Original Article

Rapid On-Site Evaluation - Efficacy of Eus FNA in Gastrointestinal and Mediastinal Lesions

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Abstract

Background: Endoscopic ultrasound-guided fine needle aspiration (EUS-FNA) has become an important minimally invasive technique for the evaluation of gastrointestinal and mediastinal lesions. Rapid On-Site Evaluation (ROSE) performed by a cytopathologist during the procedure allows immediate assessment of specimen adequacy and provides a preliminary diagnosis. This approach helps reduce inadequate samples, minimizes repeated needle passes, and facilitates early clinical decision-making. The present study was undertaken to evaluate the diagnostic utility and efficacy of ROSE in EUS-FNA of gastrointestinal and mediastinal lesions in a tertiary care centre. **Material and Methods:** This retrospective study was conducted in the Department of Pathology at a tertiary care centre over a period of one year (April 2023–May 2024). A total of 34 cases of gastrointestinal and mediastinal lesions undergoing endoscopic ultrasound-guided fine needle aspiration (EUS-FNA) with Rapid On-Site Evaluation (ROSE) were included in the study. Aspirated samples were fixed in isopropyl alcohol and stained with hematoxylin and eosin. Cytological findings obtained during ROSE were analyzed and correlated with subsequent histopathological diagnosis wherever available. Demographic details, lesion sites, cytological diagnosis, and diagnostic accuracy were evaluated. **Results:** A total of 34 patients were included in the study, with the majority belonging to the 50–70-year age group. There was a male predominance with 20 males and 14 females. The pancreas was the most common site of lesion (60%). Among the cases studied, 12 were malignant, 10 were benign neoplastic lesions, and 12 were non-neoplastic lesions. Rapid On-Site Evaluation demonstrated a positive correlation with the final histopathological diagnosis in 22 out of 34 cases. ROSE also helped in assessing specimen adequacy and reduced the need for repeated needle passes. **Conclusion:** Rapid On-Site Evaluation combined with EUS-FNA is a valuable diagnostic tool for gastrointestinal and mediastinal lesions. It improves diagnostic accuracy, ensures specimen adequacy, facilitates early diagnosis, and aids in prompt clinical management with minimal complications.

Keywords: Rapid on-site evaluation, mediastinal, gastrointestinal.

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Introduction

Rapid On-Site Evaluation with Endoscopic Ultrasound-Guided Fine Needle Aspiration is the preferred modality nowadays for the cytological diagnosis of mediastinal and gastrointestinal lesions.[1,2,3] The aim is to determine the importance of Rapid On-Site Evaluation with Endoscopic Ultrasound-Guided Fine Needle Aspiration in the diagnosis of gastrointestinal and mediastinal lesions over 1 year in a tertiary care centre.

A key part of the FNA biopsy process performed by pathologists is Rapid On-Site Evaluation, which also supports imaging-guided FNA biopsy. It involves specimen triage and sample adequacy evaluation. To utilise more material for ancillary tests, ROSE enables an initial diagnosis. By making a preliminary diagnosis, doctors may proceed with further biopsy techniques to ascertain the tumor's nodal stage or rule out metastases in a worrisome spot. ROSE and the ultimate diagnosis are highly correlated. Additionally, it may increase the diagnostic yield of biopsy or FNA procedures. Therefore, based on our research, we maintain that ROSE is required for FNAs conducted on both superficial and deeply seated lesions.

Materials and Methods

This is a retrospective study conducted in the Department of Pathology, Stanley Medical College, in a tertiary care centre. EUS FNA samples of mediastinal and gastrointestinal lesions were taken for the study. In a period of one year, about 34 cases were received. All EUS FNA samples of gastrointestinal and mediastinal lesions were fixed in isopropyl alcohol and then followed by hematoxylin and eosin staining. Findings were noted, and histopathological findings were correlated with cytological findings. The results are subjected to statistical analysis and tabulation.

