



Electrohydraulic lithotripsy under the mother-baby cholangioscope system using a colonoscope for large common bile duct stones in a patient with Roux-en-Y reconstruction

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Electrohydraulic lithotripsy (EHL) is useful for the treatment of common bile duct (CBD) stones (CBDSSs) when stones are larger than 2 cm in diameter or conventional extraction methods have proven ineffective.¹ However, EHL requires direct visualization of the CBD, which is often challenging in patients who have undergone Roux-en-Y reconstruction. There have been some reports of EHL under direct cholangioscopy using an enteroscope or ultra-slim upper endoscope for patients with a history of Roux-en-Y reconstruction.^{2,3} However, when the distal CBD is narrow or the main papilla is oriented vertically toward the intestine, it is difficult to insert the endoscope as described in previous reports. This report describes a case in which EHL was performed using a mother-baby cholangioscope system and a colonoscope for a patient who had previously undergone Roux-en-Y reconstruction.

An 80-year-old man who regularly attended a hospital for cirrhosis due to hepatitis C virus infection visited our hospital with abdominal pain. The patient had a history of radiofrequency ablation (RFA) for hepatocellular carcinoma in S8 and Roux-en-Y reconstruction for a gastric ulcer. He was diagnosed with cholangitis due to CBDSSs (Fig. 1).

Endoscopic retrograde cholangiography was planned using a short-type, double-balloon endoscope (EI-580BT; Fujifilm, Tokyo, Japan). However, the main papilla was ori-

ented vertically toward the intestine, and the catheter could not be inserted into the CBD. The patient needed biliary drainage to treat the cholangitis; therefore, percutaneous transhepatic biliary drainage (PTBD) was performed on the right side of the intrahepatic bile duct during the same procedure. Because the patient had severe cirrhosis and the RFA scar in S8, he was considered to have a risk of developing a biloma in this scar with stone removal using the PTBD route. Therefore, we retried transpapillary stone removal after 1 week.

In the second session, the catheter was inserted into the CBD using the PTBD-rendezvous technique (Fig. 2). Endoscopic papillary large balloon dilation using a 15-mm-diameter balloon (13-15 mm REN; Kaneka, Osaka, Japan) was subsequently performed. The CBDSSs were removed using mechanical lithotripsy and a balloon catheter (Trapezoid and Extractor Pro RX; Boston Scientific, Marlborough, Mass, USA). However, there was no space to deploy the basket catheter because the large CBDSSs were obstructing the CBD and the distal CBD was narrow (≤ 8 mm). Therefore, we could not capture and remove all the CBDSSs with this method (Fig. 3). EHL (Autolith Touch; Boston Scientific) under cholangioscopy was needed for the removal of the CBDSSs, and we tried to insert the enteroscope into the CBD. However, the distal CBD was narrow and the main papilla was

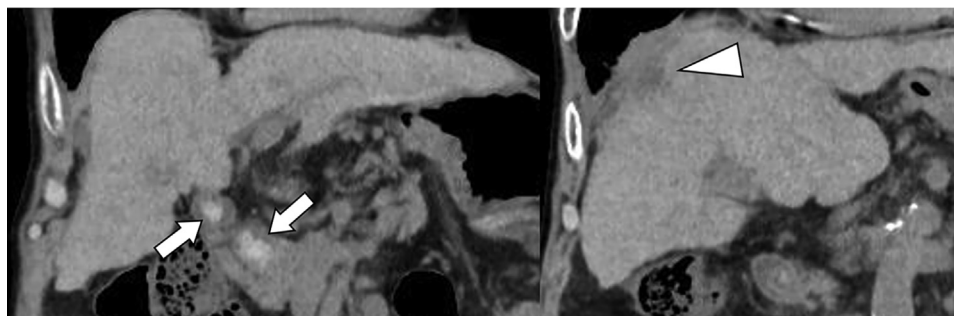


Figure 1. CT shows several common bile duct stones in the dilated extrahepatic bile duct (*arrow*). The patient's scar from radiofrequency ablation for hepatocellular carcinoma was detected in S8 (*arrowhead*).

