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Aortic Aneurysm Adhesions Complicating Concurrent Colon Cancer Management in a Rural Setting

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Background	Acute duodenal obstruction in patients with known colonic malignancies, particularly when presenting after endoscopic procedures, poses a complex diagnostic challenge. While intrinsic duodenal pathology or direct tumor extension are common considerations, extrinsic compression from adjacent vascular structures or associated adhesions represents a rare etiology. This report describes an unusual case of acute duodenal obstruction precipitated by adhesions to a calcified abdominal aortic aneurysm (AAA) in a patient with a synchronous colonic mass.
Summary	A 77-year-old male with a known colonic mass presented to a rural emergency department with severe abdominal pain, vomiting, and obstipation, occurring shortly after a colonoscopy. Initial concerns included a post-colonoscopy complication or an exacerbation related to his colonic malignancy. Computed tomography revealed a high-grade obstruction at the transverse duodenum with abnormal proximal small bowel displacement. An exploratory laparotomy identified the unexpected cause of obstruction: dense adhesions tethering the duodenum to a large, calcified infrarenal abdominal aortic aneurysm, creating a superior mesenteric artery (SMA) syndrome-like compressive effect. These adhesions were meticulously lysed, relieving the duodenal obstruction. Concurrently, an extended right hemicolectomy was performed to address the previously identified colonic adenocarcinoma in a single operative setting.
Conclusion	This case describes a novel etiology for acute duodenal obstruction, wherein adhesions to an adjacent calcified abdominal aortic aneurysm mimicked SMA syndrome. It underscores the importance of maintaining a broad differential diagnosis in patients presenting with acute proximal bowel obstruction, even in the presence of known malignancy or recent instrumentation. Furthermore, this report highlights the feasibility and potential benefits of efficient, single-stage surgical management in a rural setting, addressing both the acute obstructive emergency and the underlying colonic malignancy to optimize patient outcomes, particularly in resource-limited environments.
Key Words	calcified aortic aneurysm; acute duodenal obstruction; superior mesenteric artery syndrome; exploratory laparotomy; colonic mass

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Case Description

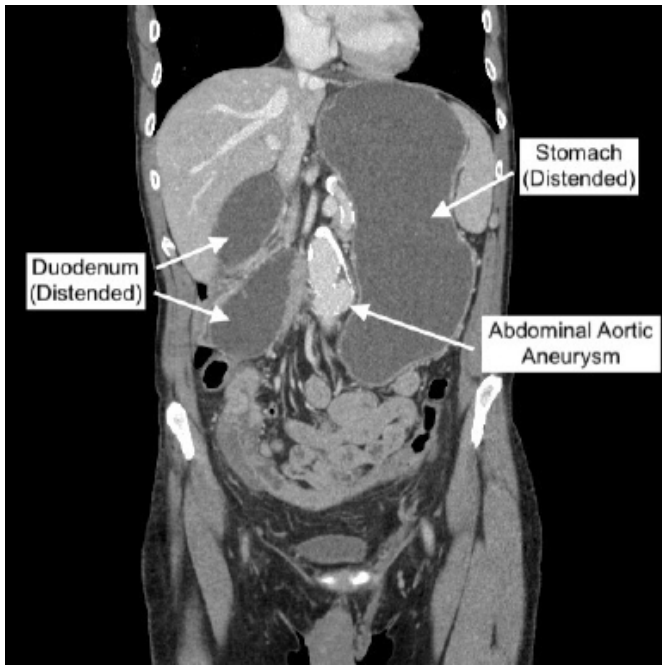
A 77-year-old male presented to the emergency department (ED) of a critical access hospital in rural Montana with acute duodenal obstruction (ADO), manifesting approximately six hours after an uneventful colonoscopy performed for the evaluation of a known transverse colon mass. During the colonoscopy, a hepatic flexure mass had been identified and tattooed for future surgical planning. The patient reported the acute onset of severe, crampy, upper mid-abdominal pain, rated 8 out of 10 in intensity, accompanied by two episodes of vomiting and obstipation. On physical examination, he exhibited diffuse abdominal tenderness with guarding localized to the right and left upper quadrants. His vital signs were notable for mild hypertension, with a blood pressure of 151/78 mmHg.

