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RESEARCH ARTICLE

APPLICATION OF ENDOSCOPIC ULTRASOUND GUIDED FNAC(EUS-FNAC) IN DIAGNOSING PANCREATIC MASS LESIONS

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Abstract

Introduction: Endoscopic ultrasound-guided fine-needle aspiration (EUS-FNAC) has become an important modality for identification of pancreatic masses. It is a minimally invasive procedure that provides excellent cell yield even in deep seated lesions. The preoperative diagnosis of pancreatic mass by EUS-FNAC can help the surgeons in early detection and confirmation of neoplasm as pancreatic mass lesions are highly concerning for pancreatic carcinoma. This study was aimed at application of EUS-FNAC in diagnosing pancreatic mass lesions.

Methods: A study was conducted for 20 cases who underwent EUS guided FNAC for pancreatic mass lesions. EUS-FNAC was performed by using a curvilinear array echo endoscope. The technique was carried out by a skilled endoscopist, and the glass slides were used to make smears from fluid that was aspirated containing corpuscular fractions. The slides were air dried before being examined cytopathologically.

Results: Out of 20 cases,10 were of pancreatic Ductal adenocarcinoma, 3 of Neuroendocrine tumor of pancreas, 2 of Acinar cell carcinoma, 1 of Solid pseudopapillary tumor, 2 of Serous cystadenoma and 2 of Mucinous cystadenoma. This was confirmed later, on further Immunocytochemical stains.

Conclusions: Out of 20 cases, 16 were malignant and 4 were benign. EUS-FNAC can help in early diagnosis and can improve the patient outcome. It is safe, cost-effective and reliable. It not only gives precise cytological diagnosis, but it also allows for the exact site of tiny lesions.

Introduction:-

Malignant conditions of pancreas are known for having a bad prognosis because it has 5-year survival rate. Tumor detection is generally delayed, advanced stage usually shows clinical presentation, and aggressive disease behaviour is observed. When discovered, surgically resectable tumors are only 20% of them while the rest 80% of patients are unable to avoid receiving palliative care, which is the sole treatment option for those with an unresectable malignancy. Furthermore, pancreatic cancer responds poorly to chemotherapy and radiation therapy, complicating

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patient management. As a result, early detection iscritical for increasing pancreatic cancer patients' survival rates and improving overall patient care. Early identificationlis difficult since malignant conditions of pancreas is frequently asymptomatic during the early stages and less accessible anatomically due to neighbouring organs that are situated in the retroperitoneum. Imaging methods such as abdominal USG, CT, MRI, ERCP, EUS, and PET have been employed to overcome these limitations.

EUS is now frequently used for the identification of pancreatic mass lesions. This technique allows for exact viewing of the lesion as well as its ability to accurately estimate the depth of lesion(2). EUS-FNAC has improved diagnostic capabilities by combining thebenefits of EUSwith fine-needle aspiration cytology (FNAC) for sample retrieval for pathologic diagnosis. EUS-FNAC outperformsother modalities because it distinguishes malignant pancreatic lesions from chronic pancreatitis, helps in staging of cancer and detecttumors smaller than 2 cm. EUS-FNAC has been the most widely used procedure for obtaining cytology sample and diagnosingpatients who are suspected of having pancreatic cancer. EUS-FNAC has been demonstrated to be beneficial diagnostically,avoiding unnecessary treatments and lowering expenses(1). It is non-invasive along with being relatively safe. (EUS-FNAC) isa technique for obtaining cells for preoperative diagnostic reasons that has acquired widespread popularity. It is especially useful forlocating tiny pancreatic mass lesions that can be missed by computed tomography(3). This is important clinically since the majority ofpancreatic mass lesions are aggressive that would benefit from early detection, diagnosis, as well as surgical management(3). Thecapacity to consistently establish or exclude malignancy is used to make therapeutic decisions in whom there is a localized pancreaticlesion. If a malignant tumour is suspected, focal pancreatic lesions are treated with partial pancreatoduodenectomy or extended distalpancreatectomy, depending on their location(5).A reliable preoperative tissue diagnosis can be quite useful in developing a therapyplan(4). This study was aimed to ascertain the application of Endoscopic Ultrasound Guided FNAC(EUS-FNAC) in diagnosingpancreatic lesions and to identify the efficacy of prompt preoperative diagnosis of pancreatic neoplasms so clinicians can plantherapeutic treatment based on the diagnosis.

