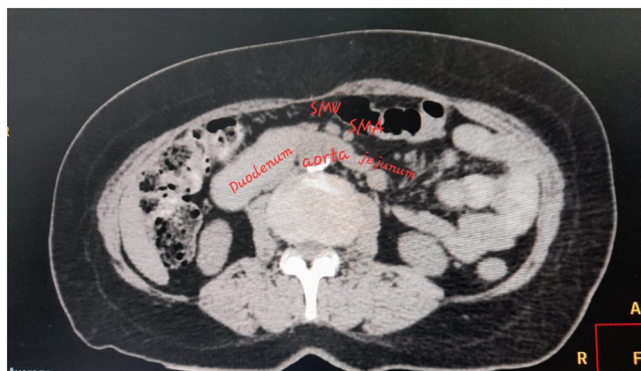


Figure 2. Duodeno-jejunal junction stricture and stenosis near to the SMV.

para-anastomotic drains was serosanguinous with no signs of infection. Laboratory tests showed stable WBC counts and hemoglobin levels, with a gradual decline in CRP levels. Feeding through the jejunostomy tube was initiated early, starting with Nutrison™ at 50 mL every 6 hours, and gradually increased. By postoperative day 2, one drain was removed due to minimal output, and the patient demonstrated clinical signs of gastrointestinal recovery, including passage of gas and stool by day three. This facilitated the removal of the nasogastric tube and transition to oral intake.

The patient's progress continued with improvements in nutritional intake and a steady decrease in inflammatory markers. By day 9, all drains were removed, and she was discharged in

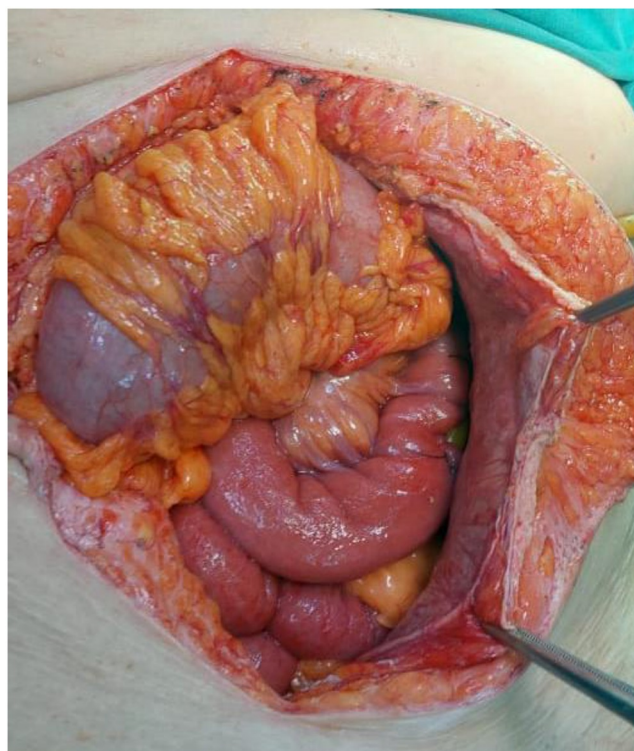


Figure 4. Final view post duodenojejunosomy anastomosis (side to side) with placement and fixation of feeding jejunostomy 20 cm from the anastomosis, witzel tunnel jejunostomy.



Figure 3. Witzel tunnel jejunostomy.

stable condition with no signs of infection. Her discharge plan included ongoing nutritional support, follow-up appointments for oncological assessment, and consideration of adjuvant



Figure 5. Resected specimen of duodenal adenocarcinoma with proximal bowel obstruction.

therapy based on the high-grade nature and lymph node involvement of her tumor.

This manuscript was prepared following the SCARE guidelines^[13].

Discussion

This case report describes a patient with high-grade duodenal adenocarcinoma, diagnosed following presentation to the ER with gastrointestinal symptoms, confirmed by duodenoscopy biopsy. The case was managed with laparotomy, duodenojejunectomy, side-to-side anastomosis, lymphadenectomy, and feeding jejunostomy placement, resulting in a favorable short-term outcome. Risk factors associated with duodenal adenocarcinoma remain unclear. While factors such as a diet rich in red meat and sugar, alcohol abuse, and caffeine consumption have been implicated in small intestine cancer, these were not reported by our patient^[1,8].

The clinical manifestations of duodenal adenocarcinoma are typically nonspecific, presenting as abdominal pain, nausea, and gastrointestinal bleeding. These symptoms were observed in our patient, who presented to the ER with such complaints. The gold standard for diagnosis is esophagogastroduodenoscopy with biopsy, which in our patient revealed an ulcerated mass at the duodenojejunal junction, confirming high-grade duodenal adenocarcinoma. Alternative diagnostic approaches, including transabdominal ultrasonography, have been reported in some cases^[14].

Surgical intervention remains the treatment of choice, with duodeno-cephalo-pancreatectomy (DCP) and segmental resection of the duodenum (SRD) being the primary techniques. While the 5-year survival rates for DCP and SRD are 27.8% and 16.9%, respectively, no statistically significant difference has been found between the two procedures^[15]. Factors such as resection to negative margins, absence of lymph node metastasis, and well to moderately differentiated tumors have been associated with improved survival outcomes^[16]. In our patient, the surgical procedure was successful with no immediate complications. Despite the favorable short-term results, it is important to note that lymph node involvement can significantly impact long-term prognosis, with positive lymph nodes being a key indicator of poorer survival outcomes^[2]. In this patient, while no lymph node metastasis was reported, the potential for occult nodal involvement remains a concern and warrants close surveillance.

Adjuvant chemotherapy has not been well-defined in the treatment of duodenal adenocarcinoma, but studies such as the ESPAC-3 trial have demonstrated improved overall survival with adjuvant chemotherapy following periampullary cancer resections, including duodenal adenocarcinoma^[17]. Given the patient's high-grade tumor and the potential for lymphatic spread, adjuvant chemotherapy could have played a crucial role in improving her long-term outlook, particularly if there were any micrometastases not detected during the surgical resection. Although our patient did not receive adjuvant chemotherapy postoperatively, her oncologist is assessing the possibility of incorporating this treatment into her care, particularly given the complexities of her case, which included bowel obstruction.

Overall, while the patient's immediate postoperative course was uneventful, her long-term prognosis remains uncertain without adjuvant therapies. The decision to initiate chemotherapy, along with regular follow-up, will be essential in managing the potential for recurrence and improving survival outcomes.

Conclusion

Duodenal adenocarcinoma, though rare, presents significant diagnostic challenges due to its nonspecific gastrointestinal symptoms. Surgical resection remains the primary treatment modality, but the lack of a well-established adjuvant chemotherapy regimen limits standardized management. Future research should focus on optimizing adjuvant therapies, improving early detection methods, and further elucidating the prognostic role of lymph node involvement. These efforts are crucial to advancing treatment strategies and enhancing patient outcomes in duodenal adenocarcinoma.

Ethical approval

Ethical approval was waived based on the observational nature of the report.

Consent

Written informed consent was obtained from the patient for publication and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

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Author's contribution

All authors have contributed equally to the work.

Conflicts of interest disclosure

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Guarantor

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Research registration unique identifying number (UIN)

Not applicable.

Provenance and peer review

None.

Data availability statement

Any datasets generated during and/or analyzed during the current study are publicly available, available upon reasonable request.

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