CASE STUDY

Peroral pancreatoscopy via the minor papilla for diagnosis and therapy of pancreatic diseases

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Direct examination of the pancreaticobiliary system permits mucosal inspection, detection of stones or mucin, and directed tissue sampling.[1-7] Although peroral pancreatoscopy (POP) is typically performed via the major papilla, the main pancreatic duct (PD) may be inaccessible because of acquired obstruction of the ventral PD ("pseudodivisum") from strictures or stones. To access the dorsal duct by ERCP in this setting, we and others have reported the technique of minor papilla endotherapy in patients without divisum with patent accessory ducts that communicate with the upstream PD.[8,9] However, it is largely unknown whether pancreatic endotherapy with POP via the minor papilla is technically feasible because of the less-stable duodenoscope position in the more proximal duodenum. We report our experience of dorsal duct pancreatoscopy (DDP) via the minor papilla.

PATIENTS AND METHODS

A retrospectively identified consecutive group of patients at a tertiary-care academic referral center underwent an attempt at dorsal POP by two experienced endoscopists, both of whom had performed >100 pancreatoscopies (R.J.S., Y.K.C.). For this technique to be considered, patients needed a minimum of 5-mm duct diameter. Institutional review board approval was obtained to collect patient data and obtain clinical follow-up. Patients were identified by a search of the endoscopy database. A data collection sheet was used to record demographic information, indication, anatomy, findings, and follow-up. Before DDP, minor papilla cannulation was achieved and pancreatography was performed under fluoroscopy. Minor papillotomy was performed if the orifice was not patulous, and downstream stenoses were balloon dilated, as necessary, to permit pancreatoscope passage. The CHF BP30 (Olympus America, Inc, Center Valley, Pa) or Spy Direct Visualization System (Boston Scientific, Natick, Mass) was passed over a 0.035-inch, 450-cm guidewire (Jagwire; Hydra Jagwire, Boston Scientific) through the working channel of a standard therapeutic duodenoscope (TJF-160, TJF-160VF; Olympus America) (Fig. 1).

All procedures were performed in the endoscopy suite with patients under general anesthesia and in the semi-prone position. Prophylactic intravenous antibiotics were administered. We used the following definitions: pancreatoscopy directed biopsies—performed directly through the pancreatoscope by using miniature forceps; pancreatoscopy-assisted, fluoroscopy-guided biopsies or brushings—intraductal biopsies or brushings performed through the duodenoscope based on a fluoroscopic spot film of the pancreatoscope position at the site of pathology.

Outcome measurements were as follows: technical success—deep intubation of the dorsal duct with the pancreatoscope; the secondary measure was completion of the intended diagnostic or therapeutic intervention. Clinical success was defined as a 50% or greater improvement in pain or reduction in opioid use for patients with painful, chronic pancreatitis.[10] Descriptive statistics were calculated by using Microsoft Excel 2010 (Microsoft, Redmond, WA, USA).

RESULTS

Between January 2002 and October 2012, 10,381 ERCPs were performed at our institution. Ten patients (3 men, 7 women, mean [± standard deviation] age 66 [±14 years]) underwent 16 attempts at DDP procedures.

Abbreviations: DDP, dorsal duct pancreatoscopy; IPMN, intraductal papillary mucinous neoplasm; PD, pancreatic duct; POP, peroral pancreatoscopy.

