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Case Report

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Jejunal Perforation Secondary to Migration of a Biliary Stent in a Liver Transplantation Patient: A Case Report

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Abstract

Endoscopic retrograde cholangiopancreatography (ERCP) is the most frequently performed procedure for treating biliary strictures. Although small bowel perforation secondary to the biliary stent migration is rare, it can be life-threatening. Treatment strategies for such perforation continue to be debated. We report a case of 54-year male patient who was admitted to our hospital complaining of severe abdominal pain and fever. The patient has a history of a biliary stenting for anastomotic stricture following an orthotopic liver transplantation at another facility. Abdominal computerized tomography (CT) revealed migration of the biliary stent and perforation of the jejunum. Due to acute abdomen presentation, ERCP retrieval was not attempted, and exploratory laparotomy was carried out showing the stent perforating two adjacent jejunal loops resulting in adherence of two loops together. The patient had an uneventful recovery with no need for further endoscopic intervention for biliary re-stenting.

Keywords: Biliary; Stent; Biliary Stricture; Bowel Perforation; Ercp.

Introduction

Endoscopic retrograde cholangiopancreatography (ERCP) plays an important role in the diagnosis and treatment of a broad range of biliary and pancreatic diseases. However, this procedure is considered one of themost difficult and invasive endoscopic procedure with an associated complication rate of approximately 15% and mortality rate of 1%. Complications associated with endoscopic biliary stenting include stent migration, cholangitis, stent blockage, hemorrhage, perforation, and pancreatitis. Among these, stent migration is the most common, and distal or proximal displacement of a biliary stent occurs in 5-10% of patients with biliary stents. However, gastrointestinal penetration or transmural perforation due to stent migration is rare, with an incidence of less than 1%. Perforation due to biliary stent displacement can occur in the duodenum, jejunum, ileum, cecum, colon, and sigmoid colon. Herein, we report acase of transmuraljejunal perforation due to the migration of a plastic biliary stent encountered. We also review the current literature pertaining to the diagnosis, therapeutic options, and prognosis of stent-related small bowel perforation.

Case Report

A 54-year-old male presented with a two-week history of right upper abdominal pain, jaundice, and fever (C). The patient has a history of orthotopic liver transplantwhich was complicated with anastomotic biliary stricture. He underwent ERCP with plastic stenting of the stricture in another facility, almost ayear prior to presentation to our facility. Physical examination revealed mild tenderness in the right upper abdominal quadrant. Abdominal computed tomography (CT) revealed migrated biliary stent with the distal end of the stent eroding the inferior wall of the third portion of the jejunum perforating another jejunal loop with no free protrusion into peritoneal cavity but with a small intraperitoneal.

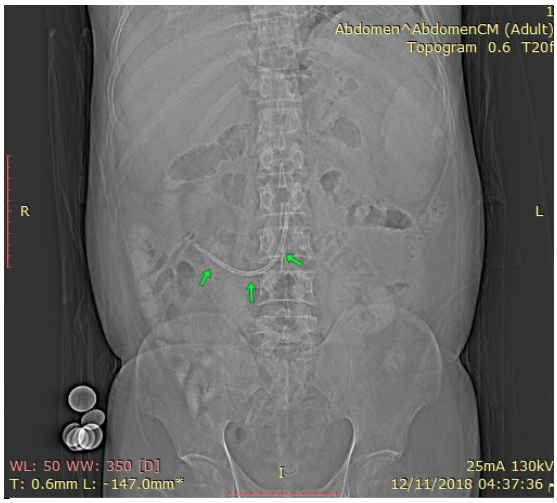

Figure 1: Abdomen computed tomography showing radio-opaque stent migration (green arrows) collection (Figure 1-3).

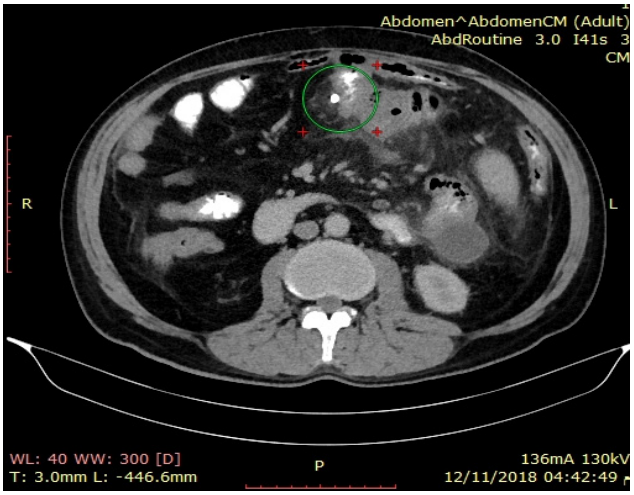

Figure 2: Axial computed topography (CT) scan of the abdomen showing radio-opaque tip of the biliary stenting (green circle) outside the jejunum with mesenteric fat stranding.

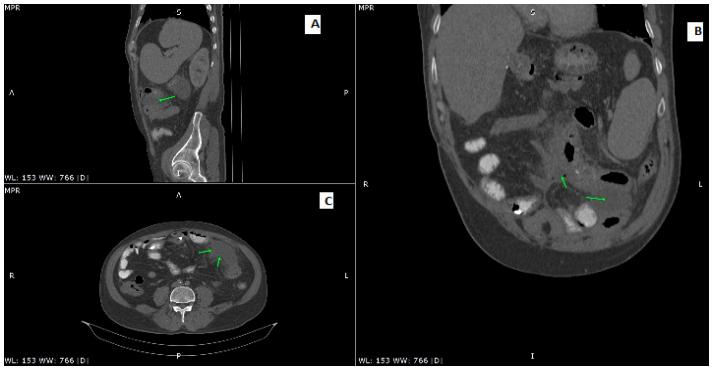

Figure 3: Computed topography (CT) scan of the abdomen showing intraperitoneal collections (green arrows) obtained in different planes A. sagittal, B. coronal and C. axial.

