Colonic stenting for a malignant large bowel obstruction with pneumatosis coli to reduce surgical risk

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ABSTRACT

Patients with a malignant large bowel obstruction are often late in seeking medical attention and are usually in poor health by the time a complete blockage is apparent. Emergency surgery in this setting, particularly in a patient with significant comorbidities, often requires the creation of an ostomy and can result in postoperative complications that delay the administration of adjuvant chemotherapy. This recent case at our center illustrates how the use of a colon stent, as a bridge to surgery, can help patients avoid the need for a stoma and reduce surgical complications.

KEYWORDS Bowel obstruction; colon stent; pneumatosis coli; risk calculator; sigmoid colectomy

The surgical management of patients with left-sided, obstructing colon cancer is complex due to both the surgical anatomy and the poor physiological condition of the patient. In addition to considering the different surgical options such as a diverting ostomy, resection with primary anastomosis, resection with colostomy, or subtotal colectomy with ileocolic anastomosis, the surgeon must contemplate the timing of surgery and the impact this may have on the patient's ability to receive adjuvant therapy expeditiously. The successful deployment of a colon stent within the obstructing cancer can convert an emergent situation to a more controlled surgical setting.^{1,2} The American College of Surgeons risk calculator can help surgeons estimate surgical risk in the two different scenarios.

CASE PRESENTATION

A 56-year-old man presented to the hospital with hepatic encephalopathy, vomiting, and severe abdominal distension. Laboratory evaluation revealed acute renal insufficiency, lactic acidosis, and elevated ammonia levels. Comorbidities included chronic obstructive pulmonary disease, alcoholic liver cirrhosis, untreated hepatitis C, and type 2 diabetes. His Model for End-Stage Liver Disease score was 22 (20% 3-month mortality) at the time of his presentation.³

A computed tomography scan of the abdomen and pelvis revealed a constricting sigmoid cancer and a dilated proximal colon (*Figure 1*). There was pneumatosis coli of the ascending colon but no air in the portal venous system. Due to the patient's American Society of Anesthesiology Classification IV status and significant comorbidities, a flexible sigmoidoscopy with biopsy and self-expanding colon stent insertion was performed instead of an immediate bowel resection. The obstructive symptoms and abdominal distension resolved and he was discharged to home 2 days later.

Three weeks later, the patient underwent a bowel preparation at home followed by admission to the hospital for a colonoscopy and laparoscopic sigmoid colectomy. A complete colonoscopy was performed (*Figure 2*) and revealed no proximal colonic lesions and healthy mucosa of the ascending colon. The patient underwent a laparoscopic sigmoid colectomy during the same anesthetic and was discharged on the fourth postoperative day.

Histologic examination of the colon specimen revealed a T3N1M0 well-differentiated adenocarcinoma. A liver biopsy, performed at surgery, confirmed macronodular liver cirrhosis and chronic hepatitis. The patient was treated with adjuvant capecitabine. The patient had no obvious cancer recurrence after 14 months of surveillance.

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Figure 1. Computed tomography images showing pneumatosis coli of the ascending colon and the obstructing sigmoid colon cancer.

Figure 2. Endoscopic picture of the stented sigmoid cancer 3 weeks after stent placement.

DISCUSSION

Patients with malignant large bowel obstructions are high-risk surgical patients. The American College of Surgeons National Surgical Quality Improvement Project surgical risk calculator helps surgeons and patients have discussions about the risks of surgery and treatment options.⁴ The standard therapy for this patient at the time of the surgical consultation is a laparotomy with abdominal colectomy. This patient initially had an American Society of Anesthesiology Classification IV status with multiple comorbidities. His estimated surgical risks for a laparotomy with total abdominal colectomy and either an ileorectal anastomosis or ileostomy include a surprisingly high 44% risk of a serious complication, a 15% risk of a return to the operating room, and a 15% risk of postoperative death (*Figure 3a*).

Figure 3. Estimated surgical risks from the American College of Surgeons National Surgery Quality Improvement Project Calculator (a) before stent placement and (b) after stent placement.

These high estimated risks motivated the treatment team to attempt placement of a colon stent to relieve the obstruction. After placement of the colon stent, the patient requires close monitoring for worsening acidosis, increased abdominal pain, or any clinical deterioration that would mandate surgery. Successful placement of a colon stent converted this high-risk, emergent situation to a more controlled surgical environment. He was able to undergo a laparoscopic procedure, and with his new American Society of Anesthesiology Classification III status and comorbidities, he was estimated to have an 11% risk of a serious complication, a 4% risk of return to the operating room, and a <1% risk of death (*Figure 3b*). The estimated length of hospital stay after operation was reduced from 19 days to 5 days according to the risk calculator.

This case also demonstrates that pneumatosis coli, in the setting of a large bowel obstruction, does not always indicate necrotic bowel.^{5,6} This patient had severe abdominal distention causing dyspnea but did not have tenderness or other signs of peritonitis. After placement of the colonic stent, the abdominal distention resolved and he never developed abdominal tenderness. Follow-up x-rays showed decompression of the colon and no pneumoperitoneum. Therefore, we felt that it was safe to discharge him home and to follow up in the clinic. This allows the obstructed bowel, which is usually edematous, to return

to its normal state and be more suitable for an anastomosis in a single operation.

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