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GUIDELINES FOR CLINICAL PRACTICE

Transnasal endoscopic biliary drainage as a rescue management for the treatment of acute cholangitis

Takao Itoi, Atushi Sofuni, Fumihide Itokawa, Takayoshi Tsuchiya, Toshio Kurihara, Kentaro Ishii, Shujiro Tsuji, Nobuhito Ikeuchi, Fuminori Moriyasu

Takao Itoi, Atushi Sofuni, Fumihide Itokawa, Takayoshi Tsuchiya, Toshio Kurihara, Kentaro Ishii, Shujiro Tsuji, Nobuhito Ikeuchi, Fuminori Moriyasu, Department of Gastroenterology and Hepatology, Tokyo Medical University, Tokyo 160-0023, Japan

Author contributions: Itoi T performed this procedure; Itoi T, Sofuni A, and Itokawa F contributed equally to this work; Kurihara T, Tsuchiya T, Ishii K, Tsuji S, Ikeuchi N, performed collected the data; Itoi T and Moriyasu F reviewed this paper.

Correspondence to: Takao Itoi, MD, PhD, Department of Gastroenterology and Hepatology, Tokyo Medical University, Shinjuku-ku, Nishishinjuku 6-7-1, Tokyo 160-0023, Japan. itoi@tokyo-med.ac.jp

Telephone: +81-3-33426111 Fax: +81-3-53816654

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Abstract

Endoscopic biliary drainage has been established to provide effective treatment for acute obstructive jaundice and cholangitis. A recently developed ultrathin transnasal videoendoscope (TNE) is minimally invasive even for critically ill patients and can be performed without conscious sedation. Transnasal endoscopic biliary drainage (TNE-BD) is performed using a front-viewing TNE with approximately 5 mm outer diameter and 2 mm working channel diameter. Finally, 5F naso-biliary tube or plastic stent are placed. Technical success rates are approximately 100% and 70% for post-endoscopic sphincterotomy or placement of self-expandable metallic stent, and intact papilla, respectively. There are no serious complications. In conclusion, although further cases should be accumulated, TNE-BD and in particular, one-step naso-biliary drainage using TNE may be a useful and novel technique for the treatment of acute cholangitis.

Key words: Transnasal endoscope; Ultrathin endoscope; Biliary drainage

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INTRODUCTION

To date, ultrathin endoscopes including transnasal endoscopes have been used for various gastrointestinal conditions[1,2]. In particular, transnasal endoscopies can be performed without conscious sedation because they are not only less stressful to patients, but also have fewer deleterious hemodynamic effects than the conventional transoral videoendoscope[3].

Endoscopic biliary drainage has been established for the treatment of acute cholangitis[4-8]. Recently, a novel approach using less invasive ultrathin forward-viewing endoscopes has been reported for the treatment of acute cholangitis[9-11]. In this study, we introduce transnasal endoscopic biliary drainage (TNE-BD) using an ultrathin endoscope.

TNE-BD PROCEDURES

Endoscopic retrograde cholangiopancreatography (ERCP) is performed with commercially available transnasal endoscopes or ultrathin pediatric endoscopes. Each specification is shown in Table 1. Prior to the procedure,

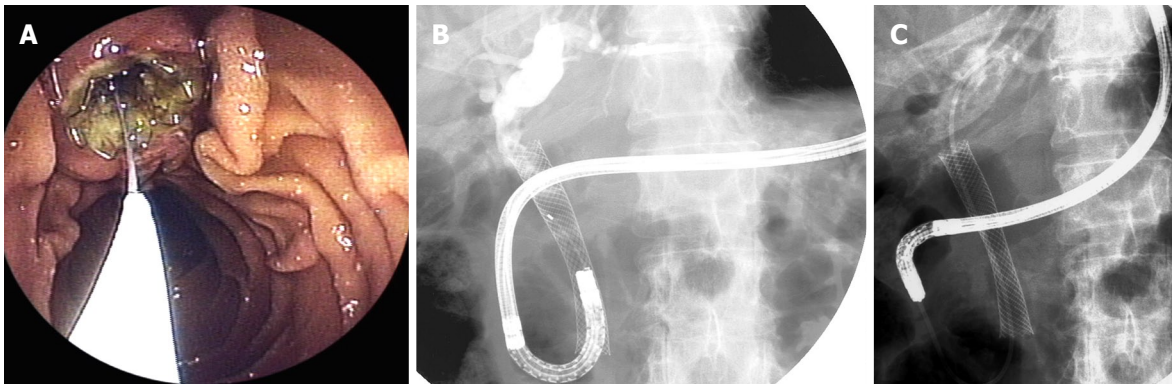

Figure 1 Transnasal endoscopic biliary drainage. A: Endoscopic image shows biliary cannulation by transnasal endoscopy in patients with placement of self-expandable metallic stent; B: Endoscopic cholangiography showed obstruction of stent; C: Transnasal endoscopic naso-biliary drainage could be performed.

