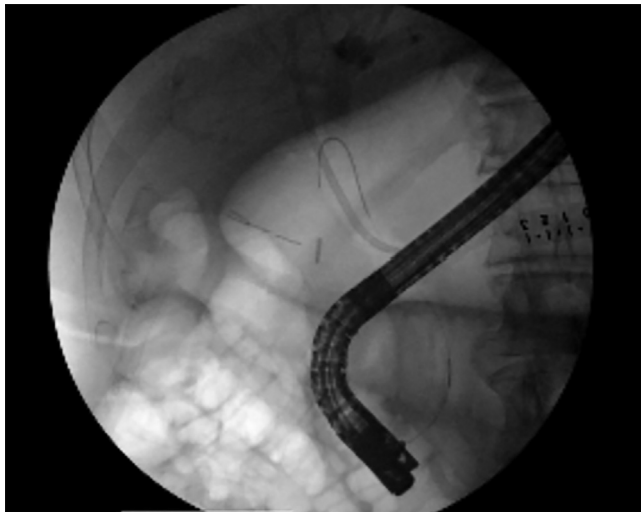




## Endoscopic retrieval of a proximally migrated biliary stent with single-operator cholangioscopy and minisnare

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An 85-year-old man with no significant medical history presented to an outside hospital (OSH) with nausea, vomiting, and abdominal pain. His laboratory evaluation was



**Figure 1.** Initial cholangiogram from the outside hospital demonstrating proximal migration of the plastic biliary stent to the right hepatic duct.



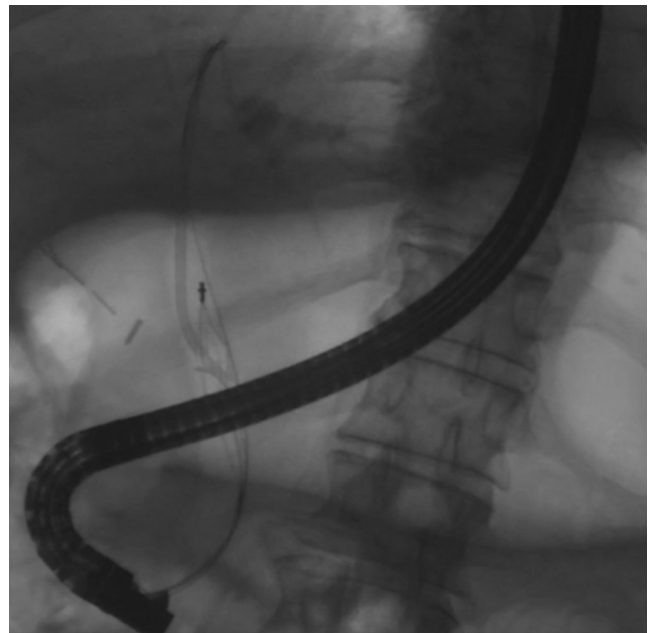
**Figure 2.** Initial cholangiogram after transfer to tertiary referral center with attempted removal of proximally migrated biliary stent by balloon traction with a 15-mm stone extraction balloon.

concerning for biliary obstruction, and a CT of his abdomen and pelvis demonstrated a 10-mm stone in the distal common bile duct with upstream biliary dilation to 20 mm. An ERCP was performed at the OSH with biliary sphincterotomy, balloon sweep with removal of the stone, and placement of an 8.5F × 7-cm plastic stent in the common bile duct.

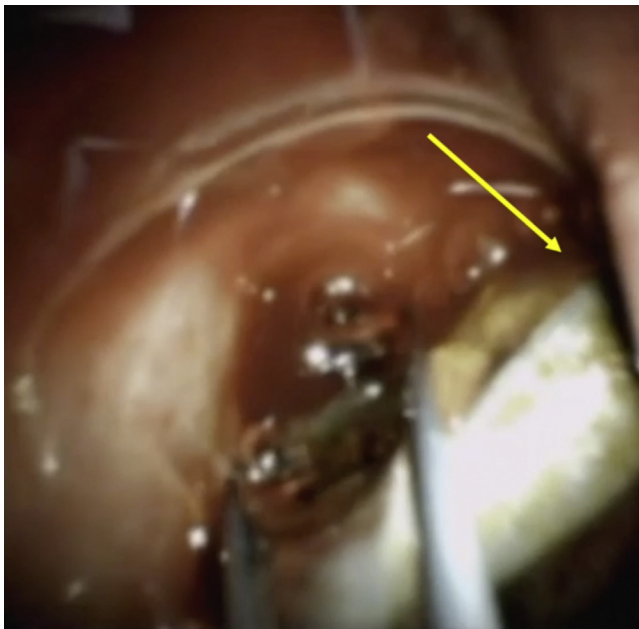
A repeat ERCP was performed 6 weeks later at the OSH for stent removal, at which point the stent was not visualized at the ampulla on endoscopic views. On cholangiogram, the stent had migrated proximally in the bile duct with the proximal end of the stent in the right hepatic duct (Fig. 1). Attempts at the OSH to remove the stent with balloon retrieval and forceps were unsuccessful, and the patient was transferred to a tertiary center for attempted removal (Video 1, available online at [www.giejournal.org](http://www.giejournal.org)).<sup>1,2</sup>

