Characterizing the extent and morphology of intraductal mucinous biliary neoplasm using a novel cholangioscope and treatment with ampullectomy

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Intraductal papillary neoplasm of the bile ducts (IPNBs) is rare and typically identified on cross-sectional imaging.[1] It may progress to invasive adenocarcinoma.[2] Proper diagnostic techniques are lacking to characterize the extent, morphology, and histologic features of these lesions.[3] We present a case using a novel cholangioscope to identify, map, and plan treatment of an IPNB in a patient who was not a candidate for surgery.

A 65-year-old man presented to his local hospital with elevated liver enzymes in a cholestatic pattern. MRCP revealed a 1-cm filling defect in the distal common bile duct (CBD) (Fig. 1). EUS revealed an echogenic lesion in the distal CBD measuring 1 cm. ERCP with sphincterotomy was performed and revealed a filling defect in the distal CBD. The duct was swept and revealed a polypoid lesion protruding into the duodenum from the distal CBD. Biopsies were consistent with an IPNB. He was referred to our tertiary care center for a multidisciplinary discussion regarding further characterization and management of the intraductal mass. Due to the patient's multiple comorbid cardiopulmonary conditions, he was not a surgical candidate and therefore an endoscopic ampullectomy was deemed appropriate for resection of the IPNB and to relieve the biliary obstruction (Fig. 2). A novel 11F cholangioscope (Micro-Tech eyeMax Endoscopy, Bradford, Pa, USA) with a 2.0-mm working channel diameter was used to characterize the extent of the IPNB and to identify concerning morphologic features (Video 1 available online at www.videogie.org). On cholangioscopy, the medial portion of the IPNB in the intra-

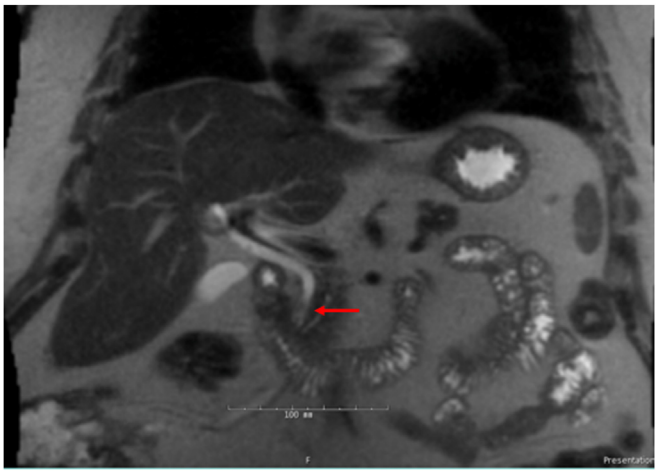

Figure 1. MRCP showing a filling defect in the distal bile duct. The filling defect is indicated by the *red arrow*.

ampullary position appeared more erythematous in comparison to the surrounding papillary projections and was continuous with the lesion in the distal CBD (Fig. 3). The

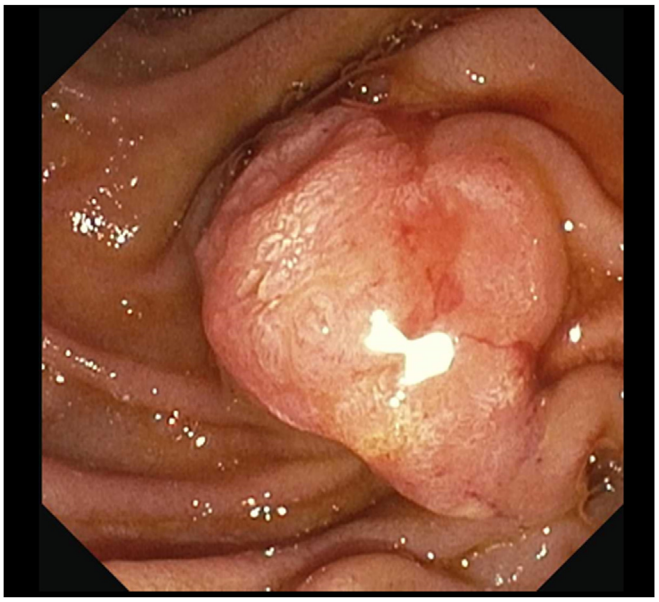

Figure 2. Intraductal papillary neoplasm of the bile duct extending into the ampulla.

