VIDEO CASE REPORT

Percutaneous single-operator video cholangioscopy using a novel short disposable endoscope: first clinical case with treatment of a complex biliary stone and inaccessible papilla after Roux-en-Y reconstructive surgery

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ERCP is technically challenging and time consuming in patients with surgically altered upper GI anatomy, in particular after Roux-en-Y reconstruction. A conventional endoscopic approach using side-viewing duodenoscopes frequently fails, and an enteroscopy-assisted technique has to be performed. However, the efficacy of therapeutic interventions via the enteroscopic route is usually limited.[1-3]

Direct cholangioscopy has emerged as a cornerstone in the evaluation of indeterminate biliary strictures and in the treatment approach for complex biliary stones.[4-6] Currently, no cholangioscopy system on the market can be used via the enteroscopic approach. Thus, these situations usually require a percutaneous approach with the insertion of an endoscope into the bile duct system.[7,8]

The first step is always to establish percutaneous access; this is done either by the interventional endoscopist or radiologist, depending on local expertise and policy. The second step is usually a series of bougination sessions, until mature and stable access is achieved. Traditionally, aside from therapeutic bronchioscopes, dedicated short cholangioscopes for percutaneous access are used. However, this approach has some critical drawbacks.[9] First, reprocessable endoscopes cannot be totally sterilized and are thus prone to the risk of infection in cases of unrecognized endoscope contamination. Second, the minimum diameter of these endoscopes is around 5 mm, implying long-lasting sequential bougination of the access tract to at least 16F within 3 to 4 treatment sessions. Third, these bronchioscopes and dedicated cholangioscopes usually offer only a 2-way deflection, which substantially limits their maneuverability and capability in performing complex interventions.

Since 2015, the digital single-operator videocholangioscopy (SOVC) system has been available and is used for transpapillary direct cholangioscopy. Its benefits in the evaluation of indeterminate strictures and intraluminal therapy of difficult-to-treat bile duct and pancreatic stones have been studied in clinical trials.[5,10,11] Case reports have shown that the device can also be used as a tool for percutaneous access, although it was formally built for long access over the accessory channel of a standard duodenoscope.[12-15]

However, the single-operator system offers advantages over reusable endoscopes. First, the SOVC itself has a diameter of 10.5F, reducing the target diameter of the access tract to 11F. Second, the SOVC system is manufactured and delivered in a sterile package, which minimizes the risk of endoscope-transmitted infections. Third, the endoscope offers 4-way deflection capabilities that allow excellent maneuverability in the bile duct system. The limitation is, of course, the smaller accessory channel of 1.2 mm in diameter. However, a dedicated biopsy forceps and a 1.9F probe for electrohydraulic lithotripsy are available. Finally, only the length of the original SOVC limits its clinical use for percutaneous access in daily practice.

CASE PRESENTATION

We report here the first clinical case of the novel short SOVC system, which was specifically designed for percutaneous access. Not only does it maintain all of the aforementioned advantages, but the short length of the insertion catheter (65 cm) further improves the deflection capability of the endoscope's tip and offers improved handling owing to the shorter endoscope (Fig. 1).

A 63-year-old man was referred from another institution for obstructive jaundice and severe cholangitis complicated by cholangiosepsis. MRCP revealed a large, obstructing stone in the common bile duct after duodenum-preserving pancreatic head resection for chronic pancreatitis 2 years earlier.[16]

The patient underwent curative right hemicolectomy for colonic cancer 1 year later. He had a complicated recovery, resulting in multiple adhesions and the need for emergency surgery for acute small-bowel obstruction months before presentation. This may be why a previous endoscopic approach using device-assisted enteroscopy failed. Percutaneous transhepatic drainage was done in our institution, leading to quick stabilization.

Two sessions of wire-guided bougination of the sinus tract were needed to achieve a diameter of 11F. A soft Yamakawa

