

Metallic stent insertion with double-balloon endoscopy for malignant afferent loop obstruction

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Abstract

Progress in double-balloon endoscopy (DBE) has allowed for the diagnosis and treatment of disease in the postoperative bowel. For example, a short DBE, which has a 2.8 mm working channel and 152 cm working length, is useful for endoscopic retrograde cholangiopancreatography in bowel disease patients. However, afferent loop and Roux-limb obstruction, though rare, is caused by postoperative recurrence of biliary tract cancer with intractable complications. Most of the clinical findings involving these complications are relatively nonspecific and include abdominal pain, nausea, vomiting, fever, and obstructive jaundice. Treatments by surgery, percutaneous transhepatic biliary drainage, percutaneous enteral stent insertion, and endoscopic therapy have been reported. The general conditions of patients with these complications are poor due to cancer progression; therefore, a less invasive treatment is better. We report on the usefulness of metallic stent insertion using an overtube for afferent loop and Roux-limb obstruction caused by postoperative recurrence of biliary tract cancer under short DBE in two patients with complexly reconstructed intestines.

Key words: Afferent loop obstruction; Double balloon endoscopy; Overtube; Metallic stent; Biliary tract cancer

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Core tip: Malignant afferent loop and Roux-limb obstruction are intractable complications caused by

postoperative recurrence of biliary tract cancer. Metallic stent insertion using an overtube under double-balloon endoscopy is a safe and feasible treatment option in such cases.

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INTRODUCTION

Malignant afferent loop obstruction is a potentially life-threatening adverse event of Billroth II gastrectomy and pancreaticoduodenectomy. The occlusion is generally caused by a recurrent tumor, and often presents as chronic, progressive, partial obstruction^[1-3]. This type of complication is expected to increase along with therapeutic advances for malignant tumors, thus necessitating the development of safe, effective treatments.

The general condition of patients with malignant afferent loop obstructions is poor due to cancer progression, and thus a less invasive treatment is preferred. Malignant afferent loop obstructions can be treated with surgery, percutaneous transhepatic biliary drainage, percutaneous enteral stent insertion, or endoscopic therapy^[4-6]. Endoscopic stents for digestive tract obstruction are a minimally invasive, useful, and safe treatment^[7-9]. The primary obstacle for endoscopic stent treatment in postoperative digestive tract obstruction is the difficulty in approaching the obstructing lesion. Of note, there are reports on the use of double-balloon endoscopy (DBE) for complicated postoperative bowel reconstructions^[10,11]. Furthermore, a short DBE, which has a 2.8 mm working channel and 152 cm working length, is useful for endoscopic retrograde cholangiopancreatography in these patients^[12]. However, because of the large diameter of the system for delivery of metallic stents (MS) in digestive tract obstructions, they cannot be deployed through the narrow working channel of a short DBE. Therefore, new methods are needed to deploy an MS with DBE.

We report on the usefulness of MS insertion using an overtube under a short DBE for afferent loop and Roux-limb obstruction caused by postoperative recurrence of biliary tract cancer in two patients with complexly reconstructed intestines.

CASE REPORT

Case 1

A man in his sixties underwent Roux-en-Y hepaticojejunostomy because of cholangiocarcinoma. Chemotherapy was performed one year later for recurrence of perito-

neal dissemination. Two years after chemotherapy, the patient developed a fever and elevated serum transaminase levels. Laboratory tests were as follows: white blood cell (WBC) counts, 9410/ μ L (normal: 4500-8500/ μ L); C-reactive protein, 4.7 mg/dL (normal: < 0.26 mg/dL); total bilirubin, 1.2 mg/dL (normal: 0.2-1.2 mg/dL); γ -glutamyltranspeptidase (γ GTP), 256 IU/L (normal: 5-40 IU/L); aspartate aminotransferase (AST), 38 IU/L (normal: 10-35 IU/L); and alanine aminotransferase (ALT), 17 IU/L (normal: 7-42 IU/L). Abdominal computed tomography (CT) showed the reconstructed jejunum that was expanded at the site of hepatectomy, mild expansion of the intrahepatic bile ducts and stenosis of the reconstructed jejunum (Figure 1A). The patient was diagnosed with malignant Roux-limb obstruction due to peritoneal dissemination and cholangitis.

