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Original Research Article

Comparison of Single versus Multiple Needle Passes in Endoscopic Ultra Sound Guided Fine Needle Aspiration Cytology and Solid Lesions and Abdominal Lymphnodes in Western Maharashtra Population

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Abstract:

Background: Endoscopic ultrasound-guided fine needle aspiration (EUS-FNA) has been used for the diagnosis of many lesions since 1992. It is a minimally invasive method for aspiration of benign and malignant lymphadenopathy.

Method: 120 patients with abdominal and mediastinum lymphadenopathy were studied. 60 patients were studied with single needle passing and 60 with multiple needle passing. Every patient underwent the EUS FNA technique under conscious sedation by using an echo endoscope in conjunction with an EVIS EXTRA CLV-80 light source. A standard 19-22 or 25 G FNA device was employed. The aspirated specimen was exposed to slides by reinsertion of the stylet within the needle.

Results: The size of the tumor in a single needle pass was 25-6 (± 12.2) and 30.90 (± 10.8) multiple needle, 36/60 cellularity in single needle passes and 52/60 in multiple needle passes. The definitive diagnosis was 50/60 in a single needle pass and 54/60 in a multi-needle pass. The highest number of regions was in 34 (28.4%) pancreas, and the least regions were duodenum, gastric mass, and gall bladder in each 2 (1.66%) number of patients. The highest number of single passes was 8 (13.3%) in the pancreas metastatic lymph node. In benign 8 (13.3%) in tubercular lymphadenopathy. In multiple needle pass 8 (13.3%) in pancreases hepatocellular carcinoma, metastatic lymph node. In benign cases, 8 (13.3%) have reactive hyperplasia, and 6 (10%) have tubercular lymphadenopathy.

Conclusion: Although the diagnostic accuracy in both single needle passes and multiple needle passes is the same, EUS-FNA provides high diagnostic accuracy in malignant and benign cases.

Keywords: EUS-FNAC, echo endoscope, EXTRA CLV-180 light source, capillary technique, lymphadenopathy.

Introduction

Abdominal and mediastinal lymphadenopathy are solid lesions present with numerous symptoms, and an acute diagnosis is important to determine the appropriate treatment and prognosis [1].

Although cross-sectional imaging and positional emission tomography are useful for detecting lymphadenopathy, it is difficult to distinguish between benign and malignant lesions using only imaging modalities [2]. Invasive procedures, such as open thoracic surgery, thoracoscopy, and laparoscopy, were previously required for histological diagnosis.

Endoscopic ultrasound (EUS) can easily access the lymph nodes and provide detailed information on shape, diameter, and internal echoic features via high-resolution images [3]. The features of malignant lymph nodes reported on EUS images are a diameter of 10 mm or greater, a round shape, sharply demarcated borders, and homogenous and hypo echoic central echo patterns. EUS guided single needle or multiple pass needle aspiration (EUS-FNA) was reported in 1992. EUS-FNA is a minimally invasive method for collecting diagnostic cytological and histological material for lymphadenopathy compared to surgery. Moreover can be used to determine cancer stages [4]. Hence, an attempt is made to compare the diagnostic accuracy and usefulness of single needle passing and multiple needle passing techniques for diagnosing lymphadenopathy.

Material and Method

120 (one hundred and twenty) patients aged between 18 to 62 years admitted at IIMS and R warudi, Badnapur (Tq), Jalna (dist), Maharashtra-431202, Medical College Hospital were studied.

Inclusive Criteria: Patients diagnosed with abdominal solid mass, including lymphnodes, and given consent in writing were selected for study.

Exclusion Criteria: (1) coagulopathy (international normalized, ratio >1.5, or platelet count <50,000/- mm3), (2) presence of intervening blood vessels and altered gastro-intestinal anatomy, (3) patients with cystic masses were excluded from the study.

Method: Out of 120 patients, 60 patients were named group-I single needle passes, and 60 patients were selected for multiple needle passes as group-II. Every patient was studied with EUS (endoscopic ultrasonography)-guided fine needle aspiration (EUS) and FNAC (fine needle aspiration cytology).

EUS-FNAC Procedures: The procedures were performed using a standardized method in patients who were under conscious sedation with intravenous Midazolam and propofol. All procedures were carried out using a linear array echoendoscope (GFUCT180; Olympus Medical Systems, Tokyo, Japan) in conjunction with an EVIS EXTRA CLV-180 light source.

