Digital cholangioscope-assisted retrieval of a proximally migrated plastic biliary stent

Himesh Zaver, MD, Juan Corral, MD, David Whitehead, MD, Victoria Gómez, MD

Endoscopic biliary stent placement offers therapeutic passage of stones and biliary drainage in the setting of both benign and malignant causes of obstruction.[1] Biliary stent migration is reported to occur in 10% of placed stents, with proximal migration responsible in approximately 5% of cases.[2] Proximal migration of biliary stents into the biliary duct can lead to obstruction, cholangitis, pancreatitis, and bile duct perforation. Ultimately, if stents cannot be retrieved endoscopically, surgical correction may be required. Retrospective studies suggest successful endoscopic retrieval of migrated stents to be between 75% and 80%. Typical maneuvers include balloon extraction, direct grasp forceps, and guidewire stent cannulation with snare capture.[3]

A 71-year-old man was referred to our tertiary care center for management of a proximally migrated plastic biliary stent. Three weeks earlier, he was seen at an outside hospital with abdominal pain and jaundice and was diagnosed as having acute cholecystitis. Laparoscopic cholecystectomy with intraoperative cholangiogram revealed filling defects suggestive of choledocholithiasis.

A plastic biliary stent was placed to provide temporary biliary drainage owing to suspicion of retained biliary stones. ERCP repeated 5 days later to remove the stent revealed proximal migration of the biliary stent into the proximal bile ducts. Attempts to remove the stent were unsuccessful at the time. The patient was transferred to our tertiary care center. At the time of evaluation, the

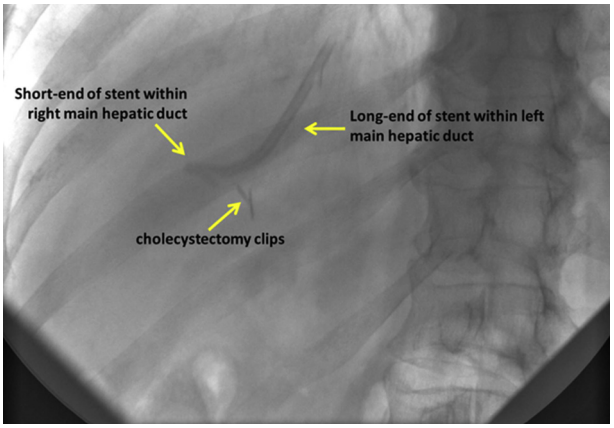

Figure 1. Radiographic control film demonstrating proximal migration of the plastic biliary stent above the level of the cholecystectomy clips and in a saddle-like position across the biliary bifurcation.

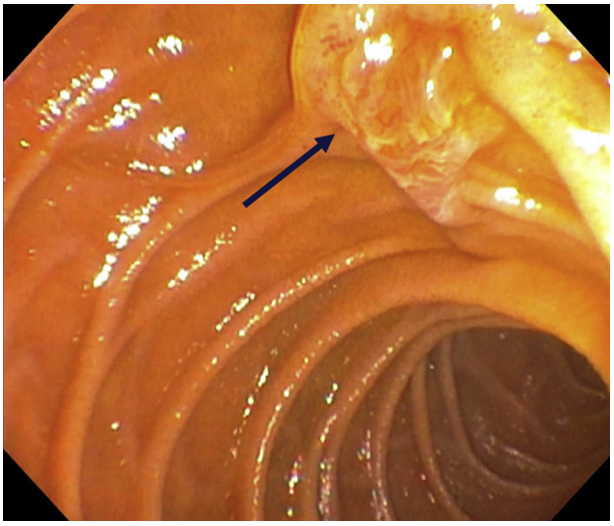

Figure 2. Widely patent major duodenal papilla *(arrow)* with evidence of a prior biliary sphincterotomy and absence of the biliary stent traversing through the papilla.

