

Endoscopic ultrasound-guided biliary drainage: Bilateral systems drainage *via* left duct approach

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Abstract

Endoscopic ultrasound (EUS)-guided biliary drainage is accepted as a less invasive, alternative treatment for patients in whom endoscopic retrograde cholangiopancreatography has failed. Most patients with malignant hilar obstruction undergo EUS-guided hepaticogastrostomy. The authors present the case of a 77-year-old man with advanced hilar cholangiocarcinoma who had undergone a roux-en-Y hepaticojejunostomy several months prior. He developed progressive jaundice and a low-grade fever that persisted for one week. The enteroscopic-assisted endoscopic retrograde cholangiopancreatography failed, thus the patient was scheduled for EUS-guided biliary drainage. In order to obtain adequate drainage, both intrahepatic systems were drained. This report describes the technique used for bilateral drainage *via* a transgastric approach. Currently, only a few different techniques for EUS-guided right system drainage have been reported in the literature. This case demonstrates that bilateral EUS-guided biliary drainage is feasible and effective in patients with hilar cholangiocarcinoma, and thus can be used as an alternative to percutaneous biliary drainage.

Key words: Biliary drainage; Endoscopic ultrasound-guided; Bilateral systems; Transmural drainage

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Core tip: Endoscopic ultrasound-guided left system drainage *via* hepaticogastrostomy can be performed with > 90% technical and clinical success in patients with obstructive jaundice. A transgastric approach for endoscopic ultrasound-guided hepaticogastrostomy to drain both intrahepatic systems was successfully performed by manipulating the guidewire until it passed across the stricture point; the two systems were then bridged with a metal stent. The authors propose

that this technique is feasible and effective for bilateral biliary drainage.

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INTRODUCTION

Endoscopic ultrasound (EUS)-guided biliary drainage was first reported in 2001 by Giovannini *et al.*^[1]. A subsequent case series described by Burmester *et al.*^[2] in 2003 demonstrated the feasibility of this technique using two platforms depending on the route of approach: EUS-guided transpapillary and transgastric. Since then, this therapeutic intervention has become an alternative treatment for patients with malignant bile duct obstruction in whom endoscopic retrograde cholangiopancreatography (ERCP) has failed, and in patients who prefer internal rather than percutaneous biliary drainage. When performed by experienced endoscopists, this technique has technical and clinical success rates of 75%-100% and 65%-92%, respectively^[3-9]. As a result, EUS-guided biliary drainage has become more popular.

EUS-guided rendezvous with a transpapillary approach or antegrade stent insertion or EUS-guided transgastric drainage (EUS-guided hepaticogastrostomy) may be useful for patients with malignant hilar obstruction in whom ERCP has failed^[10]. The case reported here describes a 77-year-old man with advanced hilar cholangiocarcinoma who underwent surgical bypass and developed obstructive jaundice thought to be due to tumor recurrence at the anastomosis site. EUS-guided bilateral biliary drainage was performed after enteroscopic-assisted ERCP failed.

CASE REPORT

A 77-year-old man with hilar cholangiocarcinoma had undergone roux-en-Y hepaticojejunostomy several months prior. He subsequently developed progressive jaundice and a low-grade fever that persisted for a week. Liver function analyses showed hyperbilirubinemia with total bilirubin of 12.7 mg/dL (reference range: 0-1.5 mg/dL), a direct bilirubin level of 11.3 mg/dL (reference range: 0-1.2 mg/dL), and an elevated alkaline phosphatase level (395 U/L; reference range: 40-125 U/L). A computed tomography (CT) scan revealed a large, ill-defined, enhanced lesion in the hilar region that had invaded hepatic segment IV and caused bilateral intrahepatic duct dilation (Figure 1). Enteroscopic-assisted ERCP

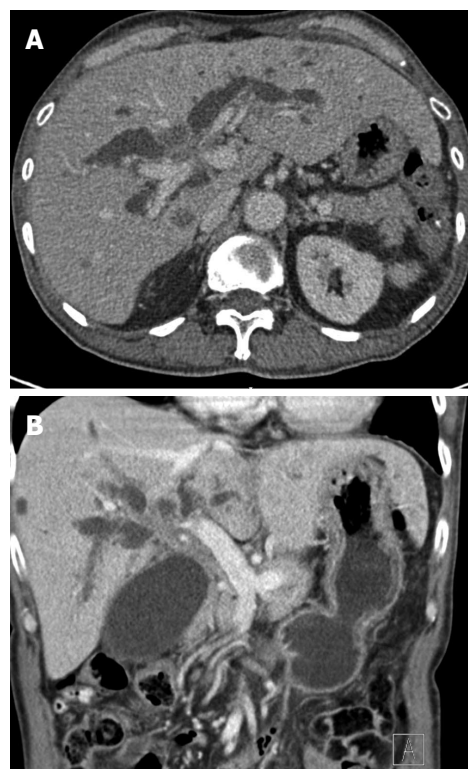


Figure 1 Computed tomography examination. A: Axial; B: Coronal computed tomography images showing an ill-defined mass in the hilar region causing bilateral intrahepatic duct dilation.

failed, and the patient was therefore scheduled for EUS-guided biliary drainage.

