ORIGINAL ARTICLE

Cholangioscopy-assisted basket extraction of choledocholithiasis through papillary support without endoscopic sphincterotomy: a pilot exploration for super minimally invasive surgery

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Cholangioscopy-assisted basket extraction for choledocholithiasis has been reported in some case series.[1,2] However, difficult operation has hindered further development of this technique. Moreover, endoscopic sphincterotomy (EST) during ERCP has always led to the loss of the sphincter's function. Some early adverse events included bleeding and perforation, and some late adverse events included cholangitis, malignant degeneration, and recurrent common bile duct (CBD) stones owing to the free duodenobiliary reflux.[3-5] In this study, we introduced cholangioscopy-assisted basket extraction through papillary support for choledocholithiasis without EST.

First, biliary intubation was conducted. Second, a covered single dumbbell-style support (12 mm in diameter, 25 mm in length) was placed in the distal CBD. Third, the cholangioscope (eyeMax, 9F; Micro-Tech, Nanjing, China) was inserted into the CBD (Figs. 1 and 2). Fourth, a 10-mm CBD stone was found. Fifth, a basket was inserted into the CBD through the working tunnel of the cholangioscope, and it trapped the stone firmly (Figs. 3 and 4). Sixth, we removed the stone from the CBD by withdrawing the cholangioscope and basket together (Fig. 5; Video 1, available online at www.videogie.org). Seventh, papillary support was removed and a plastic stent was placed in the CBD to avoid inadequate drainage of bile resulting from possible papillary edema. The patient received antibiotic prophylaxis postoperatively. No postoperative pancreatitis, bleeding, or other adverse events were encountered.

For a 10-mm CBD stone, the main advantages of this technique over traditional ERCP using a balloon or basket catheter were the visualized operation and continuation of the sphincter's function. First, radioactive injury could be reduced sharply, and pregnant patients could benefit from this technique. Second, the basket, designed for cholangioscope, could be opened in the most appropriate position and trap the stones under direct vison. Third, the operator could find related adverse events including CBD perforation, bleeding, and injury. Fourth, the reserved sphincter's function avoided the possible postoperative pneumobilia and regurgitation of the intestinal juice, and the avoidance of EST would prevent those patients who could not stop anticoagulation/antiplatelet agents from papillary bleeding. Moreover, the application of papillary support established a smooth passageway for the ingress and egress of the cholangioscope, and thus facilitated the operation of cholangioscopy-assisted basket extraction. Of note, we tried our best to design the papillary support with the optimum balance between enough support force and reasonable postoperative pancreatitis rate, which need to be confirmed by further study. On the other hand, the application of papillary support itself could reduce the postoperative pancreatitis rate by avoiding the unintentional pancreatic duct insertion of the instructions for stone extraction.

This study preliminarily confirmed the feasibility of cholangioscopy-assisted basket extraction of choledocholithiasis through papillary support. Patients, especially pregnant women and those who cannot stop anticoagulation/antiplatelet agents, could benefit from this technique because of the visualized operation and absence of EST.

DISCLOSURE

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Abbreviations: CBD, common bile duct; EST, endoscopic sphincterotomy.

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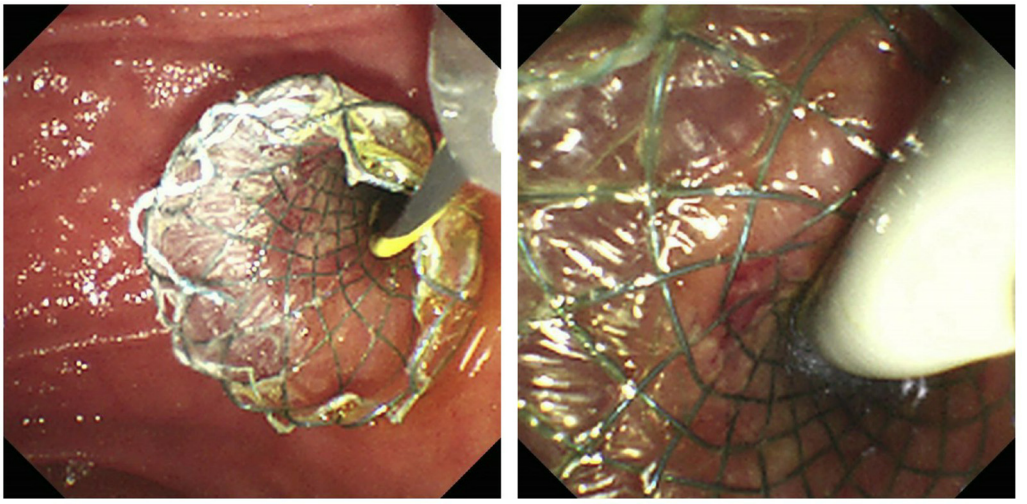

Figure 1. The cholangioscope was inserted into the common bile duct through the single dumbbell-style papillary support.

Figure 2. The cholangioscope (eyeMax, 9F; Micro-Tech).

