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## VIDEO CASE REPORT

## Peroral pancreatoscopy via the minor papilla in the diagnosis of intraductal papillary mucinous neoplasm

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Peroral pancreatoscopy (POPS) helps in the diagnosis of pancreatic disease, but the bending and narrowing of the main pancreatic duct (MPD) via the major papilla can present challenges occasionally.<sup>1-3</sup> In such cases, surgeons can approach the MPD via the minor papilla. Most cases of endoscopic minor papilla sphincterotomy (EMPS), however, are for papillary sphincter dysfunction or pancreatic duct divisum.<sup>2</sup> Here, we outline how POPS via the minor papilla was used to diagnose recurrent acute pancreatitis due to a main-duct intraductal papillary mucinous neoplasm (MD-IPMN).

This case involves a 65-year-old man with type 2 diabetes mellitus who presented with recurrent acute pancreatitis. Contrast-enhanced CT and MRCP imaging showed cystic dilation of the MPD in the pancreatic tail (Fig. 1), which EUS showed to be free of nodules. ERCP revealed a fish-mouth appearance of the major papilla owing to mucus outflow (Video 1, available online at [www.VideoGIE.org](http://www.VideoGIE.org)).

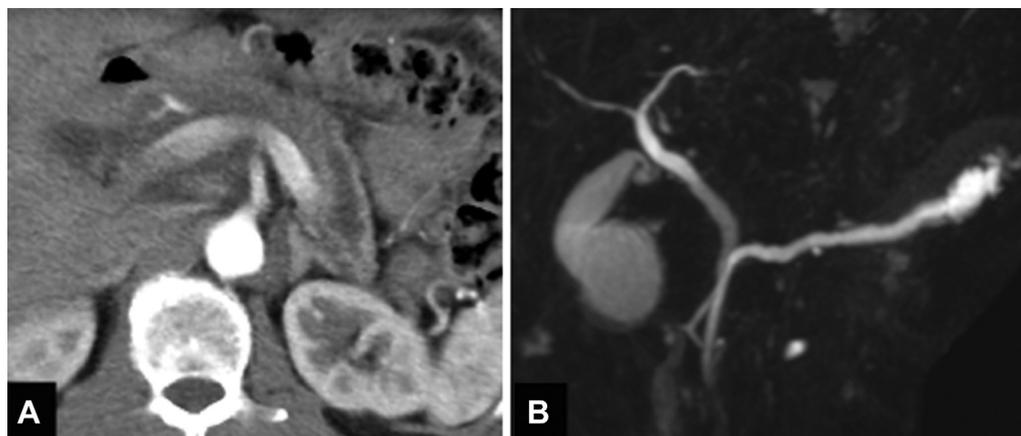
An initial approach via the major papilla was unsuccessful because of the Z-type anatomy of the main duct in the pancreatic head (Fig. 2). Because wire-guided cannulation of the minor papilla was possible, we performed EMPS (Fig. 3), but we were unable to insert the SpyScope DS2 (Boston Scientific, Natick, Mass, USA). The endoscope could, however, be inserted smoothly into the MPD with added endoscopic minor papilla balloon dilation

(EMPBD; REN, 6 mm; Kaneka Medix, Tokyo, Japan) (Fig. 3). Here, the SpyScope detected a mucus-filled duct and a salmon-roe pattern of the epithelium in the pancreatic tail (Fig. 4).