Ultrasound-guided drainage was performed for the dilated jejunal Roux-limb, but repeated inflammatory aggravation with drain obstruction occurred. Therefore, a short DBE was performed with the patient under conscious sedation. The short DBE (EC-450BI5; Fujifilm, Tokyo, Japan) was inserted into the Roux-limb obstruction (Figure 1B), and a 0.035 inch guide-wire (Radifocus; Terumo, Tokyo, Japan) was passed through the site of the stricture. Then, a standard endoscopic retrograde cholangiopancreatography injection catheter (MTW Endoskopie, Düsseldorf, Germany) was inserted, and passage through the stenosis was confirmed by radiography. The guide-wire was exchanged with a 0.035 inch Jagwire (Boston Scientific Co., Natick, MA, United States), and an overtube was left to prevent bowel expansion. The DBE was then removed. Finally, an MS (2.2 cm \times 6.0 cm, Wallflex duodenal stent; Boston Scientific Co.) was inserted through the overtube in combination with an over-the-wire technique (Figure 1C) and deployed (Figure 1D). There were no perioperative or postoperative adverse events.

After stent insertion, the patient's cholangitis, general condition, and laboratory tests improved as follows: WBC count, 7960/ μ L; C-reactive protein, 1.86 mg/dL; total bilirubin, 0.7 mg/dL; γ GTP, 96 IU/L; AST, 25 IU/L; and ALT, 19 IU/L. On CT, dilation of the Roux-limb disappeared, and chemotherapy resumed. However, this patient died because of peritonitis carcinomatosa 141 d after stent insertion.

Case 2

A man in his sixties underwent pancreaticoduodenectomy because of Vater's papilla cancer. He developed a fever and jaundice approximately 10 mo after the operation. Laboratory tests were as follows: total bilirubin 9.9 mg/dL; γ GTP, 401 IU/L; AST, 273 IU/L; and ALT, 283 IU/L. Abdominal CT showed ascites, dilation of the afferent loop, and a surrounding soft density (Figure 2A). The patient was thus diagnosed with malignant afferent loop obstruction due to peritoneal dissemination and cholangitis.

