CASE SERIES

Cytomorphological Evaluation of Solid Pseudopapillary Neoplasm of the Pancreas: A Lesser Explored Entity

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Abstract:

Solid pseudopapillary neoplasm is an unusual neoplasm of the pancreas with uncertain to low malignant potential. It accounts for 1% of pancreatic neoplasms and 3% of cystic lesions, harbouring better prognosis than other neoplasms of the pancreas having close differential diagnosis. Patients are commonly young women presenting with abdominal discomfort. Aim was to study the cytomorphological features of solid pseudopapillary neoplasm of pancreas diagnosed on Fine Needle Aspiration Cytology (FNAC) and its cyto-histological correlation. Cytology smears of five solid pseudopapillary neoplasms reported over the last five years were retrieved from the archives of pathology. The smears were evaluated for cytomorphological features and correlated with histopathology. All five cases had characteristic features on cytology such as pseudorossettes, cells having fine chromatin, indented nucleus and vacuolated cytoplasm. Histopathological correlation was available in all cases out of which four had features consistent with solid pseudopapillary neoplasm. However, one case was diagnosed as acinarcell carcinoma which was confirmed by immuno-histochemistry. The cytomorphology on FNAC plays a pivotal role in the management of the patient. Surgical resection of the neoplasm can be done with retention of the uninvolved pancreas to avoid subsequent complications.

Keywords: Cytology, Neoplasm, Pseudopapillary, Pancreas

Introduction:

Solid Pseudopapillary Neoplasm (SPN) is an unusual neoplasm of the pancreas with uncertain to low malignant potential. It accounts for 1-2% of the nonendocrine tumours of the pancreas [1]. Patients are most commonly young women presenting with abdominal discomfort [2]. The differential diagnosis can range from benign pancreatic lesions, to benign lesions with cystic change to malignant pancreatic tumours [3]. Hence, it is crucial to make an accurate diagnosis. Solid pseudopapillary tumour of pancreas have a distinctive morphology on fine needle aspiration cytology and are usually curative with adequate surgery. Therefore, early diagnosis on cytology plays a vital role in the diagnosis, treatment and prognosis of the patient [4]. The aim of this study was to understand the cytomorphological features of solid pseudopapillary neoplasm of pancreas diagnosed on Fine Needle Aspiration Cytology (FNAC) and its confirmation with histopathology.

Case Series:

A retrospective study was conducted in the Department of Pathology of a tertiary hospital over a period of five years. Cytology smears of solid pseudopapillary neoplasm reported over the last five years were retrieved from the archives of pathology. All FNAC smears were image-guided, had been fixed with 95% alcohol and stained with

Papanicolaou stain. The smears were evaluated for cytomorphological features like cellularity, cell type, nuclear details and background. The diagnosis was then confirmed with histopathology. In this study, all the patients were females and were in the third to fourth decade of their life. The most common presenting symptom was abdominal mass followed by abdominal discomfort and pain. The ultrasonography showed well demarcated mixed echogenic lesions in four cases, while one showed predominantly solid areas. The tumour was localised to the tail of pancreas in three cases, body and tail region in one case and in the head and body of pancreas in the other case.

All five cases had characteristic features on cytology such as papillary pattern, pseudo-rossettes and singly scattered cells as illustrated in Table 1. The papillae showed delicate fibro-vascular core surrounded by tumour cells. The cells were round to oval having fine chromatin (Figs. 1, 2). Two out of the five cases showed indented/grooved nucleus, small nucleoli and vacuolated cytoplasm. Background showed hemorrhage, foamy histocytes and giant cells.

Histopathological correlation was available in all cases out of which four had features consistent with solid pseudopapillary neoplasm. However, one case was diagnosed as having acinar cell carcinoma (85%) with well differentiated neuroendocrine tumour (15%) on histopathology which was confirmed by immunohistochemistry. In this case the acinar cells were positive for cytokeratin and negative for synaptophysin. The neuroendocrine tumour cells were positive for cytokeratin and synaptophysin. On reviewing cytology slides in this case the other features observed were the acinar pattern of cells and cells with abundant cytoplasm (Figs. 3, 4).

