Safety and Efficacy of Primary Metallic Biliary Stent Placement with Tract Embolization in Patients with Massive Ascites: A Retrospective Analysis of 16 Patients

Keitaro Sofue, MD, Yasuaki Arai, MD, Yoshito Takeuchi, MD, Hiroyasu Fujiwara, MD, Hiroyuki Tokue, MD, and Kazuro Sugimura, MD, PhD

ABSTRACT

Purpose: To evaluate the safety and efficacy of primary metallic biliary stent placement with tract embolization in patients with massive ascites.

Materials and Methods: Sixteen patients with malignant biliary obstruction and massive ascites (age range, 44–79 y; median age, 59 y) were treated with primary percutaneous stent placement with tract embolization. These patients were unsuitable candidates for endoscopic intervention. Etiologies of biliary obstruction were gastric cancer with hilar nodal metastases (n = 9), pancreatic carcinoma (n = 5), cholangiocarcinoma (n = 1), and gallbladder carcinoma (n = 1). Eight patients had nonhilar lesions and the remaining eight had hilar lesions. Percutaneous accesses to the biliary system and stent placements were performed in a one-step procedure, and catheters were removed with tract embolization with metallic coils.

Results: Stent placement and tract embolization were successful in all patients, without external drainage catheters left in place. Significant reduction of serum bilirubin level was observed in 14 patients (87.5%). No bile peritonitis or intraperitoneal hemorrhage occurred. Major complications included postprocedural cholangitis (12.5%), bloody bowel discharge (6.2%), and right pleural effusion (25.0%). One patient who died 19 days after intervention was deemed to represent a procedure-related mortality. During the survival period (range, 19–175 d; median, 66 d), stent occlusion was noted in two patients at 6 and 159 days after the procedure. Primary stent patency was achieved in 14 patients (87.5%).

Conclusions: Primary biliary stent placement with tract embolization is technically safe and offers an effective palliative treatment option for patients with malignant biliary obstruction and massive ascites when endoscopic intervention is not possible.

ABBREVIATION

PTBD = percutaneous transhepatic biliary drainage

Most patients with malignant biliary obstruction have advanced-stage cancers with dismal prognoses (1). Percutaneous transhepatic biliary drainage (PTBD) and metallic stent placement are established methods to manage malignant biliary obstruction (2–4) when endoscopic intervention is not possible.

The disadvantage of PTBD is its association with hemorrhage, bile leakage, and catheter dislodgment, with reported incidences of less than 5% each (5–8). Especially in patients with massive ascites, PTBD is thought to be relatively contraindicated because of the high risk of intraabdominal bleeding and peritonitis caused by bile leakage, which is believed to be secondary to the presence of a tube passing through ascites (9). As a result, selection of the treatment approach can be difficult in patients with malignant obstructive jaundice and massive ascites who are unsuitable candidates for endoscopic intervention.

Some studies have demonstrated that transhepatic tract

From the Division of Diagnostic Radiology (K. Sofue, Y.A., Y.T., H.F., H.T.), National Cancer Center Hospital, 5-1-1, Tsukiji, Chuo-ku, Tokyo 104-0045, Japan; and Department of Radiology (K. Sofue, K. Sugimura), Kobe University Graduate School of Medicine, Kobe, Japan. Received September 25, 2011; final revision received January 15, 2012; accepted January 20, 2012. **Address correspondence to** K. Sofu; E-mail: ksofue@ncc.go.jp

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Table 1. Disease and Treatment Details of Patients Undergoing One-Step Biliary Stent Placement with Transhepatic Tract Embolization

