EUS-guided methylene blue cholangiopancreatography for benign biliopancreatic diseases after failed ERCP

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Background and Aims: When ERCP fails, EUS-guided interventional techniques may be an alternative. The aim of this study was to evaluate the general outcomes and safety of EUS-guided methylene blue cholangiopancreatography in patients with failed ERCP in benign biliopancreatic diseases.

Methods: Patients with benign biliopancreatic diseases and failed ERCP were included. EUS-guided cholangiopancreatography plus injection of methylene blue was performed, and then ERCP using coloring agent flow as an indicator of papilla orifice was performed. Procedures were prospectively collected in this observational, single-center study. Technical success, clinical success, and adverse events were analyzed retrospectively.

Results: Eleven patients were included (10 choledocholithiasis, 1 pancreatic stricture). The main reason for failed ERCP was an unidentifiable papilla. EUS-guided ductal access with cholangiopancreatography and papilla orifice identification was obtained in all cases. Technical success and clinical success rates of 91% were achieved, with successful biliopancreatic drainage in 10 patients. Adverse events included 1 peripancreatic abscess attributed to a precut, which was successfully treated. No adverse events were related to the first EUS-guided stage.

Conclusion: EUS-guided cholangiopancreatography with methylene blue injection seems to be a feasible and helpful technique for treatment in patients with benign biliopancreatic diseases with previous failed ERCP because of an undetectable papilla.

The use of methylene blue (MB) as an indicator of the pancreatic or bile ducts has been described in sporadic clinical cases of failed pancreatic duct (PD) cannulation.[1,2] In seeking to improve our results and simplify the technique of EUS-guided biliary drainage (EUS-BD), the purpose of this study was to evaluate the general outcomes of EUS-guided MB injection for obtaining a cholangiopancreatography and papilla identification in patients with failed ERCP because of unidentifiable papilla and with benign biliopancreatic diseases. ERCP was attempted using the MB flow as an indicator of the papilla orifice.

Abbreviations: BD, biliary drainage; MB, methylene blue; PD, pancreatic duct.

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METHODS

Between April 2012 and January 2015, all consecutive patients were prospectively recruited and analyzed retrospectively. All procedures were performed by a single interventional endoscopist (J.G.) who annually performs more than 400 ERCPs and 500 EUS procedures (including more than 120 EUS-guided FNA) and has done more than 100 EUS-guided therapeutic procedures including EUS-BD.

Written informed consent was obtained from all patients. Our institutional review board approved the technique.

All patients with benign biliopancreatic diseases in whom ERCP transpapillary drainage had failed because of unidentifiable papilla were considered for this study. Exclusion criteria were malignant biliopancreatic diseases, nonaccessible papilla, severe coagulopathy, age younger than 18 years, and inability to give written informed consent.

Procedural technique

EUS session. The common bile duct or PD was imaged from the gastric and duodenum wall (Fig. 1A). The puncture

