ORIGINAL RESEARCH ARTICLE

Endoscopic Ultrasound Guided FNAC in Pancreatic Mass Lesions.

M.Umadevi[1], Samad[2], P AbhinayRao[2], Anirudh[2], Sriram[2], NSVM Krishna[2], Swapnika[2], Sai krishna[3], Issac Abhilash[3] & P. Shravan Kumar[4]

[1]Associate Professor,[2]Resident, [3]Assistant Professor, [4]Professor Department of Gastroenterology, Gandhi Medical college, Secunderabad, Telangana State, India.

Abstract:

Pancreatic mass lesions are highly concerning for pancreatic carcinoma with a need for early, accurate, detection and confirmation of neoplasm at the same time, avoidance of surgery is crucial in others. Endoscopic Ultra sound - EUS is considered as the most reliable and accurate test in the detection and diagnosis Of Pancreatic Masses including Pancreatic Cancer. This study aimed to evaluate the diagnostic spectrum of pancreatic lesions to analyze the cytology, and of EUS-FNA cytology for pancreatic solid and cystic lesions.

Material and Methods: We have conducted a prospective study of EUS and FNA in pts with pancreatic mass lesions between October 2008 and Jan 2020 at Gandhi Hospital a tertiary government hospital in state of Telangana .Clinical data, laboratory tests, and Cytopathological and imaging reports were collected. The final diagnosis was based on surgical findings, EUS-FNA or computed tomography (CT)-guided biopsy. EUS performed under conscious sedation at the time of EUS size, echo characteristics of lesions, vascularity, lymph nodes were noted. FNA done with linear echo endoscopic tip procore needles. Smears are prepared in endoscopy units. Then smears and sections of the cell block were evaluated by an expert pathologist for determining the adequacy of specimen

Results: 64 (72%) of the patients were males 28% were females with mean age group of 54 (42-70 years). The site of pancreatic adenocarcinoma was the head and neck in 78%, body 8% and tail in 6%, isthamus 8%. Most common symptom is Pain abdomen noted in 75%, mass per abdomen-8%), Jaundice-24% vomitings-8%, hypoglycemic attacks-8%. FNA results: Of 64patients majority of Cases were Adeno carcinomas (57.8%) NET in 3(4.5%), serous Cysteadenoma in 2 (3.1%), Mucinous Cysteadenoma in 2 (3.1%), IPMN in 1(1.5%) D in 3 (4.5%). Chronic pancreatitis in 10(15.6%), Normal in 6(9.3%) Atypical cells obtained in 3(4.5%).

Conclusion: EUS is safe, reliable method in diagnosis of pancreatic mass. It not only provides accurate cytological diagnosis but also allows exact location of small lesions.

Key words: Diagnosis, Endoscopic Ultrasound-Guided Fine-Needle Aspiration, Pancreatic Neoplasms.

Introduction:

Evaluation of patients with a pancreatic mass, involves a battery of noninvasive and Invasive tests, Inview of its retroperitoneal nature and sensitivity and specificity of tests are low. Early and accurate diagnosis is paramount for improving the therapeutic efficacy of pancreatic cancers. Diagnosis of benign and malignant neoplasms of the pancreas is increasing rapidly Pancreatic cancer is the fourth leading cause of death from cancer [1,2].

Imaging Modalities: Prior to the introduction of the EUS-FNA technique in the early 1990's, pancreatic masses were diagnosed using ERCP and percutaneous biopsy techniques ERCP, an invasive test used before

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Address for correspondence:
Dr. Malladi Uma Devi ,
Associate Professor,
Department of Gastroenterology,
Gandhi Medical College,
Secunderabad , Telangana state, India.
Email ID: umadevimalladi_66@yahoo.co.in

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the Invention of EUS, is limited by a sensitivity of 49%-66% with pancreatic duct brushing, and a reported complication rate of pancreatitis up to 6%, CT or US guided biopsy of the pancreatic tumors is more difficult to undertake due to the retroperitoneal situation of the pancreas. In addition, the risk of tumor seeding into the peritoneum or along the percutaneous needle tract has led to avoidance of the percutaneous approach to tissue diagnosis, and studies have suggested a significantly lower risk of peritoneal carcinomatosis using EUS-FNA.