Materials And Methods:-

Case selection

Data were collected from 20 patients who had underwent EUS -FNAC over a three-month period (October 2022 to December 2022). Only patients who underwent EUS-FNAC were included in this study. Out of 20 patients, almost all of them presented to the hospital with symptoms of abdominal pain.

EUS-FNAC was performed by using a curvilinear array echo endoscope. The technique was carried out by a skilled endoscopist, and the glass slides were used to make smears from fluid that was aspirated containing corpuscular fractions. The slides were air dried before being examined cytopathologically.

Cytologic diagnosis

Pathologists at D.Y. Patil Hospital made the diagnoses. Sufficient samples were then divided into two categories: benign lesions and malignant neoplasms.

Results:-

Patient characteristics

Table 1 contains information about patient's sex, age, cytology diagnosis, and aspiration site.

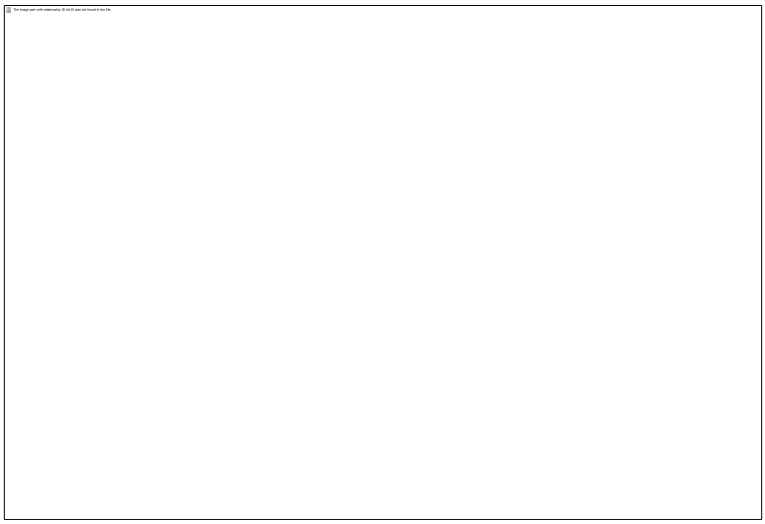
The male to female ratio among the 20 patients who had EUS-FNAC was 0.53, with 7 males and 13 females. The patients' median age was 69 years, ranging from 38 to 82 years. The cytologic findings included 16 cases (80%) of‘malignant neoplasm’, and 4 cases (20%) of ‘benign lesion’, (Table 2). Ten cases of ductal adenocarcinoma were diagnosed as cytologically malignant neoplasm, 2 cases of Acinar cell carcinoma, 3 cases of neuroendocrine neoplasm and 1 case of Solid pseudopapillary tumor, (Table 1). Specific diagnoses of cytologically 'benign lesion' included 2 cases of Serous cystadenoma and 2 cases of Mucinous cystadenoma (Table 1). The diagnosis was confirmed after doing specific immunocytochemical stains.

Table 1:-

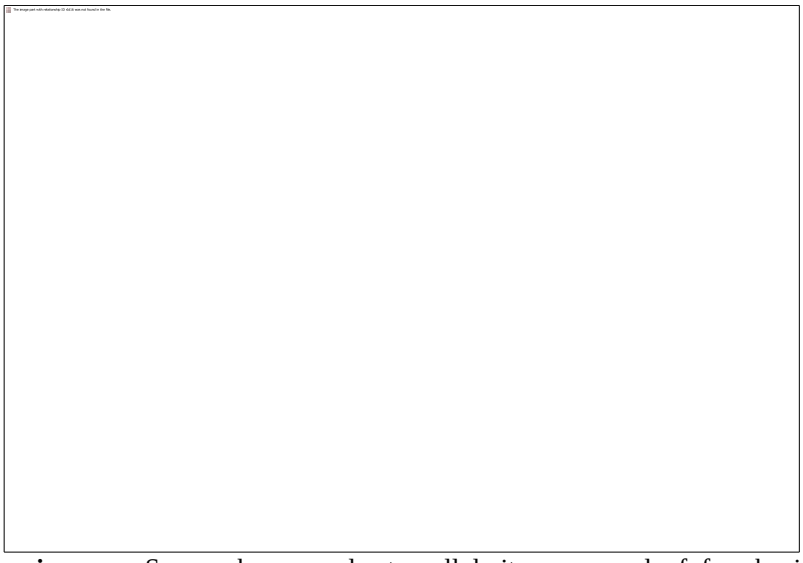
Cases	Gender	Age	Site	Cytological Diagnosis
1	M	61	Neck	Ductal adenocarcinoma
2	M	57	Tail	Ductal adenocarcinoma
3	F	70	Body	Ductal adenocarcinoma
4	M	58	Neck	Ductal adenocarcinoma
5	F	82	Tail	Ductal adenocarcinoma
6	F	71	Neck	Ductal adenocarcinoma
7	M	69	Uncinate	Ductal adenocarcinoma
8	F	53	Head	Ductal adenocarcinoma
9	F	38	Tail	Ductal adenocarcinoma
10	M	58	Body	Ductal adenocarcinoma
11	F	60	Neck	Neuroendocrine tumor
12	M	50	Tail	Neuroendocrine tumor
13	F	75	Body	Neuroendocrine tumor
14	M	75	Body	Acinar cell carcinoma
15	F	77	Neck	Acinar cell carcinoma
16	M	65	Body	Solid Pseudopapillary tumor
17	F	76	Head	Serous cystadenoma
18	F	69	Body	Serous cystadenoma
19	F	76	Tail	Mucinous cystadenoma
20	F	70	Uncinate	Mucinous cystadenoma

