Percutaneous transhepatic cholangioscopy with an ultraslim video upper endoscope with CO_2 insufflation: a feasibility study

Tsuyoshi Hamada, MD, Takeshi Tsujino, MD, PhD, Naoki Sasahira, MD, PhD, Hirofumi Kogure, MD, PhD, Hiroyuki Isayama, MD, PhD, Kenji Hirano, MD, PhD, Natsuyo Yamamoto, MD, PhD, Minoru Tada, MD, PhD, Kazuhiko Koike, MD, PhD

Tokyo, Japan

Cholangioscopy is performed widely for the diagnosis and management of biliary diseases. Peroral cholangioscopy (POCS) is considered to be less invasive and less time-consuming than percutaneous transhepatic cholangioscopy (PTCS). Nevertheless, PTCS is an effective alternative in cases in which an endoscopic approach to the biliary system is impossible or peroral endoscopic access to the intended duct fails. However, the poor quality of the cholangioscopes typically used for PTCS tends to result in incomplete observation and a prolonged procedure.

Recently, an ultraslim video upper endoscope has been used for peroral direct cholangioscopy, offering diagnostic and therapeutic advantages over commercial peroral cholangioscopes.[1-3] Furthermore, a recent report showed that CO_2 insufflation during POCS might lead to clearer images of the biliary system compared with conventional saline solution irrigation.[4]

In this case study, we demonstrated the technical feasibility and safety of PTCS using an ultraslim video upper endoscope in conjunction with CO_2 insufflation.

PATIENTS AND METHODS

Patients

Between May and July 2010, 3 patients underwent PTCS using an ultraslim upper endoscope with CO_2 insufflation at our institution. None of the patients had concomitant severe pulmonary or cardiac disease. Written informed consent was obtained from each patient before the procedure. The institutional review board approved this report of these 3 cases.

Abbreviations: NBI, narrow-band imaging; POCS, peroral cholangioscopy; PTCS, percutaneous transhepatic cholangioscopy.

DISCLOSURE: *The authors disclosed no financial relationships relevant to this publication.*

0016-5107/$36.00
doi:10.1016/j.gie.2011.04.030

Received January 16, 2011. Accepted April 19, 2011.

Current affiliations: Department of Gastroenterology, Graduate School of Medicine, The University of Tokyo, Tokyo, Japan.

Reprint requests: Takeshi Tsujino, MD, PhD, Department of Gastroenterology, Graduate School of Medicine, The University of Tokyo, 7-3-1 Hongo Bunkyo-ku, Tokyo, Japan 113-8655.

PTCS procedure

The median period between the initial percutaneous transhepatic biliary drainage and PTCS was 65 days (range 54-1670 days). Before PTCS, the sinus tract was dilated gradually to 16F in 2 or 3 sessions.

An ultraslim video upper endoscope (GIF-XP260N; Olympus Optical, Tokyo, Japan), with a 5.0-mm outer diameter and a 2.0-mm accessory channel, was used for PTCS. CO_2 was insufflated by a CO_2 regulator system (UCR; Olympus Medical Systems, Tokyo, Japan). The endoscope was disinfected by using 0.55% phtharal solution before the procedure. The endoscope was advanced into the biliary system alongside a pre-positioned guidewire (0.035-inch, 260-cm Jagwire; Boston Scientific, Natick, Mass). Bile was removed from the bile duct through the accessory channel port of the endoscope, and subsequently a small quantity of CO_2 was insufflated until the biliary mucosa was visualized clearly. In patients 1 and 3, the mucosal surface was evaluated by using a narrow-band imaging (NBI) system (CV-260SL processor, CLV-260SL light source; Olympus Optical).

Evaluation of immediate post-PTCS complications

All patients were hospitalized for at least 24 hours after the procedure to evaluate immediate complications of PTCS. An abdominal radiograph and blood for liver chemistry and pancreatic enzymes were obtained routinely 12 to 18 hours after the procedure. Post-PTCS complications were diagnosed by using the consensus guidelines.[5]

RESULTS

Patient 1

A 52-year-old woman with primary sclerosing cholangitis was referred to our institution for evaluation of right hepatic duct wall thickening on CT, suggesting hilar cholangiocarcinoma. Percutaneous brushing cytology and the pathology of target biopsy specimens obtained by using a conventional fiber cholangioscope (CHF-XP20; Olympus Optical) were inconclusive. EUS-FNA was not performed because of the absence of a visible mass. Therefore, 13 days after a conventional fiber cholangioscopy, PTCS using the new method was performed and produced clearer images of the lesion, enabling us to perform a target biopsy more precisely

