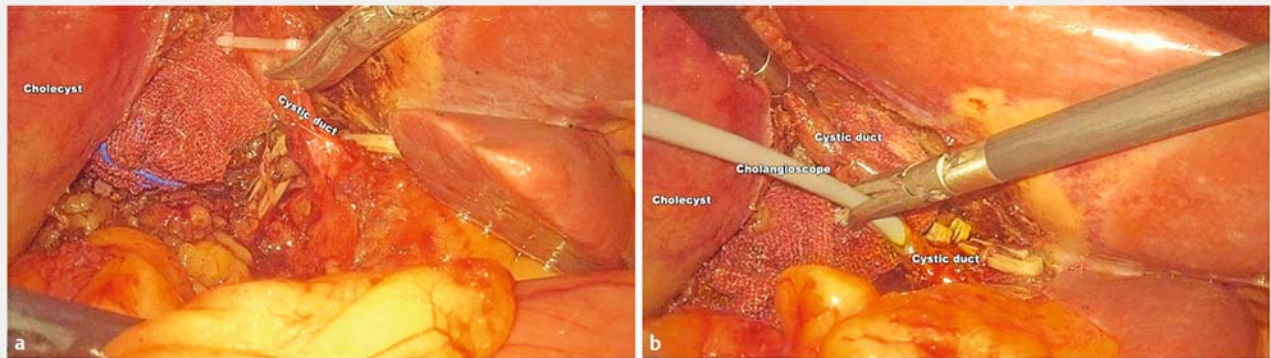
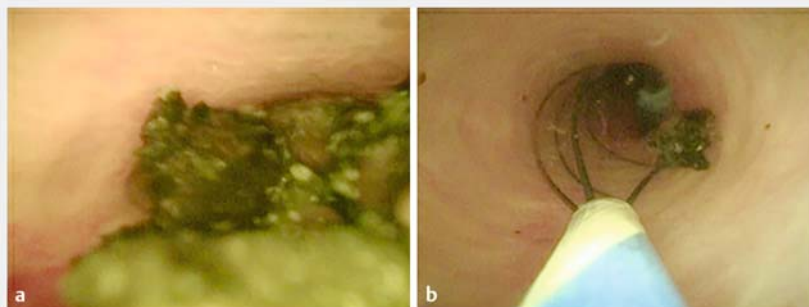


Laparoscopic common bile duct exploration through the cystic duct using flexible cholangioscopy combined with cholecystectomy for managing cholecysto-choledocholithiasis

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► **Fig. 1** Laparoscopic image of common bile duct (CBD) exploration through the cystic duct. **a** A 5-mm incision was created on the cystic duct. **b** The cholangioscope was inserted into the cystic duct through the trocar with the help of the laparoscope.



► **Fig. 2** Cholangioscopy image of common bile duct exploration through the cystic duct. **a** Multiple CBD stones were found. **b** CBD stones were extracted using a basket.

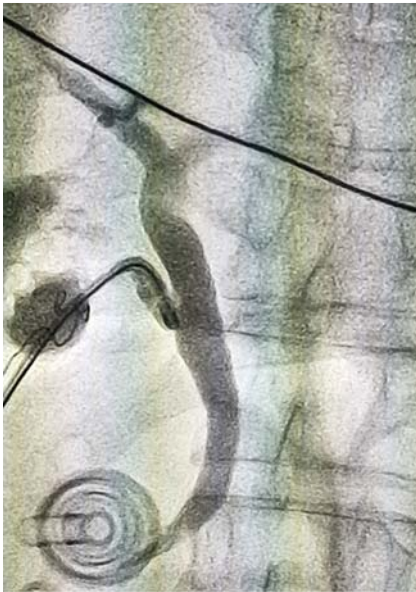


► **Fig. 3** CBD stone was removed from the cystic duct under laparoscopy.

Common bile duct (CBD) stones are present in approximately 3% to 16% patients with symptomatic gallstones [1–3]. Laparoscopic common bile duct exploration (LCBDE) and laparoscopic cholecystectomy (LC) could treat cholecysto-choledocholithiasis in one session. However, some drawbacks including the unsatisfactory controllability of the surgical choledochoscope, postoperative bile leak, and the use of the T-tube have hindered the further development of LCBDE+LC. To solve these problems, we introduced LCBDE through the cystic duct using a more flexible cholangio-

scope combined with cholecystectomy for cholecysto-choledocholithiasis. A 59-year-old man with abdominal pain underwent computed tomography (CT) examination and the result showed cholecysto-choledocholithiasis. He chose LCBDE+LC to treat the gallstones and CBD stones in one session. During this procedure, we used a novel cholangioscope with flexible controllability, which was initially designed as a single-operator peroral cholangioscopy system [4]. First the gallbladder, cystic duct, and cystic artery were dissociated under laparoscopy, and the cystic artery was cut off

using the electrocoagulation function. Then a 5-mm incision was created on the cystic duct (► **Fig. 1 a**). The cholangioscope was inserted into the cystic duct through the trocar with the help of the laparoscope (► **Fig. 1 b**). Multiple CBD stones were found and extracted using a basket under cholangioscopy in multiple sessions (► **Fig. 2**, ► **Fig. 3**). No residual stones were found under cholangioscopy and cholangiography (► **Fig. 4**). Finally, the cystic duct was clamped, and the gallbladder was removed (► **Fig. 5**, ► **Video 1**). The patient's recovery was smooth without any adverse events. Of note, this is the first experience of this technique in our team, and we hope that patients with cholecysto-choledocholithiasis