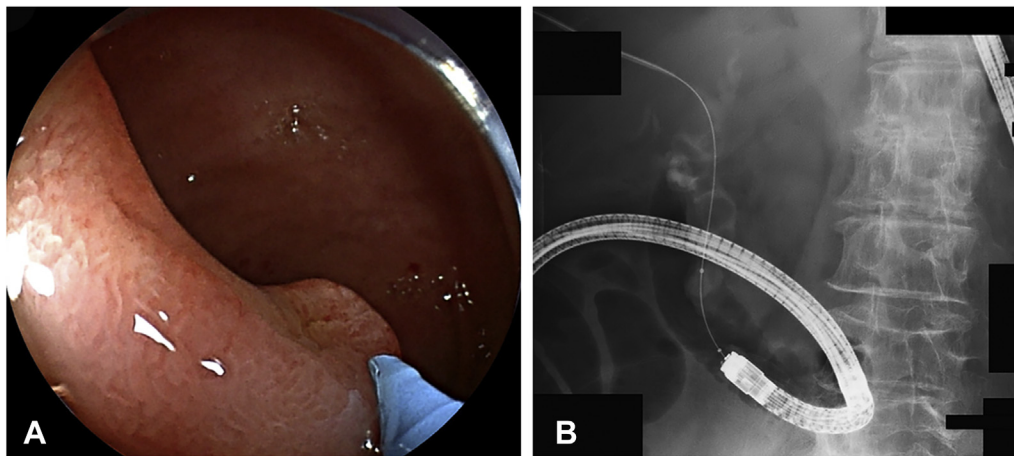


Figure 2. **A**, The main papilla was oriented vertically toward the intestine; as such, we could not insert the endoscope into the common bile duct (CBD) during the first session. **B**, After percutaneous transhepatic biliary drainage placement, we could access the CBD using the percutaneous transhepatic biliary drainage-*rendezvous* technique. However, we discovered that the CBD was clogged with large CBD stones.

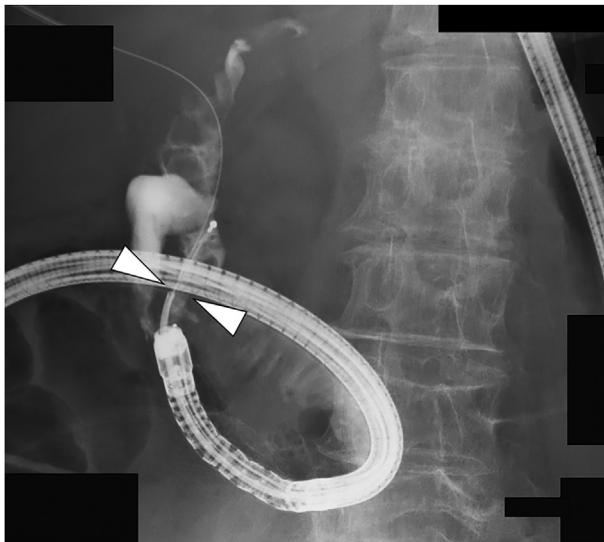


Figure 3. Because the common bile duct (CBD) was clogged with large stones, there was no space to deploy the basket catheter. The narrow distal CBD (≤ 8 mm, *arrowhead*) prevented insertion of the enteroscope into the CBD.

oriented vertically, which prevented insertion of the enteroscope into the CBD.

To pass through the narrow CBD while accounting for the vertical insertion, we considered the use of a cholangioscope (Spyglass DS, outer diameter 3.0 mm, working length 2150 mm; Boston Scientific) with a mother-baby system. In the third session, we used a colonoscope with a 3.7-mm-diameter working channel (CF-HQ290I, working length 1330 mm; Olympus, Tokyo, Japan) to insert the cholangioscope into the CBD. After the colonoscope reached the main papilla, which was already dilated from

the previous procedure, the cannula was smoothly inserted into the CBD. The guidewire was then inserted into the CBD and used to guide cholangioscope insertion through the colonoscope into the CBD. EHL was then performed under cholangioscopy (Video 1, available online at www.giejournal.org), and all of the CBDStones were successfully removed using a basket and balloon catheter (Fig. 4). No adverse events (AEs) occurred after the procedure.

We successfully performed EHL under cholangioscopy through a colonoscope in a patient with a history of Roux-en-Y reconstruction and RFA, without AEs. A native papilla has been reported to be a risk factor for AEs, including post-ERCP pancreatitis, in balloon enteroscopy-assisted ERCP in patients with a history of Roux-en-Y reconstruction.⁴ The risk of AEs was reduced in this case by using the PTBD-*rendezvous* technique to facilitate cannulation and by dividing the endoscopic retrograde cholangiography procedures into 2 separate sessions, which reduced the treatment time of each session. As such, when a colonoscope can reach the main papilla in patients with a history of Roux-en-Y reconstruction, a mother-baby cholangioscope system may be an option for resolving challenging CBDStones.

DISCLOSURE

All authors disclosed no financial relationships.

