

Bile Duct Drainage Using a Short Double-Balloon Endoscope for a Hematoma due to Hepatocellular Carcinoma After Roux-en-Y Reconstruction

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INTRODUCTION

Double-balloon endoscopy enables visualization of the entire small intestine and endoscopic interventions throughout the alimentary tract. Double-balloon endoscopy facilitates endoscopic retrograde cholangiopancreatography (ERCP) and biliary drainage in patients with surgically altered anatomy^[1,2]. We present a patient with cirrhosis, status post Roux-en-Y anastomosis, who underwent double-balloon ERCP, which enabled an endoscopic intervention to relieve obstructive jaundice due to an intraductal hematoma secondary to bleeding from a hepatocellular carcinoma (HCC).

CASE REPORT

An 84-year-old male six years status post total gastrectomy with a Roux-en-Y reconstruction for the treatment of gastric cancer (Stage II) presented with a three-day history of fever (40.0°C) and jaundice. He also had cirrhosis secondary to hepatitis C infection. His local physician suspected obstructive jaundice and cholangitis caused by choledocholithiasis based on laboratory findings and magnetic resonance imaging. He was treated with antibiotics (Tazobactam/Piperacillin hydrate), and transferred to our institution for further treatment.

On admission, he presented with a low-grade fever (37.2°C) and

ABSTRACT

An 84-year-old male status post Roux-en-Y anastomosis and cirrhosis presented with fever and jaundice. Double-balloon endoscopy showed bleeding from the papilla of Vater and endoscopic retrograde cholangiopancreatography was performed. Cholangiography revealed an intraductal filling defect due to blood clots probably caused by bleeding from the hepatocellular carcinoma. Placement of an endoscopic nasobiliary drainage tube relieved the jaundice and cholangitis. Subsequent transarterial chemoembolization for hepatocellular carcinoma was performed to control the bleeding. After removal of the tube, he was discharged. The patient developed obstructive jaundice caused by a hepatocellular carcinoma. A short double-balloon endoscope with a 2.8 mm working channel enabled metal stent placement. Double-balloon ERCP enabled biliary drainage in a patient with surgically altered anatomy and cirrhosis, and provided effective relief of symptoms.

jaundice. Laboratory findings showed elevated hepatobiliary enzymes with a Child-Pugh classification of Class C (10 points: total bilirubin 8.9 mg/dl, serum albumin 2.2 g/dl, prothrombin activity 51%, and no ascites or encephalopathy). We suspected obstructive jaundice due to direct bile duct invasion by a HCC based on magnetic resonance imaging (Figure 1). On the day of admission, ERCP using a short double-balloon endoscope (EI-530B) showed bleeding from the papilla of Vater (Figure 2a). Cholangiography showed filling defects in the bile duct (Figure 2b). Endoscopic nasobiliary drainage (ENBD) with a pig-tailed catheter resolved the jaundice and cholangitis. On the sixth hospital day, a CT scan showed a hypervascular tumor at the hepatic hilum that was diagnosed as HCC (Figure 3a). These findings suggested that the tumor had invaded the bile duct, which caused intraductal bleeding and hematomas. On the 11th hospital day, transarterial chemoembolization was successfully performed to control hemobilia and possibly limit HCC progression (Figure 3b). The hemoglobin level was maintained without transfusion (>10.0 g/dl throughout the hospital stay). He had no episodes of hypotension or overt bleeding. On hospital day 13, cholangiography via the ENBD tube showed resolution of the blood clot without biliary obstruction (Figure 2c). Just before removing the pig-tailed ENBD tube, it was straightened using a guidewire to prevent injury to the esophageal varix. After removal of the tube, the patient's hepatobiliary enzyme levels remained in the normal range. On hospital day 15, he was discharged without symptoms.

Two months after discharge, he again developed cholangitis and jaundice caused by the HCC at the hilum. Emergency ERCP using a short double-balloon endoscope with a 2.8 mm working channel (EI-530B) was performed again and an endoscopic metal stent (10 mm in diameter and 8 cm in length; Zilver[®] Self-Expanding Metal Stent, Cook, USA) was placed in the left hepatic bile duct in the presence of direct invasion by tumor so that it could span the entire length of the stenotic area. (Figure 4). We did not use a plastic stent in this patient to prevent obstruction due to coagula from the HCC and to avoid displacement of the stent. Placement of the metal stent provided symptomatic relief and normalization of the serum liver enzymes, and he was transferred for radiation therapy. He died two months later from progression of the HCC, with no recurrence of obstructive jaundice.