Endoscopic ultrasound (EUS) is one of the most sensitive and accurate modality for detecting and evaluating pancreatic mass and staging of pancreatic cancer. EUS gives us high resolution images of the entire pancreas; such as, fine parenchymal details and pancreatic ductal changes. Usually pancreatic tumors are hypoechoic or inhomogeneous masses or areas with irregular borders within the normal echotexture of the pancreas in EUS views [3]. EUS has been shown to be superior to computed tomography (CT), ultrasound (US), Endoscopic retrograde cholangiopancreatography (ERCP), or angiography in detecting tumors smaller than 3 cm in size [4].

EUS-guided fine-needle aspiration (EUS-FNA) is the best way for obtaining a histological diagnosis, especially even if the mass is poorly visualized by other imaging modalities [5]. However, differential diagnosis of pancreatic mass remains a clinical challenge. The aim of this study was to assess the diagnostic capability of the EUS-FNA in the differentiation of pancreatic mass lesions.

This study aimed to evaluate the diagnostic spectrum of pancreatic lesions to analyze the cytology, and of EUS-FNA cytology for pancreatic solid and cystic lesions.

Material and Methods:

We have conducted a prospective study of EUS and FNA in pts with pancreatic mass lesions between October 2008 and Jan 2020 at Gandhi Hospital a tertiary government hospital in state of Telangana. For each patient; clinical data, laboratory tests, and cytopathological and imaging reports were collected. Patient characteristics such as age, gender, clinical history, and physical findings were recorded. Imaging reports including EUS, sonography, CT, and magnetic resonance cholangiopancreatography (MRCP) were reviewed to assess location, size, and characteristics of the pancreatic lesions. All patients were kept on antibiotics in view of associated jaundice and other conditions

Clinical data, laboratory tests, and Cytopathological and imaging reports were collected. The final diagnosis was based on surgical findings, EUS-FNA or computed tomography (CT)-guided biopsy. EUS performed under conscious sedation at the time of EUS size, echo characteristics of lesions, vascularity, lymph nodes were noted. FNA of peripancreatic lesions, lymph nodes, or bileduct mass lesions were excluded.

All the patients provided informed consent before the procedure. EUS for guided puncture of the lesion was carried using FUZINON equipment EG 530 UT with SU 7000 Ultra sound processor. The puncture technique was the fanning one (FNA in multiple planes) with an internal stylet, reinserting it before each FNA pass and negative pressure from the beginning till the end of the procedure. Five passes were made for every mass lesion. FNA was done transgastric (body and tail lesions) or transduodenal (head and uncinate process) [6]. Onsite cytologist evaluation was not available in these cases. Using pull back method while removing stylet and fanning technique. Suction used in hard masses. At the time of EUS size, echo characteristics of lesions, vascularity, lymph nodes were noted. Aspiration needle was further washed in 70% ethanol in labeled test tubes for cell block preparation. An expert pathologist evaluated the smears and sections of the cell block rendering the final diagnosis.

EUS performed under conscious sedation with linear echo endoscopic tip procore needle PTS 22G used in 49 [78%] and 25G in 8 (11.1%), 19G in 7 (10.9%). EUS-FNA of cystic lesions was done for aspiration of fluid and solid nodules were not seen in these cysts. Limitations in approaching a pancreatic mass include difficult location, small size, necrosis and vascularity. Ideally the mass should be located in the six o' clock position with the ultrasound transducer firmly applied to the luminal wall with suction.

The final diagnosis was based on EUS-FNA cell block and/or pathology in surgical specimens, with immunohistochemistry support. In 16 patients with in conclusive samples, 5 with vascular involvement , 3 patients in whom FNA not done are insulinoma, 2 patients who lost follow up after EUS procedure were excluded from the study.