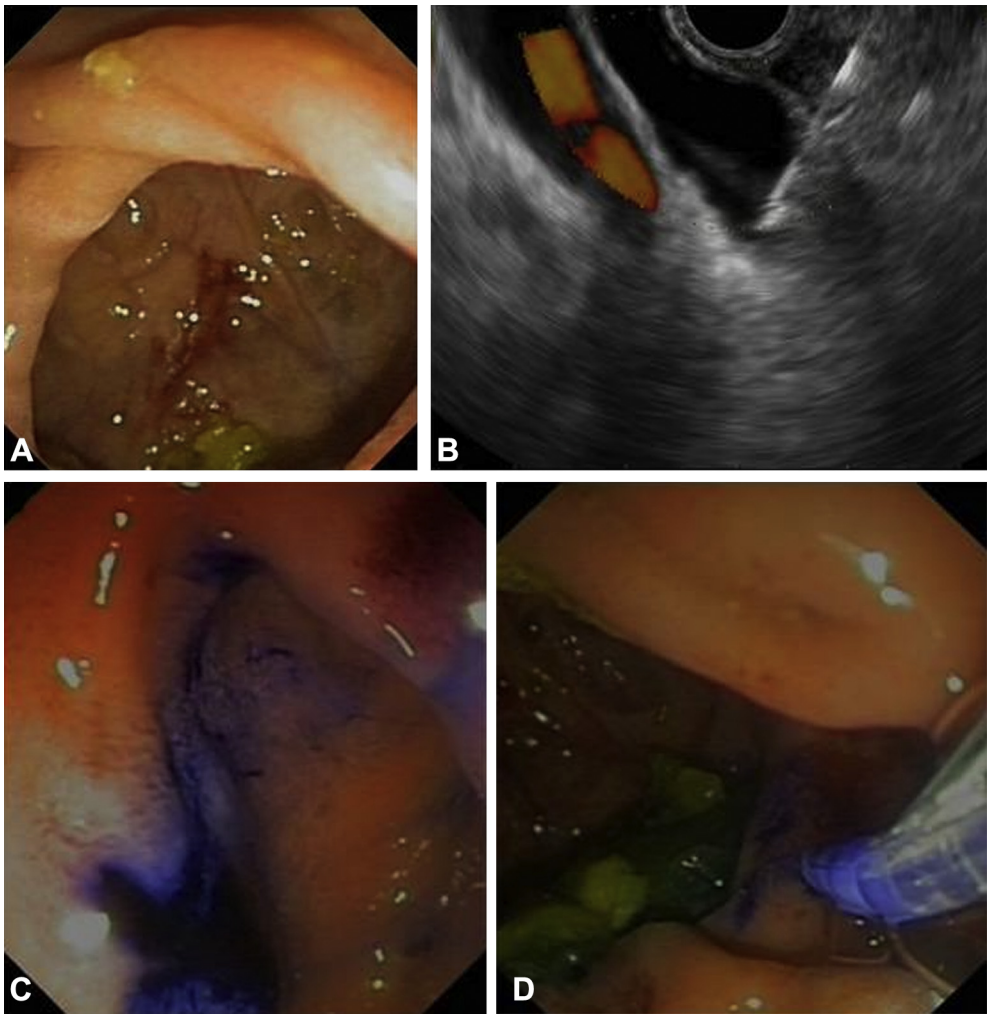

Figure 1. A, Endoscopic image of a periampullary diverticulum and undetectable orifice papilla. **B,** EUS-guided biliary access using a 22G needle. **C,** MB flow is identified coming from the major papilla orifice. **D,** Attempt at biliary cannulation with a sphincterotome (patient no. 5). *MB*, methylene blue.

was carried out using mostly a 22-gauge needle (Fig. 1B). First, bile or pancreatic juice was aspirated to confirm the intraductal location. Second, contrast medium was injected under fluoroscopic guidance to obtain a ductography. Finally, a sufficient amount (5-15 mL) of MB and saline solution (1.9 mL) was injected depending on duct diameter and the presence of contrast fluid flow into the small intestine monitored by fluoroscopy (Figs. 1-3).

ERCP session. If EUS-guided cholangiopancreatography was successful, the echoendoscope (GF-UCT140-AL5; Olympus Europe, Hamburg, Germany) was withdrawn and ERCP was attempted immediately. Papilla orifice identification was achieved by using MB flow and by a volume effect giving an image bulge. Once the papilla was reached, a sphincterotome (3.9F or 4.4F, AutotomeRX; Boston Scientific), with a .025- or .035-inch guidewire (Visiglide; Olympus or Jagwire; Boston Scientific) was first used for direct cannulation (Fig. 1D). Second, a precut with a needle-knife (microtome; Boston Scientific) was attempted. If after several attempts (3-4) cannulation was not achieved, the papilla orifice was marked using a clip, and a second ERCP session was done. If necessary, papilloplasty was performed. Finally, in accordance with findings, a stent was considered.

Technical success was defined as access to the common bile duct or PD, identification of the papilla orifice, transpapillary deep cannulation, and optimal drainage of the contrast or fluids. Clinical success was defined as resolution of the symptoms and normalization of biocheminal parameters. Safety was defined as the rate of adverse events.

All patients were monitored and admitted to our center for observation. Patient follow-up was based on outpatient examination findings, and data were collected prospectively.