Undifferentiated Carcinoma With Osteoclast-like Giant Cells of the Pancreas Misdiagnosed as a Solid Pseudopapillary Tumor

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**Introduction:** Undifferentiated carcinoma of the pancreas with osteoclast-like giant cells (UCPOGC) is a rare, highly malignant neoplasm composed of multinucleated giant cells admixed with mononuclear stromal cells. We report a case of UCPOGC misdiagnosed as a solid pseudopapillary tumor of the pancreas (SPT) based on endoscopic ultrasound-guided fine needle aspiration biopsy (EUS-FNAB).

**Methods:** We retrospectively reviewed the medical records of a patient diagnosed for the UCPOGC.

**Results:** A 58-year-old male was admitted to the hospital with abdominal pain. Abdominal CT (Figure 1a) and T1-weighted MRI (Figure 1b) revealed a low attenuated and heterogeneous mass with internal hemorrhage and necrosis in the body of the pancreas measuring 5x5 cm. The laboratory investigations including CEA and CA19-9 were within normal limits. EUS showed a hypoechogenic mass with mixed cystic and solid components in the pancreas (Figure 2a) and FNAB showed vascular architectures with pseudopapillary pattern (Figure 2b). Immunohistochemical stain revealed that the tumor cells were positive for alpha-1-antitrypsin and vimentin. Osteoclast-like giant cells admixed with abundant osteoclastic giant cells (OGCs) (Figure 2d). The OGCs were positive for CD68 (Figure 2e). Unlike the FNAB findings, the atypical mononuclear cells were positive for cytokeratin (Figure 2f). We finally diagnosed as UCPOGC on histopathological examination of surgical specimens.

**Conclusion:** Undifferentiated carcinoma with osteoclast-like giant cells of the pancreas can be misconceived as a SPT on EUS and EUS-FNAB.

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**Impact of Preoperative Endoscopic Ultrasound in Patients Undergoing Surgery for Non-Cystic Lesions of the Pancreas**


**Introduction:** Endoscopic ultrasound (EUS) is a standard modality in characterization of pancreatic lesions, especially in those patients who may undergo surgical resection. Our aim is to evaluate the impact and accuracy of preoperative EUS in patients who underwent surgical resection of non-cystic lesions of the pancreas.

**Methods:** This was a single center retrospective study. Using CPT codes, patients with pancreatic lesions were identified over a 4 year period. ECD-9 codes were further utilized to determine which patients underwent EUS, surgery or both. Data analyzed included patient’s clinical history, imaging and laboratory analyses.

**Results:** The presence of any pancreatic diagnosis was identified in 6096 patients, of which 916 patients had only EUS and no surgical intervention. On the contrary, 174 patients had surgical intervention without preoperative EUS. 297 patients had palliative care consults for advanced malignancy with no further invasive work-up. Finally, 4923 patients had neither EUS nor surgical intervention. 96 patients that had both preoperative EUS followed by surgical resection were identified. Of these 96 patients, final surgical pathological diagnoses revealed 63 non-cystic lesions. Preoperative EUS diagnoses were correlated with final surgical pathological diagnosis to determine concordance. Patient demographics, time from EUS to surgery, lesion size, number of FNA passes, and CA19-9 levels were not statistically different between the groups (Table 1). Preoperative endoscopic work-up including EUS was accurate in 48/63 (76%) patients. The accuracy was improved to 53/63 (84%) patients when suspicious or atypical cytology was considered as a positive result. The most common diagnoses were adenocarcinoma 42/63 (67%), neuroendocrine tumors 9/63 (14%), and autoimmune pancreatitis 4/63 (6%). The accuracy for adenocarcinoma was 37/42 (88%) and for neuroendocrine tumors was 6/9 (67%). In the autoimmune group, malignancy was ruled out in 4/4 (100%) patients. In 11/63 (17%) patients in whom initial EUS-FNA was nondiagnostic, a repeat EUS-FNA resulted in a positive diagnosis in 7/11 (64%) patients. However in 4/11 (36%) patients repeat EUS-FNA remained non-diagnostic. Finally in 15/63 (24%) patients, preoperative EUS and final surgical pathology was discordant.

**Conclusion:** Based upon our data, EUS has an acceptable preoperative accuracy for non-cystic lesions in patients undergoing surgical resection. The most commonly identified pathology was adenocarcinoma for which endoscopic accuracy was 88%. Improvements in non-invasive imaging, identification of novel biomarkers, and refinements in EUS imaging, tissue acquisition and analysis are needed for better diagnosis of pancreatic lesions.