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Results

Cytopathology	Total no of cases
Non neoplastic lesions:	
Inflammatory pathology	4
Chronic pancreatitis	2
Gastritis with lymphoid hyperplasia	1
Benign lesions:	
Spindle cell neoplasm	1
Gastrointestinal Stromal Tumor	3
Neuroendocrine Tumor	2
Malignant lesions:	
Positive for malignancy	7
Suspicious of malignancy	3
Adenocarcinoma	3
Metastasis from Poorly differentiated carcinoma	1
Neuroendocrine Carcinoma	1
No evidence of malignancy/ Inconclusive (haemorrhage etc)	6

- 34 patients were included in our study
- The most common age group was 50-70 years, out of 34 cases, 20 cases were males, and 12 cases were Females.
- All patients underwent Rapid On-Site Evaluation with EUS FNA
- The most common location site was found to be the pancreas (60%) in our study among gastrointestinal lesions.
- The accuracy between Rapid On Site Evaluation diagnosis and final histopathological diagnosis was noted in 22 cases out of 34 cases
- Our studies were comparable to the studies done by Klpaman et al from two medical centres, which showed that Rapid on-site evaluation increases the diagnostic accuracy.

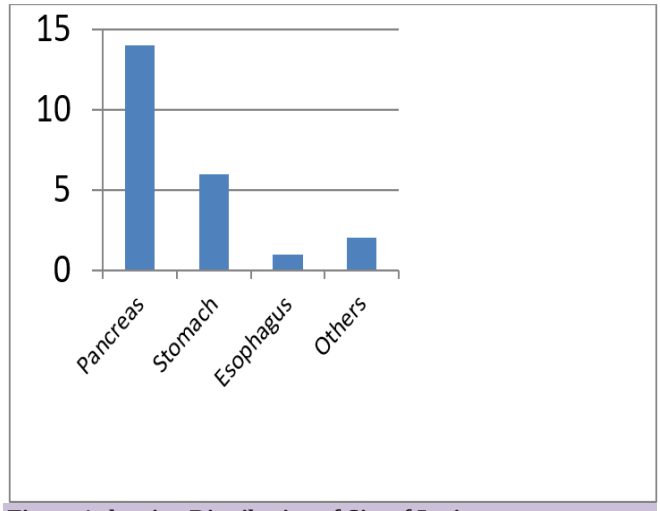

Figure 1 showing Distribution of Site of Lesion

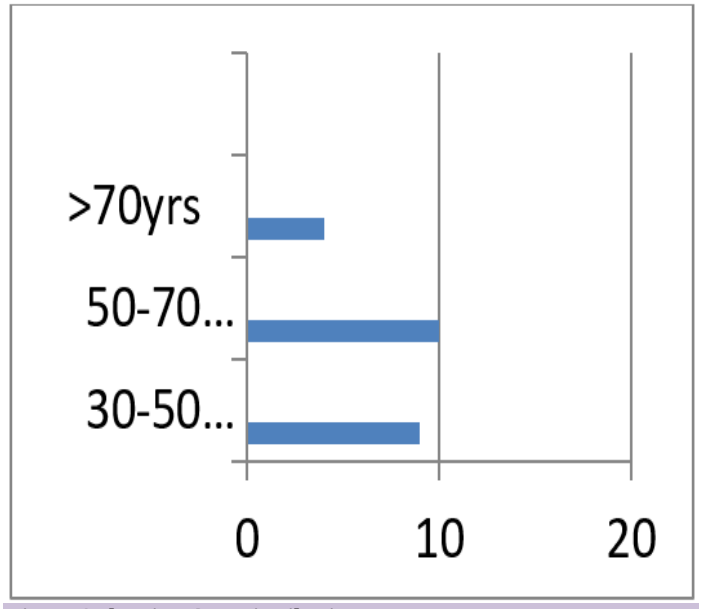

Figure 2 showing Age Distribution

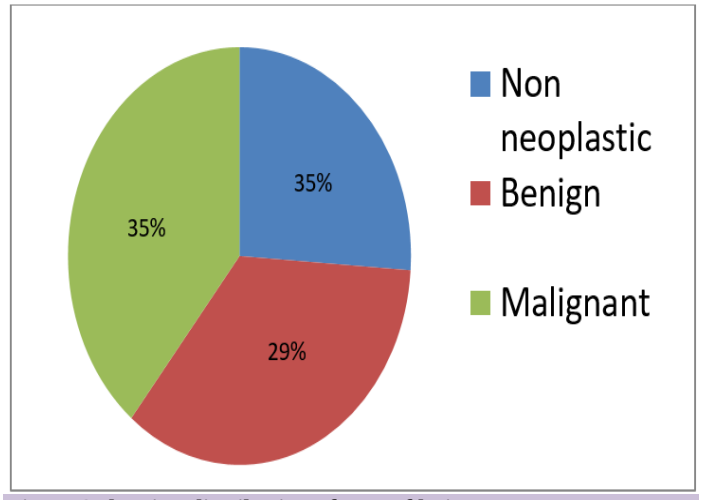

Figure 3 showing distribution of type of lesion

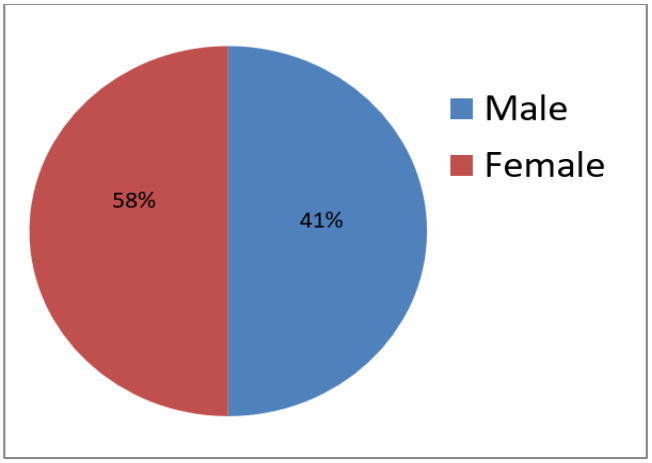

Figure 4 showing Sex Distribution

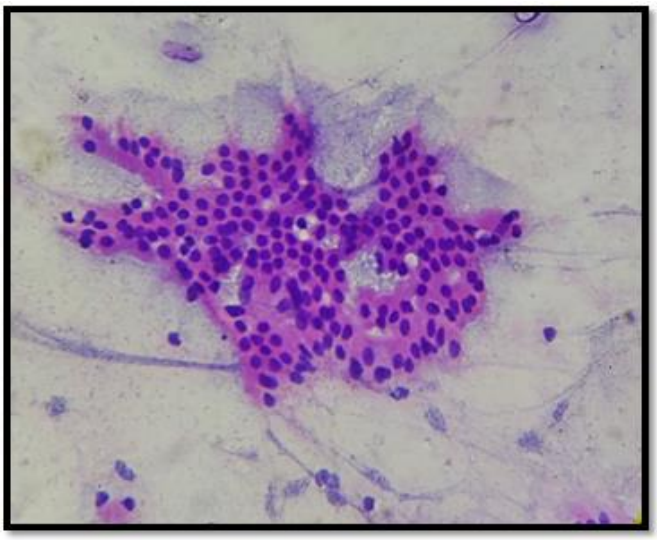

Figure 5 showing Papillary pattern of tumor cells in a mucinous background- Papillary Mucinous Neoplasm of Pancreas- High Power

