Gel-immersion electrohydraulic lithotripsy during digital single-operator cholangioscopy is helpful when bleeding occurs





► Fig. 1 Photographs showing an experimental comparison of blood being injected in the presence of: a saline; b the gelatinous liquid, with the visibility better with the gel than with saline.

Electrohydraulic lithotripsy (EHL) during digital single-operator cholangioscopy (dSOC) is a useful technique for difficult bile duct stones [1,2]; however, visibility during dSOC can be poor in the presence of bleeding or infected bile juice. In such situations, EHL may be challenging. The use of gel-immersion endoscopy using a transparent gel (Viscoclear; Otsuka Pharmaceutical Factory, Tokushima, Japan), which is more viscous than saline (> Fig. 1), has recently been reported as a method for securing the visual field [3-5]. Use of the gel-immersion technique has not yet been reported in the pancreaticobiliary endoscopic field. We herein describe technical tips for gel-immersion EHL during dSOC for bile duct stones.

An 82-year-old man was admitted to our hospital for treatment of huge common bile duct (CBD) stones. Endoscopic retrograde cholangiopancreatography (ERCP) was attempted. Biliary cannulation using a standard ERCP catheter (MTW; Endoskopie, Wesel, Germany) was performed successfully. After contrast medium had been injected into the biliary tract, a 0.025-inch guidewire (VisiGlide 1; Olympus Medical Systems) was deployed, and endoscopic sphincterotomy was performed.

Subsequently, a digital single-operator cholangioscope (SpyGlass DS; Boston Sci-



Video 1 Gel-immersion electrohydraulic lithotripsy during digital single-operator cholangioscopy is performed to treat a large common bile duct stone after bleeding from a bile duct wall injury impaired the endoscopic view.

entific) was inserted into the CBD, and a CBD stone was successfully observed, while we repeatedly injected saline and performed aspiration. We performed EHL using a 2.4-Fr EHL probe combined with an electrohydraulic shockwave generator (Lithotron EL27; Walz Elektronik) (> Fig. 2 a; > Video 1). Although EHL of the stone was partially successful, bleeding occurred owing to injury to the bile duct wall, and the endoscopic view gradually became obscured (> Fig. 2b). The gelatinous liquid was therefore injected into the CBD, after which a clear endoscopic view was obtained (> Fig. 2 c). In addition, hemostasis was spontaneously obtained. Finally, complete EHL was successfully performed and a stent was inserted (> Fig. 2 d).

In conclusion, gel-immersion EHL during dSOC may be useful where there is an unclear endoscopic view because of bleeding.

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Competing Interest

The authors declare that they have no conflict of interest.

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▶ Fig. 2 Cholangioscopic views showing: **a** endoscopic electrohydraulic lithotripsy being performed; **b** poor visibility because of bleeding; **c** the distal flange of a lumen-apposing metal stent clearly seen following the injection of the gelatinous liquid; **d** successful deployment of the lumen-apposing metal stent.

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