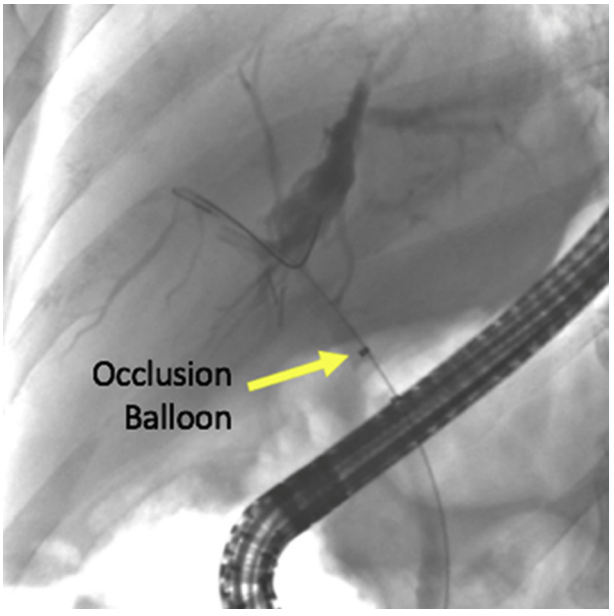

Figure 3. Fluoroscopic image demonstrating unsuccessful attempt at stent removal using an occlusion balloon and guidewire.

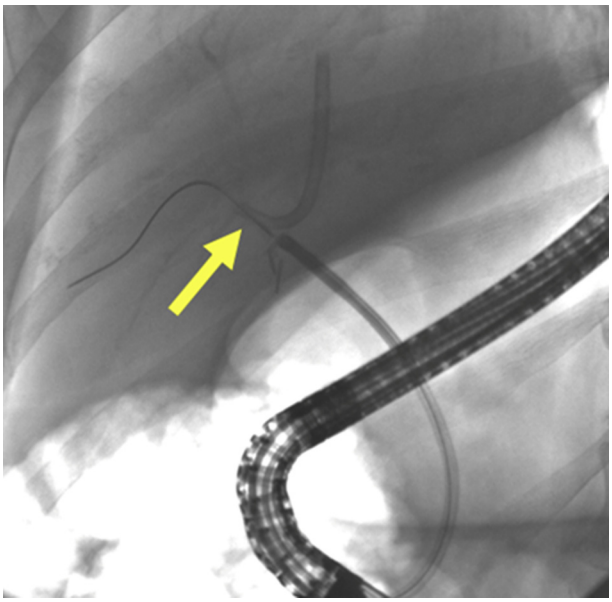

Figure 4. Fluoroscopic image showing location *(arrow)* of stent extraction effort focusing on the shorter, more visible part of the stent lodged within the right main hepatic duct.

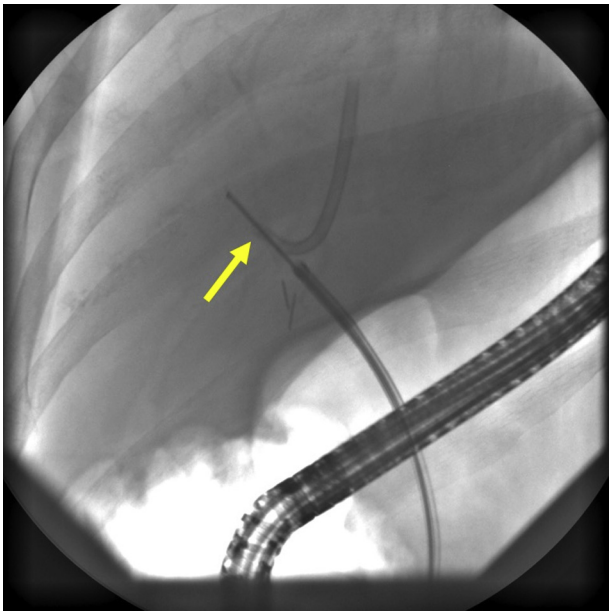

Figure 5. Fluoroscopic image showing successful passage of the biliary forceps through the side hole and out the end hole of the shorter end of the biliary stent located within the right main hepatic duct.

patient denied abdominal pain, fever, or pruritus. Results of laboratory tests, including hepatic function tests, were unremarkable. ERCP for stent removal was chosen.

Before the procedure, the patient received 100 mg of rectal indomethacin to reduce the risk of post-ERCP pancreatitis. Radiographic scout film obtained before insertion of the duodenoscope revealed proximal migration of the plastic biliary stent above the level of the cholecystectomy clips in a saddle-like position across the biliary bifurcation, with the majority of the stent located within the left main hepatic duct (Fig. 1).

