Analysis of cyst fluid obtained by endoscopic ultrasound-guided fine-needle aspiration supporting the diagnosis of a pancreatic neuroendocrine neoplasm

A 28-year-old man presented at the emergency ward for bronchopneumonia with hemoptysis. A computed tomography (CT) scan disclosed an incidental 18-mm-wide lesion in the pancreatic tail that appeared cystic with magnetic resonance imaging, with a thick wall and a solid projection, both contrast-enhanced. Serological tumor markers were in the normal range.

Endoscopic ultrasound (EUS) evaluation showed an oval, protruding mass with a mixed solid and cystic echo structure (**Fig. 1**).

Fine-needle aspiration (FNA) produced cystic fluid; two slides were smeared and one was stained with hematoxylin and eosin for rapid on-site evaluation. Part of the fluid was sent to the laboratory for tumor marker analysis, while the remainder was preserved in 95% ethanol for cell block preparation. The observation by the on-site cytopathologist of a small group of cells suspected of being a pancreatic endocrine neoplasm (PEN) (**Fig. 2**) prompted the request for analysis of chromogranin A in the cystic fluid.

Cell-block sections showed discohesive epithelial cells with a plasmocytoid appearance, regular nuclear membrane, and finely granular chromatin; immunocytochemistry (ICC) results (positivity for chromogranin A and synaptophysin) confirmed the endocrine differentiation. The proliferation index with Ki-67 was positive in < 1% of neoplastic cells (**Fig. 3**).

The final cytological diagnosis of a neuroendocrine tumor was supported by the cyst fluid analysis, showing high levels of chromogranin A (138 ng/mL, normal range 20 – 100 ng/mL), while amylase and carcinoembryonic antigen were low.

Pancreatic endocrine neoplasms are occasionally manifested as cystic lesions [1 – 4]. Differential diagnosis of pancreatic cystic neoplasms is significantly enhanced by cyst fluid analysis [5].

To our knowledge, this is the first report that demonstrates a high chromogranin A level in the fluid of a cystic pancreatic neuroendocrine tumor sampled during EUS-guided FNA. This can be a useful diagnostic tool confirming a preoperative diagnosis of PEN, especially in those cases where FNA gives little material for traditional cytological and ICC investigations.

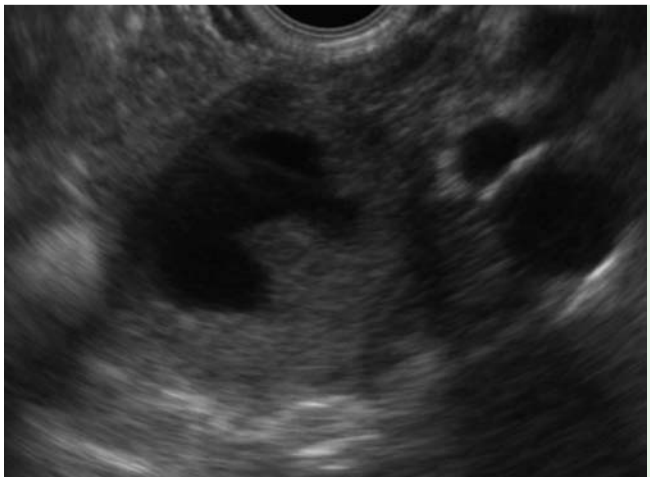

Fig. 1 Endoscopic ultrasound (EUS) image demonstrating the pancreatic lesion, which appeared oval with a thin and hypoechoic rim and a central, anechoic part; the lesion was 22 ×18 mm.

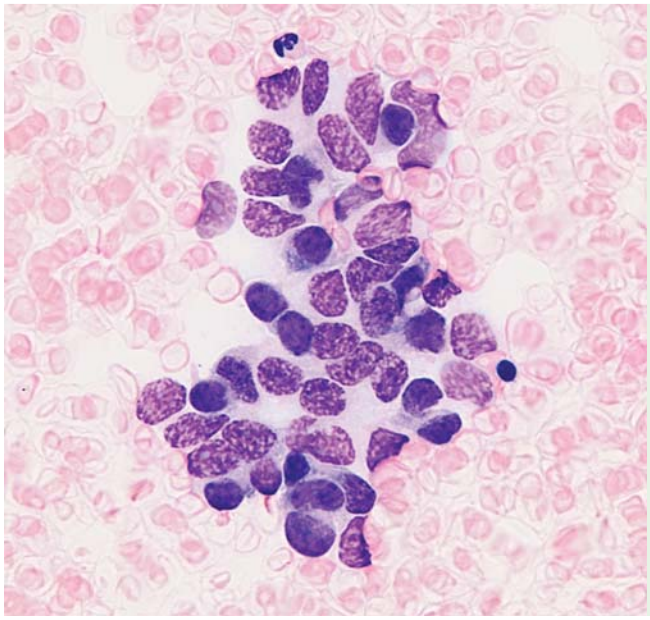

Fig. 2 A direct smear with Giemsa staining showed few epithelial cells with the cytomorphological features of neuroendocrine tumors: smooth, round nuclei, finely stippled chromatin, and delicate cytoplasm. These bland tumor cells seem to be arranged in rosette-like structures.

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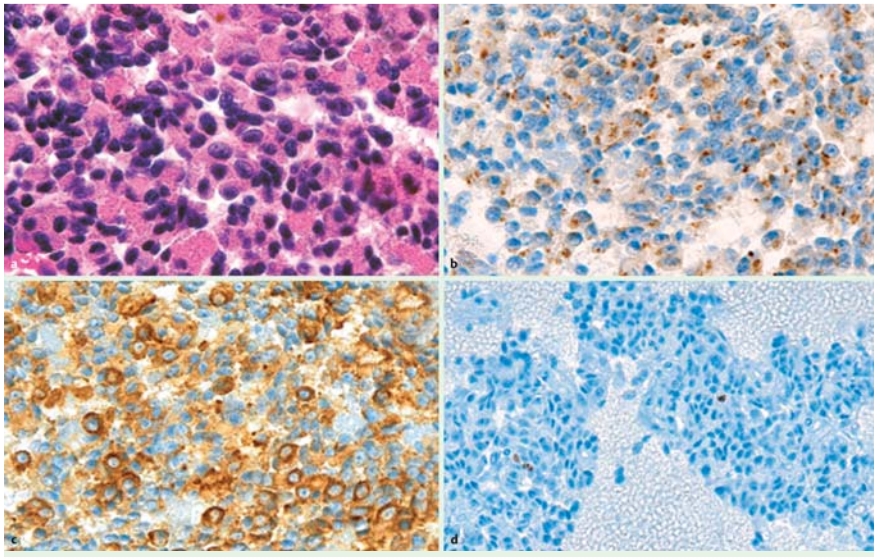

Fig. 3 Cell block preparation showing numerous cells with a plasmacytoid appearance, regular nuclear membrane, and finely granular chromatin pattern. **a** Hematoxylin and eosin stain. The neuroendocrine differentiation was confirmed by strongly positive immunostaining for **b** chromogranin A and **c** synaptophysin. **d** The proliferative index (Ki-67) was low (< 1 %).

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