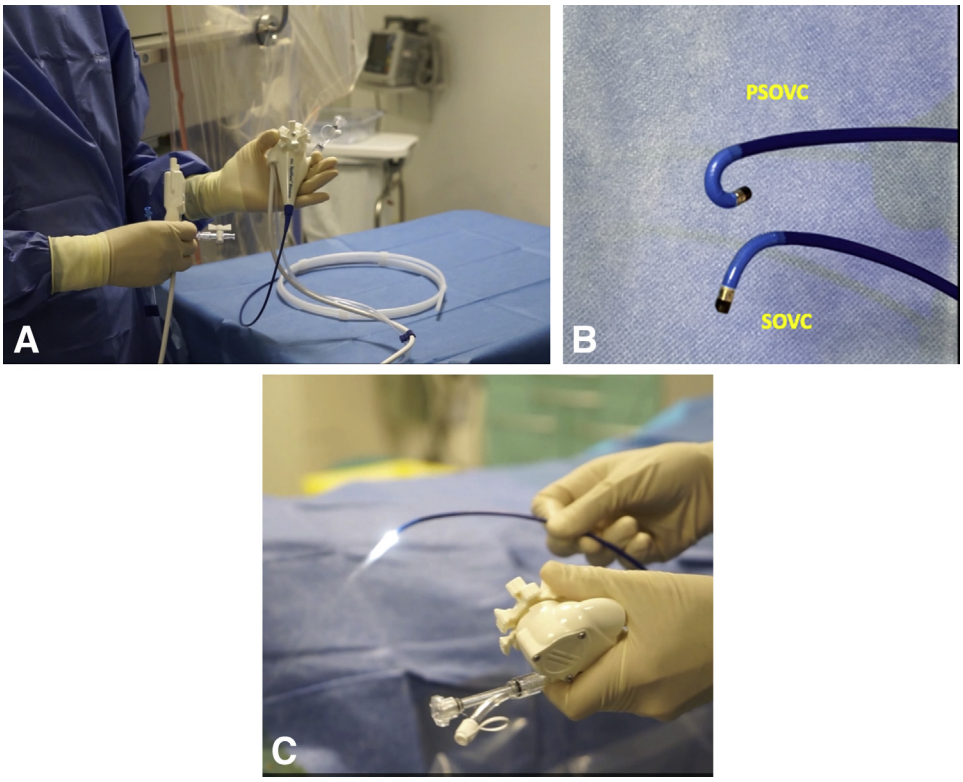

Figure 1. A, Percutaneous single-operator videocholangioscopy system with an outer diameter of the insertion catheter of 10.5F and a working length of 65 cm. **B,** Improved 4-way deflection capability of the tip compared with standard single-operator videocholangioscopy. **C,** Dedicated irrigation and suction capabilities.

drainage was implanted for temporary internal drainage. Finally, after an interval of 2 weeks for maturation of the fistula, a percutaneous cholangioscopy was performed using percutaneous SOVC (Fig. 2), with successful fragmentation of the stone by electrohydraulic lithotripsy under direct vision. Most of the fragments were pushed into the duodenum under continuous irrigation (Fig. 3; and Video 1, available online at www.VideoGIE.org). The small remaining fragments were percutaneously extracted under direct vision using a dedicated dormia extraction basket. After documentation of a complete bile duct clearance, no further implantation of a percutaneous drainage catheter was needed.

CONCLUSIONS

Novel percutaneous SOVC promises to be a useful addendum to the armamentarium of treatment options

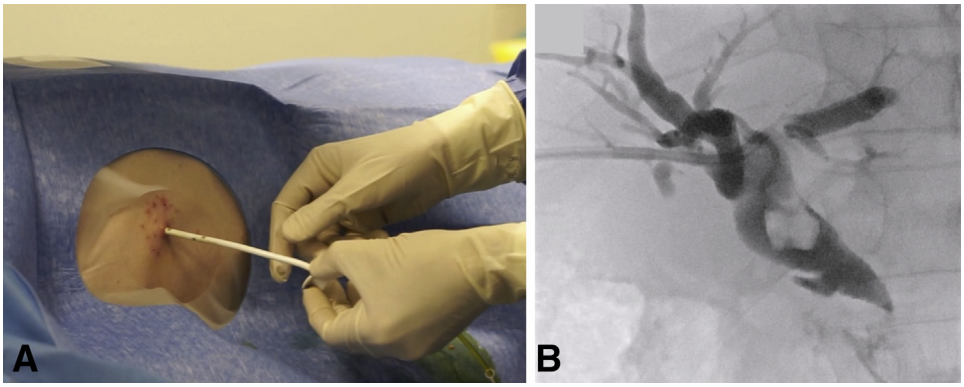

Figure 2. A, After maturation of the percutaneous fistula up to 11F for 2 weeks, the Yamakawa drainage can be removed and the cholangioscope can be inserted. **B,** Fluoroscopy shows the cholangioscope within the intrahepatic bile duct system and a large filling defect, representing a large bile duct stone in the dilated proximal common bile duct upstream of a papillary stricture.

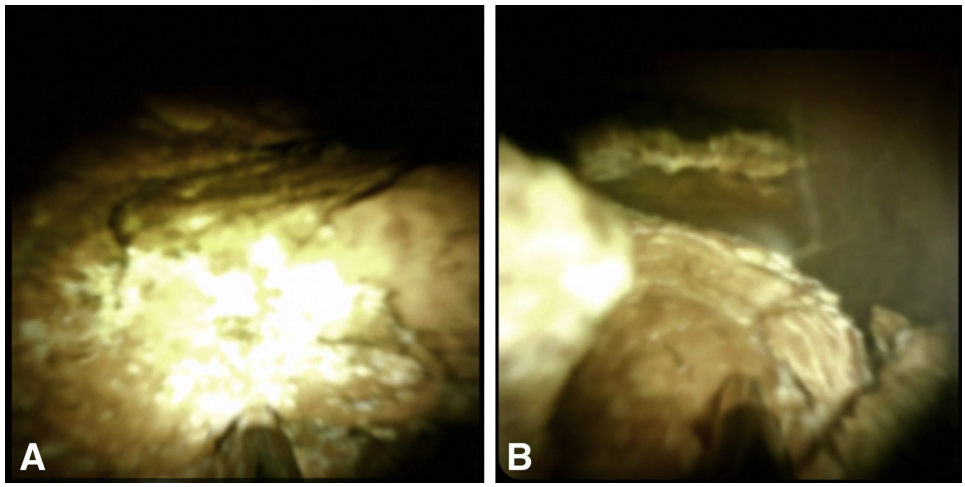

Figure 3. A, Cholangioscopic visualization of the large stone within the proximal common bile duct and insertion of a 1.9F electrohydraulic lithotripsy probe over the working channel. **B,** Effective fragmentation of the stone has been achieved.

for selected patients with complex hepatobiliary diseases and the need for a percutaneous approach.

DISCLOSURE

Dr Neuhaus and Dr Beyna both consult for and receive lecture honoraria from Boston Scientific.

Abbreviation: SOVC, single-operator videocholangioscopy.

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