Table 1: Cytomorphological Features of SPN

Case	Cellularity	Papillae	Pseudo-rosettes	Discrete cells	Nuclear grooves	Acinar pattern	Background	Histopathological diagnosis
1	Moderately cellular	+	+	+	+	-	Foamy cells	SPN
2	Moderately cellular	+	+	+	+	-	Foamy cells, few foreign body giant cells	SPN
3	Moderately cellular	+	+	+	-	-	Hemorrhage	SPN
4	Moderately cellular	+	+	+	-	-	Hemorrhage	SPN
5	Hyper-cellular	+	+	+	-	+	Hemorrhage	Acinar cell carcinoma with well differentiated neuroendocrine tumour

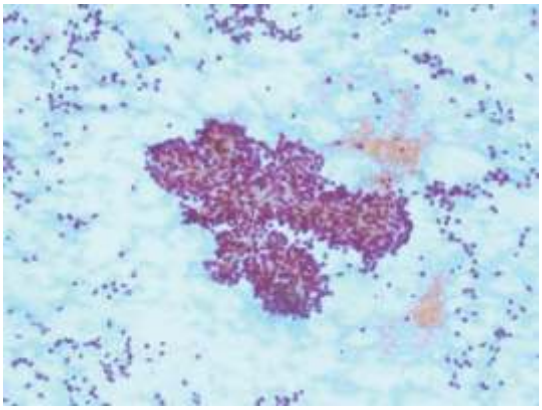

Fig. 1: Cellular Smear showing Cells Arranged in Papillary Pattern (Pap stain, 100x)

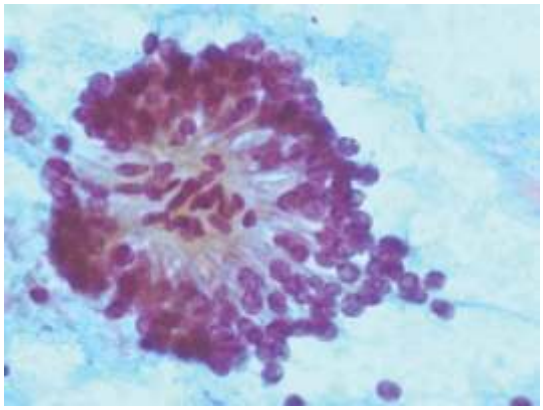

Fig. 2: Pseudorossette Arrangement of Cells. Cells are Round to Oval with Fine Chromatin (Pap stain, 400x)

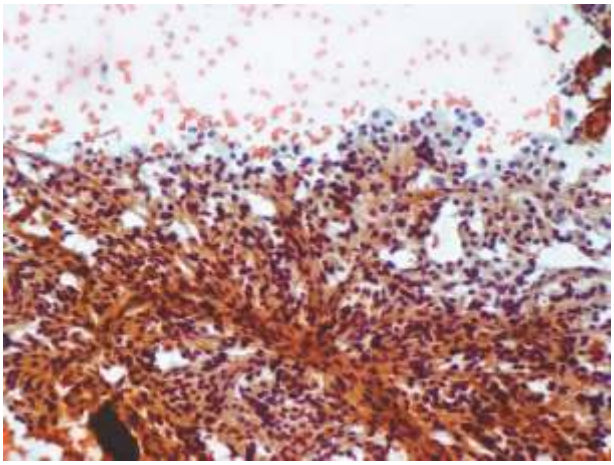

Fig. 3: Cellular Smear with Cells arranged in Papillary Pattern (Pap stain, 100x)

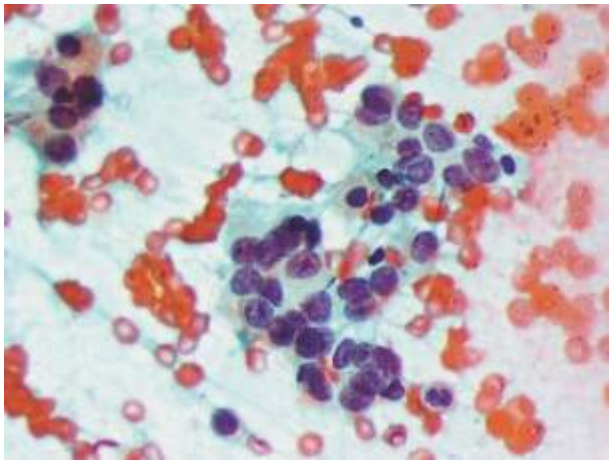

Fig. 4: Cells are arranged in Acinar Pattern. Cells have Abundant Cytoplasm (Pap stain, 400x)

Discussion:

Cytology smears from pancreatic lesions are less commonly encountered as compared to smears from other organs. This contributes to increased difficulty and errors in diagnosis. It is important to be familiar with the morphology of all the lesions in the pancreas both on cytology and histo-pathology in order to establish an accurate diagnosis. Increased knowledge about the morphology of these lesions is always beneficial.