The needle size was chosen to fit the situation randomly by endosonography. A standard 19-22, or 25-G, FNA device (Echo Tip: Cook Medical, Bloomington, IN) was employed for EUC-FNA. The capillary (slow pull) technique was employed mostly for EUS-FNA. In the same cases, suction techniques were applied during EUS-FNA in order to increase the quantity of the FNA sample. Pancreatic head masses were approached from the duodenum, while pancreatic body and tail masses were accessed from the stomach.

The adequacy of the obtained specimens was judged by the presence of macroscopic material with the cytopathologist, and puncture is repeated until adequate specimens are obtained.

After the masses were punctured by the needle, the styled was withdrawn, and the needle moved backward and forward within the masses 10 to 15 times per pass. The needle was then removed. The aspirated specimen was expressed on slides by re-insertion of the styled within the needle and air flushing of the needle.

The duration of the study was from December 2022 to May 2024.

Statistical Analysis: The baseline, characters, and target regions were classified with a percentage comparison of single needles, and multiple FNAs were also classified. The statistical analysis was carried out in SPSS software. The ratio of males and females was 2:1.

Observation and Results

Table 1: Study of Baseline Characteristics of EUS-FNA Used in Abdominal Organs and Lymph Nodes

- Size of tumor: 25.6 (± 12.2) in single needle pass group-I and 30.90 (± 10.8) in multiple needle group-II
- Cellularity: 36/60 in single needle group-I, 52/60 in multiple needle group-II
- Definitive diagnosis: 50/60 in single needle group-I, 54/60 in multiple needle group-II

Table 2: Distribution of patients according to target organs:

34 (28.3%) pancrease, 32 (2.6%) abdominal lymph nodes, 16 (13.3%) liver, 8 (6.66%) common bile duct, 6 (5%) spleen, 2 (1.66%) duodenum, 2 (1.66%) gastric mass, and 2 (1.66%) gall bladder

Table 3: Comparison of single needle passes with multiple passes for cytopathological diagnosis Malignant cases: Pancreatic carcinoma: 8 (13.3%) in group I (single needle pass), 8 (13.3%) in group II (multiple needle pass), lymphoma: 6 (10%) in group I, and 2 (3.33%) in group II. Hepatocellular carcinoma 4 (6.66%) in group-I, 8 (13.3%) in group-II, Metastatic lymph node 8 (13.3%) in group I and 8 (13.3%) in group II. In Benign cases, GIST 2 (3.33%) is only in group I. Granulomatous lesion 2 (3.33%) only in group-I, Pseudocyst of pancrease 2 (3.33%) only in group II, Tubercular lymphdenopathy: 8 (13.3%) in group I, 6 (10%) in group II, reactive hyperplasia: 8 (13.3%) in group I, and 8 (13.3%) in group II.

Table 1: Study of Baseline characteristics of EUS-FNA used in abdominal organs and lymphnodes (Number of patients: 120)

Baseline characters	Single Needle pass Group-I (60)	Multiple Needle pass Group-II (60)
Size of tumor	25.6 (± 12.2)	30.90 (± 10.8)
Cellularity	36/60	52/60
Definitive diagnosis	50/60	54/60

