

## Successful removal of a surgical clip eroded into the hepaticojejunostomy site by use of a short-type single-balloon enteroscope

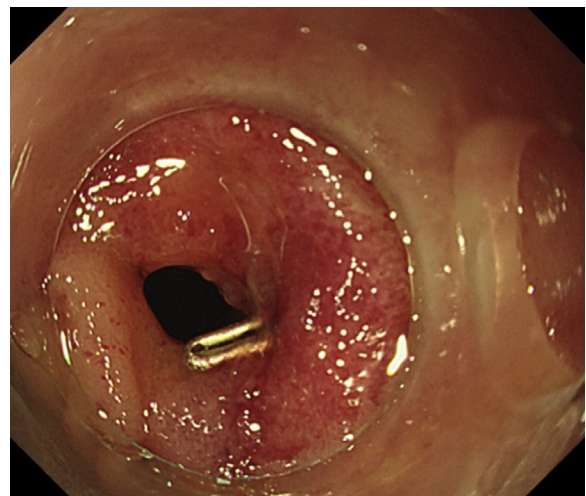


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A surgical clip eroded into the bile duct after laparoscopic cholecystectomy (LC) is a rare adverse event. We report a patient with recurrent cholangitis caused by a surgical clip that had penetrated into the hepaticojejunostomy site 17 years after LC and that was successfully removed by use of a short-type single-balloon enteroscope (short-SBE). A 76-year-old man who had undergone LC for acute cholecystitis 17 years previously and subtotal stomach-preserving pancreaticoduodenectomy for pancreatic cancer 5 years previously presented with intermittent fever and mild jaundice. He had repeatedly experienced mild cholangitis in the past 3 years, which improved with antibiotics. The results of physical examination on his recent admission were unremarkable except for mild icteric conjunctiva. Blood tests revealed the following: white blood cell count, 7050/ $\mu\text{L}$ ; C-reactive protein level, 58.0 mg/L; total bilirubin level, 47.9  $\mu\text{mol/L}$ ; aspartate transaminase level, 60 U/L; alanine transaminase level, 51 U/L; alkaline phosphatase level, 901 U/L, and  $\gamma$ -glutamyl transpeptidase level, 275 U/L. CT showed mild dilatation of the bile duct with an enhancing wall, and surgical clips after LC near the hepaticojejunostomy site (Fig. 1). Because these findings suggested cholangitis resulting from the anastomotic stricture, an overtube-assisted short-SBE (SIF-Y0015; Olympus, Tokyo, Japan) with a working length of 1520 mm and a working channel diameter of 3.2 mm was used for bile duct drainage. The enteroscope could also readily reach the hepaticojejunostomy site despite its short length. Although an anastomotic stricture was not apparent, the surgical clip had eroded into the bile duct at the anastomotic site (Fig. 2). ERCP showed obstruction of the bile flow at the level of the surgical clip (Fig. 3). Bile duct edema caused by the clip had possibly caused refractory cholangitis. Therefore, we attempted to retrieve the clip endoscopically. The clip could be pulled out smoothly with biopsy forceps (EndoJaw: FB-230U; Olympus) (Figs. 4 and 5). The clip removal might have injured the bile duct mucosa, or other clips might still have remained in the proximal bile duct; thus, we subsequently attempted direct per-oral cholangioscopy (D-POCS) to examine the bile duct. Initially, a guidewire (VisiGlide 2: length 4500 mm; Olympus) was placed into the bile duct, and then the short-SBE was extracted, leaving an overtube



**Figure 1.** Coronal reconstruction of contrast-enhanced CT view showing mild dilatation of the bile duct with an enhancing wall (yellow arrow) and the surgical clips after laparoscopic cholecystectomy near the hepaticojejunostomy site.