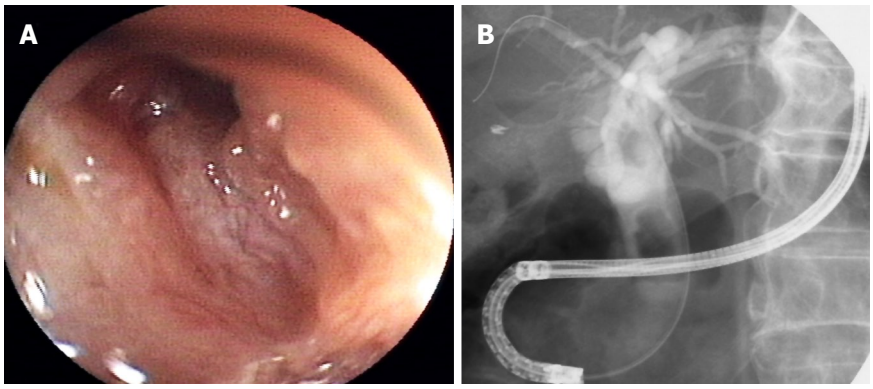

Figure 2 Transnasal endoscopic cholangiography (long scope position). A: Endoscopic image shows orifice of bile duct in patients with post-sphincterotomy; B: Cholangiography showed bile duct stones.

Table 1 Specification of transnasal endoscopes

	GIF-N260	EG-530N2	EG-1580K
Direction of view	Forward-viewing	Forward-viewing	Forward-viewing
Angle of view	120°	120°	140°
Outer diameter (mm)			
Distal end	5	5.9	5.5
Insertion end	5.5	5.9	5.1
Bending section			
Up/Down	210°/90°	210°/90°	210°/120°
Right/Left	100°/100°	100°/100°	NA
Working length (mm)	1100	1100	1050
Total length (mm)	1420	1400	1360
Working chnnel diameter (mm)	2	2	2

NA: No available.

each nasal cavity is sprayed with 0.05% naphazoline nitrate (Novartis Pharma K.K., Tokyo, Japan) for vasoconstriction. The nasal cavities are then sprayed with 4% lidocaine solution, and the oropharynx with 8% lidocaine solution (both Astra Zeneca Japan Ltd, Osaka, Japan) as topical anesthesia. Endoscopic procedures are performed without conscious sedation. Patients are put in a prone position. The transnasal endoscope is inserted through the nose under direct vision, through the most patent nostril to the pharynx. If insertion is not possible, the other nostril is tried.

The transnasal endoscope is advanced into the first and second portions of the duodenum (long scope position) (Figures 1 and 2). After confirming the major duodenal papilla, the tip of the thin catheter (5 Fr, PR-110Q, Olympus Medical Systems, Tokyo, Japan) is inserted into the bile duct. However, since the axes of the catheter cdo not usually match those of the bile duct at long scope position, the sharp angle of the scope is needed to insert a catheter in order to perform cholangiography. In patients post sphincterotomy or with a self-expandable metallic stent (SEMS) in position, selective cannulations can be safely performed without difficulty (Figure 1A-C). Prior to cannulation, endoscopists should understand the orientation at which the catheter is expected to appear on the video display for each endoscope. After deep cannulation of the catheter into the common duct, a 0.018-inch or 0.025-inch stiff-type guidewire (Pathfinder® or Jagwaire®, Boston Scientific Japan, Tokyo, Japan) is advanced into the right or left intrahepatic bile duct. When deep cannulation is difficult, a 0.025-inch Radifocus® guidewire (Terumo Co., Ltd., Tokyo, Japan) is advanced into the intrahepatic bile duct and then replaced by a stiff-type guidewire. When the orifice of the bile duct can not be confirmed by the standard method, the scope is advanced to the 3rd portion of the duodenum, the tip of the scope is then rotated, and the papilla is confirmed while pulling back the tip. Then the catheter is inserted (short scope position) (Figure 3). If bile is sufficiently aspirated, injection of contrast medium is avoided in order to prevent further contamination of the biliary tree.