Table 2:-

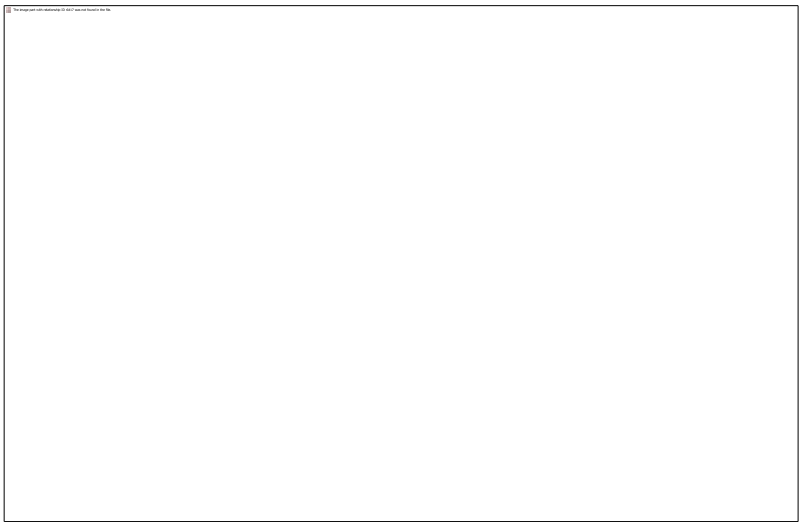
Sr. No.	Category	No. of Case	P%
1	Malignant neoplasm	16	80%
2	Benign lesion	04	20%
	Total	20	100%



- **Solid Pseudopapillary Tumor** - Cytological Smears shows cellular smears consisting of small tumor cells having psuedopapillae outline and few exfoliation of single cells into smear background. Round to oval, cuboidal and monotonous cells. Occasional cells show pleomorphism and atypia and few nuclei are round with finely granular chromatin and shows stippled chromatin. Cytoplasm is variable and faintly granular. Background shows haemorrhage and few benign ductal cells.
- Tumor cells express Cytokeratin, Synaptophysin, vimentin and Beta Catenin.
- Tumor cells are negative for Chromoganin A.



- **Ductal Adenocarcinoma -** Smear shows moderate cellularity composed of few benign ductal cells and disordered monolayer sheets of round to oval dysplastic epithelial cells having irregular cell borders. Round to oval cells with vesicular nuclei, hyperchromatic with scanty eosinophilic cytoplasm, few groups show pleomorphic cells, and nuclear irregularities. Background is haemorrhagic.
- They are positive for Cytokeratin.

