The Importance of Cyst Fluid Analysis for Differentiation of Pancreatic Cyst

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Abstract. Cystic abnormalities of the pancreas encompass a wide variety of lesions ranging from the non-malignant pseudo-cyst to neoplastic lesions. Although cystic neoplasms of the pancreas are rare, differentiation is important in determining the proper treatment.

A 55-year-old female presented with a cystic abdominal mass. Her computed tomography scan showed a cystic mass of $102 \times 99 \times 97$ mm which was well-circumscribed and homogeneous with few thin septations and mild contrast enhancement of the fibrous wall located in the body of the pancreas. Percutaneous diagnostic aspiration of the cyst fluid was performed under ultrasonic guidance for proper diagnosis and management, which revealed a CEA greater than 200 ng/ml (0-3) and amylase within normal limits 30U/L ($\leq 100$). High CEA and normal amylase values supported the diagnosis of mucinous cystadenoma rather than pseudo-cyst. With these findings, the patient underwent distal pancreatectomy with splenectomy. Pathological analysis revealed a mucinous cystadenoma of the pancreas.

This report is a confirmation that cyst fluid analysis can provide a pre-operative classification of these diagnostically difficult lesions.
variable thickness, the largest of which was 7 mm in diameter. Microscopic examination showed the cyst wall lined by non-ciliated mucous columnar cells, which were well demonstrated with alcian blue stain (ph 2.5) (Fig. 3).

With these findings the neoplasm was diagnosed as mucinous cystadenoma of the pancreas.

Discussion

Pseudo-cysts constitute the majority of cystic lesions of the pancreas. The clinical challenge is the differential diagnosis and management of cystic neoplasms from pseudo-cysts, which represent 10-15 percent of pancreatic neoplasms (5). Recognition of these tumours is clinically important in order to allow differential diagnosis between serous cyst adenomas, which are benign and can be safely observed, mucinous cystic neoplasms which have malignant potential and deserve surgical resection and pseudo-cysts which represents the majority of cystic lesions and require different management and rarely surgical resection.

The most common cystic mass of the pancreas encountered in clinical practice is a post-inflammatoty pseudo-cyst. Pancreatic pseudo-cysts are defined as localized amylase-rich fluid collections located within the pancreatic tissue or adjacent to the pancreas and surrounded by a fibrous wall that does not possess an epithelial lining. The CT findings of a pseudo-cyst include a round or oval fluid collection with a thin, barely perceptible wall or thick wall that shows evidence of contrast enhancement. They develop most often as a complication of acute or chronic pancreatitis and may develop secondary to pancreatic trauma or surgery. Since there are patients with pancreatitis who do not have abdominal pain or an increase in enzyme levels, pseudo-cysts should be considered in the differential diagnosis of unilocular cystic pancreatic lesions (6). Although a prior history of pancreatitis cannot by itself justify the diagnosis of pancreatic pseudo-cyst, careful evaluation of the patient’s clinical history is important for its accurate
diagnosis. Misdiagnosis of a cystic neoplasm as a pancreatic pseudo-cyst either delays appropriate resection or leads to the performance of an inappropriate procedure (7, 8). Since the patient mentioned above had no history of pancreatitis or abdominal trauma and the cyst was detected incidentally, neoplastic cystic mass instead of pseudo-cyst was our first diagnosis but for definitive surgical therapy we need further evaluation for accurate diagnosis.

Serous cystadenoma is also referred to as microcystic cystadenoma. Typical serous cystadenomas are composed of multiple cysts varying in size from 0.2 to 2.0 cm, the size of the tumour’s greatest dimension ranging from 1.4 to 27 cm. A central stellate scar with calcification, which is known to be characteristic for serous cystadenoma, may be observed in 30 percent of the serous cystadenoma cases. Macrocystic or oligocystic serous cystadenoma is a variant of serous cystadenoma that is very difficult to differentiate from mucinous cystadenoma. Location in the pancreatic head, lobulated contour, and lack of wall enhancement has been reported to be specific for macrocystic serous cystadenoma in comparison with mucinous cystic tumour. Lobulated contours have been reported to be a specific finding in comparison with pseudo-cyst (9).

We can easily differentiate serous cystadenoma in our case because it did not show any central scar, microcystic structure or lobulated contour. The cyst showed wall enhancement and was localized at the body of the pancreas, unlike serous cystadenoma.

Mucinous cystic neoplasms may be unilocular or multilocular and are frequently localized at the body and tail of the pancreas. The tumours are round to oval with a smooth external surface and commonly detected only after achieving a large size. Multiple enhancing septations and peripheral calcification, which can be seen in 10%-25% of cases, is an important characteristic for mucinous cystic neoplasm and can be used to differentiate them from serous cystadenomas, which are known to have central calcification.

Intraductal papillary mucinous tumour (IPMT) is characterized by cystic dilatation of a main or a side branch duct that contains thick mucoid secretions. Patients present with non-specific abdominal symptoms and sometimes hyperamylasemia. IPMTs typically occur in elderly patients and are more common in men. The side branch duct type is the most commonly mistaken for mucinous cystic tumour or pseudo-cyst. The typical location of side branch duct type IPMN is at the uncinate process and typical appearance is grapelike locular, differentiating it from it from other pancreatic cysts.

The CT findings of the cyst in our case are very similar to the mucinous cystadenoma. There was a thin delicate capsule with thin septations and it was localized at the body of the pancreas. With these characteristics it was well differentiated from IPMT and showed some similarities with a pseudo-cyst. Although it was detected incidentally and the patient was asymptomatic we needed further evaluation for proper diagnosis and management.

Since clinical and radiological indices are often inadequate to discriminate reliably among these possibilities, cyst fluid analysis can provide a pre-operative classification of these diagnostically difficult lesions (10). Carcino-embryonic antigen (CEA) levels are high in all benign and malignant mucinous cysts but are low in pseudo-cysts and serous cystadenomas. Amylase level is high in pseudo-cysts and low in cystic neoplasms (4, 10). In our case the amylase level was low and the CEA level was high. With this analysis we were able to differentiate mucinous cystadenoma from pseudo-cyst and serous cystadenoma. Evaluating the nature of the cyst together with the radiological, clinical and cyst fluid analysis, we concluded that this cyst was a mucinous cystadenoma and distal pancreatectomy was performed. The pathological examination revealed a mucinous cystadenoma which supported our pre-operative diagnosis.

Conclusion

Clinical and radiological indices are often inadequate to discriminate pancreatic cysts. Cyst fluid analysis can provide a pre-operative classification of these diagnostically difficult lesions. This report is a confirmation of the use of pre-operative cyst fluid analysis in the differential diagnosis of cystic pancreatic mass, which presents a diagnostic challenge.

References

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