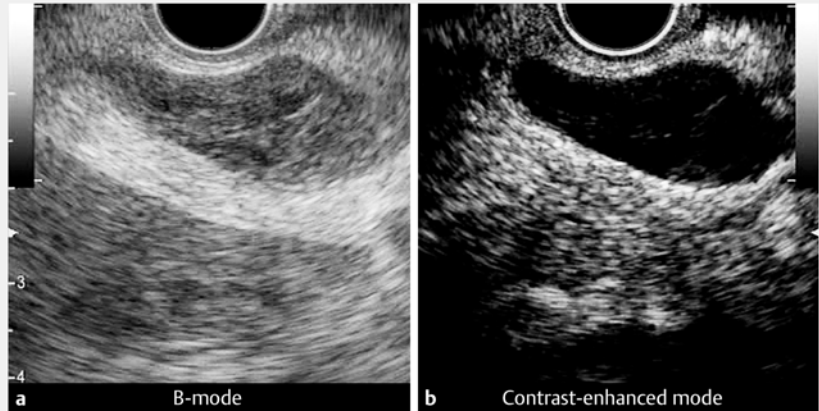


Endoscopic ultrasound-guided choledochoduodenostomy with novel use of contrast-enhanced harmonic imaging



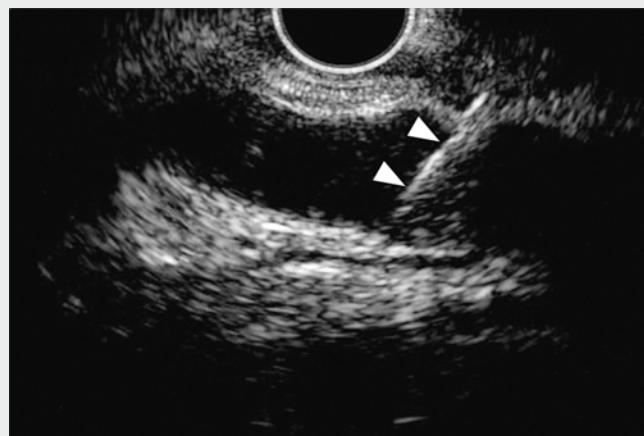
► **Fig. 1** Abdominal computed tomography (CT) scan showing bile duct dilatation and high-density components in the common bile duct, suggesting hemobilia (arrowheads).



► **Fig. 2** Endoscopic ultrasound (EUS) images showing: **a** in B-mode, heterogeneous echogenicity in the common bile duct, but poor visualization; **b** with contrast-enhanced harmonic EUS, the common bile duct as an avascular structure with a clear margin and no pooling of contrast agent in the common bile duct.

Since it was first described in 2001 [1], endoscopic ultrasound-guided choledochoduodenostomy (EUS-CDS) has been increasingly used as an alternative for biliary decompression after failed endoscopic retrograde cholangiopancreatography (ERCP). EUS-CDS has an overall technical success rate of more than 90% [2,3], but puncturing the common bile duct (CBD) can be challenging in patients with hemobilia because it presents as a heterogeneous echogenicity. Here, we present a patient for whom EUS-CDS was successfully performed under contrast-enhanced harmonic EUS (CH-EUS) guidance.

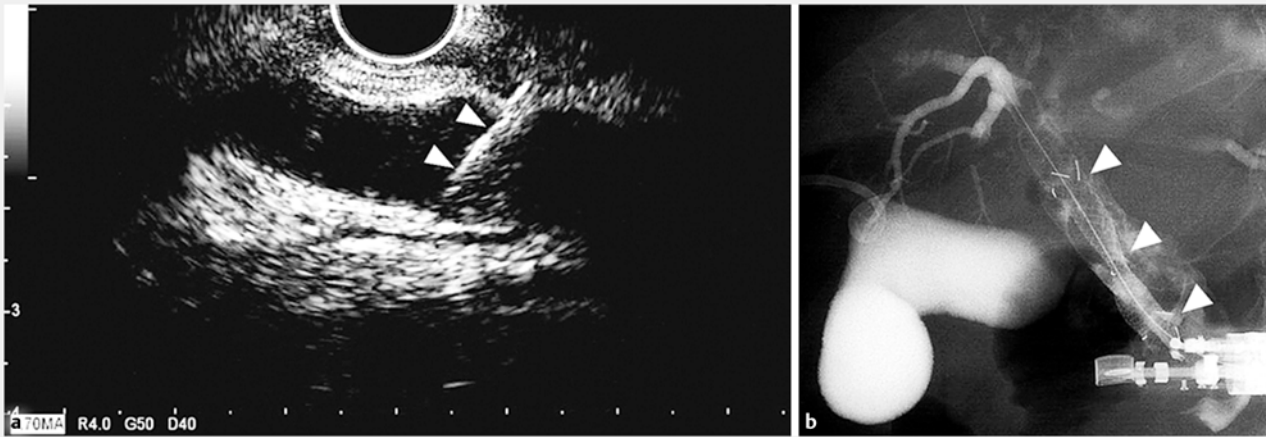
A female patient in her eighties with advanced duodenal cancer was referred to our hospital for treatment of recurrent obstructive jaundice. She had previously undergone duodenal metal stent placement and an external gallbladder drainage catheter had been placed for biliary obstruction due to direct cancer invasion of the ampulla. An abdominal computed tomography (CT) scan revealed bile duct dilatation and high-density components in the CBD, suggesting hemobilia (► **Fig.**



► **Video 1** A sonographic contrast agent (Sonazoid) was injected to determine whether there was active bleeding and to delineate the common bile duct (CBD) from the surrounding tissues during endoscopic ultrasound-guided choledochoduodenostomy. After intravenous infusion of Sonazoid, the CBD was clearly identified, allowing choledochoduodenostomy to be safely performed.

1). As her CT scan showed a dilated CBD, we elected to perform EUS-CDS. B-mode EUS revealed heterogeneous echogenicity in the CBD, but the visualization was poor. To determine whether

there was active bleeding and to delineate the CBD from the surrounding tissues, we performed CH-EUS. Immediately after intravenous infusion of 0.015 mL/kg of a sonographic contrast agent (Sonazoid;



► **Fig. 3** Cholechooduodenostomy guided by real-time contrast-enhanced harmonic endoscopic ultrasound showing: **a** the dilated common bile duct being punctured with a 19-gauge aspiration needle (arrowheads); **b** successful deployment of a covered metal stent between the common bile duct and the duodenum (arrowheads) after dilation of the fistula.

Daiichi-Sankyo, Tokyo, Japan), we identified the dilated CBD as an avascular structure, with a clear margin (► **Fig. 2**; ► **Video 1**). There was no pooling of contrast agent in the CBD, so it was punctured with a 19-gauge aspiration needle (► **Fig. 3 a**). After dilating the fistula, we successfully deployed a self-expandable covered metal stent (Niti-S Biliary Covered Stent; 8×60 mm; Taewoong Medical, Seoul, South Korea; ► **Fig. 3 b**). Following this procedure, the patient's condition improved within a few days. To the best of our knowledge, this is the first report of CDS being guided by CH-EUS. CH-EUS may be useful for patients with hemobilia in helping to clearly visualize the CBD.

Endoscopy_UCTN_Code_TTT_1AS_2AD

Competing interests

None

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