Ampullary carcinoid tumors diagnosed by endoscopic ultrasound-guided fine needle aspiration in two patients with biliary and pancreatic duct obstruction

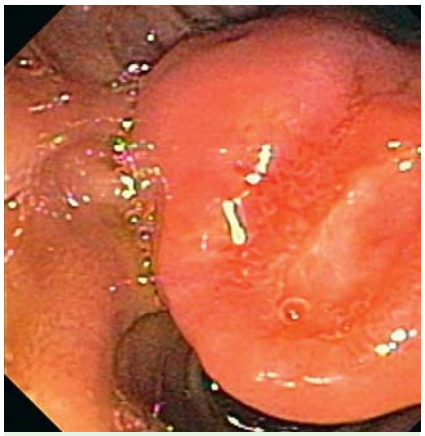

Fig. 1 Endoscopic view of a large ulcerated ampullary subepithelial lesion in case 1.

We present two cases of ampullary carcinoid tumors diagnosed and appropriately staged by EUS-FNA.

In case 1, a 46-year-old man presented with anemia and a 4.5-kg weight loss. Laboratory analysis showed: hemoglobin 11.2 mg/dL, total bilirubin 1.4 mg/dL, alkaline phosphatase 324 U/L, aspartate aminotransferase (AST) 221 U/L, and alanine aminotransferase (ALT) 205 U/L. Colonoscopy was unremarkable.

Upper endoscopy showed an enlarged and ulcerated ampulla (**Fig. 1**).

Mucosal biopsies showed non-specific inflammatory changes. Abdominal computed tomography (CT) disclosed dilation of the main pancreatic duct and the intrahepatic and extrahepatic biliary ducts. Endoscopic ultrasound (EUS) revealed a round hypoechoic 26-mm ampullary subepithelial mass, staged as T2N1Mx (**Fig. 2**).

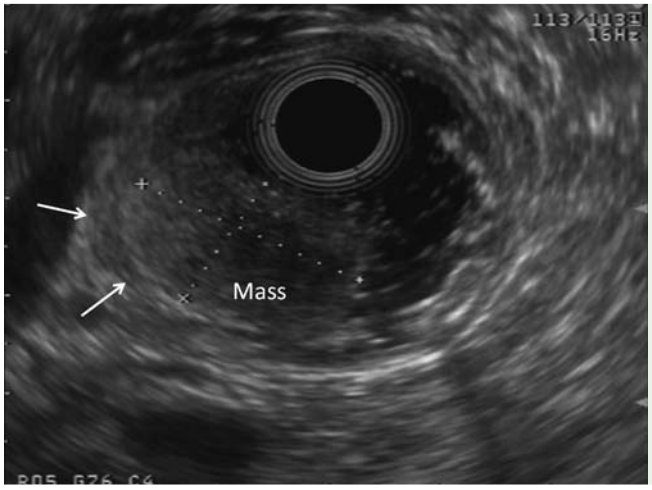

Fig. 2 Endoscopic ultrasound (EUS) view of the lesion in **Fig. 1**. The subepithelial lesion appears to invade the submucosal space, extending to but not invading the muscularis propria (arrows).

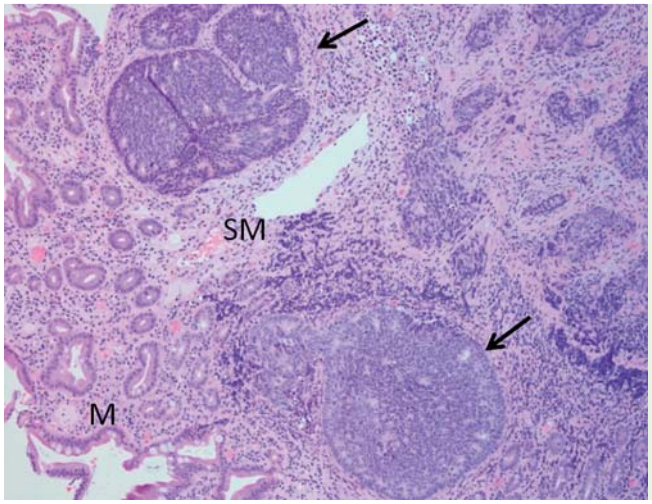

Fig. 3 Histological photomicrograph from the pancreaticoduodenectomy resection specimen in case 1, demonstrating a low grade neuroendocrine tumor forming nests and rosettes (arrows) in the submucosa (SM). The mucosa (M) appears intact (hematoxylin and eosin, × 100).