To obtain adequate drainage, the endoscopist aimed to drain both intrahepatic systems. After obtaining informed consent for this procedure, the patient was placed in a supine position under total intravenous anesthesia. A 19-gauge needle was used to puncture through the gastric cardia into hepatic segment II, and a purulent discharge was aspirated. A 0.025 ViZiguide (Terumo Medical Corp., Tokyo, Japan) was then inserted using a tapered-tip sphincterotome (PR-V234Q; Terumo Medical Corp.), and the guidewire was manipulated until it passed from the left through to the right intrahepatic duct (Figure 2). The neo-tract dilation was performed using 7.0, 8.5 and 10.0 Fr Soehendra dilating catheters. A 10 mm × 80 mm uncovered self-expanding metal stent was then inserted and deployed to connect the right and left systems (Figure 2B). Finally, a 10 mm × 100 mm covered self-expanding metal stent was deployed to form the bilo-enteric tract (Figure 3).

There were no immediate postoperative complications, and the patient was transferred to a regular ward. Nil per os was maintained for five days, and in the absence of eventful conditions, the patient was discharged after an additional three days. At the 6-wk follow-up, the patient was doing well with a normal total biliary level (1.2 mg/dL), but elevated

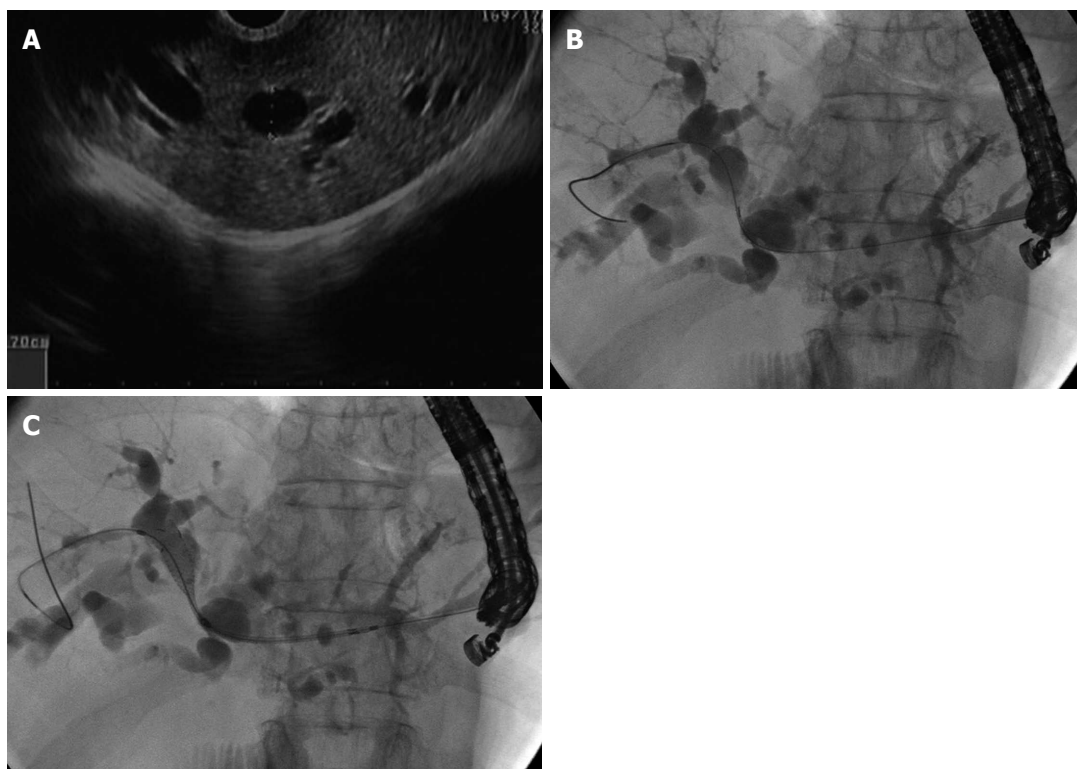


Figure 2 Guidewire insertion. A: Echoview demonstrating dilated of left system B: Cholangiogram showing the tapered-tip sphincterotome; C: The guidewire was passed to the right system from the gastric site and an uncovered self-expanding metal stent was deployed.