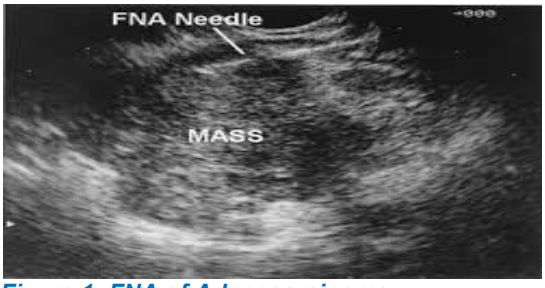


Figure 1: FNA of Adenocarcinoma

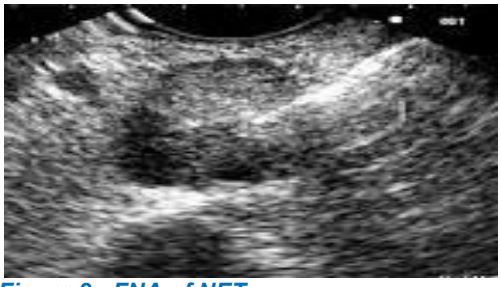
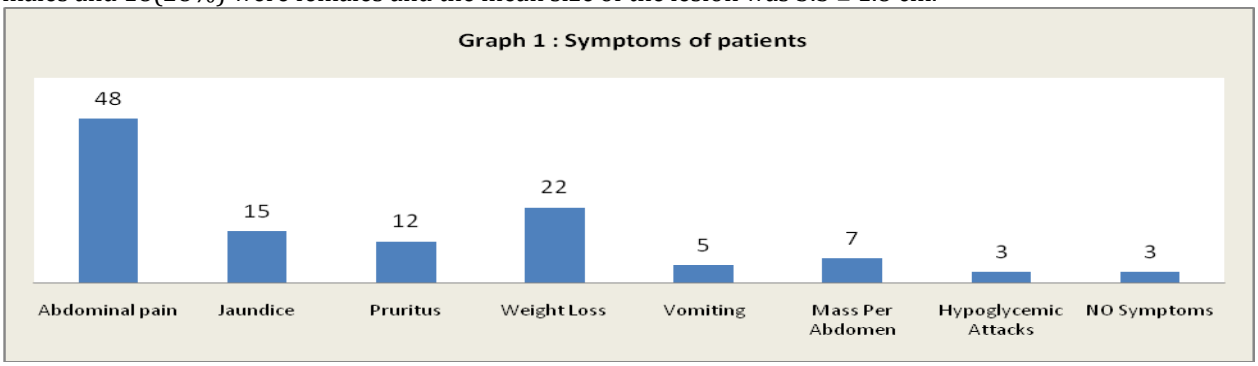


Figure 2 : FNA of NET

All positive cases treated accordingly. All negative cases were followed; all cases with atypical cells were subjected to surgery.

Observations and Results:

Out of, 64 pts who underwent EUS -FNA are in mean age group of 54 (40-70yrs). Of 64 patients, 46(72%) were males and 18(28%) were females and the mean size of the lesion was 3.5 ± 1.8 cm.



Symptoms: Out of 64 patients only 3(4.6%) were Asymptomatic, Pain abdomen noted in 48(75%), Jaundice-15(24%) mass per abdomen-7(12%), vomitings-5(8%), hypoglycemic attacks-3(4.6%).

Table 1: Location of lesion in patients

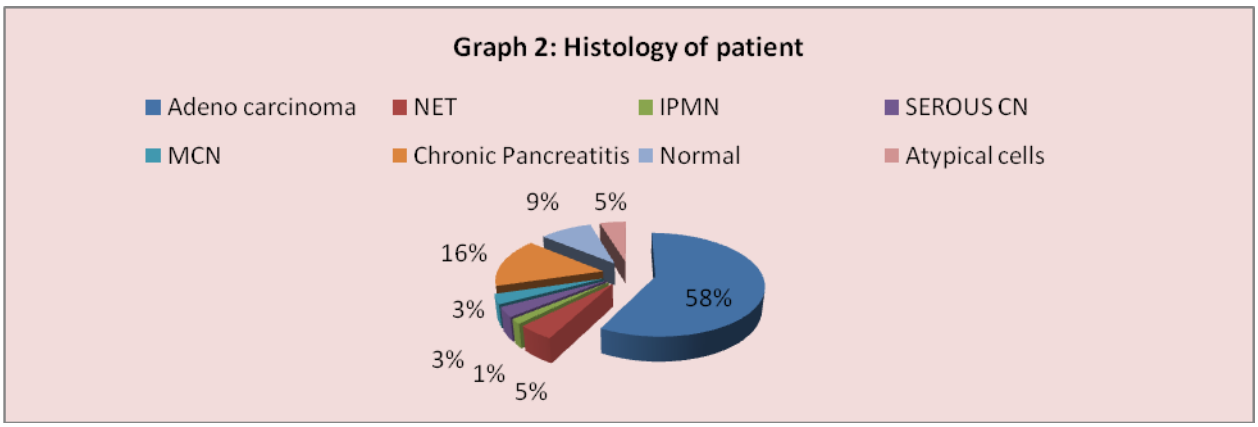
Location of lesion	Number	Percentage
Pancreatic head	46	72%
Uncinate process	05	8%
Body	07	10%
Neck	03	5%
Tail	03	5%
Diffuse	00	00

72% lesions were located in the pancreatic head, 5% in Neck, 10% in body, 5% in tail, and 8% in Isthamus.