Abbreviations: AE, adverse event; CBD, common bile duct; CBDStones, common bile duct stone; EHL, electrohydraulic lithotripsy; PTBD, percutaneous transhepatic biliary drainage; RFA, radiofrequency ablation.

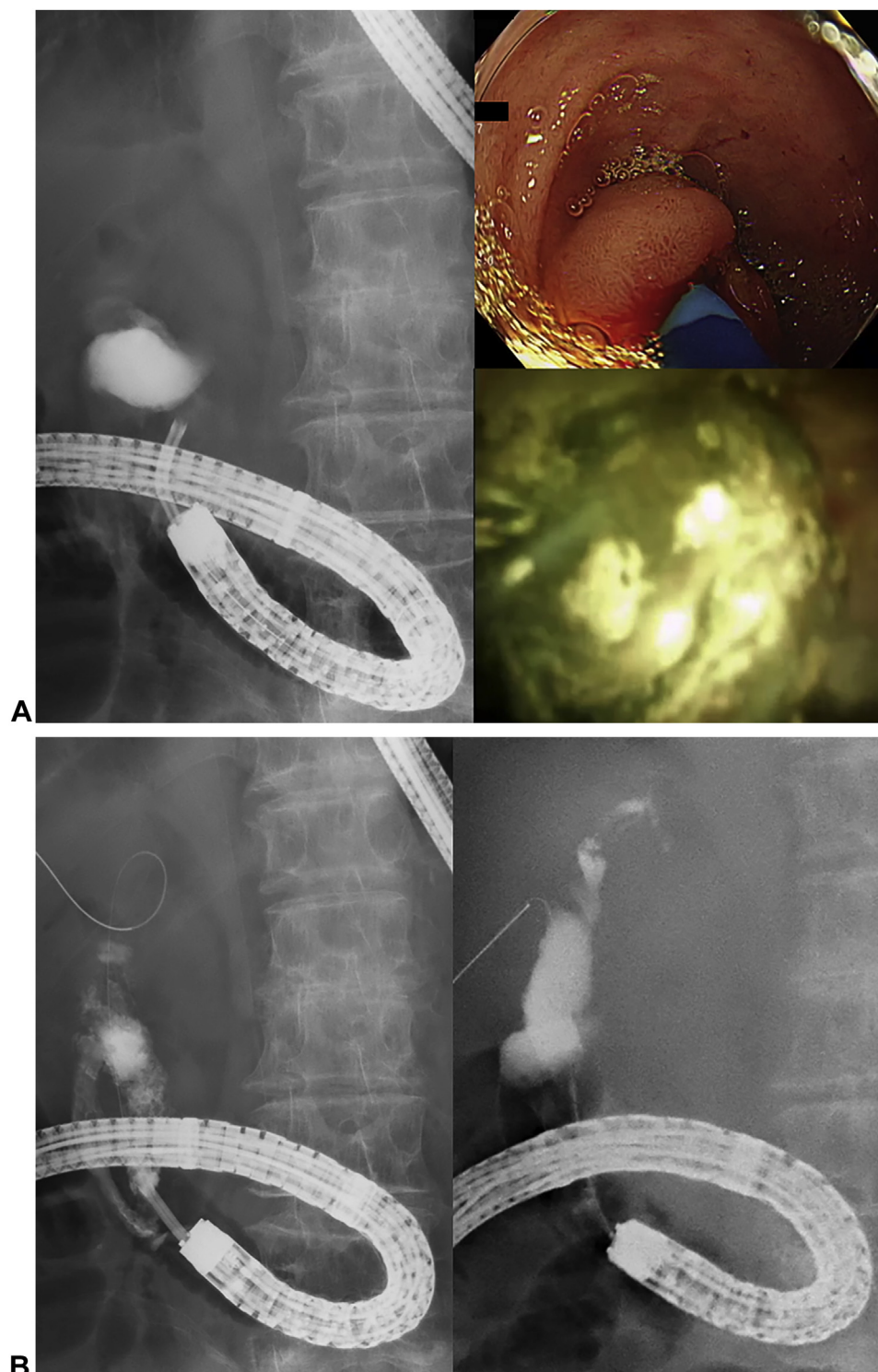


Figure 4. **A,** The cholangioscope (Spyglass DS) was successfully inserted into the common bile duct (CBD) under wire guidance through the colonoscope. CBD stones were then directly detectable by cholangioscopy. **B,** The CBD stones were shattered by electrohydraulic lithotripsy and subsequently removed using a basket and balloon catheter.

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