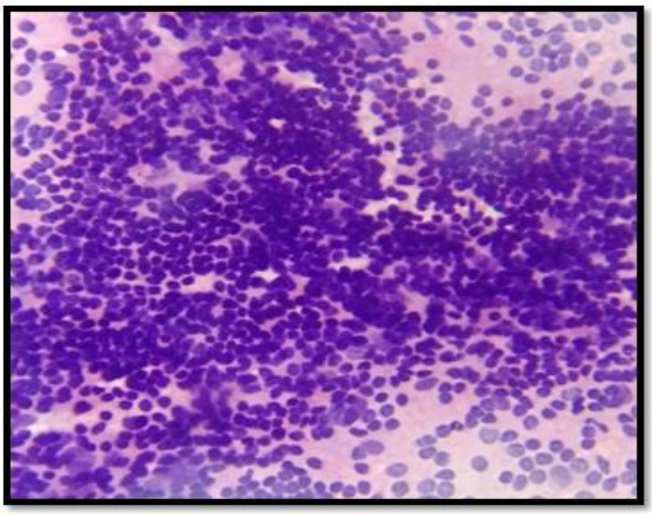

Figure 6 showing Sheets & clusters of gastric mucosal epithelial cells admixed with sheets of mature lymphocytes- Nonspecific gastritis with lymphoid hyperplasia/ MALT oma- High Power

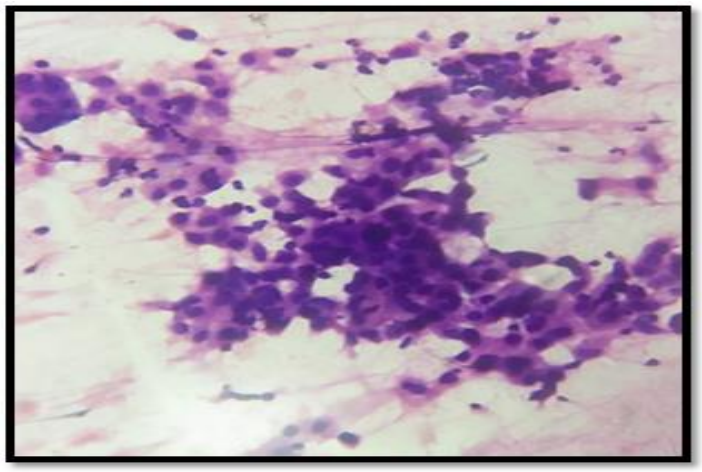

Figure 7 showing Bizaare looking cells, cells with vacuolated cytoplasm and giant cells – Smear Positive for malignancy (Probably Adenocarcinoma)- High Power

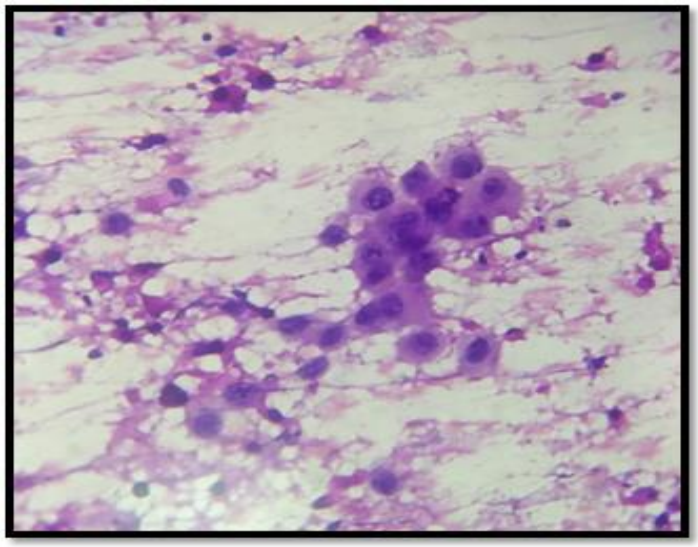

Figure 8 showing Round to oval cells with High N:C ratio, hyperchromatic nuclei – Positive for malignancy- High Power