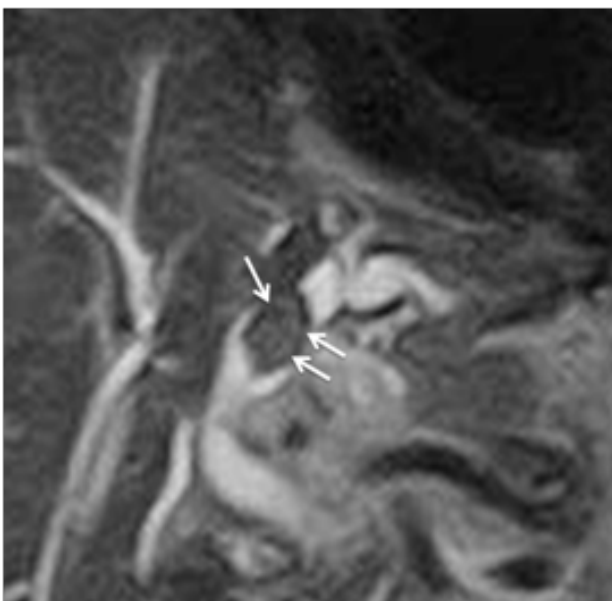


Figure 1 T2-weighted image from the MRI study shows an obstructing lesion in the bile duct (arrows)

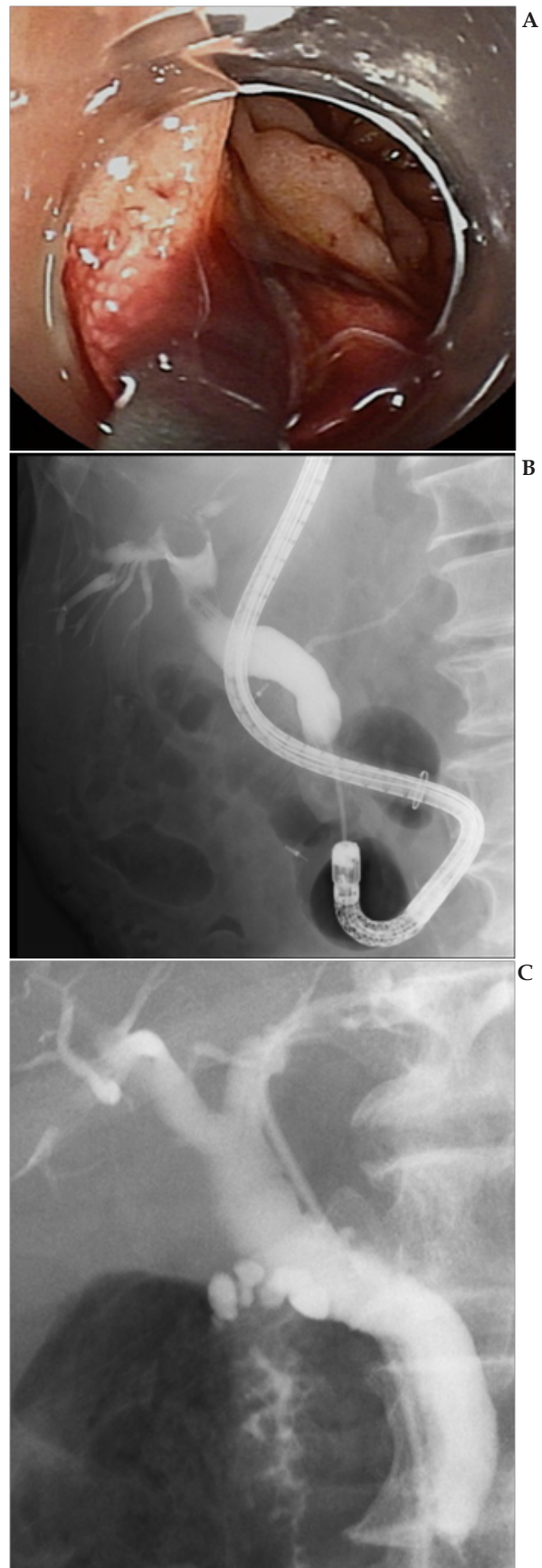


Figure 2 A: Endoscopic imaging of the intraductal hematoma; B: Cholangiography performed with double-balloon ERCP reveals filling defects due to intraductal blood clot, resulting in obstructive jaundice; C: Cholangiography via ENBD tube on hospital day 13 shows resolution of the intraductal filling defects.