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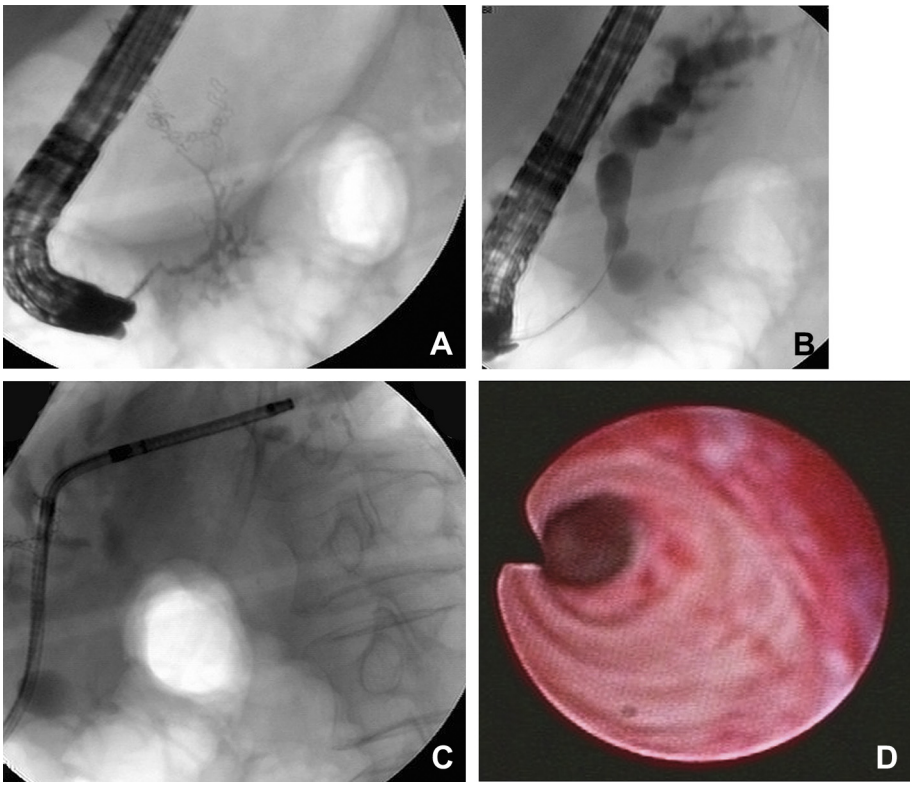

Figure 1. A, Injection of a ventral duct demonstrating pancreas divisum. **B,** Successful opacification of the dorsal duct via the minor papilla demonstrating multiple strictures. **C,** Fluoroscopic view showing pancreatoscope in dorsal duct. **D,** Benign-appearing stricture on dorsal duct pancreatoscopy.

Indications included therapy for known or suspected painful pancreaticolithiasis caused by chronic pancreatitis (n = 11/16, 69%) or suspected intraductal papillary mucinous neoplasm (IPMN) (n = 4/16, 25%), and indeterminate pancreatic stricture (n = 1/16, 6%). True congenital pancreas divisum based on lack of an obstructing stone or stricture at the ventral duct by noninvasive imaging or EUS was encountered in 9 procedures (56%), pseudodivisum in 6 (38%), and indeterminate in 1 (6%). Among the congenital pancreas divisum procedures, 5 (55%) were performed for stone and stricture disease related to chronic pancreatitis, 4 (45%) were for suspected IPMN. A mean (± SD) of 1.9 (± 1.4) ERCPs per patient had been performed before DDP. (See Table 1 for pancreatoscope usage and specifications.) Endoscopic papillotomy of the minor papilla was performed at the time of index DDP in all 10 patients to allow passage of the pancreatoscope by using a short-nose traction sphincterotome (n = 9) or a needle-knife (n = 1).

Pancreatoscope passage was successful in all patients in whom DDP was attempted via the minor papilla. The intended diagnostic and therapeutic interventions were successful in 15 of 16 patients (94%). In the one failure, biopsy forceps would not pass through the pancreatoscope because of angulation. Findings during DDP included a stone (n = 9), a benign-appearing stricture (n = 10) a papillary-appearing tumor (n = 1), and a benign-appearing dilatation (n = 1) (Figs. 1,2).

TABLE 1. Endoscope specifications and usage

Endoscope	Tip outer diameter (mm)	Working channel (mm)	Working length (cm)	No.
CHF-BP30*	3.1	1.2	187	11
Spy†	3.1	1.2	230	5

*Olympus America, Inc, Center Valley, Pa.
†Boston Scientific, Natick, Mass.

Interventions performed during DDP included electrohydraulic lithotripsy (n = 6), basket lithotripsy (n = 1), laser lithotripsy (n = 2), pancreatoscopy-directed biopsy (n = 1), pancreatoscopy-assisted, fluoroscopy-guided duodenoscopic biopsy (n = 3), and brushings (n = 1) (Table 2). A median of 2 (range 1-3) lithotripsy (electrohydraulic lithotripsy or laser) sessions were required in 4 patients to achieve complete stone clearance.

For the 5 patients undergoing DDP for painful chronic pancreatitis, clinical success was achieved at the end of therapy in 4 of 5 patients (80%). In 1 patient in whom the Spy system was used during 2 procedures, because of an acute DDP angulation that did not permit passage of the lithotripsy fiber, the pancreatoscope was removed from the duct to the duodenum, and the fiber was then successfully advanced. Subsequently, the minor papilla was freely