### PROCEDURE

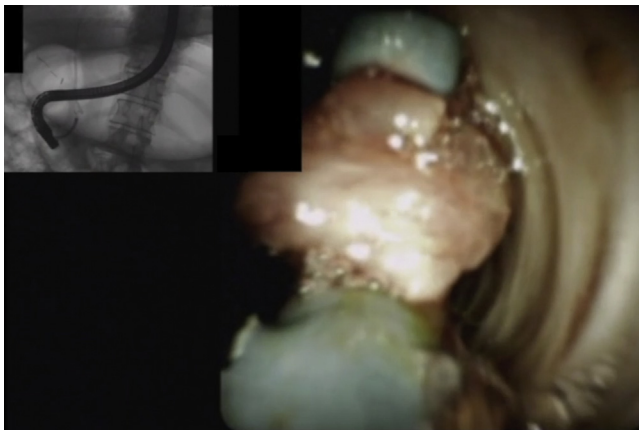
An ERCP was performed with a TJF 160VF duodenoscope (Olympus America, Chelmsford, Mass, USA), and



**Figure 3.** Attempts to remove the stent with rat-toothed forceps, 4-mm dilation balloon, Soehendra stent retriever, and lithotripsy basket (pictured here) were unsuccessful.



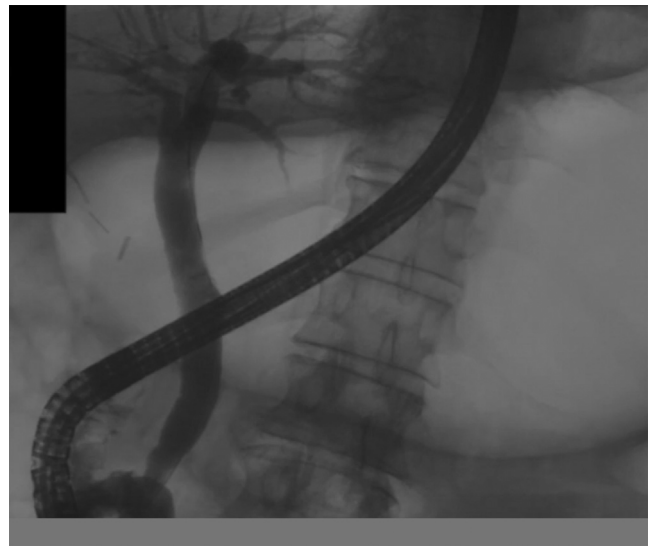
**Figure 4.** The cholangioscope was inserted into the right anterior hepatic duct for direct visualization. The distal end of the biliary stent was impacted in the bile duct wall. The mini-snare was inserted through the cholangioscope to grasp the distal flange of the stent.



**Figure 5.** The stent was removed under direct and fluoroscopic visualization with the snare grasping the distal flange.

on insertion the stent was not visualized at the ampulla. On cholangiogram, the right anterior hepatic duct contained a filling defect consistent with a migrated stent with the distal end of the stent in the mid extrahepatic bile duct (Fig. 2).

Attempts to remove the stent with a 15-mm stone extraction balloon, rat-toothed forceps, 4-mm dilation balloon, Soehendra stent retriever (Cook Medical, Bloomington, Ind, USA), and lithotripsy basket were unsuccessful (Fig. 3.) A SpyGlass Direct Visualization System (Boston Scientific, Marlborough, Mass, USA) was advanced to the right intrahepatic ducts, and a plastic stent was observed



**Figure 6.** Follow-up cholangiogram revealed no filling defects or evidence of a bile leak.

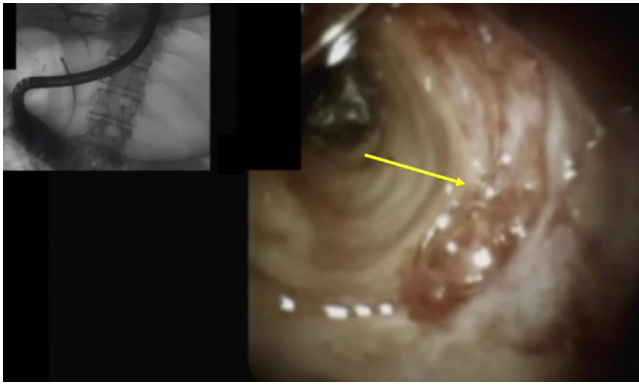


**Figure 7.** Stent-related changes were observed with direct cholangioscopic visualization in the right anterior hepatic duct.

with the distal end of the stent impacted into the bile duct wall (Fig. 4).

A mini-snare through the cholangioscope was used to grasp the distal flange of the plastic stent because the mini forceps were not thought to have enough grasp to overcome the impaction of the distal end of the stent in the bile duct wall (Fig. 5). Subsequently, the stent was pulled out of the bile duct, and the duodenoscope was removed while the stent remained ensnared.

A follow-up cholangiogram was obtained, and there were no filling defects or evidence of a bile leak (Fig. 6). The cholangioscope was reinserted, and stent-related changes were observed in the right anterior hepatic duct (Fig. 7). A clean-based ulcer with heaped-up mucosal borders was observed at the site of stent impaction in the bile duct wall, which had not previously been appreciated on the cholangiogram (Fig. 8).



**Figure 8.** A clean-based ulcer with heaped-up mucosal edges was noted at the site of distal stent impaction after stent removal.

## OUTCOME

The proximally migrated plastic biliary stent was successfully removed with ERCP and direct visualization with cholangioscopy using a retrieval snare through the working channel of the cholangioscope. This is another tool that can be considered for inwardly migrated stents that cannot be extracted using conventional ERCP techniques.

## DISCLOSURE

*Dr Mullady is a consultant for Boston Scientific. All other authors disclosed no financial relationships.*

Abbreviation: OSH, outside hospital.

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<https://doi.org/10.1016/j.vgje.2020.11.012>

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