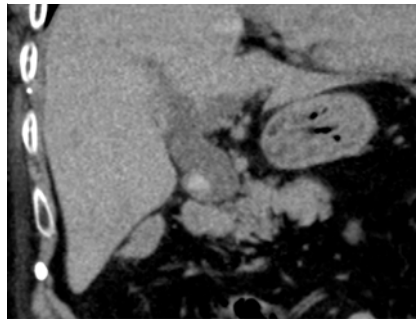


## Endoscopic cystic duct remnant stone removal using peroral cholangioscopy

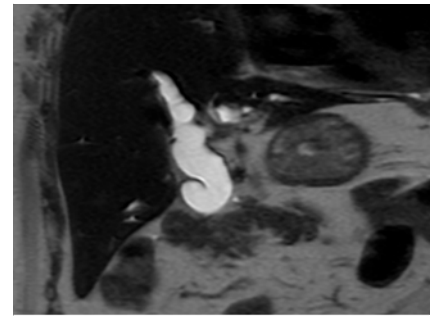


A cystic duct remnant stone is a symptom of post-cholecystectomy syndrome (PCS) reported to occur in up to 40% of patients within 2 days to 25 years after cholecystectomy [1]. Traditionally, surgery has been performed for PCS because endoscopic treatment is challenging [2]. Peroral cholangioscopy (POCS) and electrohydraulic lithotripsy (EHL) are now available for biliary stones, including cystic duct stones, which are difficult to treat with conventional procedures [3–5]. Here, we report a case of endoscopic removal of a cystic duct remnant stone using POCS, EHL, and steps targeted at its efficient removal.

An 80-year-old woman with a history of open cholecystectomy for cholelithiasis 45 years prior was admitted to our hospital owing to abdominal pain and jaundice. Computed tomography revealed a cystic duct remnant stone 2 cm in diameter (► Fig. 1). The patient underwent endoscopic biliary drainage using a plastic stent for acute cholangitis. Because removal of the cystic duct remnant stone using conventional procedures was unsuccessful, POCS (SpyGlass DS; Boston Scientific, Marlborough, Massachusetts, USA) and EHL were used (► Video 1). Fragmentation of the cystic duct remnant stone using POCS and EHL was successful; however, stone fragments in the cystic duct could not be directly removed using conventional balloon and basket catheters. Therefore, the following steps were required. First, irrigation with physiological saline while performing EHL flushed the stone fragments from the cystic duct remnant to the common bile duct (CBD), whereupon they were removed. Second, any gross stone fragments remaining in the cystic duct remnant were removed using the SpyGlass Retrieval Basket (Boston Scientific). Finally, remaining stone fragments were powdered using EHL. No adverse events occurred. Magnetic resonance



► **Fig. 1** A computed tomography image on arrival showing the cystic duct remnant stone.



► **Fig. 2** A magnetic resonance image showing no recurrence of cystic duct remnant stones 3 months after stone removal.



► **Video 1** Removal of cystic duct remnant stone achieved endoscopically using a peroral cholangioscope and electronic hydraulic lithotripsy.

imaging 3 months revealed no residual or recurrent biliary stones (► Fig. 2).

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### Competing interests

The authors declare that they have no conflict of interest.

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