The pancreatic duct and bile duct were dilated up to 4 mm and 8 mm respectively. Fine needle aspiration (FNA) showed atypical cells with round, eccentric nuclei, suggestive of a low grade neuroendocrine tumor. Immunostains for synaptophysin and chromogranin A were positive.

The patient underwent pancreaticoduodenectomy. Surgical pathology confirmed a T2N1M0 carcinoid tumor (**Fig. 3**). Imaging and clinical follow-up at 6 months were unremarkable.

In case 2, a 53-year-old woman presented with painless jaundice and a 9-kg weight loss. Physical examination revealed scleral icterus and mild non-tender hepatomegaly. Laboratory analysis showed: total bilirubin 5.9 mg/dL, alkaline phosphatase 405 U/L, AST 96 U/L, and ALT 190 U/L.

Abdominal CT showed a dilated pancreatic duct and intrahepatic and extrahepatic biliary ducts. Endoscopy revealed an 18-mm ampullary subepithelial lesion, staged on EUS as T3N1Mx (**Fig. 4** and **Fig. 5**).

The pancreatic duct and common bile duct were dilated up to 5 mm and 13 mm

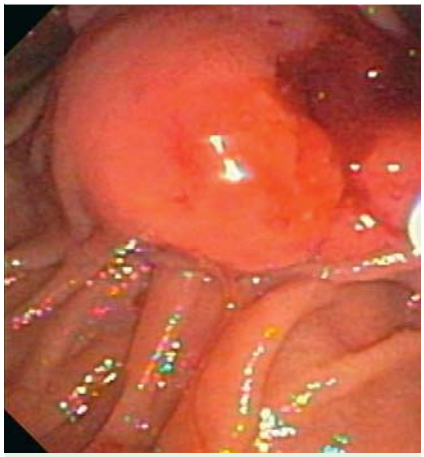

Fig. 4 Endoscopic view of a smooth, medium-size ampullary subepithelial lesion in case 2. The lesion was friable and demonstrated limited bleeding upon manipulation with a biopsy forceps.

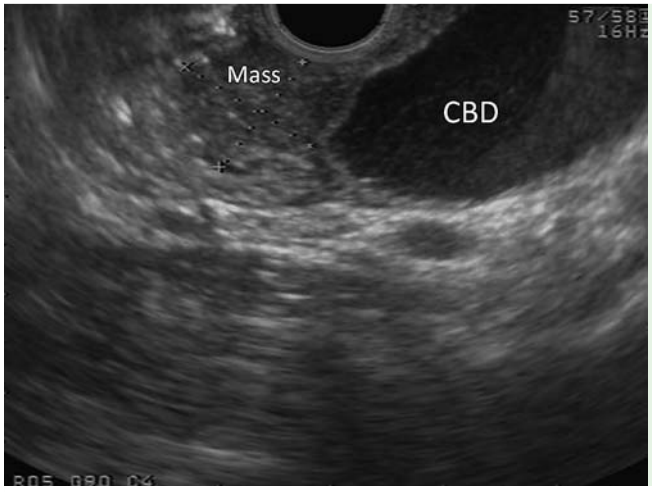

Fig. 5 Endoscopic ultrasound (EUS) view of the lesion in **Fig. 4**. The subepithelial lesion obstructs both the common bile duct (CBD) and pancreatic duct, and was staged as T3N1 on this examination.