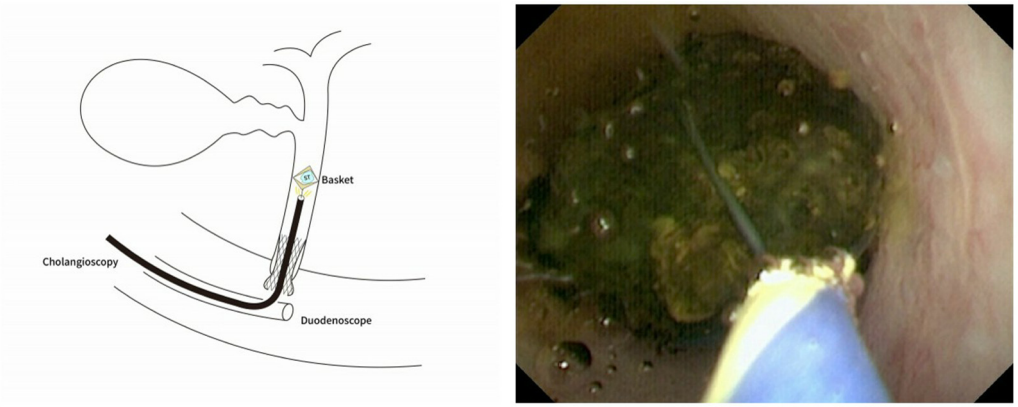

Figure 3. The sketch map and cholangioscopy vision of basket extraction for choledocholithiasis.

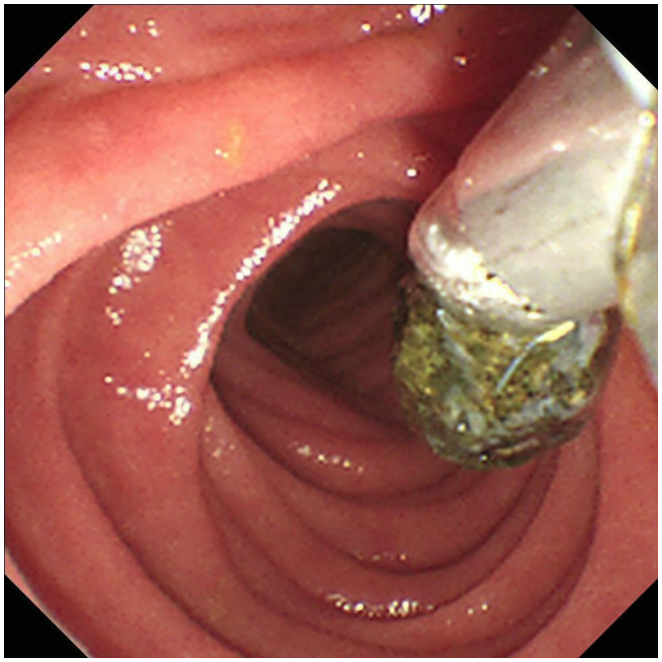

Figure 4. The stone, trapped by the basket, was extracted from the common bile duct along with the cholangioscope.

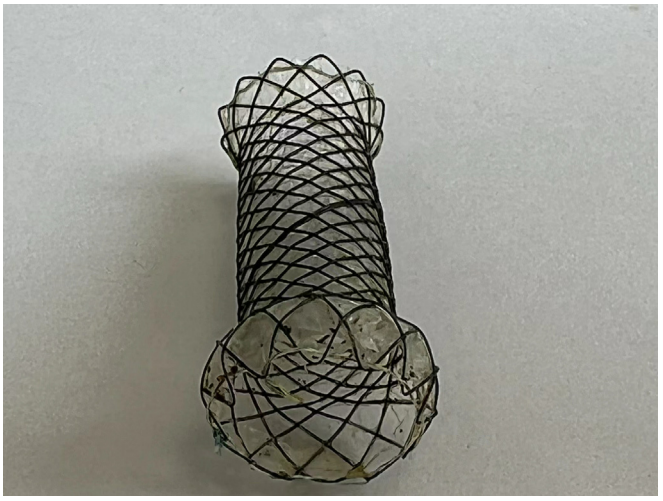

Figure 5. The single dumbbell-style papillary support was removed postoperatively.

REFERENCES

1. Fejleh MP, Thaker AM, Kim S, et al. Cholangioscopy-guided retrieval basket and snare for the removal of biliary stones and retained prostheses. VideoGIE 2019;4:232-4.
2. Han S, Shah RJ. Cholangioscopy-guided basket retrieval of impacted stones. VideoGIE 2020;5:387-8.
3. Freeman ML, Nelson DB, Sherman S, et al. Complications of endoscopic biliary sphincterotomy. N Engl J Med 1996;335:909-18.
4. Frimberger E. Long-term sequelae of endoscopic papillotomy. Endoscopy 1998;30:A221-7.
5. Hawes RH, Cotton PB, Vallon AG. Follow-up 6 to 11 years after duodenoscopic sphincterotomy for stones in patients with prior cholecystectomy. Gastroenterology 1990;98:1008-12.