Table 2: Morphology of lesion:

Morphology of lesion	Number	Percentage
Solid	44	69%
cystic	12	19%
solid lesions with cystic component	08	12%

Solid tumors and cystic lesions accounted for 69% and 19% of the cases, respectively.



Histopathology majority of Cases were Adeno carcinomas (57.8%) NET in 3(4.5%), serous Cystadenoma in 2 (3.1%), Mucinous Cystadenoma in 2 (3.1%), IPMN in 1(1.5%) d in 3 (4.5%). Chronic pancreatitis in 10(15.6%), However we got Normal report in 6(9.3%) Atypical cells obtained in 3(4.5%).

Discussion:

Endoscopic ultrasound-guided fine needle aspiration (EUS-FNA) has become increasingly widespread as a sampling technique for extracting tissue or cell samples from lesions for definitive pathology diagnosis. US-FNA is a safe, effective and efficient diagnostic tool in the evaluation of pancreatic mass lesions, Cytopathological specimens, and more recently core biopsies, may be obtained with high sensitivity (75%-98%), specificity (71%-100%), positive predictive value (96%-100%), negative predictive value (33%-85%) and accuracy (79%-98%) in the diagnosis of pancreatic cancer as compared to other modalities [8].

Cytological analysis of aspiration cytology material can readily differentiate between adenocarcinoma, islet cell malignancies, metastasis, inflammatory lesions, and cystadenomas. Chronic pancreatitis yields variably cellular smears composed of fibrotic stromal fragments, acinar tissue, mixed inflammation, and chalky calcific debris. Duct adenocarcinoma presents with high cellularity, crowded sheets of disordered ductal cells with irregular nuclear contours, anisonucleosis, vesicular chromatin, and a variable amount of cytoplasm [9].

Table 3: Symptom analysis and comparison with other groups

Symptoms	NigamN et al (n-288) [7]	Alizeh et al (n-100) [8]	Present Study (n-64)
Abdominal pain	212(73.6%)	42%	48 (75%)
Jaundice	63 (21.8%)	31%	15(24%)
Pruritus	42 (14.5%)	18%	12(20%)
Weight Loss	-	33%	22(35%)
Vomiting	-	-	5(8%)
Mass Per Abdomen	-	-	7(12%)
Hypoglycemic Attacks			3(4.6%)
NO Symptoms	-	-	3(4.6%)

Abdominal pain and Jaundice were the most common symptoms of these patients. We have noted hypoglycemic attacks in 3 patients.

Table 4 : Gender analysis

Gender	NigamN et al (n-288) [7]	Alizeh et al (n-100) [8]	Present (n-64)
Males	219(75.4%)	56%	72%
Females	69(24.6%)	44%	28%

Out Of 64 patients, 46(72%) were males and 18(28%) were females similar to other studies

Table 5 : Location of lesion

Location of lesion	NigamN et al (n-288) [7]	Alizeh et al (n-100) [8]	Present Study (n-64)
Pancreatic head	155 [62%]	79%	68%
Uncinate process	19 [7.6%]	-	8%
body	36 [14.4%]	15%	10%
Neck	8 [3.2%)	-	5%
Tail	26 [10.4%]	6%	5%
diffuse	6 [2.4%]	-	-

Majority of Lesions Located in Head and Neck (78%) in 8% lesions were present in Ishamus. We have not encountered diffuse lesions like that Of Nigam et al [7].

Table 6: Morphology of lesion:

Morphology of lesion	Nigam N et al (n-288) [7]	Alizeh et al (n-100) [8]	Present Study (n-64)
Solid	157 [62.8%]	75%	44(69%)
cystic	58 [23.2%]	7%	12 (19%)
solid lesions with cystic component	35[14.0%]	16%	8(12%)

Solid, cystic lesions, and solid lesions with cystic component accounted for 69%, 19% & 12%respectiely.

