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Ciliated pancreatic foregut cyst: MRI, EUS, and cytologic features

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ABSTRACT

Ciliated foregut cysts are extremely uncommon pancreatic cystic lesions, with—to the best of our knowledge—only five cases previously reported in the English literature. We report herein on a case of a ciliated foregut cyst of the pancreas connected with the duct of Wirsung. The magnetic resonance imaging, endoultrasonographic, and cytologic features are described and a brief review of literature is also presented.

1. Introduction

Duplication cysts are benign congenital malformations that can occur anywhere in the gastrointestinal tract but are extremely rare in the pancreas [1,2]. Foregut cysts are considered a subgroup of duplication cysts, derived from the tracheobronchial tree [3,4]. While they are common in the mediastinum and to a lesser extent in the liver, there are only few cases of pancreatic foregut cysts reported in literature. Their origin is related to sequestering of an outpouching of the primitive foregut within the pancreatic tissue during embryological development [4]. They generally present with various degrees of abdominal pain and recurrent pancreatitis or they can be discovered incidentally in asymptomatic patients [5].

We report on a case of an enteric duplication cyst of the pancreas lined with respiratory-type epithelium (ciliated foregut cyst) and connected with the duct of Wirsung. Its magnetic resonance imaging (MRI), endoultrasonographic (EUS), and cytologic features are illustrated and a review of literature is then presented.

2. Case report

A 51-year-old woman presented to our Pancreas Clinic for the evaluation of an incidentally discovered pancreatic lesion. The lesion was discovered when the patient underwent an abdominal computed tomography (CT) scan in the evaluation for neck lymphadenopathy. The patient had no symptoms related to the abdomen and had no history of pancreatic disease, alcohol abuse, or prior abdominal surgery. The lesion appeared hypodense and did not exhibit any significant enhancement. The CT scan was otherwise unremarkable.

Subsequently, the patient underwent a magnetic resonance cholangiopancreatography (MRCP) examination with intravenous administration of Gadobutrol (Gadavist, Bayer HealthCare Pharmaceuticals Inc., Leverkusen, Germany). Axial fast steady-state sequences, dual-echo T1-weighted in-phase and opposed-phase axial images, single-shot heavily T2-weighted MRCP sequences and 3D coronal MRCP, fast spin-echo T2-weighted images in axial and coronal plane, diffusion-weighted imaging (DWI) (*b* values of 0, 50, and 600) and 3D T1-weighted fat-suppressed gradient-echo axial sequences before and after contrast media administration during arterial, portal venous, and delayed phases were performed.

MRCP showed a 2-cm cystic lesion in the head of the pancreas with well-defined borders but no capsule, mildly hyperintense with evidence of layering debris on T2-weighted images, slightly hypointense on T1-weighted images, and hyperintense on trace diffusion-weighted images (DWI). No signal loss was noted on the fat-saturated images. The lesion demonstrated no enhancement on the postcontrast images. Communication with the pancreatic duct of Wirsung was noted but the main pancreatic duct was not dilated (Fig. 1). The common bile duct appeared normal in caliber and the remainder of the pancreas was normal. The lesion was thought to represent a side-branch intraductal papillary mucinous neoplasm (IPMN).

MRI features, however, were not typical for side-branch IPMN, as the lesion was only mildly hyperintense on T2-weighted images with evidence of layering debris. The patient was thus referred for an EUS and