Laboratory tests revealed white blood cell (WBC) count 20.54 × 109/L, with neutrophils of 85%. Hemoglobin level was 11 g/L, alanine aminotransferase (ALT) was 12 U/L, aspartate aminotransferase (AST) was 22 U/L, and total bilirubin (TB) was 1.3 mg/dL. Exploratory laparotomy was performed and revealed proximal and distal end of biliary stent penetrating the wall of two jejuna loops causing closed transmural perforation.

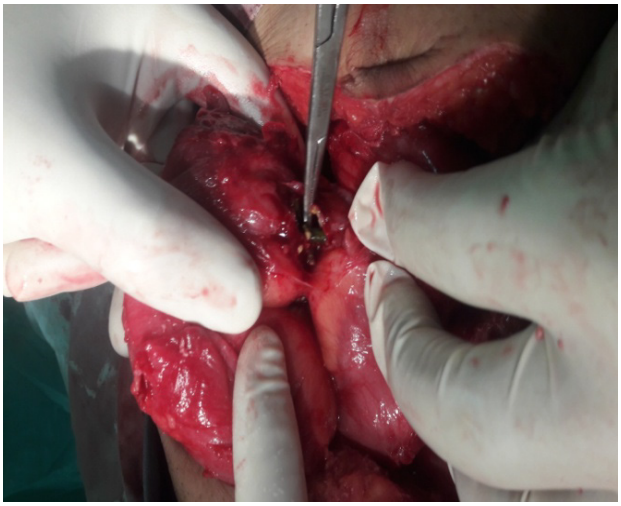

Figure 4: Intraoperative image showing biliary stent extraction from the jejunum.

Discussion

Currently, clinical classifications of ERCP-related perforations include the Stapfer classification (2000) [11], Howard classification (1999) [12], and Kim classification (2011) [13]. The Stapfer classification is the most widely used. However, none of the abovementioned classifications cover all types of ERCP-related perforations. For instance, intestinal wall perforations caused by bile duct stent migration, as mentioned in this paper, and perforation of the jejunum, ileum, cecum, colon, and sigmoid colon due to bile duct stent migration, as mentioned in other studies [6,7,8,9,10], cannot be included in the above classifications.

Endoscopically placed plastic biliary stents were first used for bile duct drainage in 1979. Subsequently, Endoscopic stenting has become a widely accepted and well-established therapy for either benign or malignant biliary obstruction. The literature indicates that the complication rate for biliary stents can range from 8 to 10%, and the most common complication is proximal or distal stent migration [4]. Duodenal perforation secondary to distal stent migration has been well documented in the literature. However, owing to the low incidence of this serious and life-threatening complication (less than 1%) [5], preventive and therapeutic methods continue to be a matter of debate.

Stent-related jejuna perforations are mainly caused by distal biliary stent migration. Thus, it is very important to determine the risk factors of biliary stent migration. However, according to a few studies, thus far, the risk factors of stent migration have not been identified definitively. Kawaguchi et al demonstrated that the risk factors for biliary stent migration include straight-type stents, common bile duct diameter > 10 mm, stent duration > 1 month, and stent with large diameter (frequency of migration was significantly

higher in cases with 10-Fr stents compared with that in cases with 7-Fr stents). Moreover, undergoing endoscopic sphincterotomy (EST) before stent placement and long biliary stent are considered risk factors for distal stent migration rather than proximal stent migration. In addition to these risk factors, Arhan et al. reported that biliary stent migration is more likely to occur in cases of benign biliary stenosis than in cases of malignant biliary stenosis. One reasonable explanation for this phenomenon is that local inflammation around the stent due to benign biliary strictures could be alleviated after biliary drainage. However, the growth of malignant tissues helps anchor the biliary stent tightly in cases of malignant strictures. In our case, this type of perforation occurred between 365 days after stent placement, which demonstrated that stent-related small bowel perforation can occur regardless of stent duration. Among the three cases at our institution, two cases of distal stent migration were noted in patients with stent duration > 1 month. Moreover, according to our case and the cases reported in the literature, all migrated biliary stents are of the straight type, which are more prone to distal migration compared to pig-tailed biliary stents. Double-pigtail biliary stents may exert an anti-migration effect by anchoring in the bile duct, and their pliable and soft plastic may prevent intestinal perforation due to stent migration. Accordingly, periodic follow-ups and timely stent replacement are highly likely to prevent such perforations effectively. Moreover, the selection of suitable stents (pig-tailed, appropriate length, diameter etc.) and avoidance of unnecessary EST may have some preventive effect on such perforations.

A distally migrated stent may cause intraperitoneal or retroperitoneal perforations. The symptoms are usually presented early and typically. In our cases, all patients presented with obvious abdominal pain in the late stage after perforation. Laboratory tests demonstrated a significant increase in WBC count and neutrophil percentage. If a perforation is highly suspected, an abdominal CT should be the preferred imaging examination. The diagnosis of a stent-related duodenal perforation can be confirmed by CT findings of intraperitoneal or retroperitoneal free air, effusion, or small bowel wall penetration caused by the distal stent. Immediate recognition of perforations is very important for the selection of surgical intervention and achieving more favorable patient outcomes. Presently, no relevant guidelines exist for preventing and managing small bowel perforations secondary to stent migration.In conclusion, jejunal perforation caused by the migration of biliary stents is a rare complication. Abdominal CT scanning is the preferred imaging examination, and subsequent surgical endoscopic treatment is feasible and effective.

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