The initial differential diagnosis was broad, encompassing potential colonoscopy-related complications such as perforation or bleeding as well as an acute exacerbation or complication related to the known colonic malignancy. However, the proximal nature of his pain as well as the severity of the obstructive symptoms raised the concern for a more complex underlying pathology distinct from these initial considerations. Given the diagnostic uncertainty and the patient's worsening clinical status, a computed tomography (CT) scan of the abdomen and pelvis was performed along with baseline laboratory studies.

The CT scan revealed a complete proximal small bowel obstruction, characterized by massive fluid distension of the stomach and proximal duodenum, with an abrupt transition point at the level of the transverse duodenum. Notably, the distal duodenum and proximal small bowel loops were abnormally displaced into the right hemiabdomen (Figure 1). An adjacent, calcified abdominal aortic aneurysm (AAA) was also identified. These findings were not typical for common post-colonoscopy complications and prompted urgent surgical consultation.

Due to the acute nature of the obstruction and the unclear etiology, which could not be fully attributed to either the recent colonoscopy or the known colonic mass, the surgical team determined that an exploratory laparotomy was indicated. Prior to surgery, and to facilitate gastric and duodenal decompression, a nasogastric tube was placed by the gastroenterology service under endoscopic guidance, as previous attempts at blind NG tube placement in the ED had been unsuccessful due to a known Zenker's diverticulum.

Figure 1. CT Demonstrating Acute Duodenal Obstruction. Published with Permission



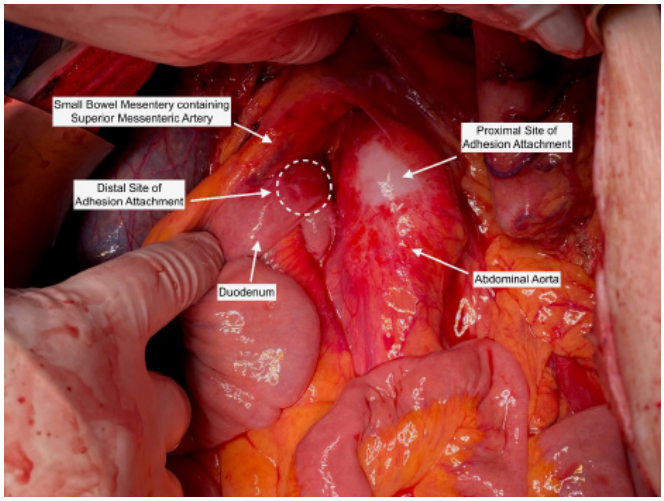
Coronal view from a contrast-enhanced CT scan of the abdomen. The image shows significant dilatation of the stomach and proximal duodenum with an abrupt transition point at the level of the transverse duodenum, consistent with a high-grade small bowel obstruction. Note the abnormal displacement of distal duodenal and proximal jejunal loops into the right abdomen. An adjacent calcified abdominal aortic aneurysm is also partially visualized.

Intraoperatively, the cause of the duodenal obstruction was identified as dense adhesions tethering the transverse duodenum to the anterior surface of the large, calcified infrarenal AAA, directly beneath the root of the small bowel mesentery. This extrinsic compression effectively created a superior mesenteric artery (SMA) syndrome-like obstruction (Figure 2). This finding was unexpected and appeared unrelated to either the recent colonoscopy or the colonic malignancy. The adhesions were meticulously lysed, allowing the duodenum to be mobilized inferiorly, away from the aneurysm, thereby relieving the obstruction.

