Using Cholangioscopy to Investigate Anatomical Variation in Bile Duct Anatomy and Facilitate Stone Extraction through Selective Cannulation

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Dhavan Parikh, M.D.
The Everett Clinic
Everett, Washington, U.S.A.

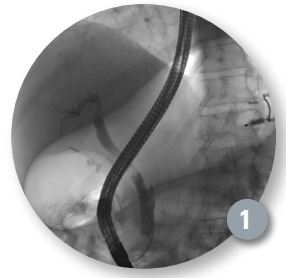
technique spotlight

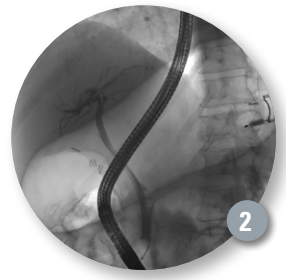
Patient History

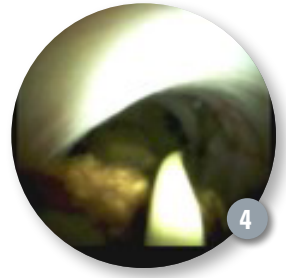
A 76-year-old man was referred by an outside hospital and presented to our hospital with biliary colic. Computed tomography imaging at outside facility noted choledocholithiasis and cholelithiasis. Upon admission, the patient was noted to have elevated bilirubin (7.8 mg/dL) and alkaline phosphatase (346 U/L) levels. An initial ERCP with sphincterotomy was performed with clearance of the common bile duct. The patient underwent laparascopic cholecystectomy the following day with intraoperative cholangiogram showing multiple filling defects in the common bile duct, presumably from dropped stones during the cholecystectomy.

Procedure

Cannulation of the papilla was performed through the existing sphincterotomy and a 0.035" x 450cm straight Hydra Jagwire™ High Performance Guidewire was placed into the biliary tree. A cholangiogram showed multiple filling defects in the mid common bile duct (Figure 1). Sphincteroplasty up to 10mm was performed, followed by balloon sweeps that recovered numerous cholesterol stones. An occlusion cholangiogram was then performed to assess for clearance of the bile duct. This showed two filling defects adjacent to the distal common bile duct (Figure 2). A balloon sweep was then repeated but failed to clear the filling defects. The SpyGlass™ DS System SpyScope™ was passed over the existing guidewire to investigate further. Cholangioscopy was performed and uncovered atypical biliary anatomy with low medial insertion of the cystic duct (Figure 3). The guidewire was removed and the SpyScope was advanced into the cystic duct where two yellow stones were detected (Figure 4). The SpyScope







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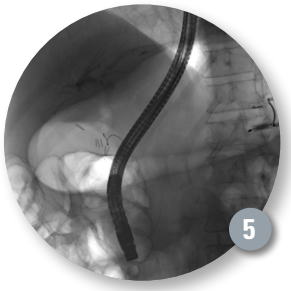
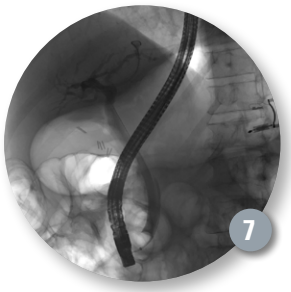


was then used to selectively cannulate the cystic duct, which was confirmed on fluoroscopy (Figure 5). The SpyScope™ was then exchanged for an extraction balloon and balloon sweeps of the cystic duct led to removal of both stones (Figure 6). Repeat occlusion cholangiogram through the main duct did not reveal any additional filling defects (Figure 7). The patient tolerated the procedure well and showed both symptomatic and chemical/laboratory improvement during long-term follow-up.

Outcome

The patient had retained stones within the cystic duct that were unable to be removed by standard balloon sweep. The SpyGlass™ DS System was used to identify a rare cystic duct variant and enabled selective cannulation. Ultimately this enabled clearance of retained stones within the cystic duct.

Conclusion



The patient had retained stones within a cystic duct of unusual anatomy and low medial insertion that could not be retrieved by standard cannulation and balloon sweep. The SpyGlass DS System allowed for detection of anatomical variation in the biliary tract and selective cannulation of the cystic duct, which would have otherwise been a significant technical challenge, possibly requiring repeated procedures and surgical intervention. The SpyGlass DS System is a useful tool for delineation of biliary tract anatomy and facilitates selective cannulation, reducing procedure time and allowing for endoscopic management of disease.

Boston Scientific Corporation
300 Boston Scientific Way
Marlborough, MA 01752-1234
www.bostonscientific.com/gastro
www.EndoSuite.com

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