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Case Report

Bowel perforation caused by distal biliary stent migration: A case report and literature review

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Endoscopic biliary stent insertion is a well-established treatment for many benign and malignant diseases affecting the hepatobiliary and pancreatic systems. The most common complication is stent occlusion, while proximal or distal biliary stent migration is relatively rare. Distal biliary stent migration most commonly affects the duodenum and rarely the small bowel, colon or rectum. In the majority of biliary stent migrations, the biliary stent passes through the intestine without incident. Herein, we report a case of bowel perforation caused by distal biliary stent migration.

Keywords: biliary stent, migration, perforation

Introduction

Acute abdominal pain is a common and emergent condition in the emergency department (ED) that must be investigated and treated immediately. The transpapillary placement of plastic stents was first described by Soehendra and Reynders-Frederix in 1979[1] and today is widespread. Biliary stents are made from plastic or metal. Plastic stents are used for benign biliary obstruction and metallic stents for malignant obstruction.[2] Plastic stents have a shorter duration of patency and a higher incidence of occlusion and displacement, but are lower in cost and easier to remove or change. Most plastic biliary stents are straight with a slightly curved shaft and flaps over each end to prevent migration. Stent migrations still occur, despite these design features.[3]

Biliary stent migration is a complication that has been well described in the literature. Its prevalence has been estimated to be 5 to 10%. Stents usually pass through the intestine without incident. Among the complications associated with stent migration, intestinal bleeding, obstruction, fistula, and perforation are of utmost importance. Perforation of the gastrointestinal tract secondary to stent migration is a rare event occurring in less than 1% of cases.[4]

Case report

A 75-year-old man had a history of hypertension and postcholecystectomy. He had undergone endoscopic retrograde cholangiopancreatography (ERCP) 2 months previously for biliary pancreatitis and cholangitis at our hospital. During ERCP, common bile duct (CBD) stones were found with CBD dilatation. Therefore, a plastic endoscopic retrograde biliary drainage (ERBD) 8.5 Fr, 7 cm stent was inserted to prevent impaction of CBD stones. He presented at the ED with fever for 2 days and progressively worsening lower abdominal pain for 1 week. On arrival at the ED, his vital signs were body temperature 38.3°C, blood pressure

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143/98 mmHg, heart rate 95 beats/min, and respiratory rate 20 breaths/min.

Physical examination revealed tenderness over lower abdomen with rebounding pain and muscle guarding. Laboratory investigation showed white blood cell count of 23410/μL with 82% neutrophils and 7.5% bands, C-reaction protein level of 20.1 mg/dL, and creatinine level of 1.5 mg/dL. Plain abdominal X-ray (Figure 1) showed subphrenic free air over right upper quadrant of abdomen and ERBD stent over right lower quadrant of abdomen. Based on these results, hollow organ perforation due to distal migrated biliary stent was suspected. Abdominal computed tomography (CT) scan (Figure 2) disclosed pneumoperitoneum and biliary stent in the right lower quadrant of abdomen. Emergent surgical intervention was performed. Migrated plastic biliary stent (Figure 3) was found within the peritoneum, but outside the gastrointestinal tract. We were unable to demonstrate the site of perforation in our case due to complete resolution of perforation. However, much fibrin coating over sigmoid colon was noted. After surgical intervention, peritoneal lavage, drainage, and antibiotic treatment, the infection was controlled and he was discharged on the 15th day after admission.