A short DBE (EC-450BI5; Fujifilm) was performed,

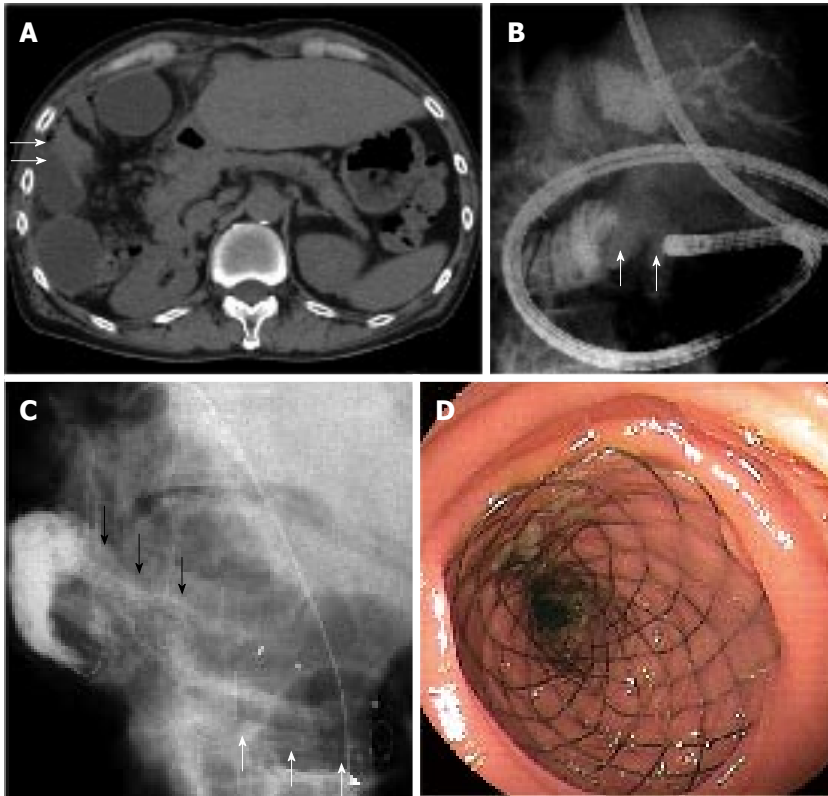


Figure 1 Metallic stent insertion with double-balloon endoscopy for malignant afferent loop obstruction in case 1. A: Abdominal computed tomography showed the reconstructed jejunum that was expanded at the site of hepatectomy, expansion of intrahepatic bile ducts, and the stenosis of the reconstructed jejunum (arrows); B: The stenosis (arrows) was seen when the double-balloon endoscopy (DBE) reached the Roux-limb obstruction; C: An overtube was left to prevent bowel expansion. The DBE was then removed and an metallic stent (MS) (black arrows) was inserted through the overtube (white arrows) in combination with the over-the-wire technique; D: A Wallflex duodenal MS with a diameter of 2.2 cm and a length of 6.0 cm was deployed.

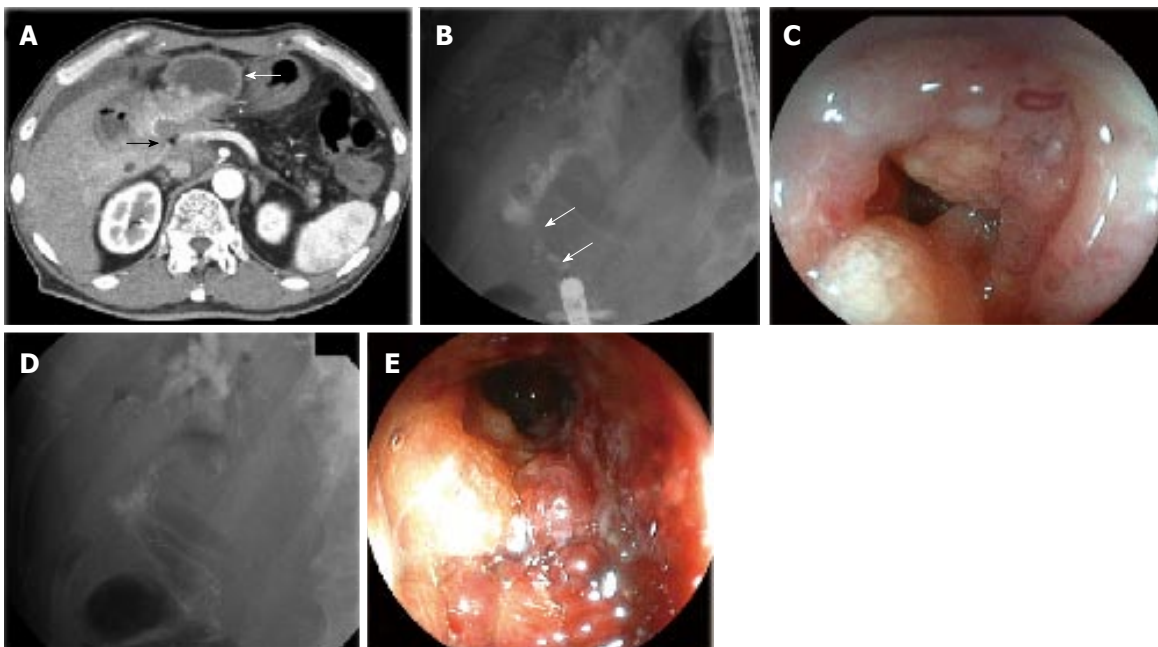


Figure 2 Metallic stent insertion with double-balloon endoscopy for malignant afferent loop obstruction in case 2. A: Computed tomography showed ascites, dilation of the afferent loop (white arrow), and a surrounding soft density (black arrow); B: The double-balloon endoscopy reached the afferent loop obstruction (arrows); C: Stenosis with irregular mucosa was seen; D and E: A Niti-S duodenal metallic stent with a diameter of 2.2 cm and a length of 6.0 cm was inserted and deployed.

which revealed stenosis with irregular mucosa at the afferent loop obstruction (Figure 2B and C). An MS (2.2

cm × 6.0 cm, Niti-S D-type stent; Taewoong Medical Inc., Seoul, South Korea) was inserted and deployed as

described in case 1 (Figure 2D and E). There were no perioperative or postoperative adverse events.