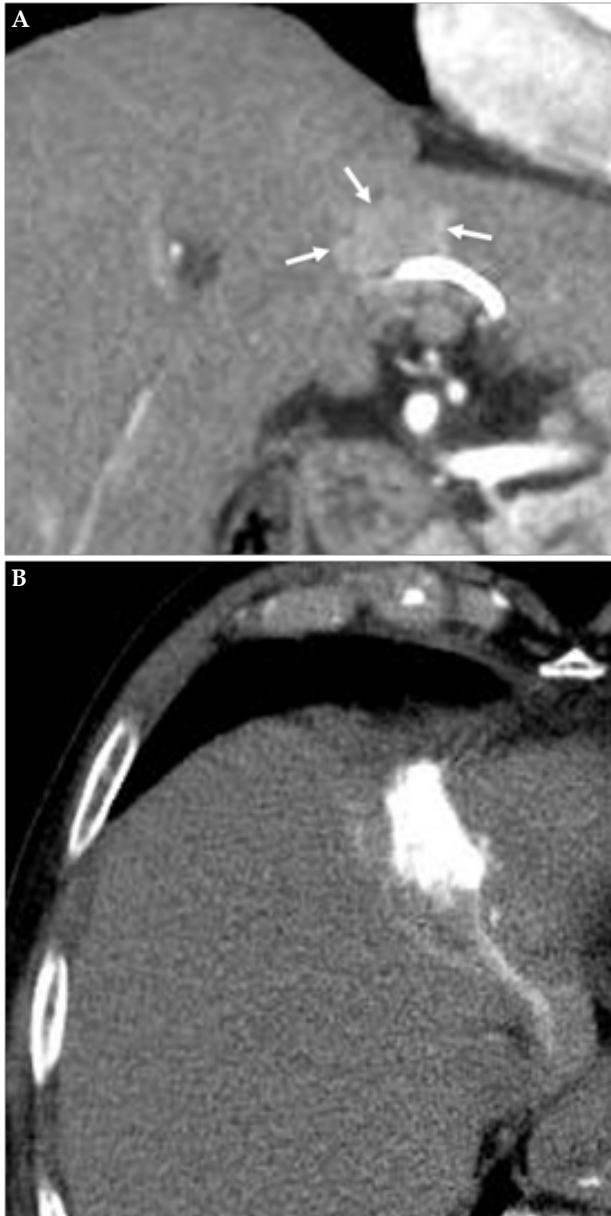


Figure 3 A: CT scan performed before transarterial chemoembolization shows early phase enhancement in the HCC adjacent to the ENBD tube (arrows); B: After transarterial chemoembolization, lipiodol is shown in the tumor.

DISCUSSION

The care of this patient emphasizes two advantages of double-balloon ERCP compared to percutaneous transhepatic biliary drainage (PTBD) in patients with liver cirrhosis and surgically altered anatomy^[1-3]. First, an endoscopic approach is useful to directly view the papilla of Vater and recognize active blood flow. Second, it provides a favorable route to relieve obstructive jaundice without the risk of iatrogenic hemobilia. The etiology of hemobilia may be difficult to identify, and is often associated with liver trauma, cholecystolithiasis, vascular malformations or the result of hepatobiliary tract interventions. [4] Third, the use of a short double-balloon endoscope with a wide working channel enables metal stent placement despite surgically altered anatomy. When a patient with liver cirrhosis presents with hemobilia, HCC invasion into the bile duct should be considered since this tumor is hypervascular compared to other biliary tract tumors.

