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Pancreatic Disorders and Therapy

Opinion Article

Epidemiology and Pathophysiology of Pancreatic Mucinous Cystadenoma

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DESCRIPTION

Mucinous Cystadenoma (MCN) is a pancreatic epithelial neoplasm that produces mucin and forms cysts. They account for nearly half of pancreatic cystic neoplasms, the Serous Cystadenoma (SCN) and Intraductal Papillary Mucinous Neoplasm (IPMN). MCNs and IPMNs share characteristics such as cyst formation, mucin production, and progression to invasive carcinoma. MCNs are most commonly found in the pancreas's body and tail region. MCNs are most commonly seen in females, and they usually present in a young woman with no prior history of pancreatitis or risk factors. Magnetic resonance imaging or contrast-enhanced computed tomography, supplemented by endoscopic ultrasound with cyst fluid aspiration. MCNs are premalignant neoplasms that are best treated surgically. A completely excised cyst with no signs of carcinoma is unlikely to recur and does not require regular monitoring.

Etiology

The exact cause of this neoplasm is unknown, but it has an immunophenotype similar to ovarian type stroma. The etiology could be female hormone stimulation of immature endodermal stroma or implantation of primary yolk cells in the pancreas. The KRAS gene (Ki-ras2 Kirsten rat sarcoma viral oncogene homolog) is the most common and early genetic alteration in MCN. Invasive or high-grade lesions have SMAD4 (Mothers against decapentaplegic homolog 4) and TP53 (tumor protein 53) mutations.

Epidemiology

MCNs are uncommonly compared to pseudocysts and pancreatic ductal adenocarcinoma, with few epidemiological studies available. MCNs apparently account upto 29% of pancreatic neoplastic cystic lesions. MCNs are mostly seen in women, and the average age of diagnosis is between 40 and 50 years (range 4 to 95 years). Almost all MCNs occur in women, and these lesions are uncommon in men. The majority of MCNs are found in the pancreas's body and tail region.

Pathophysiology

MCNs are well-encapsulated and typically have a range of up to 25 cm. The pancreatic ductal cell is the source. MCNs can range from benign to borderline and, in some cases, malignant lesions. They typically grow slowly. MCNs that lack malignant characteristics are considered premalignant. MCNs are mucin-producing cystic epithelial neoplasms with septations. When the cyst fluid is aspirated, it is typically thick and viscous. Columnar epithelium lines the cysts, which may occur in a single layer with papillary projections. In an MCN, the presence of ovarian stroma is the pathognomonic finding. Fine Needle Aspiration (FNA) cytology reveals honeycomb sheets with clusters of mucin-producing columnar cells rich in mucin. MCNs do not react with the pancreatic ductal system, which is the primary distinction between them and IPMNs.

History and imaging techniques

The use of both history and imaging techniques helps to improve the accuracy of the diagnosis. Because MCNs can occur along with any one of the following conditions: Abdominal pain, recurrent pancreatitis, gastric outlet obstruction, jaundice, or weight loss, hence detailed diagnostic information is required to rule out the pancreatitis. However, most cystic neoplasms are discovered accidentally while diagnosing for another disease. In rare cases, the examination may reveal a lump in the upper abdomen.

CONCLUSION

Pancreatic MCNs are mucin-producing cystic neoplasms that mostly affect women. They are mostly found in the body and tail of the pancreas and do not communicate with the duct system. A distinct subepithelial OTS is present in the tumour. Malignancy is uncommon in MCN, and its progression is slow. The prognosis for non-invasive MCNs is excellent. Based on limited follow-up studies, pathologically distinct patterns of invasion in MCNs-AIC may predict clinical outcome. Molecular genetic studies revealed that KRAS mutations occur early in tumorigenesis, whereas CDKN2A and TP53 mutations appear more frequently as dysplasia progresses. SMAD4 inactivation is a late event that occurs only in invasive carcinoma.

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