Given the resolution of the acute duodenal obstruction and the presence of the previously identified colonic mass, the decision was made to proceed with definitive oncologic resection during the same operation. An extended right hemicolectomy, including mobilization of the splenic flexure, was performed to address the hepatic flexure adenocarcinoma. The patient's postoperative course was managed with continued nasogastric decompression, intravenous fluids, and appropriate analgesia. He experienced an

uncomplicated recovery, with a gradual return of bowel function over several days. Oral intake was successfully initiated on postoperative day 4, and he was discharged on postoperative day 7 with arrangements for appropriate oncologic and surgical follow-up.

Figure 2. Intraoperative View Following Lysis of Aortic Adhesions. Published with Permission



Intraoperative photograph of the upper abdomen following meticulous lysis of adhesions between the transverse duodenum and the underlying calcified abdominal aortic aneurysm. The image demonstrates the freed duodenum now able to fall away from the aneurysm, relieving the extrinsic compression that had caused the obstruction.

Discussion

Acute duodenal obstruction occurring in the immediate post-colonoscopy period is an uncommon event, and its etiology can be varied. While ADO has been documented in the literature as a rare complication of conditions such as perihepatic adhesions or appendicitis in the setting of intestinal malrotation, its occurrence secondary to adhesions to a calcified AAA following colonoscopy appears to be a novel finding.[1,2]. A review of published literature reveals few analogous instances, with most post-colonoscopy obstructions manifesting in the large intestine, typically related to volvulus or Ogilvie's syndrome.[3] The uniqueness of the present case lies in the extrinsic duodenal compression caused by an underlying, previously undiagnosed anatomical relationship between the duodenum and a calcified AAA, unmasked or exacerbated by the events surrounding the colonoscopy.

The clinical presentation in this case bore resemblance to both superior mesenteric artery syndrome and the exceptionally rare aortoduodenal syndrome. SMA syndrome involves compression of the third portion of the duodenum between the aorta and the SMA, whereas ADS describes duodenal compression directly by an AAA. While ADS has been reported fewer than 40 times in the literature, the pathology in our patient was distinct: the obstruction was not caused by direct compression from the AAA itself, but rather by dense adhesions tethering the duodenum to the aneurysm, effectively creating an SMA syndrome-like physiology.[4] Consequently, unlike ADS where treatment centers on surgical correction of the AAA, our patient's obstructive symptoms were alleviated by meticulous lysis of these adhesions.

This case underscores the critical importance of maintaining a broad differential diagnosis when evaluating patients with acute abdominal pain and obstructive symptoms, even in the context of recent endoscopic procedures or known concurrent pathologies like colonic masses. The unexpected intraoperative finding of duodenal obstruction secondary to AAA-related adhesions emphasizes the value of comprehensive preoperative imaging and, when diagnostic uncertainty persists, the indispensable role of exploratory laparotomy. This is particularly relevant for surgeons practicing in rural or resource-limited settings, where access to advanced diagnostic modalities or subspecialty consultation may be constrained, necessitating decisive surgical intervention based on clinical acumen and initial imaging.

Conclusion

The complex presentation of this patient, involving both a known colonic malignancy and an unexpected acute proximal small bowel obstruction from a novel etiology, highlights the necessity of thorough preoperative evaluation and decisive surgical management, particularly in the post-endoscopy setting. This case represents, to our knowledge, a previously undescribed cause of ADO, where adhesions to a calcified AAA mimicked SMA syndrome. Furthermore, it demonstrates the importance and feasibility of efficient, single-stage surgical intervention in a rural healthcare environment, successfully addressing both the acute obstructive emergency and the underlying colonic malignancy, thereby optimizing the patient's outcome and ensuring a timely oncologic response in a resource-limited area.

Lessons Learned

Acute duodenal obstruction can arise from a multitude of etiologies. This case introduces a novel mechanism, distinct from both SMA syndrome and ADS, wherein adhesions to a calcified abdominal aortic aneurysm were the direct cause of the patient's obstructive symptoms. This underscores the need for clinicians to consider a wide range of possibilities, including rare extrinsic compressive phenomena, when faced with proximal bowel obstruction.

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