

*Case report*

## Endoscopic ultrasound-guided drainage of obstructed biliary duct: report of a case

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### SUMMARY

**Endoscopic ultrasonography (EUS) is a well established method for interventional procedures such as transmural drainage of pancreatic pseudocysts or celiac plexus neurolysis (CPN). There are only few reports of EUS-guided drainage of obstructed biliary ducts and none of them in Greece as far as it is known.**

**The present case report describes the first EUS assisted biliary drainage in our hospital.**

**Key words:** endoscopic ultrasound, cholangio-drainage, cholangiocarcinoma.

### INTRODUCTION

Cannulation and therapeutic drainage of an obstructed bile duct during endoscopic retrograde cholangiopancreatography (ERCP) may sometimes be unsuccessful. Percutaneous transhepatic biliary drainage and surgery are alternatives with a high mortality and morbidity rate.<sup>1,2</sup> We present here the case of a patient who underwent EUS-guided palliation of obstructive jaundice after ERCP failure.

### DESCRIPTION OF CASE

An 88-year-old man with known cholangiocarcinoma was hospitalised with cholangitis. He had previously been treated twice for the same symptoms with ERCP

and stent insertion. Transabdominal ultrasound (US) demonstrated marked dilation of the common bile duct (24mm), as well as dilation of intrahepatic bile ducts. Laboratory data were consistent with cholestasis and cholangitis.

An ERCP procedure was attempted but was not possible because the tumor was infiltrating the duodenum and the duodenoscope could not pass after the bulb of the duodenum and reach the papilla.

An EUS-guided-colangio-drainage was then decided. Midazolam and pethidine were administered for sedation. The patient was monitored through pulse oxymetry. Informed consent was obtained for the procedure. EUS was performed with a linear interventional echendoscope Pentax 3830U with a 3,8mm biopsy channel and US processor. The device used for puncture was a Giovannini Needle Wire device. The severely dilated common bile duct with the previously (through ERCP) inserted plastic stent and biliary sludge were easily identified (Figure 1). At first the common bile duct was punctured transduodenally under EUS guidance using a needle knife (which is preloaded in the device) while applying current. Once the puncture had been created, the guide wire was advanced to maintain position in the bile duct. Subsequently and while maintaining the position of the guide wire, under EUS guidance, a guiding catheter and a plastic 10 Fr stent were advanced into the desired position using the pushing catheter (Figure 2). Then the guiding catheter and guide wire were retracted and removed into the endoscope, while maintaining the position of the pushing catheter. The entire device was withdrawn from the endoscope. The correct stent placement was confirmed endoscopically (confirming bile coming out of the stent) and radiographically (subsequent radiograph showed the presence of gas in the biliary duct

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**Fig. 1.** EUS image of the severely dilated common bile duct with the previously (through ERCP) inserted plastic stent and biliary sludge.



**Fig. 2.** EUS image of EUS-guided plastic stent insertion.

that was missing in previous radiograph) (Figures 3-4).

There was no procedure – related complication. After stent insertion, evidence of cholangitis resolved and the patient was discharged from hospital. On telephone contact, 40 days after the procedure, the patient was still alive, without signs of cholestasis such as jaundice, though cachectic due to malignancy.

## DISCUSSION

ERCP with stent insertion is a well-established procedure for palliation of patients with malignant biliary strictures. In some cases, however, placement of a stent by means of a duodenoscope is not possible. It may fail



**Fig. 3.** Radiograph before the insertion of the EUS-guided plastic stent. The presence of the stent (inserted through ERCP) and the absence of gas within the bile ducts are noted.

when the bile duct is severely obstructed by a tight infiltrating stricture, when it is severely angled or in the presence of a complex peripapillary diverticulum. Besides, there are cases when it is not possible to reach the papilla, as for example after gastric resection Billroth II or Roux en Y anastomosis or because of the presence of an infiltrating tumor that alters the anatomy and the endoscope cannot pass through the bulb of the duodenum (as is the case). In recent years EUS has assumed a greater role in these cases. The proximity of the transducer to the bile ducts is a major advantage even after surgical procedures or when the papilla is not accessible.

EUS guided biliary drainage was first described in a porcine model in 1998.<sup>3</sup> Since then, cases in which the procedure was performed in patients,<sup>4-7</sup> have been reported. The technique involved EUS guided transgastric or transduodenal puncture of the common bile duct. If it was possible, the guidewire was advanced antegrade across the papilla or surgical anastomosis and an ERCP



**Fig. 4.** Radiograph showing both stents and the presence of gas in the biliary tract

procedure with stent placement was performed immediately afterwards having been helped by the guidewire placement.<sup>4,6</sup> If that was not possible (the passage of the guidewire through the papilla) or when the papilla was not accessible, a stent was placed transmurally through the echoendoscope.<sup>5</sup>

Passage of a guidewire through the duct was preferred, if possible, instead of transmural stent placement as it was less likely to result in significant leakage or complications if drainage was unsuccessful. Besides larger diameter, even multiple stents can be deployed.

The main risk of the technique is bile leakage into the abdomen with subsequent bile peritonitis, though in well experienced hands this is not frequent. In all the case reports described previously in the bibliography,<sup>4,7</sup> the procedure was not associated with significant complications and such is our case.

In our opinion this procedure should be performed only in tertiary care centers with experience in therapeutic applications of EUS and only after ERCP has been

tried by an experienced gastroenterologist and failed.

Alternative approaches for accessing and draining obstructed ducts include percutaneous transhepatic biliary drainage (PCTR)<sup>1,2</sup> or surgery. The former has a complication rate of up to 15% and both of them have high mortality and morbidity rates. In comparison with PCTR, EUS-guided cholangio-drainage offers greater quality of life because of internal placement of the stent and is less interventional compared with surgery.

The size of the stents offered (10Fr) is large enough to offer sufficient drainage.

In recent years EUS has evolved greatly and has made possible new therapeutic interventions under EUS guidance. Besides EUS-guided celiac plexus neurolysis,<sup>8</sup> injection of various potentially therapeutic substances into malignant pancreatic tumors<sup>9</sup> or EUS-guided drainage of pancreatic pseudocysts,<sup>10</sup> new therapeutic possibilities have been added such as EUS guided drainage of the biliary system in benign<sup>7</sup> and malignant diseases when the bile duct is inaccessible by conventional ERCP.

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