Table 7 – Histopathology

Histology	Alizeh et al [8]	Nigam N et al [7]	Present Study (n=64)
Adeno carcinoma	61%	71.6%	37(57.8%)
Cholangio carcin	6%	-	-
Lymphoma	3%	2.2%	-
NET	6%	10.5%	3(4.5%)
IPMN	1%	3.4%	1(1.5%)
SEROUS CN	-		2(3.1%)
MCN	2%	5.6%	2(3.1%)
Chronic Pancreatitis	3%	-	10(15.6%)
Normal	13%	-	6(9.3%)
Inadequate	3%	1.6%	-
Atypical cells	-	-	3(4.5%)

NET will show cellular aspirate, isolated cells, bare nuclei, pseudo rosettes, uniform, round or oval nuclei, eccentric nuclei, finely stippled chromatin, and moderate-to -abundant cytoplasm [10]. Among the cystic lesions, serous cystadenoma smears display sparse cellularity, clean background, flat sheets, and loose clusters of cuboidal cells, clear or granular cytoplasm with indistinct borders, bare nuclei, small round nucleus, fine chromatin, and inconspicuous nucleolus [11]. Mucinous neoplasm of pancreas consists of IPMN and mucinous cystic neoplasm (MCN). Their distinction, based solely on cytologic features, may not be possible. Diagnostic clue toward IPMN is mucin extrusion through ampulla and cyst-by-cyst appearance in EUS. Cytomorphology of MCN and IPMN consists of the hypocellular specimen, thick mucin, columnar mucinous cells (sheets, papillae, or isolated cells), and nuclear and architectural atypia [12].

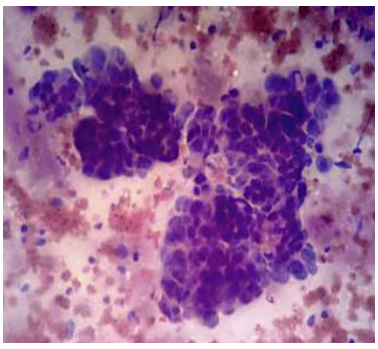


Figure 3 : Cystadenocarcinoma

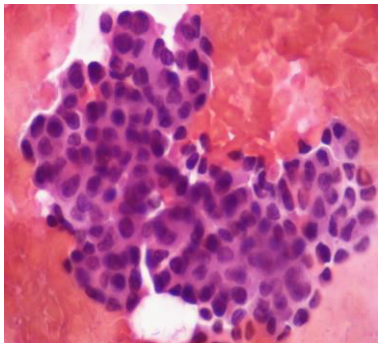


Figure 4 : Adenocarcinoma

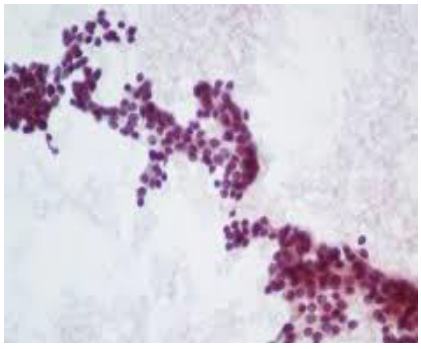


Figure 5: NeuroendocrineTumour NET

EUS imaging and cell block preparation along with an integration of immunohistochemistry can yield a better diagnosis and enhance the accuracy of diagnosing cystic lesions [12]. EUS-FNA has high sensitivity, specificity, PPV, and NPV for solid and cystic pancreatic tumors8 allowing inadvertent surgery in non-neoplastic lesions and inappropriate delay in surgical planning of malignant cases. Inadequacy rates are reported to be as low as 1.5–2% for pancreatic EUS-FNA [8] and we have not included them in analysis. This is usually due to the difficulty in obtaining an adequate specimen because of technical problems in accessing the mass with FNA needle, exuberant inflammation, or fibrotic reaction described in the pancreatic tumors. There is a consensus opinion that onsite cytopathology with the real-time interpretation of samples is the best for optimal patient care [10]. The one caveat to the high diagnostic yield of EUS-FNA is in the presence of chronic pancreatitis where sensitivity decreases to 74% compared to 91% with normal surrounding pancreatic parenchyma [13].

Conclusion:

Endoscopic ultrasound (EUS) is one of the most sensitive and accurate modality for detecting and evaluating pancreatic mass and staging of pancreatic cancer. EUS gives us high resolution images of the entire pancreas.

Endoscopic ultrasound (EUS) is safe, reliable method in diagnosis of pancreatic mass. It not only provides accurate cytological diagnosis but also allows exact location of small lesions.

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