Chromo-pancreatoscopy for preoperative evaluation of main duct intraductal pancreatic mucinous neoplasm

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CASE PRESENTATION

A 59-year-old man was referred for evaluation of a dilated main pancreatic duct (MPD) associated with pancreatic atrophy on magnetic resonance imaging (Fig. 1). After undergoing an EUS at an outside facility, he was advised to undergo a total pancreatectomy. He presented to our facility for a second opinion.

PROCEDURE DETAILS

On EUS, the pancreatic duct appeared normal in the pancreatic head, with diffuse dilatation beyond the pancreatic neck, where it measured 11 mm (Fig. 1). We proceeded with ERCP to further evaluate. Pancreatogram revealed a nondilated MPD in the pancreatic head, with an ansa loop that communicated with a severely dilated MPD, starting in the region of the pancreatic neck (Fig. 2). Given the inability to pass a cholangioscope into the MPD via the "Z" type ansa loop, we decided to use the dorsal duct as a more direct route for pancreatoscopy. After several failed attempts at cannulation, a double-wire rendezvous technique was used, and the minor papilla was successfully cannulated (Fig. 3). A minor papillotomy was then performed, and an 8.5F × 22-cm plastic stent was placed in the MPD. Following this, the patient was discharged home. On repeat ERCP 4 weeks later, the pancreatic stent was removed and the MPD was cannulated using a cholangioscope. On pancreatoscopy, a lesion with fish egg–like projections was visualized in the downstream 2 cm of the MPD (Fig. 4). The remainder of the

Abbreviations: IPMN, intraductal pancreatic mucinous neoplasm; MB, methylene blue; MPD, main pancreatic duct.

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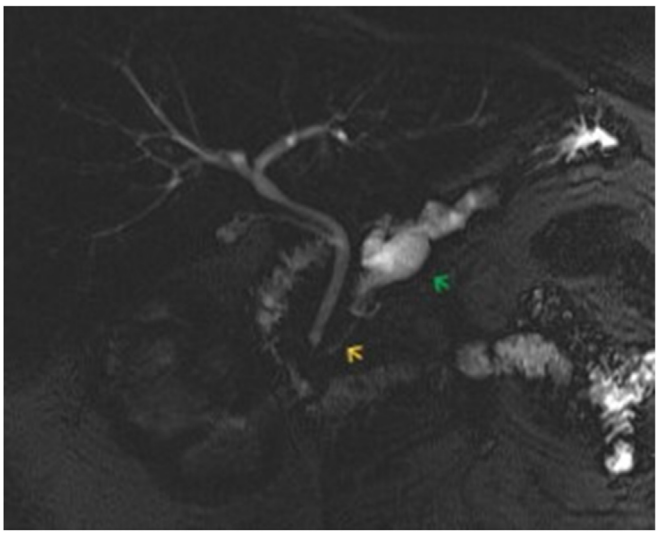

Figure 1. Magnetic resonance imaging demonstrating a diffusely dilated pancreatic duct in the body and tail of the pancreas (*green arrow*). The pancreatic duct in the pancreatic head appears to be nondilated (*yellow arrow*).

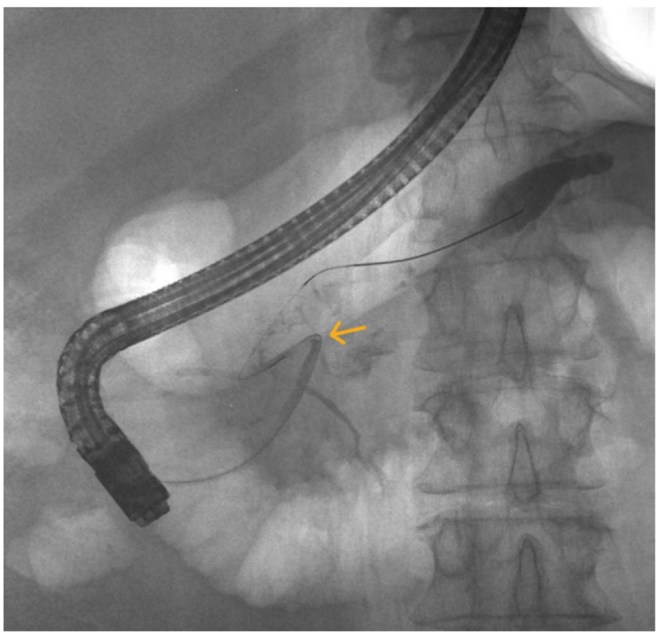

Figure 2. Pancreatogram demonstrating a nondilated pancreatic duct in the pancreatic head, with an ansa loop (*yellow arrow*) that communicates with a severely dilated main pancreatic duct in the body and tail of the pancreas.