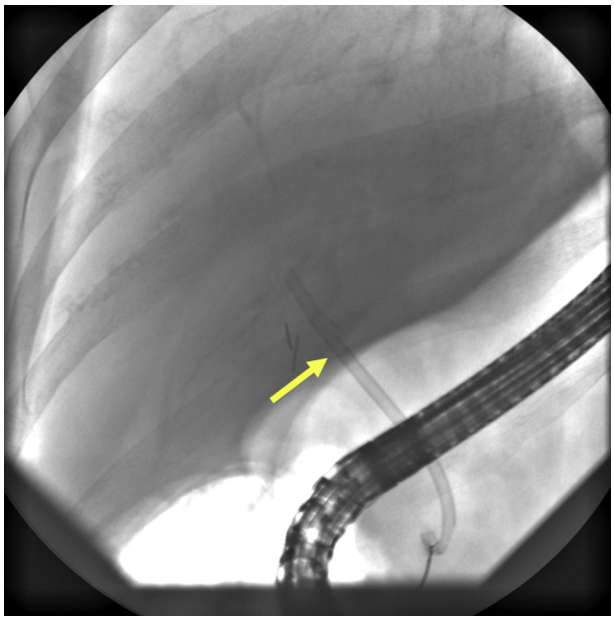

Figure 6. Fluoroscopic image showing straightening of the intact biliary stent into the extrahepatic bile duct after traction was placed on the end hole of the stent using 1-mm cholangioscopy miniature forceps.

Figure 7. Cholangiogram revealing no evidence of extravasation suggestive of trauma to the bile ducts or filling defects suggestive of retained stones or stent products.

The duodenoscope was introduced into the mouth and guided to the second portion of the duodenum, where a widely patent major papilla was seen with evidence of a prior biliary sphincterotomy and absence of the biliary stent traversing through the papilla (Fig. 2). After cannulation with an occlusion balloon and guidewire, contrast was injected into the biliary tree. Attempts to retrieve the stent by using various techniques, including grasping with biliary forceps and use of an occlusion balloon, were unsuccessful (Fig. 3).

We decided to proceed with digital single-operator cholangioscopy for direct visualization. Our patient received periprocedural antibiotic prophylaxis with 500 mg of intravenous levofloxacin. A commercially available digital cholangioscope guided over a wire cholangioscopy revealed the majority of the stent to be lodged within the left hepatic duct (SpyGlass Direct Visualization System; Boston Scientific, Marlborough, Mass, USA). Thus, attention was focused on the shorter, more visible part of the stent lodged within the right main hepatic duct (Fig. 4).

Using 1-mm cholangioscopy-assisted miniature forceps, we discovered that when in the closed position, the forceps were small enough to fit through the side aperture of the stent (SpyBite Biopsy Forceps; Boston Scientific). The tip of the closed forceps was passed through the side aperture located next to the flap and guided through to the end hole of the stent. Fluoroscopic imaging showed passage of the biliary forceps through the side hole and out the end hole of the shorter end of the biliary stent located within the right main hepatic duct (Fig. 5).

With the jaws of the forceps opened, significant traction was placed on the end hole of the stent, allowing the entire intact stent to straighten into the extrahepatic bile duct, as seen on fluoroscopic imaging (Fig. 6). The stent was then safely guided into the duodenum. Once in the duodenum, a snare was used to recapture it and pull it through the duodenoscope. The biliary tree was once again swept with an occlusion balloon, and 1 biliary stone was removed. A final cholangiogram demonstrated no evidence of extravasation suggestive of trauma to the bile ducts or filling defects suggestive of retained stones or stent products (Fig. 7). The patient was discharged in stable condition without acute postprocedural adverse events.

Although rare, proximal migration of biliary prostheses can result in significant morbidity. When conventional methods for stent extraction fail, the use of digital single-operator cholangioscopy and cholangioscopy-assisted accessories can provide rescue techniques, reducing the need for surgical correction. The smaller diameter of cholangioscopy-assisted forceps offers the advantage of fitting through plastic stents, thus allowing a secure grasp on the stent. Knowledge of the diameter of the cholangioscopy-assisted accessories—in this case, 1-mm miniature forceps—assisted in our decision to use them to retrieve the migrated stent.

DISCLOSURE

All authors disclosed no financial relationships relevant to this publication.

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Division of Internal Medicine, Mayo Clinic, Jacksonville, Florida.

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