



A Study on Comparison among Aspiration and Non Aspiration Technique of lymph node with Fine Needle Cytology

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ABSTRACT

Introduction: Fine needle aspiration cytology (FNAC) is a easy and safe method. It has been used for the identification of superficial palpable lesions successfully. Deep-seated lesions have also been sampled by fine needle aspiration cytology with the imaging techniques with considerable success. FNAC is a straightforward, easy and reliable practice for the early diagnostic assessment of enlarged lymph nodes. The aim of the study conducted was to compare the two techniques- FNAC and FNNAC for diagnostic adequacy in superficial enlarged lymph nodes.

Materials and Methods: The study was conducted in 50 patients with superficial enlarged lymph nodes using both the techniques- FNAC and FNNAC. Relevant history and clinical examination were taken. The two techniques were compared for the diagnostic adequacy based on five parameters using Mair et al scoring system.

Results: In the present study, the cumulative score for FNNAC was more in comparison to that of FNAC (6.90 >6.60). For individual parameters, the average score for parameters like background blood (1.47 >1.44), degree of cellular degeneration (1.40 >1.30), trauma (1.40 >1.26) and retention of architecture (1.25 >1.16) were better in case of FNNAC in comparison to FNAC. However, average score for amount of cellular material was more (1.43 >1.39) in case of FNAC than FNNAC. All these differences observed among various parameters were, however, statistically nonsignificant with P-values of 0.416, 0.422, 0.319, 0.201, 0.160 and 0.1176

Conclusion: Both FNAC and FNNAC yield good material for diagnostic of evaluation of superficial enlarged lymph nodes. FNNAC provided superior quality smears for the interpretation and diagnosis of superficial enlarged lymph nodes. FNNAC is a good technique that needs to be utilised in the routine cytology practice for sampling of superficial enlarged lymph nodes.

Keywords: FNAC, FNNAC, diagnosis, cellular, cytology.

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INTRODUCTION

Fine needle aspiration cytology is a easy and harmless practice. It has been used for the identification of superficial palpable lesions productively. Deep-seated lesions have also been sampled by fine-needle aspiration cytology with the imaging techniques with considerable hit.

Fine-Needle Aspiration Cytology (FNAC) is conventional by most patients as a noninvasive technique for Valuating lymphadenopathy.¹ The course of action involves aspiration of cellular material with the help of a needle mounted to a piston through, which suction is applied. A new method Fine Needle Non-Aspiration Cytology (FNNAC), which involves sampling with a needle not mounted to a piston has been developed. No suction pressure is applied. The material enters the hub of the needle with the help of capillary action.^{2,3} Some studies have revealed this practice to be superior or equivalent to fine-needle aspiration cytology in a variety of vascular tissues mainly thyroid lesions.^{4,5} However, a partial number of studies is available, which evaluate the two techniques in case of superficially-enlarged lymph nodes. Hence, the aim of this study is to evaluate the two techniques in patients presenting with superficially enlarged lymph nodes. The present study was to evaluate the two techniques- FNAC and FNNAC for investigative competence in superficially enlarged lymph nodes.

MATERIALS AND METHODS

The study was conducted in the cytology section, Department of Pathology, Great Eastern Medical School & Hospital. Patients who attended the cytology section with superficial palpable enlarged lymph nodes of size more than 0.5 cm were sampled. Deep seated, nonpalpable lymph nodes and lymph nodes with size less than 0.5 cm were excluded from the study. The procedure was explained to the patients and consent was obtained from each patient. Relevant history and clinical examination were taken. Both the procedures were performed by a single cytopathologist. The lesion was grasped with two fingers of one hand and prepared by applying an antiseptic solution. Needle attached to the syringe holder was advanced into the center of the lump using quick smooth motion. Suction was applied by pulling the piston at least one third of the total length of the syringe. With the suction held steady, the needle was moved back and forth within the lump using short quick strokes. After gently withdrawing, the needle sample was expressed onto the slide after reattaching the needle. FNNAC was performed using the needle alone. The needle held between thumb and