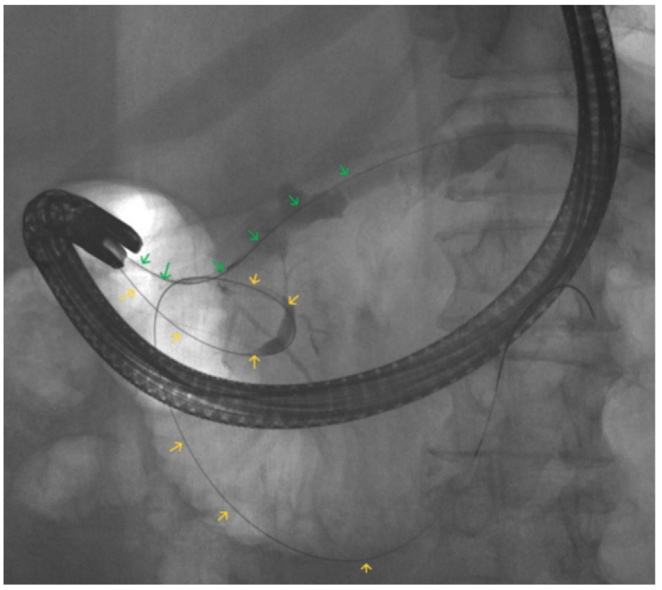

Figure 3. Fluoroscopic image demonstrating a double-wire rendezvous technique that was used to cannulate the dorsal pancreatic duct. The first wire (*yellow arrows*) is passed through the major papilla (ventral duct) and subsequently advanced through the dorsal duct (minor papilla) in an anterograde fashion and coiled several times in the duodenum. Keeping the first or rendezvous wire in place, the dorsal duct is cannulated by railroading a modified sphincterotome over the rendezvous wire, and a second wire (*green arrows*) is advanced into the dorsal duct.

Figure 4. Pancreatoscopy image of the fish egg–like appearance of the intraductal papillary neoplasm in the pancreatic neck before staining with a blue dye.

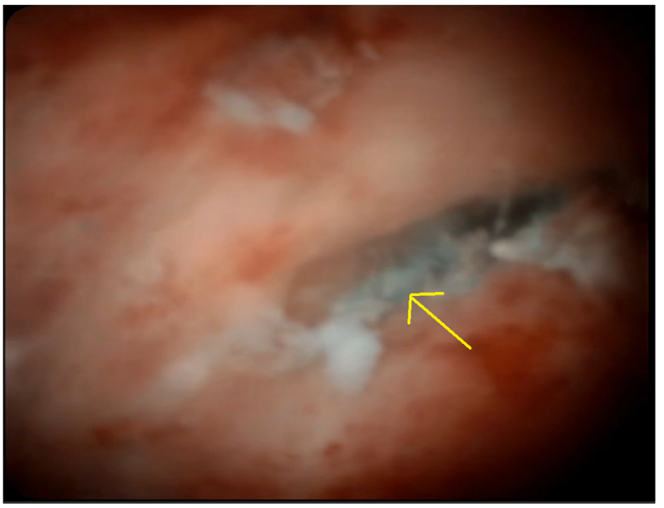

Figure 5. Pancreatoscopy image of the inflamed benign ductal mucosa in the body-tail of the pancreas after staining with a blue dye. The dye stains the fibrinous exudates (*yellow arrow*) but does not stain the ductal epithelium.

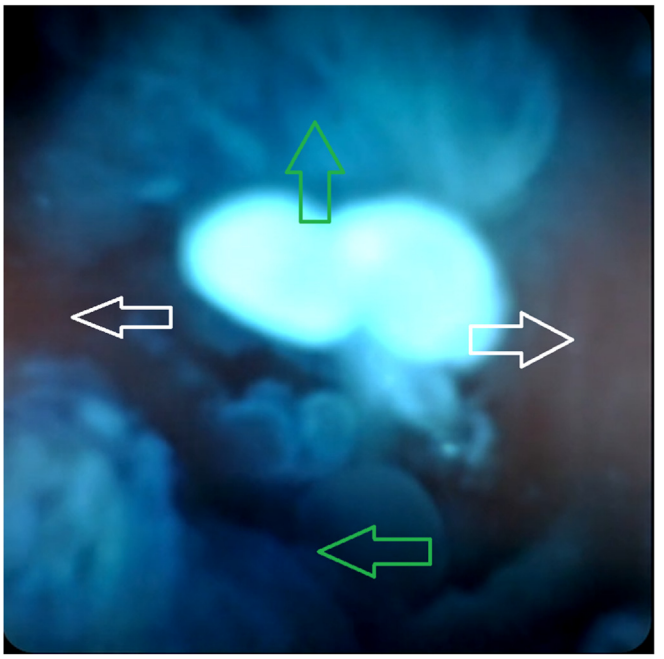

Figure 6. Pancreatoscopy image demonstrating a difference in the uptake of blue dye between the nondysplastic main duct–type intraductal pancreatic mucinous neoplasm (*green arrows*) and the surrounding ductal epithelium (*white arrows*).

