Biliary Stent Migration: A Therapeutic Challenge

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Abstract

Biliary stenting is a commonly performed procedure and is usually uneventful. Stent migration is an uncommon event but its management can pose a therapeutic challenge to the endoscopist. Though majority of migrated plastic stents can be retrieved by therapeutic endoscopists, some require surgical intervention. We report two such cases of biliary plastic stent migration in which endoscopic retrieval either failed or was contraindicated. Both patients had previously undergone sphincterotomy and 10Fr plastic biliary stent placement. The first case of proximal stent migration resulted in impaction of proximal stent flap into one of the side branches of the left hepatic duct. In second case distally migrated stent had perforated across the duodenal wall resulting in peritonitis necessitating emergency laparotomy. We have discussed different endoscopic maneuvers for retrieval of migrated biliary stents and reviewed the role of surgery in such complicated scenarios. (J Dig Endosc 2010;1:19-21)

Key words: Biliary stent, stent migration, surgery

Introduction

Biliary plastic stent placements are commonly performed to treat a variety of biliary disorders. Migration of biliary stent is an uncommon event and occurs in 5 - 10% of patients (1,2). Majority of migrated biliary stents pass out spontaneously into the duodenum or can be successfully extracted endoscopically but their extraction endoscopically can be technically challenging in few cases. We describe two cases of biliary plastic stent migration in whom endoscopic extraction either failed or was contraindicated.

Case Series

During last one year, a total of 282 plastic stents, all 10 Fr-sized, were placed by us; of them 18 (6.4%) stents migrated during follow-up. Sixteen of 18 (88.9%) migrated stents were successfully retrieved endoscopically. The remaining two cases in whom endoscopic extraction either failed or was contraindicated are described below.

Case 1

A 58 year male presented to us with upper abdominal pain, jaundice and fever. Investigations revealed leukocytosis and deranged liver function test. Ultrasonography showed cholecystolithiasis and choledocholithiasis. In view of cholangitis, endoscopic retrograde cholangiopancreatography (ERCP) was performed. Ampullary opening was located at the margin of a large periamplullary diverticulum. The calculus was crushed with a mechanical lithotripter and fragments extracted. A 10 Fr 10cm plastic biliary stent (Wilson Cook, USA) was placed. The patient improved clinically and cholangitis subsided. He was discharged with advice for stent removal and reassessment after 4 weeks. During his follow-up ERCP, it was noted on fluoroscopy that the stent had migrated proximally and the flap at its upper end had impacted into one of the side branches of the bile duct (Fig. 1). On endoscopic view the distal end of the stent was not visible initially. Removal was attempted with extractor balloon, foreign body forceps and Dormia basket but repeated attempts failed to dislodge the impacted stent in spite of stent being grasped by forceps and basket. The distal...
tip of the stent could be withdrawn into duodenum with the help of extractor balloon (Fig. 2) but recoiled back into the common bile duct once the balloon was deflated. A laparoscopic cholecystectomy with CBD exploration and stent removal was done. There were no complications postoperatively and the patient is doing well on follow-up.

**Case 2**

A 33 year female was referred to us for a suspected postcholecystectomy biliary leak. ERCP confirmed the leak from cystic duct. An endoscopic sphincterotomy was done and a biliary stent (10cm, 10Fr, Microvasive, Boston Scientific, USA) was positioned across the leak. Patient was discharged in a stable condition. However, she presented to the Accident and Emergency room with severe abdominal pain, vomiting and abdominal distention. Clinical examination was suggestive of intestinal perforation and this was confirmed on a CT scan which suggested the stent to be located outside the duodenum. At laparotomy the stent was noted to have perforated through the duodenal wall (Fig. 3). Stent was removed and duodenal leak was sealed. Postoperative recovery was uneventful and she is doing well on follow-up.

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**Figure 1**: Fluoroscopic view showing migrated stent inside bile duct with impacted proximal flap into one of the side branches of left hepatic duct (arrowhead)

**Figure 2**: Endoscopic view showing distal tip of biliary stent just outside papillae during attempted removal with balloon extractor

**Figure 3**: Duodenal perforation with peritoneal migration of plastic biliary stent seen at laparotomy

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**Discussion**

Migration of biliary stent is a relatively uncommon problem. However its management can pose a technical challenge for the therapeutic endoscopist. Available data suggests that proximal or distal biliary stent migration may occur in up to 5-10% of patients and these results have been validated in several studies across the globe (1,2). Patients with stent displacement may present with symptoms of recurrent biliary obstruction or be discovered incidentally, during routine stent exchange/removal, as in our first case. Only rarely stent migration may lead to bowel perforation and present as a medical emergency (3). The risk of stent migration appears to be higher for benign as compared to malignant biliary strictures. Moreover, shorter stents and
single stents have also been shown to have a higher rate of migration (4). Also, chances of distal migration are more with proximal biliary strictures.

The majority of proximally migrated bile duct stents can be retrieved during ERCP. Two large studies by Lahoti et al and Tarnasky et al have reported similar overall success rates for stent retrieval of about 85% with success rates being marginally better in benign bile duct disorder compared to malignant obstruction (2,5). The proximally migrated biliary duct stents are usually retrieved using combination of balloons and baskets. If the distal tip of the stent lies near the papilla, it can be exposed by pulling the stent downward after placing an extraction balloon alongside it. If the distal end of the stent is free, the lasso technique using a basket or polypectomy snare is an alternative (6). This method is more easily performed in patients with a pre-existing sphincterotomy and a dilated bile duct. The above described methods are not applicable when the distal stent tip is impacted against the bile duct wall. In our case, in spite of the fact that the distal tip was free and could be extracted partially into the duodenum, the impacted proximal end prevented complete extraction and the stent recoiled to its primary position once traction was released. Repeated attempts with both balloon and basket failed. In the series of cases reported by Tarnasky et al (2), only 1 out of 44 proximally migrated biliary stent required laparotomy and bile duct exploration for stent removal. The stent had been placed for a benign bile duct stricture and it had migrated proximally to lie in the right intrahepatic ductal system. Surgery was done as the patient presented with cholangitis. A thorough review of literature failed to document a single case where the proximal flap of a biliary stent was impacted in a biliary radicle leading to repeated failure of endoscopic stent removal using multiple techniques.

In nearly 46% patients in the series reported by Lahoti et al (5), more than one ERCP was required to retrieve the migrated stent. It has been suggested that in patients with failed one attempt at retrieval of migrated stent, a second stent may be placed with subsequent attempts to remove both stents at a later date. However in our first case as the proximal stent flap was impacted in a biliary radicle and because of associated gall bladder stones it was decided to go for surgery rather than place another stent.

Studies have documented that 43% of distally migrated biliary stents evacuate spontaneously (1). Amongst stents that do not pass spontaneously, most become embedded in the duodenum; usually in diverticula (7). Endoscopic removal may be attempted if there is no evidence of perforation. Roses et al have reported successful endoscopic retrieval of a plastic stent perforating the duodenal wall (8). A clip was placed in the perforation at the same time. However, in view of frank peritonitis we preferred to perform surgery in our second case.

These two cases demonstrate rare complications of biliary stents, which required surgery to rectify the problem.

References