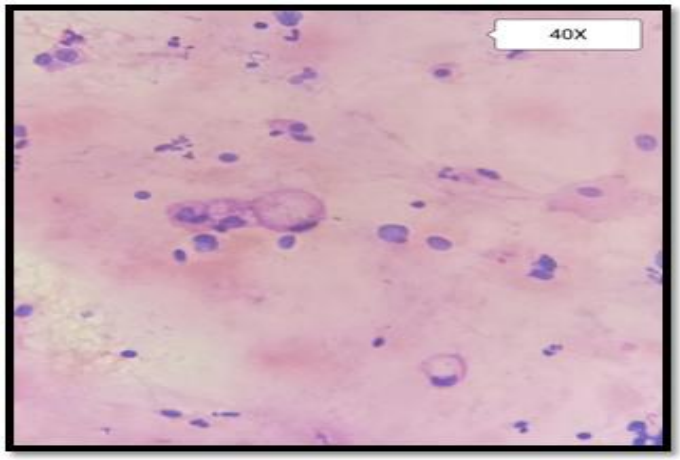

Figure 9 - Cells showing signet ring morphology in a background of lymphocytes – High Power

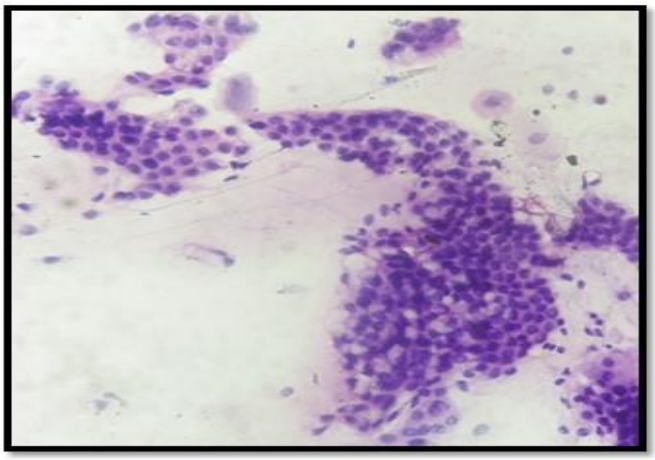

Figure 10- Monotonous population of round cells with round nucleus and moderate eosinophilic cytoplasm- Neuroendocrine tumor/ Epitheloid GIST- Low Power

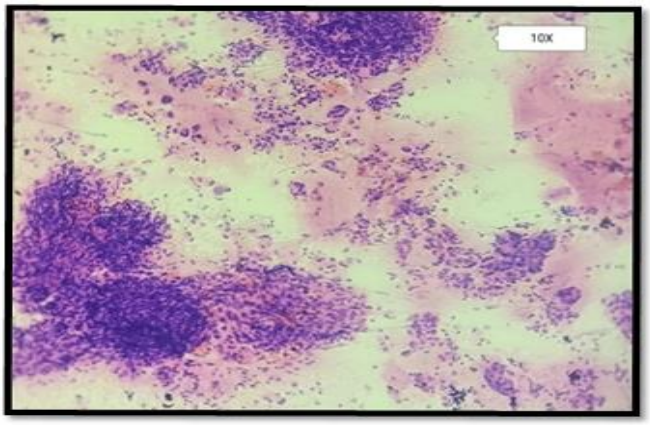

Figure 11: Sheets, clusters and singly scattered malignant cells with pleomorphic hyper-chromatic nuclei- Low Power

Figure 12- Table showing positive correlation with histopathology

Site	No Of Cases	Positive Correlation
PANCREAS	12	10
STOMACH	7	3
ESOPHAGUS	1	1
RETROPERITONEAL NODE	1	1
MEDIASTINUM	1	1