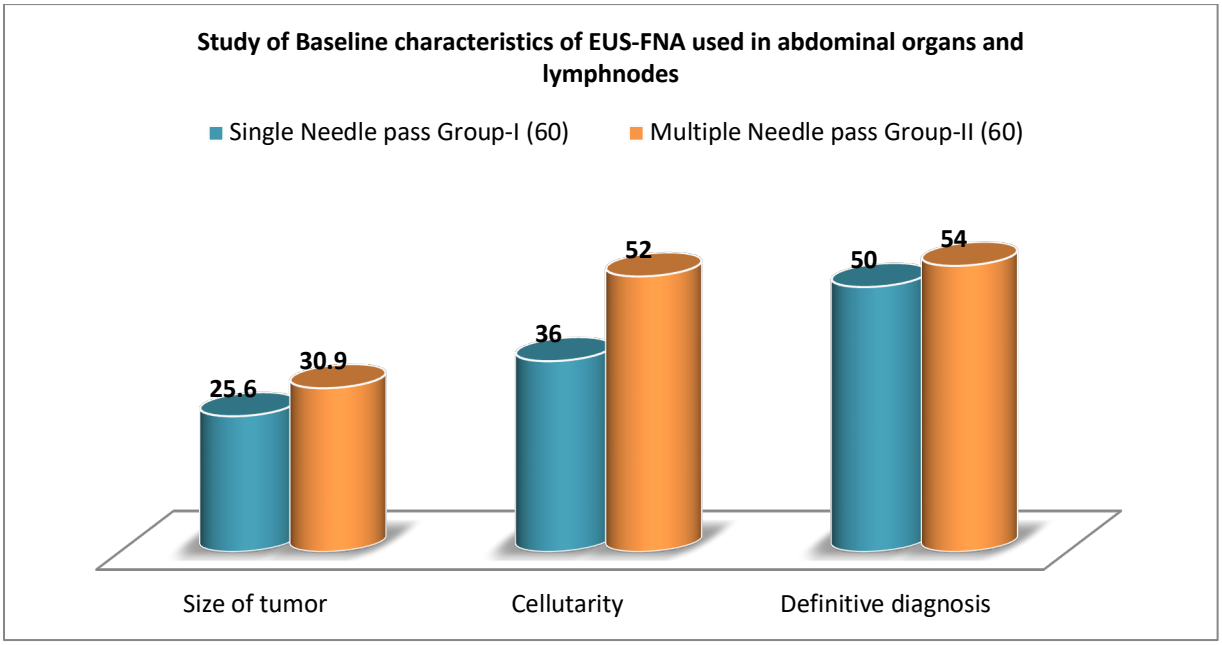

Figure 1: Study of Baseline characteristics of EUS-FNA used in abdominal organs and lymphnodes

Table 2: Distribution of patient according to target regions (Number of patients: 120)

EUS-FNA site	No. of cases (120)	Percentage (%)
Pancreas	34	28.3
Abdominal lymph Node	32	26.6
Mediastinal lymph Node	18	15
Liver	16	13.3
Common Bile duct	8	6.66
Spleen	6	5
Duodenum	2	1.66
Gastric Mass	2	1.66
Gall Bladder	2	1.66

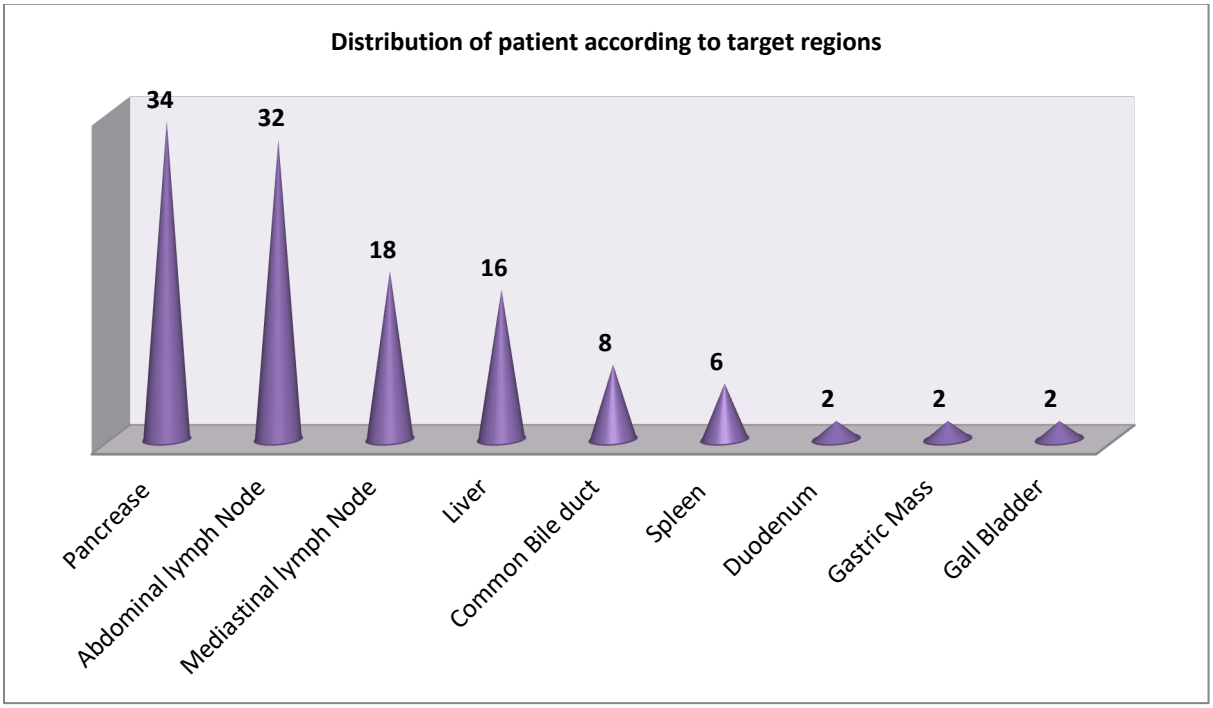

Figure 2: Distribution of patient according to target regions

Table 3: Comparisons of single needle pass with multiple pass for cytopathological diagnosis (Number of patients: 120)