Abbreviations: CBD, common bile duct; IPNBs, intraductal papillary neoplasm of the bile ducts.

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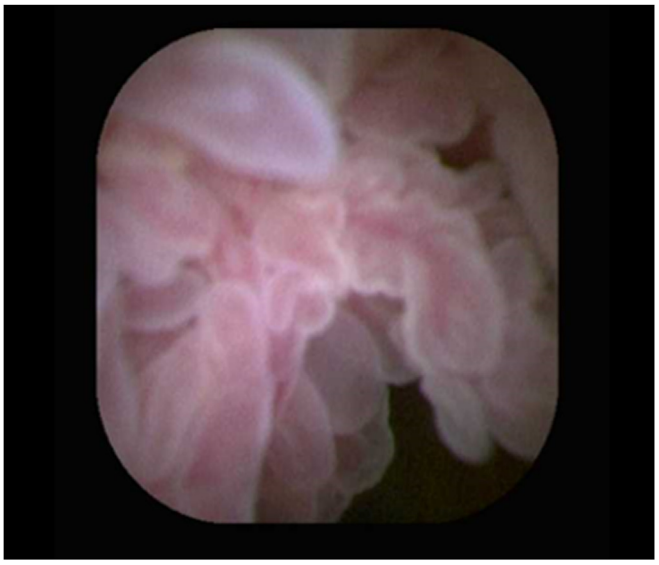

Figure 3. Villiform lesion visualized using the novel cholangioscope, of the lower third of the bile duct, concerning for intraductal mucinous neoplasm.

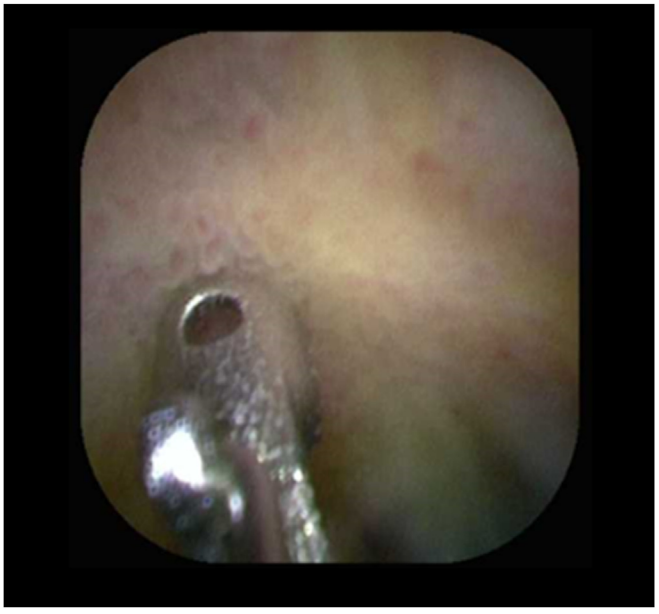

Figure 4. Biopsies from the intraductal papillary neoplasms were taken using large 1.6-mm biopsy specimens forceps.

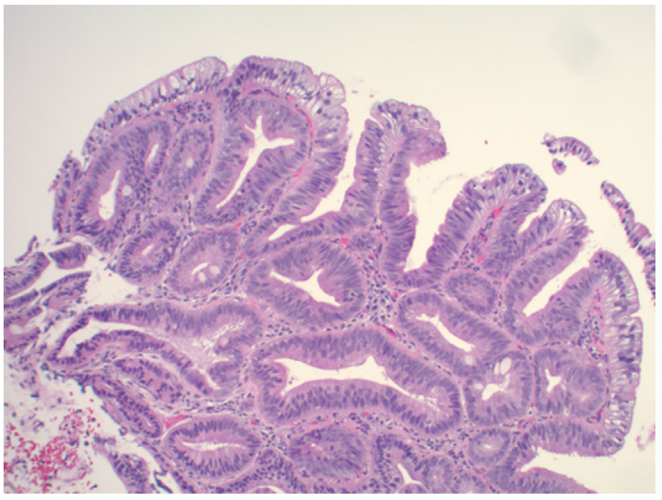

Figure 5. Histology showing a distal common bile duct intraductal papillary neoplasm. The lesion shows mucinous papillary cytoarchitecture with low-grade dysplasia (H&E, orig. mag. × 100).