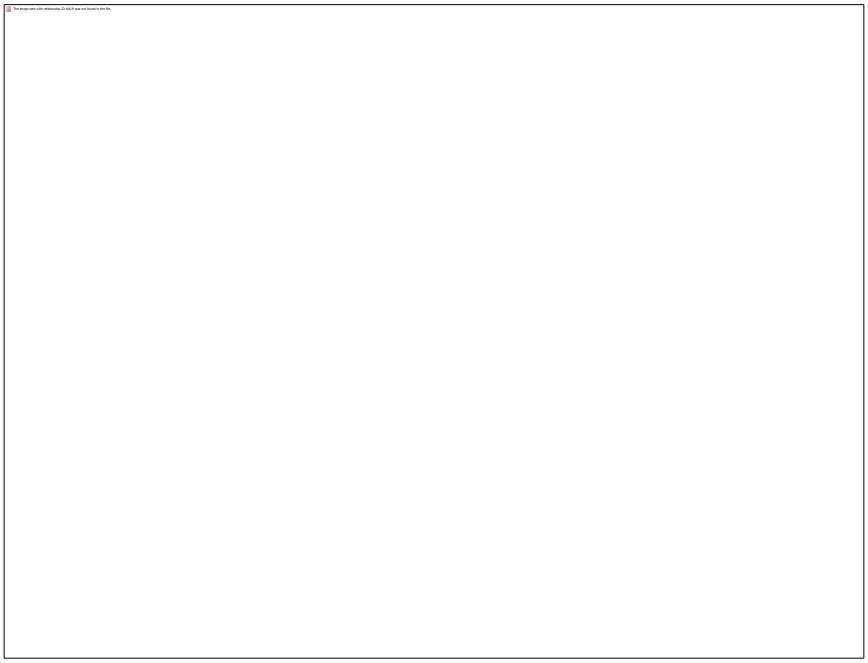


- **Neuroendocrine tumor of Pancreas** -Smears are having scanty cellularity and shows normal ductal cells and occasional group of round to oval cells arranged in small cluster and few scattered cells. These cells shows mild pleomorphism with round nuclei, speckled chromatin with inconspicuous nucleoli & indistinct cell borders.
- They are found to be positive for Synaptophysin, Chromogranin A.

Acinar cell carcinoma

Poorly differentiated neoplastic cells with focal acinar formations, large nuclei exhibiting irregular chromatin clumping, size variation, and varying N:C ratios. Many mitotic figures are present, consistent with aggressive growth.

They are positive for keratins.



Serous cystadenomas –

Small clusters of homogeneous cuboidal epithelial cells with finely granular cytoplasm and spherical nuclei, evenly scattered chromatin, smooth nuclear membranes, and undetectable nucleoli; clean background. Tumor cells showing modest nuclear pleomorphism on a monolayer sheet.

Mucinous cystadenoma–
They were characterised by tiny clusters and honeycomb sheets of comparatively bland mucin-containing columnar cells in a mucin-rich background. The nuclei were found to have regular nuclear membranes, fine chromatin, and inconspicuous nucleoli.

Discussion:-

EUS-FNAC is routinely used and has been demonstrated to be effective. As EUS-FNAC has become the gold standard for getting patient's specimens, the importance and demand for EUS-FNAC optimisation has increased. This study is aimed towards the improvement of patient's care through early detection and diagnosis of pancreatic mass lesions. To assess the precision, the diagnosis was validated using particular immunocytochemical stains. Overall, our findings were encouraging and justify the continued use of EUS-FNAC for pancreatic lesion.

After ensuring that our study's overall results were generally favourable, it can be said that EUS-FNAC done for the pancreatic mass lesions is a reliable approach for obtaining cells for diagnostic purposes. In the preoperative diagnosis and staging of suspected pancreatic cancer, EUS has shown to be superior compared to conventional transabdominal ultrasonography (US), computed tomography (CT), and magnetic resonance imaging (MRI)(7). Conventional CT scans do not reliably detect lesions smaller than 1.5 cm. Lesions that measure 0.2-0.5 cm or greater can be identified rather convincingly because of the improved image resolution of EUS. (6).

EUS is useful in differentiating pancreatic cystic lesions, and we used EUS-guided FNAC for preoperativediagnosis to determine how feasible the organ-preserving surgery is, in this work. If the circumstances permitted, we believe that having quick evaluation on site can be valuable and advantageous. Because just one typical specimen of pancreatic mass lesion by EUS-FNAC was available, a thorough adequacyassessment was impossible.

As a result, it can be inferred that EUS-FNAC is trustworthy and highly accurate. When we put safety of patients and economical benefits at priority, EUS-FNAC might be recommended as a first-line pathologic evaluation for pancreatic lesions with high clinical suspicion of cancer.

Conclusion:-

With advancing time, the incidence of malignancy is seen quite commonly along with the benign lesions of pancreas as seen in this study. Early detection is the best possible method to save the life of patients and EUS- FNAC being minimally invasive and having better diagnostic accuracy may help in reducing the mortality of patients. It is safe, cost-effective and reliable. It not only gives precise cytological diagnosis, but also allows for the exact site of tiny lesions.

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