Pt. No.	Age (y)/ Sex	Primary Tumor	Biliary Obstruction	Degree of Biliary Dilation	Puncture Site/No.*	Stents	Paracentesis
1	57/ F	PC	Nonhilar	Moderate	Right/1	2	No
2	59/ M	PC	Nonhilar	Moderate	Right/1	1	Yes
3	72/ M	PC	Nonhilar	Severe	Right/1	1	Yes
4	74/ F	PC	Nonhilar	Mild	Left/1	2	No
5	57/ M	GC	Nonhilar	Moderate	Right/1	1	No
6	65/ M	GC	Nonhilar	Mild	Right/1	1	Yes
7	74/ F	GC	Nonhilar	Moderate	Right/1	1	Yes
8	50/ M	GBC	Nonhilar	Moderate	Right/1	1	No
9	60/ M	GC	Hilar (Bismuth I)	Severe	Left/1	2	No
10	66/ M	GC	Hilar (Bismuth I)	Moderate	Left/1	1	No
11	58/ M	GC	Hilar (Bismuth II)	Moderate	Left/1	4	No
12	52/ M	GC	Hilar (Bismuth III)	Moderate	Right/1	1	Yes
13	68/ F	GC	Hilar (Bismuth III)	Moderate	Right/2	3	No
14	44/ M	PC	Hilar (Bismuth III)	Moderate	Right/2	3	No
15	79/ M	CC	Hilar (Bismuth III)	Severe	Right/1	1	No
16	56/ M	GC	Hilar (Bismuth IV)	Moderate	Right/3	3	No

Note.— CC = cholangiocarcinoma, GBC = gallbladder carcinoma, GC = gastric cancer, PC = pancreatic carcinoma.
* Puncture number refers to the number of accesses into the biliary system.

embolization can prevent the complications associated with percutaneous intervention (10–15). Stent placement in a one-step procedure could immediately resolve biliary obstruction, shortening the duration of placement of the temporary drainage catheter (4,16–18). In addition, percutaneous biliary metallic stent placement with tract embolization performed in a single session might be a favorable method to manage biliary obstruction in patients with massive ascites who are not suitable candidates for endoscopic intervention or in whom endoscopic treatment has failed.

The purpose of the present study was to evaluate the safety and efficacy of primary metallic biliary stent placement with tract embolization in patients with massive ascites.

MATERIALS AND METHODS

Patient Population

This retrospective study was conducted in accordance with the principles of the amended Declaration of Helsinki, and with the approval of the institutional review board. Between July 2005 and June 2010, 16 patients with malignant biliary obstruction and massive ascites, in whom conventional endoscopic drainage failed or could not be performed because of altered anatomy after surgery, were treated with primary percutaneous expandable metallic stent placement. The patient population included 12 men and four women with a mean age of 62 years (median, 59 y; range, 44–79 y; **Table 1**).

Etiologies of malignant biliary obstruction were gastric cancer with nodal metastases (n = 9), pancreatic carcinoma (n = 5), cholangiocarcinoma (n = 1), and gallbladder carcinoma (n = 1). The diagnosis of biliary obstruction was confirmed by computed tomography (CT) and/or ultrasonography (US; **Fig 1a**). Eight patients had lesions involving the middle and distal common bile duct, and eight had proximal bile duct (ie, hilar) lesions. The latter were classified according to Bismuth classification as follows: type I, n = 2; type II, n = 1; type III, n = 4; and type IV, n = 1 (**Table 1**). All 16 patients had massive ascites caused by peritoneal dissemination and/or advanced disease, and five patients had liver metastases. Massive ascites was defined as a large amount of fluid in the paracolic regions and around the liver at the proposed puncture site, and resulted in a tense abdomen determined with imaging and physical examination (9,19). Cytologic examination of the ascites was performed in 12 of 16 patients, and a malignant cytologic result was revealed in nine patients.

In 11 of the 16 patients, endoscopic intervention was attempted, but resulted in failure because of gastroduodenal invasion by the primary disease (n = 8) or rigidity of the papilla of Vater (n = 3). In the remaining five patients, the endoscopic approach was not attempted because of previous surgery with Roux-en-Y conversion.

Procedures

Written informed consent was obtained from all patients before the procedures. All procedures were performed under local anesthesia with 1% lidocaine and conscious sedation with midazolam and pentazocine or fentanyl. Intravenous broad-spectrum antibiotic prophylaxis was routinely administered 6 hours before the procedure in all patients