ACG CASE REPORTS JOURNAL

CASE REPORT | BILIARY

Migrated Plastic Biliary Stent Causing Cecal Perforation

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ABSTRACT

Plastic biliary stents can spontaneously dislodge from the common bile duct and migrate distally into the bowels. Most migrated plastic biliary stents get passed with stools without any complication. However, in rare cases, migrated biliary stents can cause bowel perforation requiring urgent intervention. We report a rare case of a 53-year-old woman presenting with severe lower abdominal pain secondary to migrated plastic biliary stent causing cecal perforation. Computed tomography revealed a radiopaque linear foreign body within the cecum. The patient underwent emergent laparoscopy with stent removal and was discharged 2 days later without long-term complications.

KEYWORDS: stent migration; plastic biliary stent; cecal perforation

INTRODUCTION

Biliary stents are commonly used for biliary drainage during endoscopic retrograde cholangiopancreatography (ERCP). Biliary stent complications include hemorrhage, stent occlusion, cholangitis, and pancreatitis.[1] Biliary stent migration and dislocation from the common bile duct (CBD) can occasionally occur in patients with biliary stenting, with most stents passing spontaneously with feces without the need for intervention.[2] However, distal bowel perforation by migrated biliary stents occurs rarely and may require endoscopic or surgical intervention. Early detection and management of distal bowel perforations are essential because they can be life-threatening. Patients with colonic perforation can present with abdominal complaints or without symptoms, so clinicians should have a high index of suspicion when encountering those patients.[2] We report a rare case of a migrated plastic biliary stent causing cecal perforation.

CASE REPORT

A 53-year-old woman with a history of recurrent benign distal CBD strictures and ERCP with biliary sphincterotomy and plastic biliary stent placement presented to the hospital for removal of the 10-Fr-by-7-cm plastic biliary stent and reassessment of the distal CBD stricture (Figure 1). Before this presentation, the patient underwent computed tomography (CT), magnetic resonance imaging with contrast, and endoscopic ultrasound-guided biopsy of the stricture to rule out malignancy. Imaging did not show any masses, and the biopsy was negative for malignancy. Given those findings, the stricture was believed to be benign, and the suspected cause was choledocholithiasis. At this presentation, she was complaining of mild abdominal pain and nausea. ERCP showed a 15-mm stricture in the lower third of the CBD with no presence of the old plastic stent. A new 10 mm x 6 cm fully covered self expanding metal stent was placed in the CBD (Figure 2). The patient was discharged and scheduled for a repeat ERCP after 6 months to remove the metal stent. One day later, she presented to the emergency department with constant severe right lower-quadrant abdominal pain and nausea that started a few hours before her presentation. She denied any fevers or chills. Her vital signs were stable with temperature 36.5 °C, blood pressure 130/81 mm Hg, heart rate 94 beats/min, respiratory rate 23 breaths/min, and oxygen saturation 100% on room air. Abdominal examination was significant for severe tenderness to palpation and guarding in the right lower quadrant. Laboratory tests revealed a white blood cell count 7.1 (normal = 4.5–11 × 109/L) with 72% neutrophils and 22% lymphocytes. Abdominal and pelvic CT scan revealed a radiopaque linear foreign body within the cecum, representing the initial CBD plastic stent placed (Figure 3). CT scan also revealed right colonic diverticulosis. No abdominal abscess or free intraperitoneal air was identified on the CT scan. Given the location of the stent and that prepping the patient would pose a risk of dislodging the stent and causing fecal peritonitis, surgical treatment of the cecal perforation was preferred over endoscopic treatment. The patient underwent

ACG Case Rep J 2024;11:e01424. doi:10.14309/crj.0000000000001424. Published online: July 10, 2024