► **Fig. 4** No residual stones were found under cholangiography.

lithiasis can benefit from this procedure if conditions allow.

The advantages of this technique over traditional LCBDE + LC include better controllability, enabling complete clearance of CBD stones, and a smaller incision in the cystic duct instead of the CBD, avoiding the placement of a T-tube and post-operative bile leak.

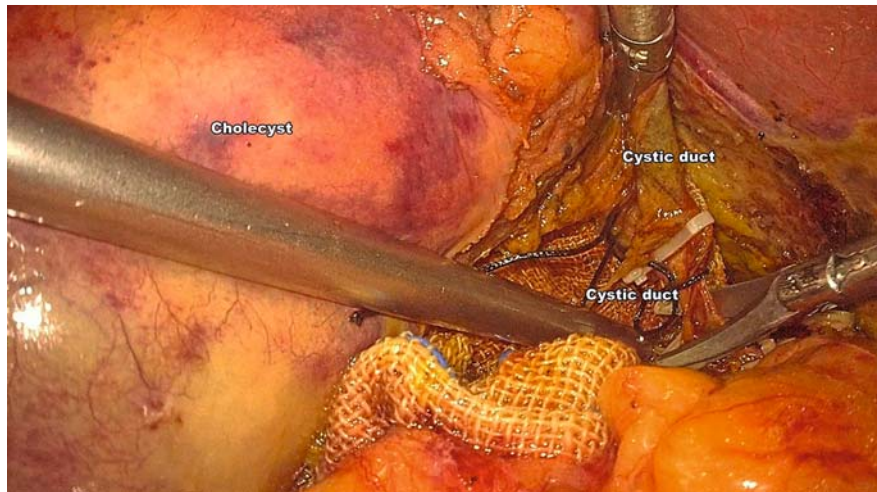
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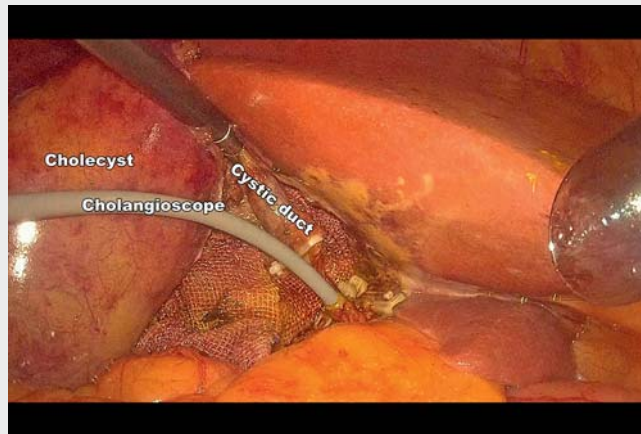
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Competing interests

The authors declare that they have no conflict of interest.



► **Fig. 5** The cystic duct was clamped, and the gallbladder was removed.



► **Video 1** Laparoscopic common bile duct exploration through the cystic duct using flexible cholangioscopy combined with cholecystectomy.



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References

- [1] EASL Clinical Practice Guidelines on the prevention, diagnosis and treatment of gallstones. *J Hepatol* 2016; 65: 146–181. doi:10.1016/j.jhep.2016.03.005
- [2] Tazuma S. Gallstone disease: Epidemiology, pathogenesis, and classification of biliary stones (common bile duct and intrahepatic). *Best Pract Res Clin Gastroenterol* 2006; 20: 1075–1083. doi:10.1016/j.bpg.2006.05.009
- [3] Collins C, Maguire D, Ireland A et al. A prospective study of common bile duct calculi in patients undergoing laparoscopic cholecystectomy: natural history of choledocholithiasis revisited. *Ann Surg* 2004; 239: 28–33. doi:10.1097/01.sla.0000103069.00170.9c
- [4] Zhang W, Chai N, Zhai Y et al. Cholangioscopy-assisted extraction of choledocholithiasis and partial sediment-like gallstones

through papillary support: A pilot exploration for super minimally invasive surgery. *Endoscopy* 2023; 55: E274–E275. doi:10.1055/a-1974-8701

Bibliography

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