Difficult biliary cannulation: use of physician-controlled wire-guided cannulation over a pancreatic duct stent to reduce the rate of precut sphincterotomy (with video)

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Background: Successful cannulation of the common bile duct (CBD) remains the benchmark for ERCP. Use of a pancreatic duct (PD) stent to facilitate biliary cannulation has been described, although the majority of patients require precut sphincterotomy to achieve CBD cannulation.

Objective: To report the performance characteristics of using a PD stent in conjunction with physician-controlled wire-guided cannulation (WGC) to facilitate bile duct cannulation.

Design: Retrospective cohort.

Setting: Two tertiary care, academic medical centers.

Patients: All undergoing ERCP with native papillae.

Intervention: In cases of difficult biliary access in which the PD is cannulated, a pancreatic stent is placed. After this, physician-controlled WGC is attempted by using the PD stent to direct the sphincterotome into the biliary orifice. If cannulation is unsuccessful after several minutes, a precut sphincterotomy is performed over the PD stent or the procedure is terminated.

Main Outcome Measurements: Frequency of successful bile duct cannulation and precut sphincterotomy.

Results: A total of 2345 ERCPs were identified, 1544 with native papillae. Among these, CBD and PD cannulation failed in 16 (1.0%) patients, whereas 76 (4.9%) patients received a PD stent to facilitate biliary cannulation. Successful cannulation was achieved in 71 (93.4%) of 76 patients, 60 (78.9%) of whom did not require precut sphincterotomy. Complications included mild post-ERCP pancreatitis in 4 (5.3%) and aspiration in 1 (1.3%). Precut sphincterotomy was complicated by hemorrhage, controlled during the procedure in 2 (13.3%) of 15.

Conclusions: Physician-controlled WGC over a PD stent facilitates biliary cannulation while maintaining a low rate of precut sphincterotomy. (Gastrointest Endosc 2010;71:275-9.)

Deep cannulation of the bile duct is an important benchmark of successful ERCP. In a minority of patients, the endoscopist will encounter a challenging papilla in which cannulation of the pancreatic duct (PD) can be achieved but deep access of the common bile duct (CBD) remains elusive. In these cases, some endoscopists will perform a precut needle-knife sphincterotomy to obtain access to the CBD. Precut sphincterotomy significantly increases the risk of procedure-related complications, including pancreatitis, hemorrhage, and perforation.[1-4] In particular, complications of this intervention are highest among less-experienced physicians who perform this intervention less than once per week.[2]

Two groups have reported the use of a PD stent to achieve bile duct cannulation without the use of a precut sphincterotomy.[5,6] Slivka[6] first described the technique when using the PD stent as a guide for an ultratapered cannula (5-4-3 tip Contour cannula; Microvasive, Natick, Mass) in 3 patients. Goldberg et al[5] successfully achieved

Abbreviations: CBD, common bile duct; PD, pancreatic duct; WGC, wire-guided cannulation.

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deep bile duct cannulation in 38 (97.5%) of 39 patients after placement of a 5F polyethylene stent in the PD (Geenen or Zimmon stent, Cook Medical, Bloomington, Ind). However, 23 (59%) patients required precut sphincterotomy to access the CBD. The PD stent likely facilitates biliary cannulation by straightening the common channel and by preventing inadvertent access to the PD. In doing so, the endoscopist uses the stent to direct a guidewire or sphincterotome tip in the direction of the biliary orifice once the papilla is engaged. Another potential advantage of this approach is that PD stent placement reduces the rate of ERCP-associated pancreatitis among higher-risk patients.[7-10]

With the advent of short wire (260 cm) ERCP platforms,[11] physician control of the wire has become easier. Physician-controlled wire-guided cannulation (WGC) has been compared with standard cannulation techniques in several clinical trials, and some studies suggest a lower rate of ERCP-associated pancreatitis.[12-15] We report a modified technique combining the use of a PD stent with physician-controlled WGC to facilitate biliary cannulation.

Capsule Summary

What is already known on this topic

- When papillae interfere with deep access of the common bile duct, a precut needle-knife sphincterotomy may be performed, but it increases the risk of pancreatitis, hemorrhage, or perforation.

What this study adds to our knowledge

- In a retrospective study, the use of a pancreatic duct stent to facilitate biliary cannulation resulted in a 93% success rate and a 19% rate of precut sphincterotomy through the use of wire-guided cannulation.

METHODS

We performed a retrospective, cohort study of all ERCPs performed between January 2006 and April 2008 by 2 experienced endoscopists (R.A., D.P.) who each perform more than 350 ERCPs per year at 2 independent tertiary care medical centers. Both endoscopists routinely attempt freehand cannulation or a WGC technique when attempting to cannulate a native papilla. A sphincterotome with a 4.4F tip and a short, straight 0.035-inch guidewire are usually used. When biliary cannulation is unsuccessful, both endoscopists routinely use a PD stent to facilitate biliary cannulation before resorting to precut sphincterotomy. All patients with a native papilla that could be reached by using a duodenoscope were included in this study. We identified all patients who required a PD stent to facilitate biliary cannulation within our electronic endoscopy databases (Provation MD; Provation Medical, Minneapolis, Minn, and gGastro; gMed, Weston, Fla). Standard biliary cannulation and failure to cannulate the CBD and PD were excluded.

The primary outcome was the rate of successful biliary cannulation without performing a precut sphincterotomy. We also reported rates of precut sphincterotomy and procedure-related complications. The research protocol was approved by the Human Research Protection Offices at the participating institutions.

Technique

If biliary cannulation is unsuccessful, the PD is cannulated and a 0.025- or 0.035-inch guidewire is advanced to the level of the mid pancreatic body to allow placement of a soft polyethylene stent. The type of stent is left to the discretion of the endoscopist, either a 4F (if using a 0.025-inch wire) or 5F stent with an external pigtail and single internal flange (Freeman pancreatic stent; Hobbs Medical Inc, Stafford Springs, Conn) or a 5F stent with a double external and single internal flange (Geenen pancreatic stent; Cook Medical, Bloomington, Ind). The internal flange is occasionally removed to promote spontaneous passage of the stent after the procedure. A pancreatic sphincterotomy was not performed before deploying the PD stent. The stent may be deployed by using the sphincterotome as a pusher. Once the stent is advanced to its desired position, the wire is pulled back into the sphincterotome and attempts at biliary cannulation resume. Physician-controlled WGC of the bile duct is then attempted over the PD stent.[12-14] This technique is summarized in Figure 1A and B. If cannulation is unsuccessful after several minutes, a precut sphincterotomy is performed over the PD stent (Fig. 1C) or the procedure is terminated and the patient rescheduled for another attempt. Several examples of using a PD stent to facilitate biliary cannulation are demonstrated in the attached video clip (Video 1, available online at www.giejournal.org). Postprocedure PD stent management was left to the discretion of the endoscopist.

Statistical analysis

We used descriptive statistics to report the performance characteristics of physician-controlled WGC in conjunction with a PD stent. Comparative statistics (χ^2 test) were used to evaluate the technique between the 2 endoscopists. Statistical analysis was performed by using Stata version 10.0 (StataCorp LP, College Station, Tex).

RESULTS

A total of 2345 ERCPs were performed during the study period, 1544 with native papillae that could be reached by using a therapeutic duodenoscope (TJF-160VF; Olympus America, Center Valley, Pa). Of these, biliary duct and PD