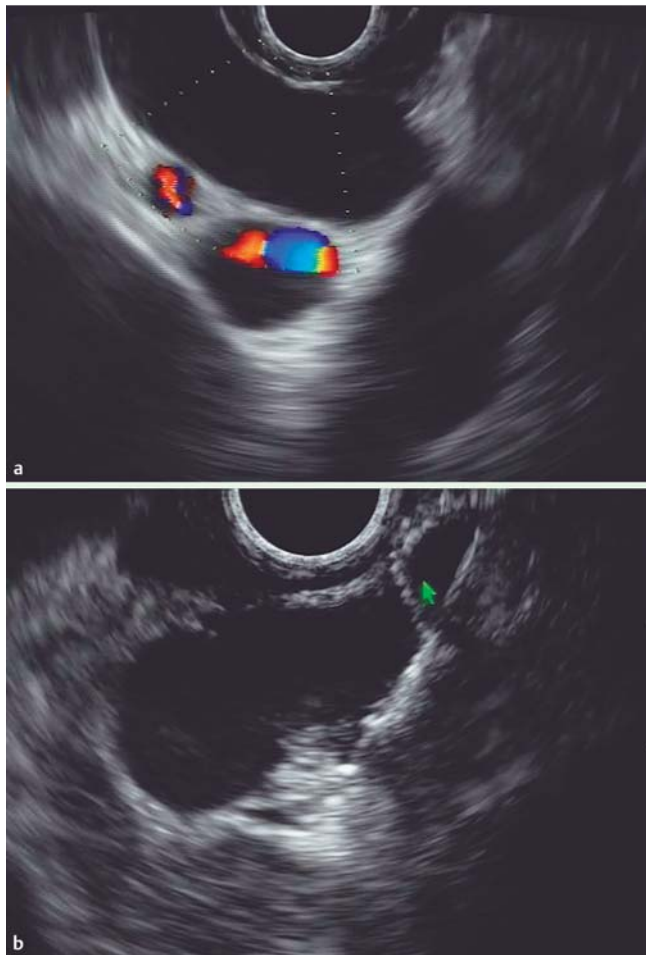


## Single-session fluoroless endoscopic ultrasound-guided fine-needle aspiration and choledochoduodenostomy with a biliary lumen-apposing stent

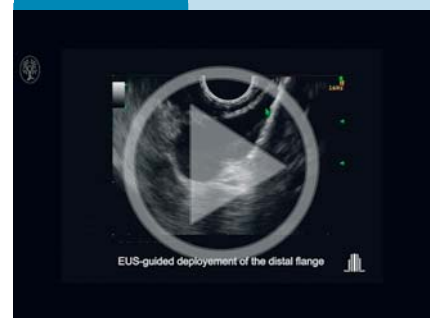


**Fig. 1** **a** In a 56-year-old woman with unresectable pancreatic cancer causing obstructive jaundice and anorexia, endoscopic ultrasonography (EUS) shows a hypoechoic tumor in the pancreatic head, with signs of invasion of the duodenal wall. **b** EUS-guided fine-needle aspiration is done with a 22-gauge needle. **c** Rapid on-site cytopathologic evaluation reveals pancreatic adenocarcinoma.



**Fig. 2** **a** Endoscopic ultrasonographic (EUS) image of a dilated common bile duct from the duodenal bulb. **b** EUS-guided deployment of a biliary lumen-apposing stent (6 × 8 mm, Hot AXIOS). The arrow indicates the distal end of the biliary stent, located inside the common bile duct.

### Video 1



Single-session fluoroless endoscopic ultrasound-guided fine-needle aspiration and choledochoduodenostomy with a dedicated biliary lumen-apposing stent for management of an unresectable pancreatic mass. EUS, endoscopic ultrasound; FNA, fine-needle aspiration; CBD, common bile duct.

A 56-year-old woman with unresectable pancreatic cancer causing obstructive jaundice and anorexia was referred to our unit for tissue diagnosis and biliary drainage before undergoing evaluation by a medical oncologist. Previous endo-

scopic retrograde cholangiopancreatography (ERCP) to attempt biliary cannulation because of signs of severe tumoral invasion in the papilla area had failed, and biopsy specimens were negative for malignancy.

Endoscopic ultrasound (EUS) revealed a solid tumor of the pancreatic head, signs of vascular and duodenal wall invasion, and severe dilatation of the common bile duct (CBD) of up to 13 mm. During a single session, first EUS-guided fine-needle aspiration (FNA) was done with a 22-gauge needle, and rapid on-site cytopathologic evaluation revealed a malignant diagnosis (● Fig. 1); second, EUS-guided biliary drainage was performed successfully.

All procedures were carried out under endosonographic guidance alone, without fluoroscopic assistance. The Hot AXIOS System (Xlumena, Mountain View, California, USA) was used to puncture the CBD directly from the duodenal bulb, without needle or guidewire insertion. A specific

diabolo-shaped biliary lumen-apposing metal stent (inner diameter 6 mm, length 8 mm) was successfully placed. All four steps of placing the delivery system were done under EUS guidance (► Fig. 2). Trans-mural drainage, as a choledochoduodenostomy, was obtained, and a large amount of dark bile drained into the antrum and duodenum. The total duration of the procedure, from insertion to withdrawal of the linear echoendoscope, was 28 minutes.

This case is a good example of the successful development of dedicated devices designed to be used in interventional EUS, in such a way as to reduce procedure time, device exchange, technical steps, and possibly adverse events [1–3] and at the same time improve the final clinical outcome. As can be seen in ► Video 1, this cautery-tipped stent delivery system simplifies technique, making the difficult easy and allowing fluoroless EUS-guided FNA plus a choledocoduodenostomy [4,5] to be conducted in a single session.

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**Competing interests:** None

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