**Figure 2.** Surgical clip eroded into the bile duct at the anastomotic site.

and a guidewire. A transnasal endoscope (GIF-XP290N; Olympus) could easily reach the hepaticojejunostomy site through the overtube and was inserted smoothly into the bile duct over the guidewire. D-POCS showed no extravasation of contrast medium, no bile duct injury, and no remaining clips in the proximal bile duct (Fig. 6 and

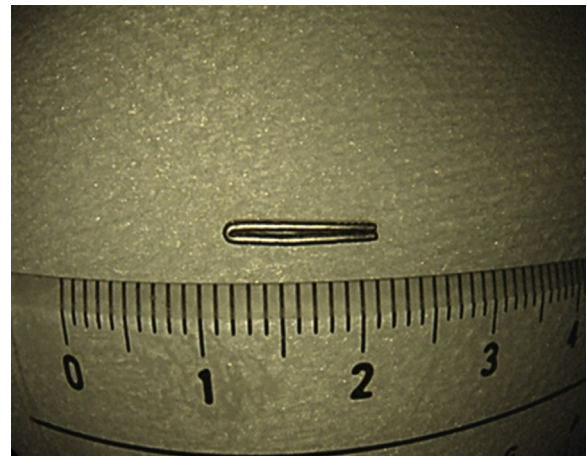
Written transcript of the video audio is available online at [www.VideoGIE.org](http://www.VideoGIE.org).



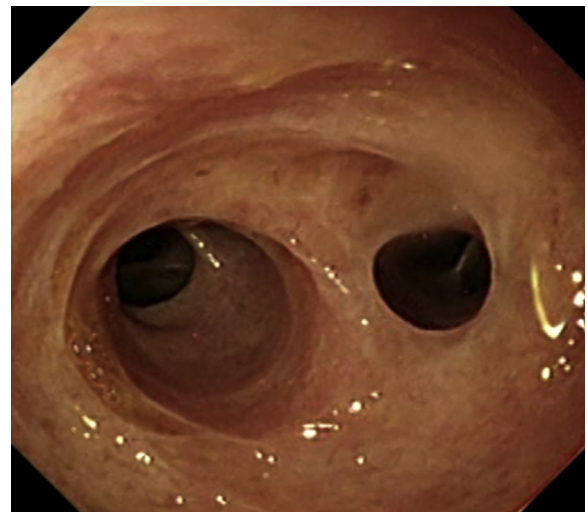
**Figure 3.** ERCP view showing obstruction of the bile flow at the level of the surgical clip.



**Figure 4.** Extraction of the clip with biopsy forceps.



**Figure 5.** Clip after removal.



**Figure 6.** Direct per-oral cholangioscopic view showing no bile duct wall injury and no other clips remaining in the proximal bile duct.

[Video 1](http://www.VideoGIE.org), available online at [www.VideoGIE.org](http://www.VideoGIE.org)). The total procedure time was 50 minutes, and there were no procedure-related adverse events. The patient's posttreatment course was unremarkable, with an almost complete normalization of his liver and biliary enzymes at his 1-month follow-up visit. He did not experience cholangitis during the 5 months after the procedure. A surgical clip eroded into the bile duct is a rare adverse event whose mechanism remains unclear. Clips that have eroded into the bile duct often cause bile duct stones. The typical symptoms are not different from those of noniatrogenic cholangitis. ERCP with stone or clip removal is a common modality for treating clip migration. Although ERCP for patients with altered upper-GI anatomy is difficult, it is feasible to access the hepaticojejunostomy site using short-SBE. Short-SBE is also useful because it allows the use of various endoscopic devices, owing to the large working channel diameter of the enteroscope. Various biliary interventions, including stone extraction and biliary stent placement,

can be performed by the use of a short-SBE. Furthermore, it is easy to perform D-POCS simultaneously while leaving an overtube and a guidewire. In conclusion, the use of short-SBE is an effective method of accessing a hepaticojejunostomy site for therapeutic biliary intervention in patients with altered upper-GI anatomy.

## DISCLOSURE

*All authors disclosed no financial relationships relevant to this publication.*

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