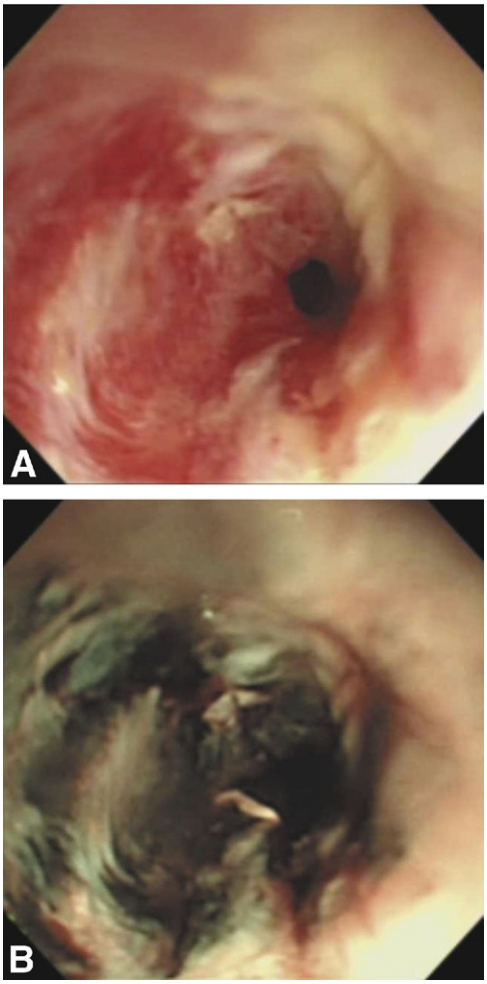

Figure 1. Peroral cholangioscopy images by using an upper endoscope with CO_2 insufflation (patient 1). **A,** The tumor site and red and thickened biliary mucosa were observed. **B,** Narrow-band imaging observation revealing the tumor prominence more clearly.

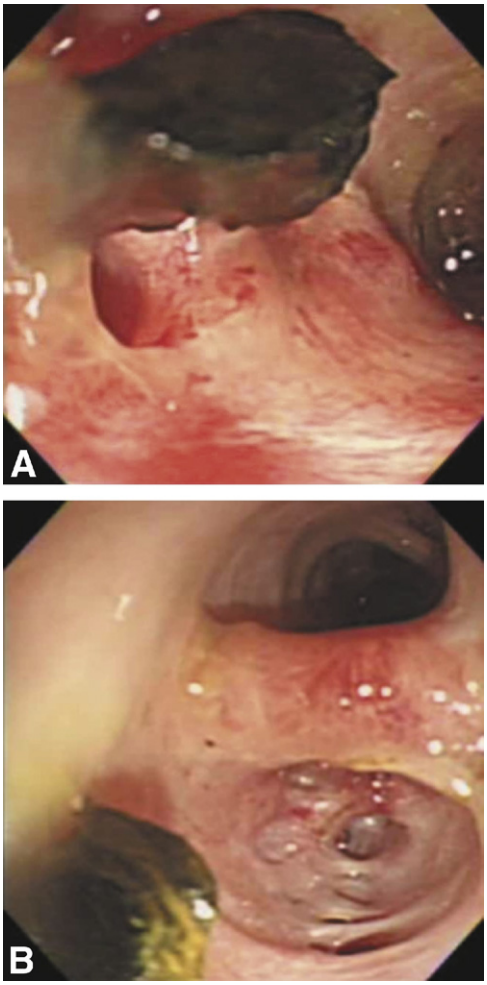

Figure 2. A, B, Peroral cholangioscopy images using an upper endoscope with CO_2 insufflation (patient 2) showing intrahepatic biliary stones.

by using larger (2-mm) biopsy forceps (FB-19K-1; Olympus Medical Systems) (Fig. 1). As a result, the pathological diagnosis of adenocarcinoma was confirmed, and radiation therapy was administered.

Patient 2

A 32-year-old man with a history of choledochojejunostomy for congenital biliary atresia was admitted to our institution for the management of intrahepatic biliary stones. He had undergone percutaneous removal of intrahepatic biliary stones at the age of 28 years. Although CT revealed recurrent stones in the intrahepatic duct, percutaneous transhepatic cholangiography failed to show the stones. Thus, we decided to remove the biliary stones under direct PTCS visualization. Because he had experienced recurrent cholangitis after previous percutaneous procedures, including a routine catheter exchange, CO_2 insufflation was preferable to saline solution irrigation during PTCS using an ultraslim endoscope to reduce the risk of PTCS-related cholangitis. PTCS performed by using the new method clearly demonstrated the presence of many tiny stones, which were removed successfully by using a retrieval basket catheter (FG-33W; Olympus Medical Systems) in 1 session (Fig. 2).

Patient 3

Obstructive jaundice caused by lower bile duct cancer developed in an 82-year-old man who had undergone percutaneous transhepatic biliary drainage at another institution. He was referred to our institution for surgical resection.

Contrast-enhanced multidetector CT showed slightly increased bile duct wall thickness between the hilar and common bile ducts, suggesting longitudinal cancer spread along the bile duct. PTCS using the new method was performed to evaluate the lateral superficial spread of the tumor. Compared with conventional white light observation, NBI delineated the margin of the cancerous lesion more clearly; under NBI observation, although irregular mucosa and abnormal vessels (tumor vessels) were ob-