forefinger of one hand was inserted into the mass and moving the needle rapidly in and out within the mass as with conventional fine needle aspiration method, but without attachment to a syringe or holder. Upon withdrawal of the needle, a syringe filled with air was then attached to needle to enable expression of needle contents onto the glass slide and optimal, uniform and thinly-spread smears prepared. Half of the smears prepared were fixed in 95% ethanol for Papanicolaou staining and the other half were air-dried and stained with May-Grunwald-Giemsa (MGG). The staining procedure was done by a single cytotechnician for standardisation. The best of the smears were taken for the study. The smears from both the techniques were examined and scored by a single experienced cytopathologist. The scoring was based on five criterion using point scoring system of Mair et al, the details of which are given in Table 1.

On the basis of five criteria tabulated, a cumulative score between 0-10 points was allocated to each fine-needle specimen, which was then categorised according to one of the three categories- 1. Unsuitable for diagnosis- (0-2). 2. Suitable for diagnosis- (3-6). 3. Diagnostically superior- 5 (7-10). Student's 't' test was performed to compare the two techniques for statistical analysis.

RESULTS

A total of 50 patients were included with 29 males and 21 females involving the age group ranging from 1 to 90 years. A few of the cases presented with multiple enlarged lymph nodes and were sampled from more than one site. Majority of cases presented with involvement of cervical group of lymph nodes (67%). The most common cause was found to be reactive lymphadenitis (37%) followed by tubercular lymphadenitis (32%). Metastatic lymph node was found to be a significant cause of lymphadenopathy (17%) (Table 2).

The number of smears obtained from each technique (FNAC and FNNAC) ranged between 2 to 6. The number of slides obtained was marginally more in FNAC than FNNAC. Grossly, the aspirates obtained were greyish-white to blood mixed. Aspirates from FNNAC were less blood-mixed than FNAC. Mair's scoring system was used to compare the quality of smears. The scores obtained by each technique were based on five individual parameters. The scores obtained were tabulated. The cumulative score for FNNAC was more in comparison to that of FNAC (6.90 >6.60). For individual parameters, the average score for parameters like background blood (1.47 >1.44), degree of cellular degeneration (1.40 >1.30), trauma (1.40 >1.26) and retention of architecture

(1.25 >1.16) were better in case of FNNAC in comparison to FNAC. However, average score for amount of cellular material was more (1.43 >1.39) in case of FNAC than FNNAC. All these differences observed among various parameters were, however, statistically nonsignificant with P-values of 0.416, 0.422, 0.319, 0.201, 0.160 and 0.1176 (Table 3).

Diagnostic adequacy of each technique was obtained by combining both diagnostically superior and diagnostically adequate smears. Diagnostically, adequacy of FNAC was 97% and FNNAC was 96%. FNNAC yielded diagnostically superior samples in more numbers of cases (28 out of 50) in comparison to FNAC (26 out of 50) while FNAC yielded diagnostically adequate material in more number of cases (48 out of 50) in comparison to FNNAC (47 out of 50). Failure rate for FNAC was 3% in comparison to FNNAC, which had a failure rate of 4% (Table 4).

