E-Videos

Contrast enhancement for undetectable intrahepatic bile duct to facilitate endoscopic ultrasound-guided hepaticogastrostomy





▶ Fig. 1 The dilated intrahepatic bile duct was not visible on endoscopic ultrasonography.

Endoscopic ultrasound-guided hepaticogastrostomy (EUS-HGS) has utility as a salvage procedure when transpapillary biliary drainage is too difficult [1–3]. Contrast-enhanced endoscopic ultrasound (CE-EUS) allows evaluation of perfusion in real time during endoscopic ultrasound (EUS) and can be used to evaluate a range of tumor types [4, 5]. Herein, we demonstrate the use of CE-EUS to visualize the intrahepatic bile duct (IHBD) during EUS-HGS.

A 74-year-old woman diagnosed with pancreatic head cancer associated with biliary obstruction was referred for management of obstructive jaundice after failure of endoscopic retrograde cholangiography due to duodenal obstruction. EUS-HGS for biliary drainage was planned. A convex-type EUS scope (EG-580UT; Fujifilm, Tokyo, Japan) was inserted to evaluate the left lobe of the liver from the stomach. Although computed tomography (CT) had demonstrated dilatation of the IHBD, the IHBD could not be visualized on B-mode EUS (> Fig. 1). Careful evaluation revealed a portion of the dilated IHBD, but the IHBD was filled with echogenic bile juice with similar echogenicity to the adjacent liver parenchyma. As clear visualization of the IHBD was challenging with EUS, we decided to perform contrast-enhanced EUS-HGS (CE-EUS-HGS). An ultrasound contrast agent (Sonazoid; GE Healthcare



Fig.2 Contrast-enhanced endoscopic ultrasonography enabled clear identification of the dilated intrahepatic bile duct. **a** Extended pure harmonic mode. **b** B-mode.



Fig.3 Puncture of the bile duct using a 19-gauge fine needle aspiration needle under endoscopic ultrasound guidance. **a** Extended pure harmonic mode. **b** B-mode.

Pharma, Tokyo, Japan) was intravenously administered and enabled clear visualization of the IHBD on the extended pure harmonic mode of EUS (> Fig.2). The dilated IHBD was punctured using a

19-gauge needle (► Fig. 3). Proper puncture was confirmed by injection of contrast through the hepaticogastrostomy followed by insertion of a guidewire into the biliary system (► Fig. 4). The fistula



▶ Fig.4 Contrast injection confirmed appropriate puncture of the bile duct, and a guidewire was inserted into the biliary system.



► Fig.5 Hepaticogastrostomy: a plastic stent was deployed at the fistula.

was dilated with a 7-Fr bougie dilator. Finally, a 7-Fr dedicated plastic stent for HGS (TYPE IT; Gadelius, Tokyo, Japan) was deployed at the fistula (**> Fig. 5**). Obstructive jaundice resolved after the procedure without any adverse events (**> Video 1**).

In normal liver, the bile duct is the only structure that is not enhanced on CE-EUS. CE-EUS-HGS may have utility in the clear and accurate detection of the IHBD in cases where visualization of the IHBD on EUS is limited by the presence of concentrated bile juice.

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Competing interests

The authors declare that they have no conflict of interest.

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