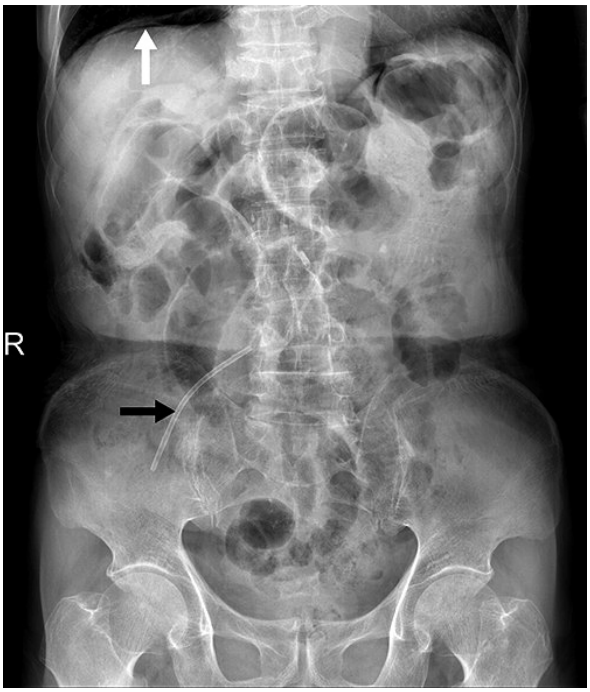

Figure. 1 Plain abdominal X-ray shows subphrenic free air (white arrow) over right upper quadrant of abdomen and ERBD stent over right lower quadrant of abdomen (black arrow).

Figure. 2 Computed tomography scan of the abdomen shows extralumination of the migrated stent (black arrow) and pneumoperitoneum (white arrows).

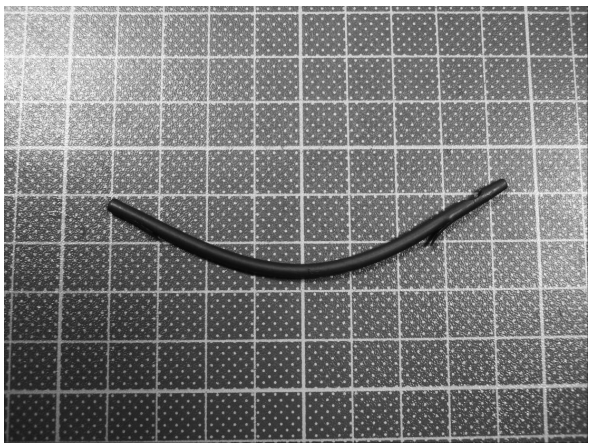

Figure. 3 Migrated plastic biliary stent that was found within the peritoneum, but outside the gastrointestinal tract.

Discussion

A retrospective review of 378 biliary plastic stent insertions showed 13.5% with either proximal or distal migration; 7.9% with proximal migration; and 5.9% with distal migration. Most proximal

biliary stent migrations are symptomatic with cholangitis and jaundice and require endoscopic retrieval of stents. Patients with distal biliary stent migration tend to be asymptomatic and are usually detected incidentally.[5]

The risk factors associated with biliary stent migration have been described. Malignant strictures, large diameter stents, and short stents are significantly associated with proximal biliary stent migration. Long stents, proximal strictures, and postcholecystectomy are associated with distal biliary stent migration.[6] Migration of biliary stent is more common in patients with benign than malignant disease of the biliary tree. Growth in diameter of the biliary tract and decreased inflammation after stent placement in benign disease contribute to higher migration rate. The migration rate is low in malignant disease due to tumor growth.

In 92% of cases with intestinal perforation after biliary stent migration, the site of occurrence is the duodenum.[7] Residual intestinal perforation mostly occurs in sigmoid colon and only rarely in the small intestine. A retrospective review of 21 cases of perforation of the large intestine due to distal biliary stent migration showed that in 19 cases perforation occurred over sigmoid diverticulum, in 1 case perforation occurred over non-diverticular sigmoid colon, and in 1 case perforation occurred in rectum. Diverticulosis, intestinal hernia, and intra-abdominal adhesion are risk factors for complications due to biliary stent migration.[8]

Currently, there is no standard diagnostic or therapeutic strategy for perforation due to biliary stent migration. The decision to treat medically, surgically, or endoscopically depends on the site of injury, size, type of perforation, operator experience, and clinical status of the patient. In cases with obvious peritonitis, such as in our patient, or unstable hemodynamics, immediate surgical intervention is warranted. Distal migration of biliary stent is not usual or innocent. It has the potential to cause life-threatening complications. To prevent serious complications, endoscopists should choose biliary stent of correct size, length, and shape and avoid prolonged placement of stent in benign disease.

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