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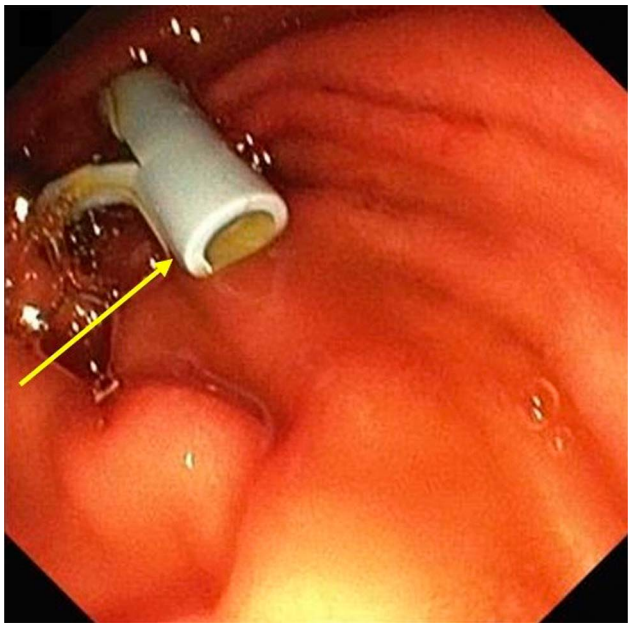

Figure 1. Esophagogastroduodenoscopyshowing 10-Fr-by-7-cm plastic stent placed in the common bile duct (yellow arrow).

emergent laparoscopy, which revealed a plastic biliary stent protruding through the cecum near the appendiceal base and ileocecal valve with a small amount of purulent drainage in the right pericolic gutter and in the hepatorenal recess. The stent was removed, and given the proximity of the defect to the ileocecal valve and the small size of the defect with minimal contamination, a primary repair of the defect with coverage with an omental flap was performed. The patient had an uneventful recovery and was discharged home on postoperative day 2.

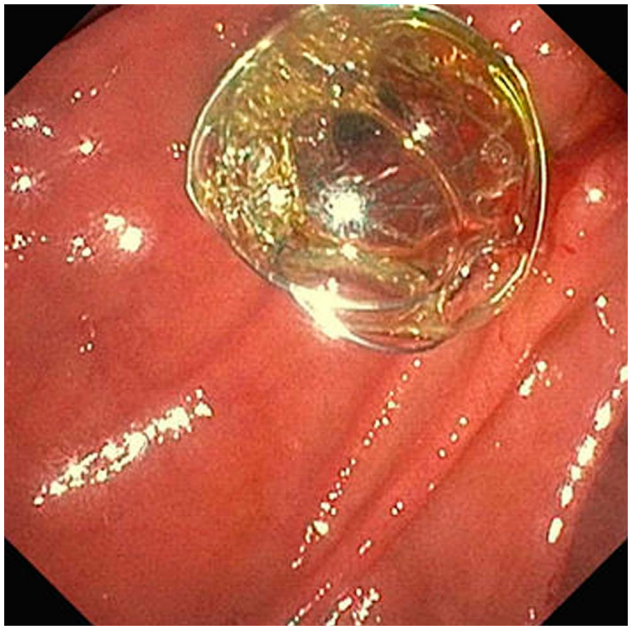

Figure 2. Esophagogastroduodenoscopy showing 10 mm x 6 cm fully covered self expanding metal stent placed in the common bile duct.

DISCUSSION

ERCP-guided biliary stenting has been widely used to relieve malignant and nonmalignant biliary obstruction. Biliary stent migration and dislocation from the CBD can occur in 5%–10% of patients with biliary stenting.[2] Migrated biliary stents can lead to complications such as fistula, abscess, obstruction, and gastrointestinal tract perforation.[1]

Risk factors associated with a higher risk of biliary stent migration include distal and benign strictures, single stent use, stent duration >1 month, history of sphincterotomy or sphincteroplasty, CBD dilation > 1 cm, long stents, and large diameter stents. One systematic review of 81 cases of bowel perforation from migrated biliary stents showed that the most common type of migrated stents causing perforation is plastic stents, and the most common site of perforation is the duodenum.[3] In addition, one multicenter retrospective study found an increased risk of biliary stent migration with dilated CBDs, longer biliary stents, distal benign biliary strictures, and intraoperative sphincterotomies.[4] According to another retrospective cohort study, biliary plastic stent migration was more common in benign biliary strictures than malignant.[5]

