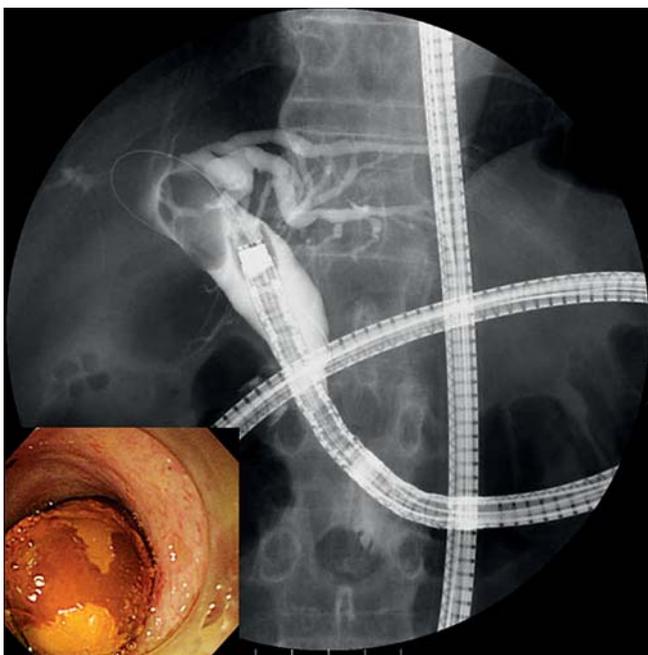


## Electrohydraulic lithotripsy under peroral direct cholangioscopy using short-type single-balloon enteroscope for large common bile duct stone in patients with Roux-en-Y gastrectomy

Balloon enteroscopy-assisted endoscopic retrograde cholangiopancreatography (BEA-ERCP) has improved the outcomes of ERCP in patients with reconstructed gastrointestinal anatomy [1,2]. However, BEA-ERCP requires high technical expertise, and large stones in the common bile duct (CBD) are difficult to treat. Binmoeller et al. reported that electrohydraulic lithotripsy (EHL) is useful for the treatment of CBD stones that could not be engaged in the basket in patients with normal gastrointestinal anatomy [3]. EHL with an ultra-slim endoscope during peroral direct cholangioscopy (PDCS) [4], and EHL with a single-balloon enteroscope under PDCS [5] have been reported in patients with hepaticojejunostomy. This report describes a 78-year-old man with gastric cancer who underwent Roux-en-Y total gastrectomy. EHL was performed with a short-type single-balloon enteroscope (prototype, SIF-Y0004V01; Olympus Medical Systems, Tokyo, Japan) under PDCS. The patient was admitted during a week-end with abdominal pain and fever, and

was diagnosed with cholangitis due to CBD stones. The patient underwent BEA-ERCP 2 days after admission. Bile duct cannulation was performed using the double-guidewire technique (▶ **Video 1**). Cholangiography revealed a shadow defect, 30×20 mm, in the CBD. Endoscopic papillary large balloon dilation was performed using a 15–18-mm balloon dilation catheter (CRE; Boston Scientific, Natick, Massachusetts, USA). The notch on the balloon disappeared after the balloon was dilated to 15 mm. The single-balloon enteroscope was inserted into the CBD, using a dilated balloon as an anchor, and a large stone was seen (▶ **Fig. 1**, ▶ **Video 2**). The stone was crushed using EHL during PDCS (▶ **Video 3**). The stone fragments were removed using a 4-wire wire-guided retrieval basket and retrieval balloon (▶ **Video 4**). The time required to reach the papilla was 11 minutes. The procedure time was 56 minutes. No procedure-related adverse events occurred. Abdominal pain and cholangitis improved rapidly, and the patient was discharged the following day.



**Fig. 1** Peroral direct cholangioscopy performed using a short-type single-balloon enteroscope. Inset, a large stone was observed.

### Video 1

Reaching the papilla of Vater and cannulation of the bile duct by the double-guidewire technique. Cholangiography showed a large filling defect.

### Video 2

Endoscopic papillary large balloon dilation. When the scope was inserted into bile duct using an inflated balloon as an anchor, a large stone was seen.

### Video 3

Electrohydraulic lithotripsy under peroral direct cholangioscopy using a short-type single-balloon enteroscope.

### Video 4

The stone fragments were removed using a 4-wire wire-guided retrieval basket and a retrieval balloon.

These results suggest that EHL with an single-balloon enteroscope during PDCS is a useful procedure in patients with Roux-en-Y gastrectomy.

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**Competing interests:** None

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