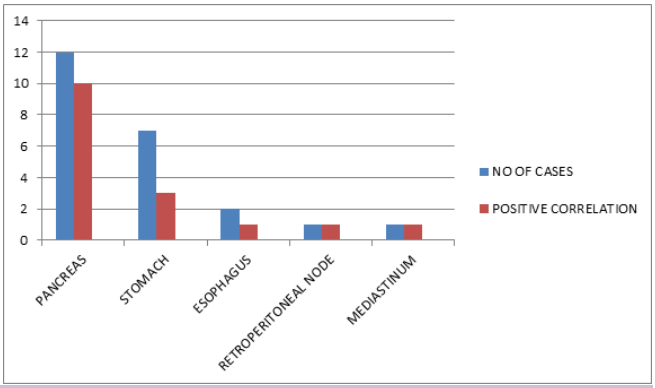

Figure 13: Chart showing positive correlation with histopathology

Discussion

A range of things, from malignant neoplasms to nonneoplastic illnesses, make up pancreatic lesions. Pancreatic cancers and cystic lesions have become more common over the last ten years.[4,5] In our study, most of the cases of pancreatic lesions were chronic pancreatitis, ductal adenocarcinoma & one case of papillary mucinous cystic neoplasm of the pancreas. [Figure 5]

All cases of chronic pancreatitis and adenocarcinoma of the pancreas [Figure 7] were positively correlated with histopathology.

Out of 34 cases in our study, 7 cases were from the stomach (submucosal lesion in the body, fundus, and antrum of the stomach), and 2 cases were from the oesophagus.

Submucosal lesions can be diagnosed by means of EUS-FNA. Submucosal lesions that have been commonly reported in our institution are lymphoproliferative disorders, gastrointestinal stromal tumors, and leiomyoma.[6,7]

The most common age group presented with submucosal lesions of the stomach was of above 60 years; Among 7 cases, one case was reported as chronic non-specific gastritis with lymphoid hyperplasia [Figure 6]; one case as adenocarcinoma; one case reported as neuroendocrine tumor; 1 case as gastrointestinal stromal tumor/ benign spindle cell lesions.

Out of 7 cases, we received tissue samples from 3 cases, and all 3 cases were positively correlated with histopathological examination.

Out of 2 cases in the oesophagus, one case was positive for malignancy & positively correlated with histopathology.

One case of multiple conglomerate lymph nodes in the retroperitoneum showed features of metastatic adenocarcinomatous deposits/ lymphoma [Figure 8]; Histopathology and Immunohistochemistry confirmed the diagnosis of metastatic adenocarcinomatous deposits.

The majority of mediastinal lesions we commonly encounter are solid lesions like thymoma and lymphoma, cystic lesions like foregut duplication cyst, pericardial cyst, and metastasis.

In our department, we came across one case of EUS FNA of-a posterior mediastinal lymph node,e which was reported as smear positive for malignancy.[8] Histopathology examination suggested the possibility of Thymoma/ squamous cell carcinoma. Thus, by means of application of ROSE during EUS-FNA, we can pick up the diagnosis early and provide a way for initial treatment, which proves its efficacy.

Rapid On-Site Evaluation with Endoscopic ultrasound guided Fine Needle Aspiration lessens the period of diagnosis, to check for malignant cells with fewer needle passes.

Thus, Rapid On-Site Evaluation is considered an independent factor in the accuracy of Endoscopic Ultrasound Guided Fine Needle Aspiration.

Conclusion

Rapid On-Site Evaluation (ROSE) plays a significant role in improving the diagnostic yield of Endoscopic Ultrasound-Guided Fine Needle Aspiration (EUS-FNA) in gastrointestinal and mediastinal lesions. In our study, ROSE demonstrated good correlation with final histopathological diagnosis and helped ensure specimen adequacy while minimizing the need for multiple needle passes. The pancreas was the most common site

of involvement, and both neoplastic and non-neoplastic lesions were effectively identified using this technique. Thus, the integration of ROSE with EUS-FNA serves as a reliable, safe, and efficient diagnostic approach that facilitates early detection, accurate diagnosis, and timely clinical management of gastrointestinal and mediastinal lesions.

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Nil.

Conflicts of interest
There are no conflicts of interest.

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