After insertion of the MS, the patient's general condition and laboratory tests improved: total bilirubin, 1.5 mg/dL; γ -GTP, 296 IU/L; AST, 92 IU/L; and ALT, 77 IU/L. Chemotherapy was resumed, however this patient also died from peritonitis carcinomatosa 140 d after stent insertion.

DISCUSSION

Afferent loop and Roux-limb obstruction are rare adverse events that result in the obstruction of the postoperative intestinal tract. When jaundice and/or fever occur in a postoperative cancer patient with intestinal tract reconstruction, it is important to consider afferent loop or Roux-limb obstruction due to recurrence. Obstructions are typically treated with surgery; however, the general condition of many of these patients is so poor that surgery is not possible. In such cases, insertion of an MS through the stenosis is a useful treatment.

Although percutaneous stent deployment has been reported^[13,14], the endoscopic approach allows for direct identification of the stenosis. There are few reports using this method, due to the difficulty in reaching the stenosis with an endoscope, and the need for a scope with a large enough working channel diameter to permit insertion of an MS. In the cases reported here, malignant afferent loop and Roux-limb obstructions were confirmed by DBE and the stenoses were penetrated with a guide-wire. The endoscope was then removed, leaving the overtube to prevent bowel expansion and deploy the MS with an over-the-wire technique. With this method, the stents were safely and easily inserted through the stenoses using a DBE, eliminating the need for a new endoscope. DBE was chosen over a colonoscope in these cases, as it can cause patient discomfort and poses a risk to the patient's health. Stents were safely inserted without a high degree of difficulty and did not produce major adverse events. Moreover, the patients were able to leave the hospital early.

There are other treatments for afferent loop obstruction, such as percutaneous transhepatic biliary drainage or endoscopic ultrasound-guided transhepatic drainage. When a hepatic-jejunal anastomotic stricture coexists, these methods may be particularly useful. However, biliary access can be challenging in patients without dilation of intrahepatic biliary ducts or in patients with ascites. In our cases, we could confirm the absence of judge hepatic-jejunal anastomotic strictures because the bile ducts were easily contrasted by cystography from the afferent loop. Thus, treatments should be selected depending on the patient's condition.

In conclusion, MS insertion using an overtube for afferent loop and Roux-limb obstruction from postoperative recurrence of biliary tract cancer under short DBE is safe and feasible. However, it is necessary to

accumulate more cases to determine the true rates of adverse events and confirm the effectiveness of this approach in comparison with surgery and other treatments.

COMMENTS

Case characteristics

Two men in their sixties who underwent Roux-en-Y hepaticojejunostomy after presenting with cholangiocarcinoma and a fever (Case 1) and pancreaticoduodenectomy due to Vater's papilla cancer after presenting with fever and jaundice (Case 2) are reported here.

Clinical diagnosis

Case 1: Fever; Case 2: Fever and jaundice upon physical exam.

Differential diagnosis

Pseudocyst; ileus.

Laboratory diagnosis

Case 1: WBC, 9410/ μ L; C-reactive protein, 4.7 mg/dL; total bilirubin, 1.2 and 9.9 mg/dL; γ -glutamyltranspeptidase, 256 and 401 IU/L; aspartate aminotransferase, 38 and 273 IU/L; and alanine aminotransferase, 17 and 283 IU/L, for case 1 and case 2, respectively.

Imaging diagnosis

Computed tomography (CT) in case 1 revealed expansion at the site of hepatectomy in the reconstructed jejunum, mild expansion of intrahepatic bile ducts, and stenosis of reconstructed jejunum; in case 2, CT revealed ascites, dilation of the afferent loop, and a surrounding soft density.

Treatment

Metallic stent insertion with double-balloon endoscopy for malignant afferent loop and Roux-limb obstruction.

Related reports

Afferent loop and Roux-limb obstructions caused by postoperative recurrence of biliary tract cancer are rare and intractable.

Term explanation

Malignant afferent loop obstructions are rare adverse events due to the obstruction of the postoperative intestinal tract of Billroth II gastrectomy and pancreaticoduodenectomy.

Experiences and lessons

Metallic stent insertion using an overtube for afferent loop and Roux-limb obstruction caused by postoperative recurrence of biliary tract cancer under short double-balloon endoscopy is safe and feasible.

Peer-review

The technique is interesting and clinically relevant, and will be of interest to this journal's readership.

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