MPD appeared diffusely erythematous with fibrinous exudates, likely due to the previously placed stent. Because of underlying inflammation, we were unable to clearly identify margins of the lesion and excluded skip lesions. We therefore used methylene blue (MB) to highlight any dysplastic epithelium. Twenty milliliters of 0.1% MB were administered through the irrigation channel of the cholangioscope using a syringe, starting at the pancreatic tail. MB was slowly administered while the scope was withdrawn toward the ampulla. After waiting for 30 seconds, all excess dye was suctioned, and the duct was irrigated with water. The inflamed ductal mucosa in the body-tail of the pancreas appeared uniform with no focal abnormalities and did not stain blue (Fig. 5). In the neck, the lesion

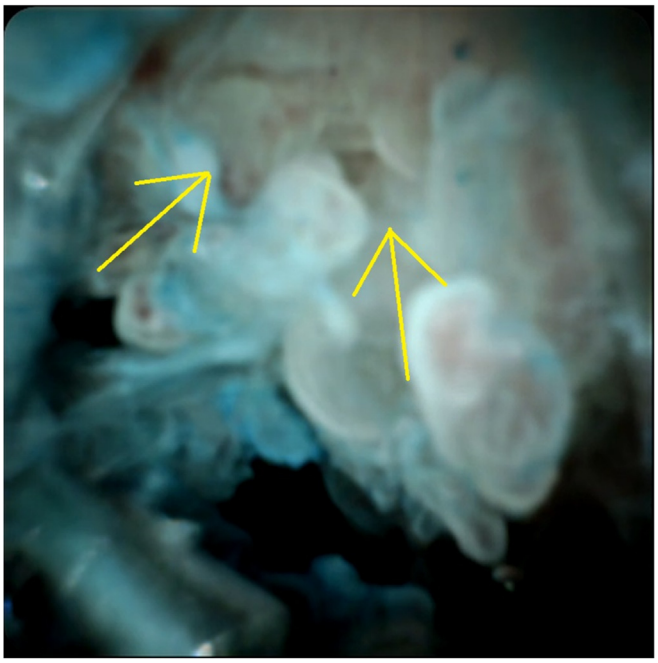

Figure 7. Pancreatoscopy image demonstrating a difference in the uptake of blue dye within the main duct–type intraductal pancreatic mucinous neoplasm (IPMN). Areas of the main duct IPMN with low-grade dysplasia that have low-grade cellular atypia stain blue, whereas areas with intermediate grade cellular atypia (*yellow arrows*) do not stain blue.

stained blue. There was a noticeable difference in the uptake of MB at the outer border of the lesion (Figs. 6 and 7). Targeted biopsy specimens were obtained from the lesion. In the body and tail, considering the uniform absence MB uptake, 2 to 3 sites were randomly selected in each area and biopsy specimens were obtained. Histopathology revealed intraductal pancreatic mucinous neoplasm (IPMN) with low-grade dysplasia from the lesion that stained blue, and normal ductal mucosa from all the other areas of the MPD that did not stain blue (Video 1, available online at www.videogie.org).

DISCUSSION

When the extent of ductal involvement is unclear in main duct IPMN, preoperative staging may be helpful to better define the extent of the disease and exclude skip lesions. In cases in which the extent of the disease cannot be determined, patients undergo total pancreatectomy.[1] In patients with clearly defined ductal involvement, partial pancreatic resection may be performed.[2] Peroral pancreatoscopy is highly sensitive (95%) for the diagnosis of IPMN.[2] In patients with pre-existing pancreatic stents, due to foreign body–related ductal inflammation, accurate characterization of the underlying mucosa can be challenging. MB-aided cholangioscopy leads to different staining patterns in normal, dysplastic, and inflamed common bile duct mucosa and has been safely used in the pancreatic duct.[3-5]

CONCLUSION

We demonstrate feasibility of chromo-pancreatoscopy to better define the extent of MPD involvement in patients with main duct IPMN. In this case, we were able to avoid a total pancreatectomy. Further studies are needed.

DISCLOSURE

Dr Yang is a consultant for Microtech, Medtronic, Olympus, Fujifilm, and Apollo Endosurgery. Dr Arain is a consultant for Cook Medical, Merit, Boston Scientific, and Olympus. Dr Hasan is a consultant for Boston Scientific and Olympus. The other authors disclosed no financial relationships relevant to this publication.

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