

## Transdiaphragmatic endoscopic ultrasound-guided right hepaticogastrostomy for biliary drainage after Ivor-Lewis esophagectomy

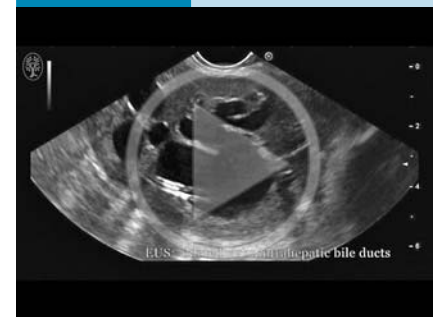
Two male patients, aged 64 years (case 1) and 62 years (case 2), developed obstructive jaundice after presenting with peritoneal carcinomatosis. The patients had previously undergone Ivor-Lewis esophagectomy for esophageal adenocarcinoma, and received perioperative chemotherapy 24 and 20 months, respectively, after the initial surgery. Computed tomography scan showed metastatic disease recurrence, with dilation of the right intrahepatic bile ducts as a result of tumoral infiltration of the liver hilum (case 1) and of the celiac area with ascites (case 2). Endoscopic retrograde cholangiopancreatography (ERCP) failed in both patients because of pyloroduodenal invasion.

Both patients underwent an endoscopic ultrasound (EUS)-guided antegrade approach with the echoendoscope placed in the gastropasty in the intrathoracic position (● Fig. 1 a). The dilated right hepatic bile duct was punctured through the gastric wall and the diaphragm using a 19-gauge needle (● Fig. 1 b). A 0.035-inch guidewire was positioned within the main right hepatic duct because the cholangiogram showed that the extrahepatic bile duct was occluded. A 6-Fr cystotome (Endo-Flex, Voerde, Germany) was used to create a fistula. A half-covered, self-expandable, metal stent (Giobor; Tae-woong Medical, Gyeonggi-do, South Korea), 10 cm in length, was then

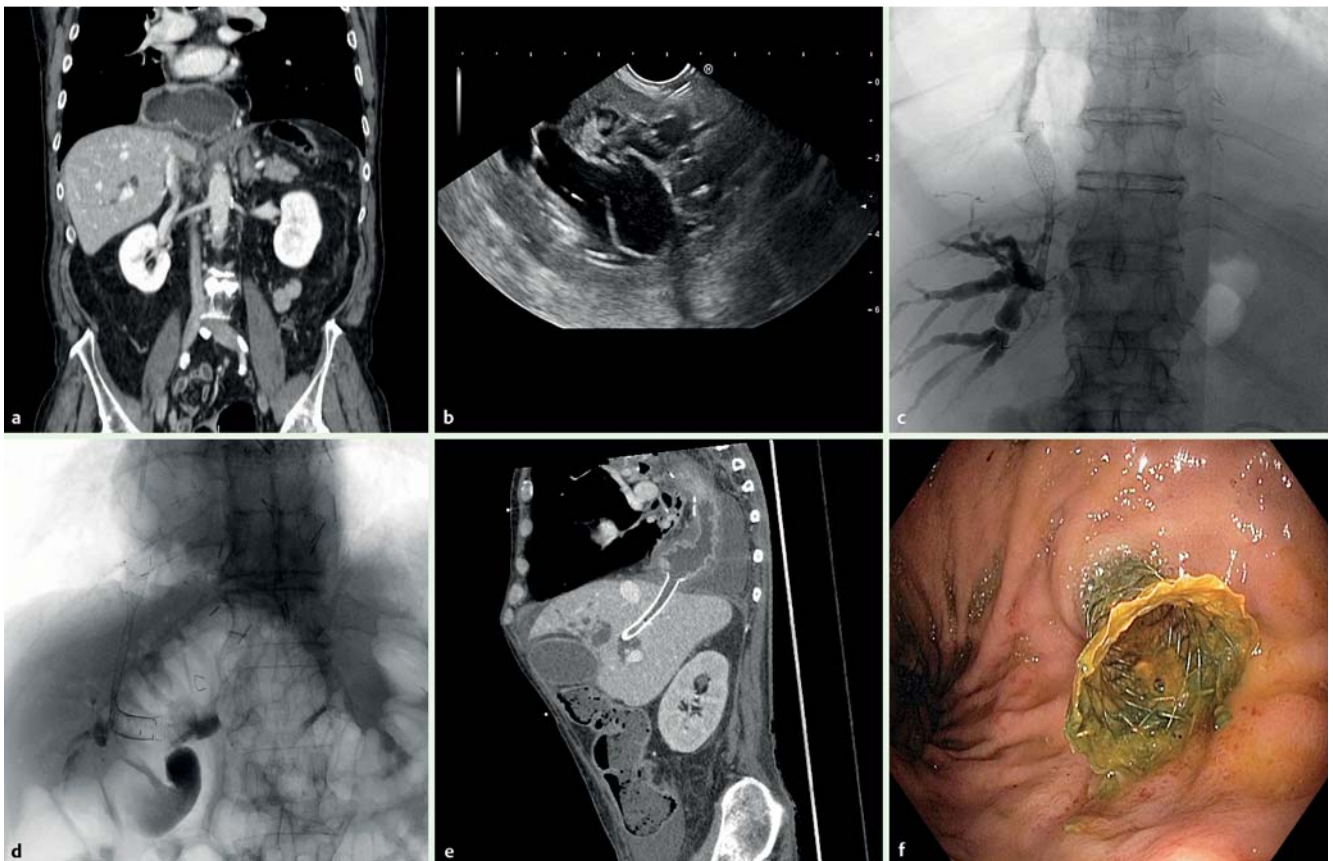
placed through the fistula (● Fig. 1 c–f, ● Video 1).

There were no procedural complications. Resolution of jaundice and a decrease in serum bilirubin to the normal level occurred at Day 10 and Day 11, respectively. The patients were discharged home after

### Video 1



Transdiaphragmatic endoscopic ultrasound-guided right hepaticogastrostomy for biliary drainage after Ivor-Lewis esophagectomy, with placement of a half-covered, self-expandable, metal stent.



**Fig. 1** Biliary drainage following Ivor-Lewis esophagectomy and in the setting of peritoneal carcinomatosis. **a** Computed tomography image (coronal slice) showing the subdiaphragmatic gastropasty and dilated right intrahepatic bile ducts. **b** Endoscopic ultrasound (EUS) view of the transgastric puncture of the dilated intrahepatic bile ducts using a 19 G needle. **c, d** Fluoroscopic view of the transdiaphragmatic stent in place (case 1 [c], case 2 [d]). **e** Computed tomography reconstruction showing the transdiaphragmatic EUS-guided right hepaticogastrostomy. **f** Endoscopic view of the transgastric half-covered, self-expandable, metal stent in place.

11 and 15 days, respectively. Chemotherapy was started for neoplastic recurrence 1 month after biliary drainage.

EUS-guided biliary drainage has been reported as a salvage procedure in expert hands when ERCP fails [1–4] and recently as a first-line treatment [5]. To our knowledge, these are the first two cases to demonstrate the feasibility of an EUS-guided hepaticogastrostomy after Ivor-Lewis esophagectomy. This procedure involved a transdiaphragmatic route following subdiaphragmatic puncture from the intrathoracic gastroplasty. The procedure does not seem to be associated with more morbidity than conventional subdiaphragmatic transgastric or transduodenal routes, as no procedure-related adverse events, particularly pneumothorax or pneumoperitoneum, occurred in these patients.

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**Competing interests:** None

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