Details	Diagnosis	Group-I single pass (60)	Group-II Multiple pass (60)
Malignant cases	Pancreatic carcinoma	8 (13.3%)	8 (13.3%)
	Lymphoma	6 (10%)	2 (3.33%)
	Hepatocellular carcinoma	4 (6.66%)	8 (13.3%)
	Metastatic lymph Node	8 (13.3%)	8 (13.3%)
Benign cases	GIST	2 (3.33%)	0
	Granulomatous lesion	2 (3.33%)	0
	Pseudo cyst of pan crease	0	2 (3.33%)
	Tubercular lymphadenopathy	8 (13.3%)	6 (10%)
	Reactive Hyperplasia	8 (13.3%)	8 (1.3%)

GIST = Gastro-intestinal stromal tumors

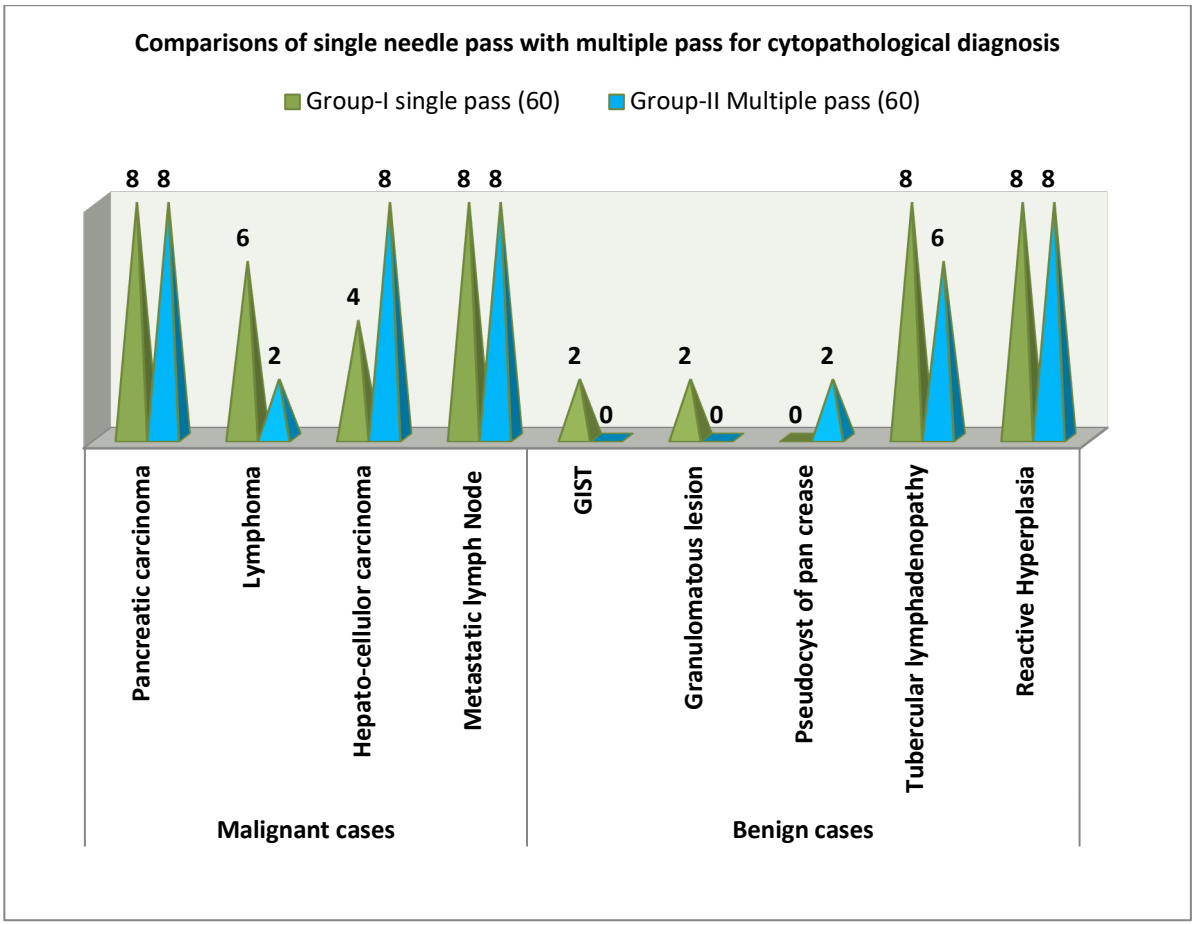

Figure 3: Comparisons of single needle pass with multiple pass for cytopathological diagnosis

Discussion

Present a comparative study of single versus multiple needle passes in endoscopic ultrasound-guided fine needle aspiration cytology and solid lesions and abdominal lymph nodes in the western Maharashtra population. In the baseline study size of tumor 25.6 (± 12.2) in single needle pass group-I, and 30.90 (± 10.8%) in multiple needle pass group-II, cellularity was 36/60 in group-I, 52/60 in group-II. The definitive diagnosis was 50/60 in group-I, 54/60 in group-II (Table 1). In the distribution of patients according to target regions, the highest number of patients was 34 (28.3%), followed by the pancreas, followed by the pancreas, followed by the abdominal lymph node, 32 (26.6%), and the least target lesion was 2 (1.66%) observed in the duodenum, gastric mass, gall bladder (Table 2).

In the comparison of single needle with multiple needle passes study. In malignant cases, the highest number of patients had pancreatic carcinoma and metastatic lymph node 8 (13.3%) in both single needle passes and multiple passes groups. In benign cases, the highest number of patients were 8 (13.3%) had tubercular lymphadenopathy and reactive hyperplasia in the single needle pass group, and the highest number of patients in the multiple

needle pass group-II 8% in benign cases (Table 3). These findings are more or less in agreement with previous studies [5,6,7].

It is always challenging to make an accurate diagnosis of solid pancreatic masses discovered on abdominal masses. The accuracy of EUS-FNA for solid lesions varies from 78 to 95%. Certain Neoplasms, such as lymphoma, neuroendocrine tumors, stromal tumors, well-differentiated adenocarcinoma of the pancreas, and immunoglobulin G-4 autoimmune pancreatitis, require histological examination to assess tissue architecture and cell morphological changes in order to formulate a more accurate diagnosis [8]. The cellularity was affected by the number of needle passes for the pancreas and lymph nodes; the mean number of passes required was 3:1 and 2, respectively.