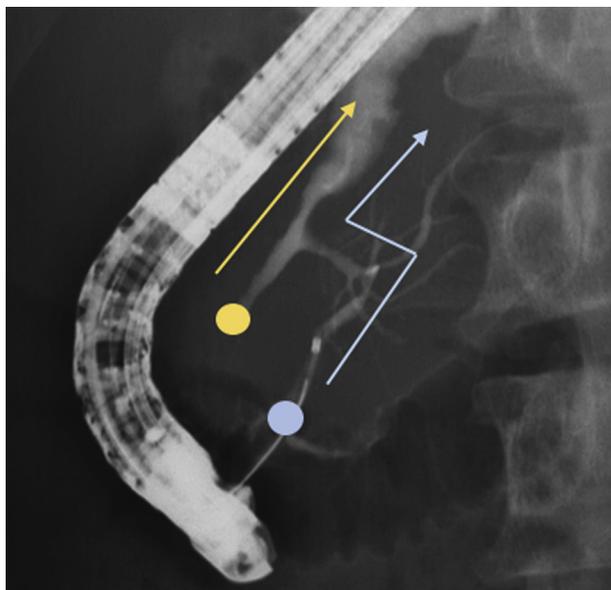
Because this approach enabled a qualitative diagnosis of MD-IPMN showing horizontal progression, and because of the risk of bleeding and post-ERCP pancreatitis, a biopsy was not performed. There were no ERCP-related adverse events. A pathologic diagnosis was made of intraductal papillary mucinous carcinoma (noninvasive, gastric type, Pt, TS1, masked type, pTis, ly0, v0, ne0, PCM0, DPM0, pN0, pStage0 according to the Union for International Cancer Control, eighth edition) (Fig. 5). The patient underwent laparoscopic pancreatectomy and was discharged on postoperative day 7 without any adverse events. After 8 months, the patient remains recurrence free.

This case was novel in 2 ways. First, POPS via the minor papilla made diagnosis of the lesion range possible, which contributed to the surgical resection. Second, POPS was safely inserted through a combination of EMPS and EMPBD.

Brian et al<sup>2</sup> reported POPS via the minor papilla in 10 patients with pancreas divisum, with a technical success rate of 94%. Moreover, 4 of the 5 cases of diagnostic POPS experienced an effect on the treatment plan. Although POPS via the minor papilla is not always



**Figure 1.** A, Contrast-enhanced CT revealed acute pancreatitis at first visit. B, MRCP showed main pancreatic duct dilation from the head to tail, with cystic dilation in the tail of pancreas.



**Figure 2.** An approach via the major papilla was unsuccessful because of the Z-type anatomy of the main pancreatic duct (MPD) in the pancreatic head (*blue dot and arrow*). An approach via the minor papilla offered direct access to the MPD (*yellow dot and arrow*).

possible, it may be considered in cases under appropriate conditions. For ERCP procedures that require a large-diameter device to be inserted via the minor papilla, proper access is essential. Gerke et al<sup>4</sup> reported that 60%

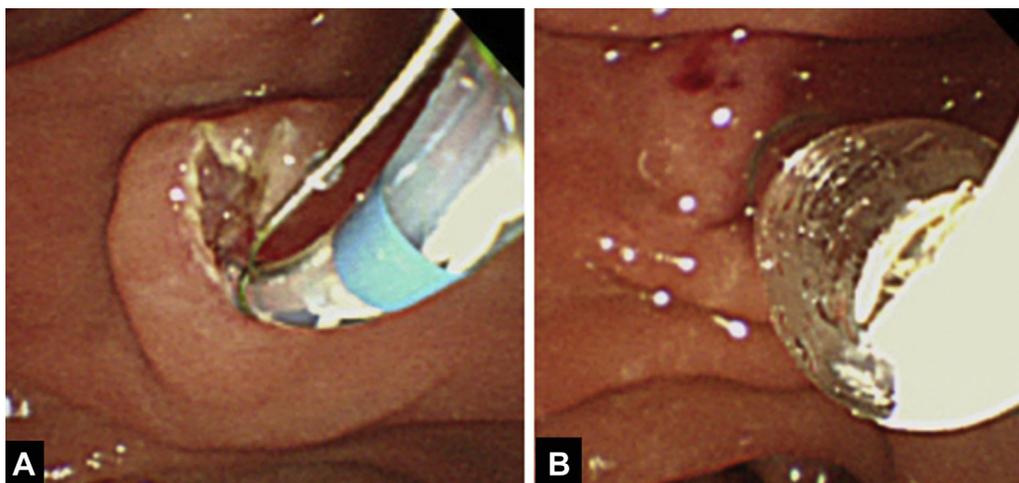
of patients with recurring acute pancreatitis saw an improvement after EMPS; post-ERCP pancreatitis was found in 11.2% of cases, with no bleeding or perforation. It is not recommended for EMPS to exceed the papillary nodule for risk of perforation,<sup>1</sup> but in our case, it was difficult to perform SpyScope-only EMPS. Yamamoto et al<sup>5</sup> reported EMPBD with pancreatic stent placement in 16 cases of pancreatic divisum and chronic pancreatitis, achieving a clinical improvement in 13 of 16 patients (81.3%). One case of mild pancreatitis was admitted without bleeding or perforation. EMPBD is an effective and safe intervention in the minor papilla, and the safe insertion of the SpyScope was possible with EMPBD in our case.