Solid pseudopapillary tumour of the pancreas was first described by Dr. Frantz in 1959, hence it is also called as Frantz tumour [5]. The cell of origin is believed to be the uncommitted epithelial cell which can exhibit either exocrine or endocrine differentiation or both [6]. This entity should be kept it mind when an adolescent girl or young woman presents with an abdominal mass. Since the patient can be managed by adequate surgery it

is important to be aware of the characteristic cytological features to enable an early diagnosis [7].

The cytomorphological features in this study were similar to that observed in other studies [2,4]. The smears are generally cellular. The cells are seen in papillary pattern, pseudorossettes and scattered singly. The same pattern was observed in all the cases. The cells are round to oval with preserved cytoplasm and bland chromatin. Some studies have observed the presence of mitotic figures which was absent in our study. According to one of the studies nuclear grooving is the most important finding [8]. However, we observed this finding in only two cases.

On reviewing the cytology slides in the case which showed discrepancy, the following distinguishing features were observed. The cells were arranged in acinar pattern, cells showed abundant cytoplasm and prominent nucleoli in few. On cytology, the cellularity of the smears, the pattern of arrangement of cells and the morphology of the cells should be carefully assessed. These subtle features can provide important clues and help in accurate diagnosis. Acinar cell carcinoma is an important differential diagnosis for solid pseudopapillary tumour of pancreas. It is important to be able to distinguish between the two on cytological examination since acinar cell carcinoma requires more radical surgery whereas solid pseudopapillary tumour of the pancreas can be managed more conservatively. A careful search for the acinar pattern and assessment of the cytoplasm should be done in order to rule out a diagnosis of acinar cell carcinoma. In ambiguous cases a differential diagnosis of acinar cell carcinoma should be suggested so that the operating surgeon can decide on the management of the patient.

SPN should be differentiated from other cystic lesions of pancreas like pseudocyst which is most common followed by serous cystadenoma, intraductal papillary mucinous neoplasm and rarely from ductal adenocarcinoma and islet cell tumour. Hence, a brief knowledge of these entities is essential. All these lesions show female predominance while ductal adenocarcinoma shows male predominance and islet cell tumour shows no sex predilection. Smears from pseudocyst of pancreas is sparsely cellular showing predominantly inflammatory cells and macrophages, occasional columnar and metaplastic squamous cells. Serous cystadenoma occurs commonly in the elderly and yields a watery aspirate with sparse cellularity showing monolayered sheets and only occasional presence of papillary fragments. Mucinous neoplasm of pancreas is common in the third to sixth decades and yields a thick and mucoidaspirate showing abundant extracellular mucin with tumour cells which are columnar and having a bland nuclear morphology in most cases unless it is malignant, in that case, features of pleomorphism are seen. Ductal adenocarcinoma is common in the elderly and shows cells arranged in three dimensional clusters, microglandular pattern and occasional papillary pattern. Islet cell tumour of pancreas is common in the adults and cytological smears show dispersed cells, loosely cohesive clusters and pseudorossettes with cell nuclei showing speckled nuclear chromatin, prominent nucleoli and granular cytoplasm [9]. It is important to diagnose SPN accurately and differentiate this entity from all its differentials as it has an excellent prognosis with good long term survival following surgical treatment. Since SPN is a vascular tumour, timely management can avoid complications like hemoperitoneum and intraoperative hemorrhage.

Conclusion:

The diagnosis of solid pseudopapillary tumour of pancreas requires high index of suspicion. Early diagnosis on cytology is pivotal in the management of the patient, hence it is necessary to identify the subtle clues. The presence of acinar pattern of cells and presence of cells having abundant cytoplasm necessitates careful examination. Surgical resection of the neoplasm can be done with retention of the uninvolved pancreas to avoid subsequent complications.

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