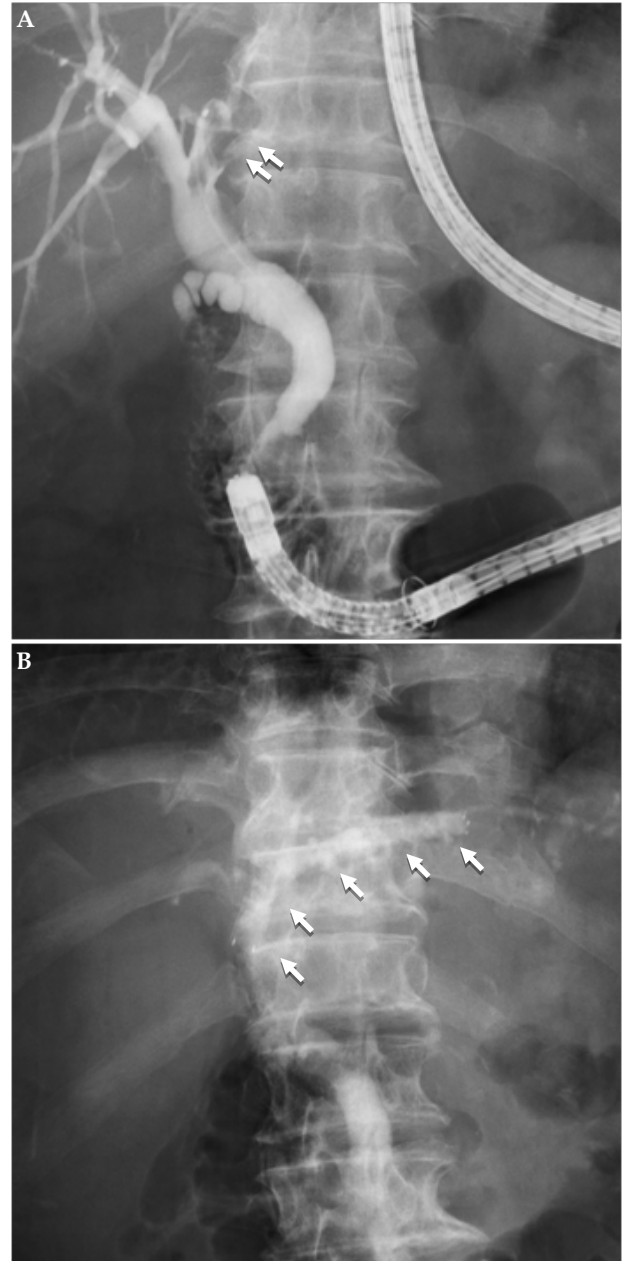


Figure 4 A: Cholangiography revealed HCC of the hilum (arrows) obstructing the left hepatic duct; B: After the successful introduction of the metal stent (arrows).

Double-balloon ERCP provided a transluminal approach for biliary drainage in this patient. For the treatment of obstructive jaundice, PTBD is the standard treatment for patients with surgically altered anatomy. However, PTBD has a potential risk of iatrogenic biliary bleeding, especially in patients with ascites, thrombocytopenia, or a coagulation disorder due to cirrhosis. Until recently, ERCP was difficult in patients status post Roux-en-Y anastomoses, since conventional endoscopes cannot reach the papilla due to the long afferent loop. PTBD tube limits the movement of body and gives the pain. Therefore, transluminal approach improves the quality of life of patients at the terminal stage.

A high successful intubation rate in the blind end in patients with surgically altered anatomy has been reported using a balloon-assisted endoscope^[5,6]. In patients with a Roux-en-Y anastomosis, indigo carmine injection at the duodenum is useful to identify the

afferent limb^[1]. Reports of double-balloon ERCP in patients with invasive HCC are comparatively rare. Recently, Chang *et al.* reported the treatment of obstructive jaundice due to HCC invasion, using a modified single-balloon endoscope constructed using a conventional upper GI endoscope and an overtube, and placed a plastic stent to relieve the jaundice^[7]. Kogure *et al* reported multiple metal stent placements in patients with malignant biliary obstruction using a double-balloon endoscope. In the present patient, a double-balloon endoscope with a 2.8 mm working channel and a short length (152 cm) facilitated metal stent insertion despite surgically altered anatomy that maintained the patency of the biliary tract until he died. The use of short double-balloon endoscopes (EC-450B15 and EI-530B) enables use of most ERCP devices available despite surgically altered anatomy. Although the double-balloon endoscope accommodates a metal stent, the serpentine form of the endoscope caused friction preventing smooth delivery of the metal stent. Therefore, we injected 1.0 mL of olive oil into the working channel to decrease the friction before stent delivery.

ERCP using a short double-balloon endoscope provided symptomatic relief from biliary obstruction due to an intraductal hematoma in this patient. An endoscopic approach is useful to directly view the papilla of Vater. This strategy is a viable option in patients with obstructive jaundice caused by HCC complicated by cirrhosis and surgically altered anatomy.

CONFLICT OF INTERESTS

Author H.Y. has a consultant relationship in FUJIFILM Corporation and has received honoraria, grants and royalties from the company. He has patents for double-balloon endoscope produced by FUJIFILM Corporation. Author T.Y. belongs to the Department of Endoscopic Research and International Education (Funded by FUJIFILM Medical) and has a consultant relationship in FUJIFILM Corporation and has received honoraria and grants from this corporation. Other

authors have no conflict of interest.

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