DISCUSSION

A number of studies have shown FNNAC similar to FNAC technique in various superficial palpable lesions. The technique of non-aspiration is predominantly well suited for biopsy of the thyroid and other vascular tissues. The cell yield maybe smaller than with aspiration, but not significantly so.^{5,7} Demographically, cervical lymph nodes was found to be the most common site of involvement in our study as has been reported by many other studies.⁸ Reactive lymphadenitis (37%) was found to be the most common cause of lymphadenopathy marginally ahead of tuberculous lymphadenitis (32%). Similar results have been reported by many other studies Bharathi et al.⁹ Comparing performance of FNAC and FNNAC in the present study, the diagnostic adequacy of FNAC and FNNAC in lymph nodes was 97% and 96%, respectively. Kate et al. reported diagnostic adequacy of 95% in case of FNC (fine needle capillary) sampling in lymph node lesions.⁷ Bharathi et al reported diagnostic adequacy by FNNAC as 80% and by FNACP (fine needle aspiration cytopathology) as 98%. This variation maybe attributed to the difference in mean age (45 yrs. in Bharathi et al compared to 32.55 yrs. in present study) of the patients, which presented with lymphadenopathy. As the age increases, lymphadenopathy shifts from reactive lymphadenopathy being common cause in younger patients to metastatic malignancy in older patients (Bharathi et al). Akhtar et al reported sufficient

material provided by FNAB (fine needle aspiration biopsy) in 88% and by FNCB (fine needle capillary biopsy) in 86%.⁵ Similarly, Raghuvver et al reported that it was possible to give a diagnosis by FNS (fine needle sampling) in 85% while with FNA (fine needle aspiration) diagnosis was possible in 87.5%.¹⁰ The variations can be due to site of the involvement of lymph node, demographic variation and expertise of the individual involved in procedure. FNNAC yielded diagnostically superior samples in more number of cases (56%) in comparison to FNAC (52%) while FNAC (97%) yielded diagnostically adequate material in more number of cases in comparison to FNNAC (96%) in current study. Failure rate for FNAC was 3% in comparison to FNNAC, which had a failure rate of 4%. However, this difference was statistically nonsignificant. Ghosh et al reported similar findings where it was concluded that diagnosis was adequately possible in more number of cases by FNA (94.37%) than NA (non-aspiration) (90%) technique, but the diagnostic smears of superb quality were more by NA (38.12%) than by FNA (21.25%) technique with a significant statistical difference.¹¹ Similar result were also reported by Akhtar et al who dealt exclusively with FNCC (fine needle capillary cytology) of the lymph node lesions.⁵ In their study, FNCC yielded quantitatively better and qualitatively superior material as compared to that obtained by FNAC. However, scantily cellular, nondiagnostic material reported in some instances of FNCC has been attributed to less cellular or fibrotic lesions (Akhtar et al, Ghosh et al, Mair et al), which it seems that need a more vital sampling that is somewhat more efficiently achieved with the suction pressure of FNAC.^{5,6,11}

CONCLUSION

FNAC in addition to FNNAC yield good material for identification of superficial enlarged lymph node. FNNAC is low-priced, easy and simple to study. There is fine control over the needle to direct it inside the lesion and better perception of the lesion. FNNAC provided better quality smears for the analysis and identification of superficial lymph nodes. FNNAC is well tolerated by the patients mainly children as the apprehension of trauma is less compared to FNAC. FNNAC is a good technique that needs to be utilised in the routine cytology practice for sampling of superficial enlarged lymph nodes. To amplify the chance of identification in a sample, both FNAC and FNNAC may be used to supplement each other.

Criterion	Qualitative Description	Point scores
Background blood or clot	Large amount: Great compromise in diagnosis	0
	Moderate amount: Diagnosis possible	1
	Minimal: Diagnosis easy specimen of textbook quality	2
Amount of cellular material	Minimal to absent: Diagnosis not possible	0
	Sufficient for Diagnosis	1
	Abundant: Diagnosis simple	2
Degree of cellular degeneration	Marked: Diagnosis impossible	0
	Moderate: Diagnosis possible	1
	Minimal: Good preservation diagnosis easy	2
Degree of cellular trauma	Marked: Diagnosis not possible	0
	Moderate :Diagnosis possible	1
	Minimal : Diagnosis obvious	2
Retention of appropriate architecture	Minimal to absent: Non diagnostic	0
	Moderate: Some preservation e.g. follicles, papillae, acini, flat sheets, syncytia or single cell pattern	1
	Excellent architectural display closely reflecting histology: Diagnosis obvious	2