This case report demonstrates that POPS is a useful and safe mapping tool for the diagnosis of MD-IPMN via the minor papilla and, in combination with EMPS and EMPBD, it is useful for inserting a large device, such as a SpyScope, via the minor papilla.

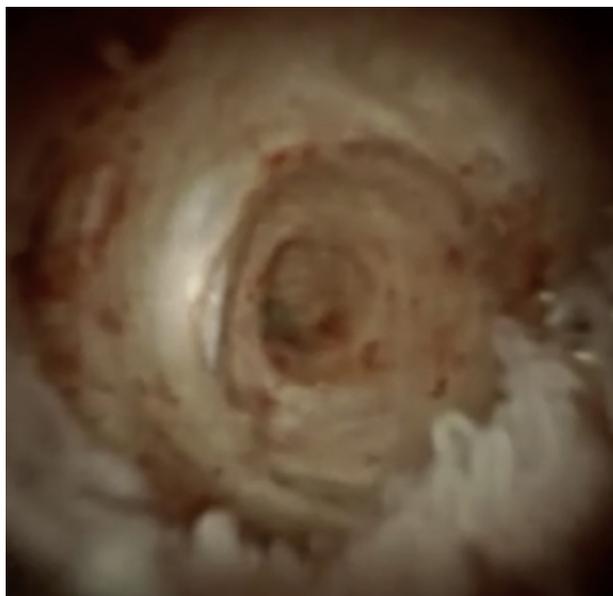
## DISCLOSURE

*All authors disclosed no financial relationships.*

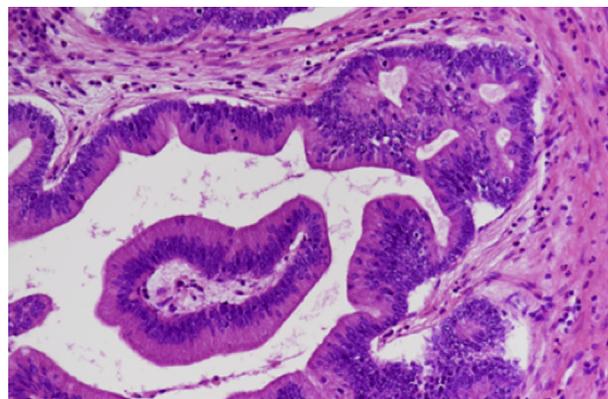
*Abbreviations: EMPBD, endoscopic minor papilla balloon dilation; EMPS, endoscopic minor papilla sphincterotomy; MD-IPMN, main-duct intraductal papillary mucinous neoplasm; MPD, main pancreatic duct; POPS, peroral pancreatoscopy.*



**Figure 3.** **A,** Endoscopic minor papillotomy. **B,** Endoscopic minor papilla balloon dilation with 6-mm diameter balloon.



**Figure 4.** A salmon roe-like appearance of the epithelium was observed in the tail of the pancreas.



**Figure 5.** The pathologic diagnosis was noninvasive intraductal papillary mucinous carcinoma.

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