

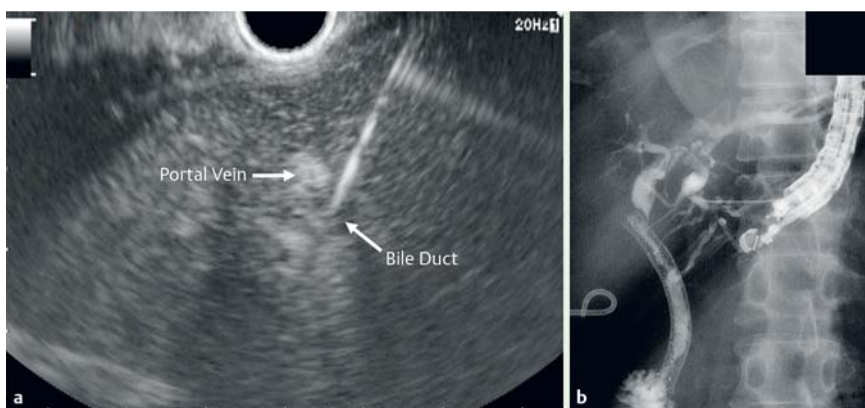
## Hepaticogastrostomy guided by real-time contrast-enhanced harmonic endoscopic ultrasonography: a novel technique



**Fig. 1** Contrast-enhanced computed tomography (CT) image showing a dilated left intrahepatic bile duct.



**Fig. 2** Contrast-enhanced harmonic endoscopic ultrasonography (EUS) image in the post-vascular phase showing the intrahepatic bile duct as a contrast defect.



**Fig. 3** Hepaticogastrostomy guided by real-time contrast-enhanced harmonic endoscopic ultrasonography (EUS). The dilated intrahepatic bile duct has been punctured using a 19-gauge aspiration needle and, after aspiration of bile, a small amount of contrast medium has been injected.

### Video 1



A sonographic contrast agent (Sonazoid) is injected to enhance the contrast between the bile duct and the hepatic parenchyma during endoscopic ultrasonography (EUS)-guided hepaticogastrostomy. After intravenous infusion of Sonazoid, the dilated intrahepatic bile duct could be identified and was punctured with a 19-gauge aspiration needle, which allowed hepaticogastrostomy to be safely carried out.

EUS-HGS was successfully performed under real-time contrast-enhanced harmonic EUS guidance.

A 55-year-old woman with obstructive jaundice secondary to gastric cancer was referred to our hospital. She had previously undergone endoscopic transpapillary metal stenting for biliary obstruction caused by lymph node metastasis. Stent occlusion occurred 6 months after stent deployment and an ERCP was attempted; however, the ampulla was inaccessible because of a duodenal stricture.

As computed tomography (CT) scanning revealed a dilated LIBD (● Fig. 1), EUS-HGS was performed. Although the left hepatic lobe could be visualized well with an echoendoscope from the stomach, the LIBD was invisible. The contrast between the bile duct and the hepatic parenchyma was enhanced by performing contrast-enhanced harmonic EUS. Immediately after an intravenous infusion of sonographic contrast agent (Sonazoid; Daiichi-Sankyo, Tokyo, Japan) had been administered, the dilated LIBD could be identified (● Fig. 2) and was punctured with a 19-gauge aspiration needle (● Fig. 3). After the fistula had been dilated, a covered metal stent was successfully deployed (● Video 1). The strong contrast between the liver par-

Endoscopic ultrasonography-guided hepaticogastrostomy (EUS-HGS) has recently been developed as an alternative biliary drainage technique for failed endoscopic retrograde cholangiopancreatogra-

phy (ERCP) [1–3]. A recent review revealed its overall technical success rate to be 82% [4], but puncturing the left intrahepatic bile duct (LIBD) is occasionally challenging. Here we present a case in which

enchyma and the LIBD lasted until the stent had been deployed.

Sonazoid, a unique ultrasound contrast agent, is phagocytosed by Kupffer cells in the liver, which enables persistent and stable image enhancement [5]. When the normal hepatic parenchyma is enhanced, the bile ducts are clearly delineated as contrast defects as they do not contain Kupffer cells. In this patient, the bile duct was filled with sludge and debris, which may have impaired the visibility of the dilated LIBD on conventional EUS. In such cases, EUS-HGS under real-time contrast-enhanced imaging may be useful to clearly visualize and decisively puncture the LIBD.

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**Competing interests:** None

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