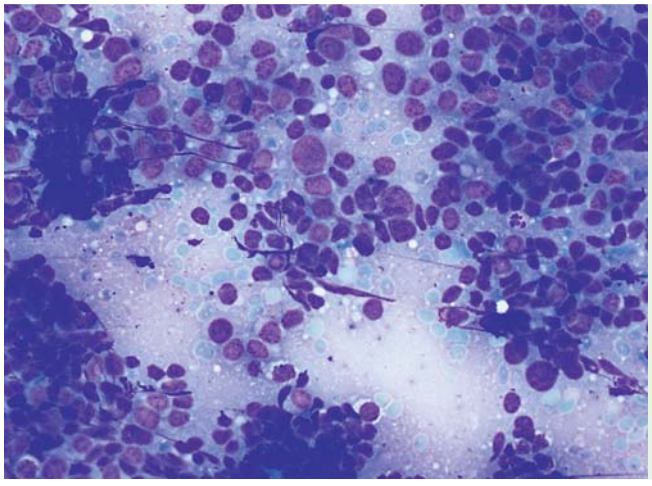

Fig. 6 Air-dried fine-needle aspirate specimen from the lesion in **Fig. 5**, demonstrating loosely cohesive cells with peripheral clumping of chromatin, and exhibiting a high degree of pleomorphism – all features of a high grade neuroendocrine tumor (Diff Quick stain, × 550).

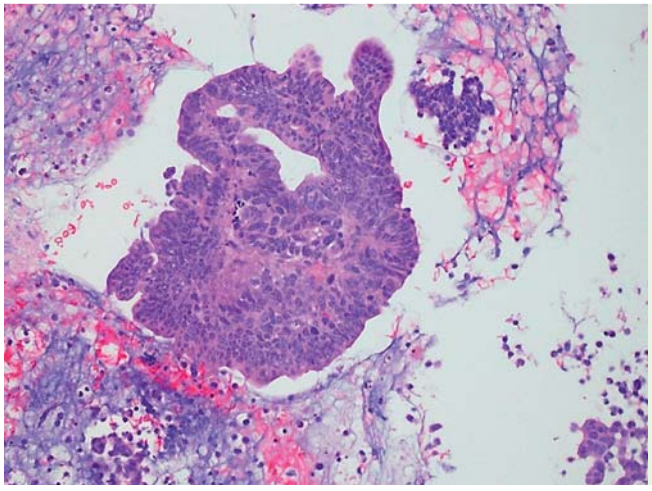

Fig. 7 Histological photomicrograph from pancreaticoduodenectomy resection specimen in case 2, demonstrating significant cell crowding and overlap with individual cellular features similar to those seen on the fine needle aspiration smears (**Fig. 6**) (hematoxylin and eosin, × 200).

respectively. FNA showed malignant pleomorphic cells with round, eccentric nuclei, suggestive of high grade neuroendocrine tumor (**Fig. 6**). Immunostains for cytokeratin, synaptophysin, and chromogranin A were positive.

The patient underwent pancreaticoduodenectomy. Histological examination confirmed a T3N1M0 high grade carcinoid tumor (**Fig. 7**). Imaging and clinical follow-up at 3 months were unremarkable.

Ampullary carcinoid tumors compromise 2% of ampullary malignancies and account for 0.3% of all gastrointestinal neuroendocrine tumors [1]. To date, approximately 100 cases of ampullary carcinoid tumor have been reported in worldwide literature [2]. Endoscopic diagnosis is usually limited by the subepithelial nature of the tumor. EUS-FNA provides accurate diagnosis and staging of ampullary malignancies in general [3]. In a series of 41 patients with ampullary tumors, the accuracy of EUS was found to be superior to that of CT and equivalent to that of magnetic resonance imaging (MRI) for T staging (EUS 73%, CT 26%, MRI 54%) and N staging (EUS 67%, CT 44%, MRI 77%) [4]. The role of EUS-FNA in the early diagnosis and staging of ampullary carcinoid tumors has been described only once before in the literature in English [5].

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Competing interests: None

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Bibliography
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