Table 1. Scoring System Developed by Mair et al, to Classify Quality of Smears in FNAC and FNNAC

Cytological Diagnosis	Males	Females	Total
Reactive lymphadenitis	12	8	20
Tuberculous lymphadenitis	8	8	16
Metastatic deposits	5	3	8
Hodgkins lymphoma	2	1	3
Non- Hodgkins lymphoma	2	1	3

Table 2. Causes of Lymphadenopathy

		Total Points	Mean	Standard Deviation	t- value	p- value
Background blood or clot	FNAC	71	1.44	0.56	0.812	0.416
	FNNAC	73	1.47	0.53		
Amount of cellular material	FNAC	72	1.43	0.54	0.806	0.422
	FNNAC	69	1.39	0.55		
Degree of cellular degeneration	FNAC	65	1.30	0.48	1.000	0.319
	FNNAC	69	1.40	0.55		
Degree of cellular trauma	FNAC	63	1.26	0.46	1.30	0.201
	FNNAC	68	1.40	0.50		
Retention of appropriate architecture	FNAC	58	1.16	0.39	1.412	0.160
	FNNAC	63	1.25	0.50		
Total	FNAC	329	6.60	1.30	1.578	0.1176
	FNNAC	342	6.90	1.45		

Table 3. Showing Average Score Per Case for Each Category in 100 Cases

REFERENCES

- [1] Waekly PE, Cibas ES. Lymph node. In: Cibas ES, Ducatman BS, eds. *Cytology, diagnostic principles and clinical correlates*. 3rd edn. Elsevier 2009;p. 319.
- [2] Orell SR, Vielh P. The techniques of FNA cytology. In: Orell SR, Steratt FG, eds. *Fine needle aspiration cytology*. 5th edn. Elsevier 2012;p. 10.
- [3] Zajdela A, Zillhardt P, Voillemot N. Cytological diagnosis by fine needle sampling without aspiration. *Cancer* 1987;59(6):1201-1205.
- [4] McElvanna K, Pyper P, Miller K. A comparison of fine- needle aspiration versus non-aspiration cytology of thyroid nodules. *The Internet Journal of Surgery* 2009;25(2).
- [5] Akhtar SS, Imran-Ul-Huq, Faiz-U-Din M, et al. Efficacy of fine-needle capillary biopsy in the assessment of patients with superficial lymphadenopathy. *Cancer* 1997;81(5):277-280.
- [6] Mair S, Dunbar F, Becker PJ, et al. Fine needle cytology-is suction necessary? A study of 100 masses in various sites. *Acta Cytol* 1989;33(6):809-813.
- [7] Kate MS, Kamal MM, Bobhate SK, et al. Evaluation of fine needle capillary sampling in superficial and deep- seated lesions. An analysis of 670 cases. *Acta Cytol* 1998;42(3):679-684.
- [8] Qadri SK, Hamdani NH, Shah P, et al. Profile of lymphadenopathy in Kashmir valley: a cytological study. *Asian Pacific J Cancer Prev* 2012;13(8):3621-3625.
- [9] Bharathi K, Anuradha S, Khalique A. A prospective study to compare the aspiration and non-aspiration techniques in fine-needle cytology of lymph node and to evaluate the diagnostic accuracy of aspiration cytology in lymph node lumps. *Int J Biol Med Res* 2012;3(3):2147-2152.
- [10] Raghuvver CV, Leekha I, Pai MR, et al. Fine needle aspiration cytology versus fine needle sampling without aspiration. A prospective study of 200 cases. *Indian J Med Sci* 2002;56(9):431-439.
- [11] Ghosh A, Misra RK, Sharma SP, et al. Aspiration versus non-aspiration technique of cytodiagnosis - a critical evaluation in 160 cases. *Indian J Pathol Microbiol* 2000;43(2):107-112.