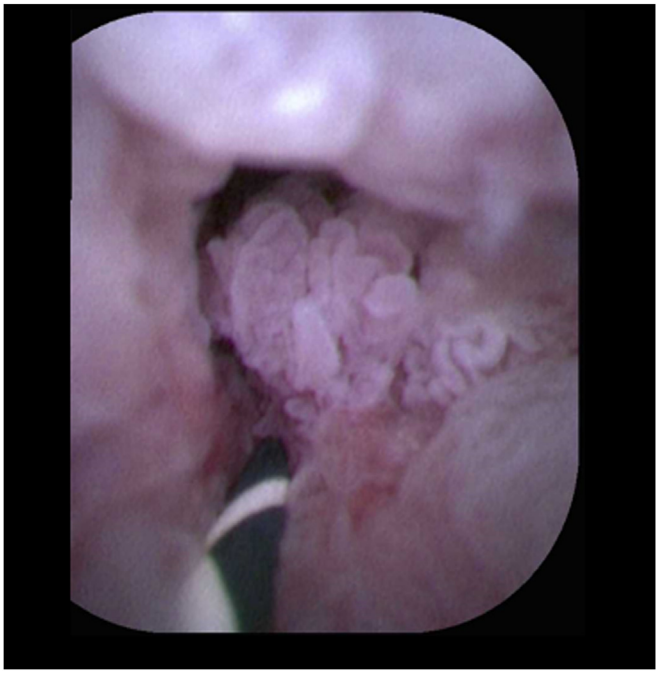

Figure 6. Intra-ampullary area of the common bile duct that appeared more erythematous and villiform compared with the lesion in the more proximal area of the common bile duct, which was consistent with the histology showing high-grade dysplasia.

extent of the lesion was clearly visualized via the cholangioscope to the middle third of the CBD and did not appear to have the same concerning features as the intra-ampullary portion. Biopsy specimens were taken using a 1.6-mm biopsy forceps from the lower third and middle third of the CBD from the IPNB (Fig. 4). An ampullectomy was performed using hot snare cautery (Video 1). The pancreatic duct was then cannulated, and a temporary plastic stent was placed to prevent pancreatitis. The patient was observed overnight without postprocedural adverse events. Biopsy specimens of the mid/distal bile duct confirmed an IPNB with low-grade dysplasia (LGD) (Fig. 5). The ampulla demonstrated LGD and high-grade dysplasia (HGD) with histologic features significant for an IPNB extending into the ampullary duct and papilla of Vater (Fig. 6). There was remaining dysplastic tissue in the cauterized deep margins of the resected ampulla, but the peripheral margins were negative for dysplasia. Surveillance ERCP with cholangioscopy was performed 3 months later, and biopsy specimens

were obtained from the remaining IPNB in the distal CBD. Pathology showed LGD without HGD or malignancy. Endoscopic surveillance was planned for 6 months.

This was a unique case of an IPNB extending into the ampullary duct. A novel cholangioscope helped identify concerning features of the IPNB. An ampullectomy was done to relieve the obstruction and resect the intra-ampullary area with HGD. Intra-ampullary lesions may be difficult to visualize on cholangioscopy, but we were confident the HGD was resected given our negative peripheral margins on histology and subsequent surveillance biopsies of the IPNB not demonstrating HGD or malignancy. Cholangioscopy has emerged as a useful endoscopic tool to better characterize the morphology and extent of the IPNB in the biliary tract.[4] The novel cholangioscope allowed for improved image quality and enhanced visualization of the IPNB because of the increased resolution and optimal illumination of the biliary tract. This enabled us to determine the morphology and extent of the IPNB, gain targeted biopsy specimens of the lesion, and plan our endoscopic intervention. The 1.6-mm biopsy forceps obtained a larger tissue sample for better histologic assessment. This novel cholangioscope allowed for improved visualization, accurate longitudinal mapping, and biopsies of the IPNB to plan surveillance and endoscopic treatment.

DISCLOSURE

Dr Mehta is a consultant for Boston Scientific, Conmed, and Medtronic. Dr Waxman is a consultant for Boston Scientific, Medtronic, and Cook Medical. All other authors disclosed no financial relationships relevant to this publication.

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