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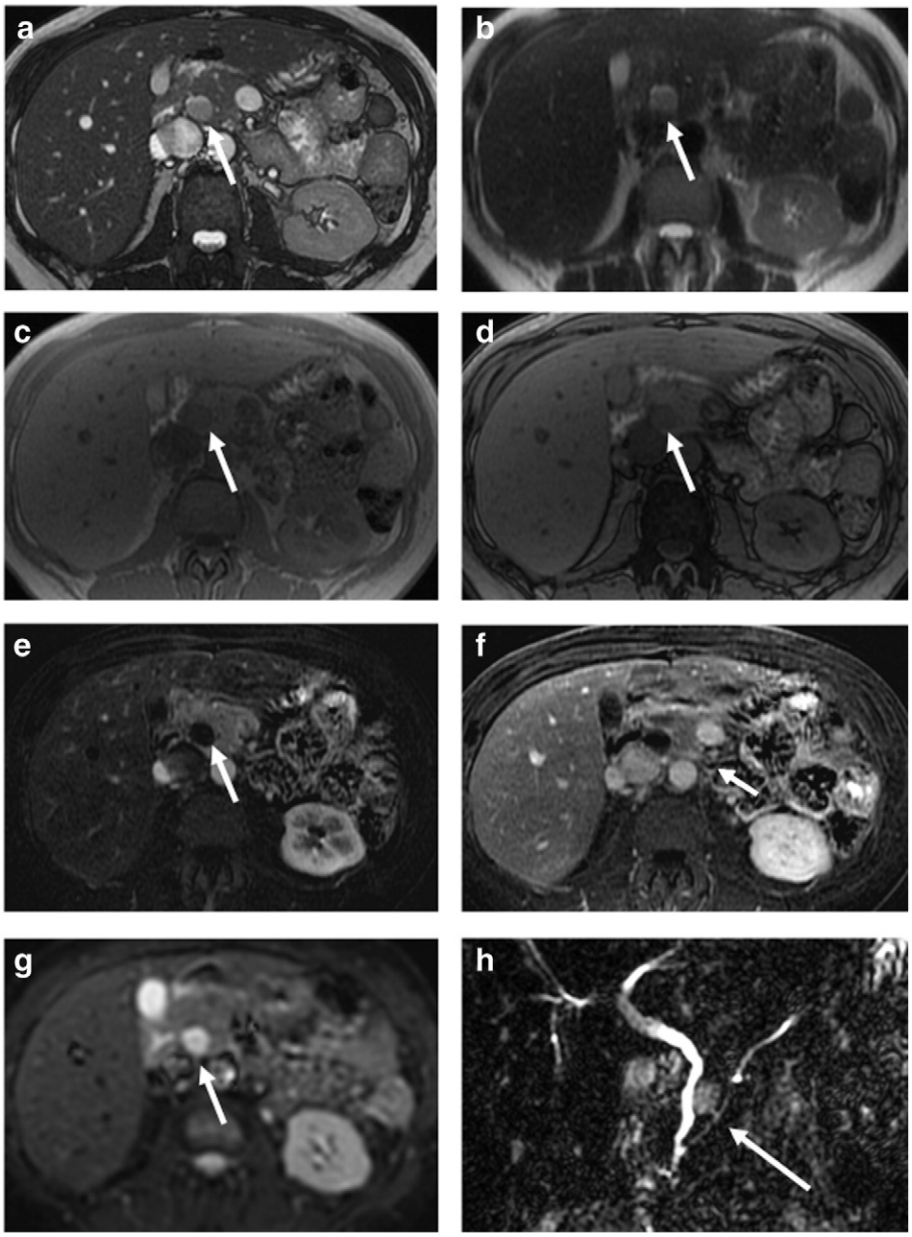

Fig. 1. Contrast-enhanced MRI/MRCP of the pancreas. (a) Axial fast steady-state image shows a well-defined, round lesion located in the head of the pancreas (white arrow). (b) Axial T2-weighted image shows a slightly hyperintense lesion with some layering debris. (c) Axial T1-weighted in phase image demonstrates a mildly hypointense lesion, without signal loss on opposed phase image (d). Axial contrast-enhanced subtracted T1-weighted images during arterial (e) and portal venous (f) phases show lack of enhancement of the lesion. (g) Axial high-*b*-value DWI trace image demonstrates hyperintensity of the lesion. (h) Coronal 3D MRCP shows communication of the lesion with the pancreatic duct of Wirsung (white arrow), which is normal in caliber.

a fine-needle aspiration (FNA) of the mass. The EUS was performed with a linear echoendoscope at 7.5 MHz frequency and showed a 2-cm well-defined oval mass in the head of the pancreas. The mass was hypoechoic and homogenous in echotexture. The borders of the mass appeared discrete and well-defined (Fig. 2). The mass was avascular at ultrasound Doppler evaluation.

An FNA was performed in the same session, demonstrating, on subsequent histopathological evaluation, cystic debris with detached ciliated tufts and sheets of ciliated columnar epithelium with goblet cells, consistent with a ciliated foregut cyst of the pancreas (Fig. 3).

3. Discussion

Foregut cysts, also known as enteric cysts or duplication cysts, are rare congenital malformations that may occur in the pancreatic head, body, or tail. These cysts are simple cysts featuring a bilayered smooth muscle wall and an epithelial lining [1,6,7]. During fetal development, the tracheobronchial tree, esophagus, gastrointestinal tract, pancreas, and liver arise from the primitive foregut, and foregut cysts may contain epithelium reflective of any of these foregut organs, such as cartilage or respiratory glands for bronchogenic cysts. A cyst lined with ciliated columnar epithelium is referred to as a ciliated foregut cyst, as in our case [4,8,9]. Foregut cysts may also be lined by gastric, intestinal, or squamous epithelium; the well-oriented bilayer of smooth muscle and lack of dermal adnexal structures histologically distinguishes these duplication cysts from mature cystic teratomas that may also occur in the pancreas [6].

To our knowledge, only five cases of true pancreatic foregut cysts are reported so far in English literature [4,9–12]. Patients presented with abdominal pain or history of pancreatitis in four cases, and in one