Cystic masses of the pancreas: how useful is cyst fluid analysis in the diagnosis ?

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Background and Aims:
Evaluation of the cystic masses of the pancreas is a challenge in the routine daily practice. The differential diagnosis between cystic tumors (serous cystadenoma,mucinous cystadenoma,mucinous cystadenocarcinoma and IPMN) , pseudocysts and cystic masses in solid pancreatic tumors. Pancreatic cyst fluid analysis seems to have an added value in the differential diagnosis, but the utility in the daily practice is questioned due to varying accuracy reports and differences in laboratory kits used for analysis. The objective of this study was to investigate the accuracy and value of cyst fluid analysis in the differentiation of benign from (pre-)malignant masses of the pancreas in our center.
Methods:
A prospectively maintained registery of patients who underwent EUS FNA with cyst fluid aspiration and analysis between 2007 and 2010 in our center was reviewed. Data collected included clinical history with imaging, FNA cytology and definitive pathology if available. CEA,amylase,lipase and CA19.9 in the cyst fluid was determined, if enough fluid could be aspirated(> 1ml in our laboratory). CEA<5 ng/ml was considered a serous cystadenoma,CEA>192 ng/ml was considered a premalignant or malignant cystic lesion. Amylase>5000 U/L with low CEA was diagnostic for a pseudocyst.
Results:
We performed a total of 60 EUS FNA with cystic fluid analysis in 54 patients. There were an equal number of male and female patients with a mean age of 61,2 yrs. Mean cyst diameter was 3,5 cm(range: 0.9 cm-9 cm).
In 20 patients we had a definitive pathological diagnosis:
- benign pathology : serous cystadenoma(SCA) (2 pat), pseudocyst(4 pat), a vascular lesion(1pat)
- potential malign : mucinous cystadenoma(MCA) (1 pat), intraductal papillary mucinous neoplasia(IPMN) (1 pat)
- malign pathology : adenocarcinoma (9 patients) neuroendocrine tumour(NET) (2pat),
Cytology results were non-contributive in 6/20 patients(30 %). Cytology results were non-contributive in 6/20 patients(30 %). In the remaining 14 cases, the cytology was false positive for a mucinous cyst(MCA and IPMN) in 3 patients but predicted the correct diagnosis in 9 patients (sens: 90% , spec: 25%, accuracy: 71%).
Cyst fluid analysis predicted benign pathology in 6/7 patients and non-benign pathology in 11/13 patients(sens: 84%, spec: 85%,accuracy: 85%) .
Pseudocyst was correctly diagnosed in all 4 patients
In patients with cystic neoplasms(SCA,MCA and IPMN) the cyst fluid analysis could differentiate mucinous from non-mucinous lesions in 3/4 patients.
In patients with cystic malignant lesions(adenocarcinoma and NET) we found high CEA levels with a mean of 3472 ng/ml (range: 446-10652). 7/11 patients had a CEA> 1000 ng/ml. 2/11 patients in this group had a normal CEA.
In 15 additional patients without a definitive surgical pathology cystic pancreatic lesion could be considered as a pseudocyst due to a typical clinical presentation, imaging results and follow up. In 17/19 pseudocysts(4 operated and 15 typical cases), the cyst fluid analysis confirmed the diagnosis.

Three major side effects were reported: infection of the pseudocyst in 1 patient, bacteriemia with fever in 1 patient and 1 case of bleeding at the punction site. All 3 patients did well with conservative therapy.

Conclusion:

Cyst fluid analysis helps to differentiate benign(pseudocyst,serous cystadenoma) from non-benign pancreatic masses(mucinous cystadenoma, IPMN,cystic adenocarcinoma and cystic neuroendocrine tumors) in our center.

Results of cyst fluid analysis are very accurate in differentiating pseudocysts from other cystic pancreatic lesions. In possible malignant cysts, a high CEA value in the cyst fluid can be helpful in the diagnosis if cytology and imaging are inconclusive.