Plastic biliary stent type may also affect the risk of migration. To prevent migration, double-pigtail biliary stents are coiled proximally and distally, whereas straight biliary stents have side flaps. There have been controversial data regarding the risk of straight vs double pigtail plastic stent migration. Some studies reported that straight type biliary stents are more prone to distal migration compared with double pigtail biliary stents which anchors in the bile duct.[6] However, double-pigtail biliary stent distal migration has also been reported.[7] One study compared the long-term incidence of distal stent migration between straight and double pigtail biliary stents in patients with irretrievable bile duct stones.[8] They found that the probability of distal stent migration was higher with double-pigtail stents compared with straight stents.[8]

Colonic perforations by migrated biliary plastic stents have been rarely described, with the sigmoid being the most involved colonic segment.[9] The most reported risk factor for stent-migration–associated colonic perforation is diverticulosis, followed by adhesions, hernias, and strictures.[1] In one study that identified 37 cases of colonic perforations secondary to migrated stents, they found that 62% of the cases had diverticular disease, as in our case.[1] Moreover, plastic biliary stent type may affect the risk of bowel perforation. Double-pigtail biliary stents may prevent bowel perforation because of their pliable and soft plastic compared with the straight tip of straight biliary stents.[10] Plastic biliary stents that have migrated to the large intestine and passed through the narrow diameter of the small intestine seldom result in symptoms.[1] In our case, the patient presented with severe lower abdominal pain requiring immediate intervention. Therefore, patients with a history of biliary stenting presenting with abdominal pain should raise the suspicion of stent dislocation and migration.

Figure 3. Axial (A) and coronal (B) sections of the abdominal and pelvic computed tomography showing a radiopaque linear foreign body within the cecum extending into the appendix laterally and perforating into the peritoneal cavity medially (yellow arrows).

The management of stent-migration–associated bowel perforation should be individualized according to the patient's age and comorbidities, clinical presentation, and perforation location. Endoscopic management should be considered, when possible, due to the lower risk of associated morbidity compared to surgical management. Surgical management should be performed in clinically unstable patients with signs of peritonitis or life-threatening symptoms.[11] Endoscopic management is feasible in clinically stable patients and elderly patients with multiple comorbidities, in which surgical management can exacerbate their morbidities and increase mortality.[11] However, most research on endoscopic treatment for bowel perforation caused by migrating stents focuses on duodenal or distal large bowel perforation.[12] In our case, the patient had signs of mild peritonitis that warranted surgical management, and given the cecal location of the stent and that prepping the patient would pose a risk of dislodging the stent and causing fecal peritonitis, surgical treatment of the perforation was preferred over endoscopic treatment.

In conclusion, plastic biliary stent insertion is an essential procedure for short-term decompression of the biliary system. Clinicians should be aware of stent-migration–associated bowel perforation and consider it a differential diagnosis for patients presenting with abdominal pain after ERCP with stent placement. In addition, plastic biliary stents should be inserted with caution and closely followed up to prevent the possibility of life-threatening perforations. Further research is needed to identify more risk factors for stent migration and to develop strategies to prevent this complication.

DISCLOSURES

Author contributions: MY Swied was involved in the care of the patient, wrote the first draft of the manuscript, and wrote the final version after receiving input from the other authors. Y. Al Turk was involved in the care of the patient, reviewed and edited the first draft of the manuscript. M. Maitar performed diagnostic and therapeutic esophagogastroduodenoscopy on the patient, provided pictures and captions of esophagogastroduodenoscopy images, and approved the final draft of the manuscript. Y. Al Turk is the article guarantor.

Financial disclosure: None to report.

Previous presentation: This case was presented at the American College of Gastroenterology Annual Scientific Meeting; October 20–25, 2023; Vancouver, BC, Canada.

Informed consent could not be obtained for this case report. All identifying information has been removed.

Received September 18, 2023; Accepted May 31, 2024

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