Endosonographic characteristics of malignant lymph nodes include a large size hypo echogenicity, a distinct border, a round shape, and high tissue stiffness on elastography. Unfortunately, simple lymph node morphology assessed through EUS is not sufficient to definitely distinguish benign nodes from malignant ones; thus, an appropriate tissue sampling technique with concomitant pathological confirmation is often employed [9].

Comparative results based on studies using newer FNB needles are still scarce. In fact, the Fransen and Fork-tip needles, characterized by a surface with multiple cutting points designated to provide improved control at the puncture site and stability at the tip, allowing for enhanced penetration, showed very promising results in abdominal masses [10]. The diagnostic accuracy rate was significantly higher in the EUS-FNB as compared to the EUS-FNA. EUS-FNB allows for a wide range of tests for personalized diagnosis. Moreover, it enables generic testing, which is useful in the individualized medicine era [11]. Hence, EUS-FNB may expand the available diagnosis and treatment tools, even for lymphadenopathy.

Summary and Conclusion

In the present study of the comparison of single versus multiple needle passes in endoscopic ultrasound-guided fine needle aspiration cytology and solid mass lesions and abdominal lymph nodes in the western Maharashtra population, Although there was no difference in the diagnostic accuracy between both groups, EUS-FNB with multiple needle passes provided high diagnostic accuracy. The present study demands that such clinical trials be carried out on a large number of patients in hi-tech hospital where the latest techniques are available to confirm the present diagnostic accuracy.

Limitation of study: Owing to the tertiary location of the research center, the small number of patients, and the lack of the latest techniques, we have limited findings and results.

This research paper has been approved by the ethical committee of JIIU's Indian Institute of Medical Sciences and Research (IIMSR), Warudi Badnapur (Tq), Jalna (dist), Maharashtra-431202

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