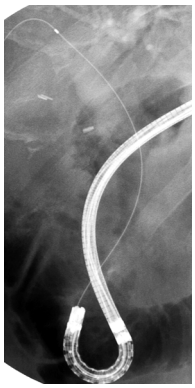

Figure 3 Transnasal endoscopic cholangiography (short scope position). Bile duct cannulation by transnasal endoscopy at the short scope position.

Table 2 Advantage and drawbacks of transnasal endoscopic biliary drainage

Advantages	Drawbacks
Fewer deleterious hemodynamic effects	Low success rate of selective cannulation
Possible procedure without conscious sedation	Limited devices
Possible one-step placement of nasobiliary tube	Limited procedures
Possible procedure in the bedside	Impossible transnasal insertion

Finally, one or two 5-Fr diameter double pig-tail or straight indwelling biliary stents (ZEBD-5-7, Cook Endoscopy Inc., Winston-Salem, NC, USA), or a 5-Fr straight-tip NBD catheter (ENBD-5-NAG, Cook Endoscopy Inc., Winston-Salem, USA) are placed, following the guidewire.

DISCUSSION

Recently, some endoscopists have revealed that TNE-BD is feasible and safe[9-12]. Despite established biliary drainage using a conventional duodenoscope, one of greatest motivations to perform the TNE-BD may be that it is minimally invasive even for critically ill patients (Table 2)[3]. Our important data could reveal that transnasal endoscopy has less hemodynamic effects than the transoral videoendoscope. In particular, endoscopic nasobiliary drainage using a conventional duodenoscope may be cumbersome to convert from an orobiliary to a nasobiliary tube after the endoscope is withdrawn. The endoscopist may be at risk of infectious diseases due to penetration of the skin from biting, while the patients may suffer complications resulting from the blind passage of a finger or forceps into the posterior pharynx[13]. To avoid these unnecessary risks, a one-step method using transnasal endoscopic nasobiliary drainage has advantages[10]. Furthermore, there may be the possibility of performing this procedure by the bedside rather than in the endoscopic room although comparatively skillful technique is needed without X-ray.

Although TNE-BD is a novel and unique drainage technique, there is no argument whether this can be an alternative technique to conventional ERCP. Firstly, TNE has some disadvantages. Side effects of TNE are rare, but the incidence ranges between 1.5%-22.6%[2]. The most common is transnasal insertion. Dumortier reported that failures in TNE were more likely to occur in young female patients undergoing TNE with instruments larger than 5.9 mm[2]. In reports of TNE-BD[9-12] there was no failure of insertion, probably because of the small sample size. Further investigation with a large number of patients is necessary, and the development of more flexible and thinner scopes may overcome the side effects of transnasal insertion in the near future.

One of most serious drawbacks of TNE-BD is success rate of selective cannulation, in particular of the bile duct. In our previous study, TNE-BD was performed in limited patients post sphincterotomy or placement of self-expandable metallic stent because of patient benefit, resulting in successful procedures in all but one. However, in patients with intact papilla, the success rate of bile duct cannulation in TNE-BD was comparatively low (72%) compared to conventional ERCP (96%, P = 0.053). Theoretically, using forward-viewing endoscopes the axes of the catheter cannot be matched to those of the bile duct at the long scope position except for particular patients, for instance, with periampullary diverticula. Therefore, performing TNE-BD at the long scope position, may be a good indication for patients with post-endoscopic sphincterotomy or placement of SEMS. In contrast, in patients with intact papilla, a short scope position may be necessary to perform bile duct cannulation unless using sphincterotomy.

Another drawback of TNE-BD is the limited number of devices because of a small working channel. At the present time, there are 3 commercially available TNEs (GIF-XP260N: Olympus medical systems, Tokyo, Japan, EG-530N2, Fujinon Toshiba ES Systems Co., Ltd., Tokyo, Japan, EG-1580K: Pentax Co Ltd, Tokyo, Japan) (Table 1). The specifications of these 3 TNEs are similar. In particular, the working channel diameter is only 2 mm, leading to limitations of device usage. Furthermore, the lack of elevator system may cause the failure of stent insertion when the stricture is very tough.

Serious procedure-related complications have not been reported. Nevertheless, ERCP procedures using TNE or ultrathin endoscope have some possibilities for direct endoscopic diagnosis or therapy into the bile duct for instance, electrohydraulic lithotripsy and tumor ablation[14-19]. In the future, improvement of ultrathin endoscopes may lead to minimumally invasive diagnosis and therapy in patients with biliary tract diseases.

In conclusion, although further cases should be accumulated, TNE-BD, in particular, one-step nasobiliary drainage using TNE may be a useful and novel technique for the treatment of acute cholangitis.

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