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Madhusudhan R. Sanaka
Thomas Jefferson University

Thomas E. Kowalski
Thomas Jefferson University

Corey Brotz
Thomas Jefferson University

Charles J. Yeo
Thomas Jefferson University

Peter McCue
Thomas Jefferson University
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Authors

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Introduction:

Serous cystadenomas (SC) of the pancreas are uncommon benign cystic neoplasms that were first differentiated from mucinous cystadenomas in 1978 by Compagno and Oertel (1-3). Serous cystadenomas characteristically have a spongy gross appearance and are composed of innumerable tiny cysts lined by flattened cuboidal or polygonal cells with clear to pale eosinophilic cytoplasm atop of thin fibrous septae. Since 1978, five unique SC subtypes have been identified (4-5). Here we report a case of a solid serous adenoma, a rare serous cystadenoma subtype.

Case report:

A 74 year-old man was incidentally found to have a pancreatic mass during an evaluation for renal colic. An abdominal CT scan revealed a 1.5 cm diameter, enhancing mass in the anterior aspect of the body of the pancreas (Figure 1). An endoscopic ultrasound demonstrated a 1.9 x 1.3 cm well circumscribed, hypoechoic mass (Figure 2). The pancreatic parenchyma appeared normal as did the adjacent vascular structures. There was no peripancreatic or celiac axis lymphadenopathy. Fine needle aspiration of the mass was performed, but the specimen was found to be inadequate for cytologic evaluation. Concern for malignancy prompted surgical consultation and plan for surgical resection. Intraoperatively, the mass was found to be encapsulated and was enucleated.

Due to the proximity of the resection cavity to the main pancreatic duct, the cavity was drained via a Roux-en-Y pancreaticojejunostomy. Gross pathology demonstrated a 1.6 x 1.3 cm well-demarcated solid mass (Figure 3). Microscopic study showed an encapsulated tumor composed of vague nodules with dense collagenous septa (Figure 4). The tumor cells had small round nuclei and clear or pale amorphophilic cytoplasm (Figure 5). There was no necrosis, cytologic atypia, or abnormal mitotic figures. Some tumor cells contained glycogen granules as demonstrated by periodic acid-Schiff (PAS) staining. Immunohistochemical staining revealed tumor cells positive for cytokeratin CAM 5.2 and negative for synaptophysin and chromogranin. The tumor was diagnosed as a solid serous adenoma of the pancreas. The patient recovered uneventfully and was discharged home on postoperative day 5. The patient was seen two month post-operatively and was fully recovered.

Discussion:

Solid serous adenoma of the pancreas is an extremely rare benign tumor of the pancreas. The tumor was first described in 1996 (1) as a solid pancreatic tumor composed of cells morphologically and histochemically indistinguishable from those of SC, and was therefore thought to represent a solid SC variant. The second report published in 2004, confirmed the existence of a solid pancreatic tumor with cells morphologically and immunohistochemically indistinguishable from those of SC and distinct from other known solid tumors of the pancreas, supporting solid serous adenoma as a SC subtype (2).

It is postulated that the cells of solid serous adenoma are SC cells that lack secretory capability and it is the secretion of serous fluid that imparts the cystic architecture to serous cystadenomas (1).

Solid serous adenomas are therefore well-circumscribed tumors formed by clear to pale polygonal to cuboidal cells arranged in nests, sheets, and trabeculae separated by thick fibrous bands. Although small acini with glandular spaces may be present, cystic spaces are absent. PAS and PAS-diastase stains show abundant cytoplasmic glycogen. Histologically, the differential diagnosis includes the rare primary clear-cell "sugar" tumor of the pancreas, clear cell carcinoma, clear cell islet cell tumor, and metastatic renal cell carcinoma (1). These other rare solid tumors of the pancreas are excluded on immunohistochemical bases. As such, solid serous adenomas are immunoreactive for CAM 5.2, epithelial membrane antigen, and neuron-specific enolase but negative for HMB-45, synaptophysin, chromogranin, insulin, glucagon pancreatic peptide, gastrin, somatostatin, vasoactive intestinal polypeptide, serotonin, bombesin, calcitonin, lipase 21, lipase 105, chymotrypsin, and trypsin.

Similar to other pancreatic incidentalomas, solid serous adenomas are usually asymptomatic and incidental findings on imaging studies performed for other reasons (6). The rarity of these tumors, the difficulty in achieving a definitive preoperative diagnosis, and the potential for malignancy invariably leads to the recommendation for surgical excision. Accordingly, our patient underwent surgery with enucleation of a well-encapsulated tumor and no evidence of residual or metastatic disease. He is asymptomatic after six months. In two of the previously reported cases, patients were well at 1 and 5 years post-operatively (1-2). Similarly, we expect our patient to continue to do well. In conclusion, solid serous adenoma is an extremely rare, benign pancreatic tumor with solid architecture but cytologic, histochemical, and immunohistochemical features identical to that of serous cystadenoma.

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Figures & Legends

Figure 1

Abdominal CT scan showing 1.5-cm hypervascular *arrow*) in the anterior aspect of the body of the pancreas

Figure 2

Endoscopic ultrasound showing 1.9-× 1.3-cm hypoechoic mass (*arrow*) in the body of the pancreas

Figure 3

Gross surgical specimen demonstrating a well-demarcated solid mass.

Figure 4

Low-power microscopy revealing an encapsulated tumor composed of nodules and dense collagenous septa (hematoxylin and eosin; original magnification, $\times 10$)

Figure 5

High-power microscopy showing bland appearing cuboidal cells with small round nuclei and pale eosinophilic cytoplasm (hematoxylin and eosin; original magnification, $\times 40$)