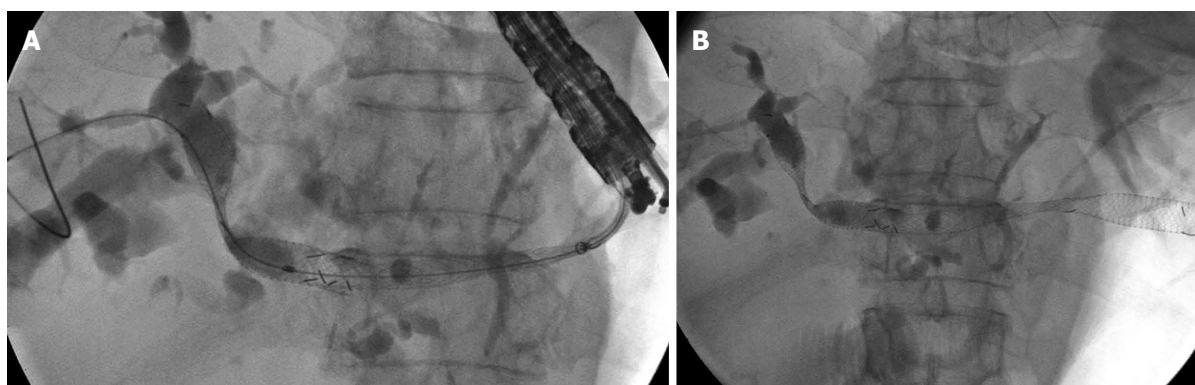


Figure 3 Dilation. A: Cholangiogram showing deployment of the covered self-expanding metal stent; B: After the guidewire was removed.

alkaline phosphatase (247 U/L).

DISCUSSION

EUS-guided left system drainage *via* hepaticogastrostomy is a common procedure with > 90% technical and clinical success rates for patients with obstructive jaundice^[11]. Typically, a transmural approach *via* the stomach is utilized, either by cauterization, non-cauterization/balloon dilation, or graded dilation, followed by stent insertion. In the case presented here, the right and left systems were completely separated by tumor invasion. Therefore, in order to drain the

right system, a second stent was bridged across the stricture point at the common hepatic duct. In 2013, Park *et al*^[12] reported a drainage procedure using direct access to the right intrahepatic duct *via* the duodenal bulb. More recently, Ogura *et al*^[13] reported a case series of 11 patients who underwent right system drainage *via* a transgastric approach similar to the one reported here, though with the use of different instruments. The results of the present case provide further evidence that EUS-guided bilateral biliary drainage is feasible and effective for patients with hilar cholangiocarcinoma, and can be used as an alternative to percutaneous biliary drainage.

COMMENTS

Case characteristics

A 77-year-old male patient with type IV malignant hilar obstruction who presented with jaundice and fever.

Clinical diagnosis

Malignant tumor obstructing the hilar area causing bilateral biliary system blockage.

Differential diagnosis

Cholangiocarcinoma, hepatocellular carcinoma, or mixed cholangio-hepatocellular carcinoma.

Laboratory diagnosis

Hyperbilirubinemia with a total bilirubin level of 12.7 mg/dL and direct bilirubin of 11.3 mg/dL, and an elevated alkaline phosphatase level (395 U/L).

Imaging diagnosis

Computed tomography revealed a soft tissue mass involving the common hepatic duct and portions of the left intrahepatic duct resulting in upstream dilation of both systems.

Treatment

Endoscopic ultrasound (EUS)-guided bilateral biliary drainage via a transgastric approach.

Related reports

EUS-guided hepaticogastrostomy is commonly performed to drain the left system. In contrast, there are few reports demonstrating techniques to drain both intrahepatic systems via a single puncture site.

Term explanation

EUS-guided hepaticogastrostomy is a novel alternative treatment for biliary drainage in patients for whom endoscopic retrograde cholangiopancreatography has failed and who prefer internal rather than percutaneous biliary drainage or surgical bypass procedures.

Experiences and lessons

EUS-guided hepaticogastrostomy for bilateral drainage of both hepatic systems is feasible if the guidewire is successfully manipulated to pass the stricture point from the left system across to the right.

Peer-review

This case report describes the successful use of EUS-guided bilateral biliary drainage in a patient with malignant hilar obstruction.

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