

ORIGINAL RESEARCH

Diagnostic utility of fine needle aspiration cytology in lymphadenopathy and its correlation with Histopathology

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ABSTRACT

Background: FNAC has demonstrated excellent diagnostic accuracy. The present study was conducted to assess diagnostic utility of fine needle aspiration cytology in lymphadenopathy. **Materials & Methods:** 400 patients of lymphadenopathy were subjected to FNAC using 23-25 G needle & 10 ml syringe and Franzens handle. Biopsy samples were stained with H&E. The aspiration smears were studied to arrive at a probable diagnosis. In the available cases FNAC diagnosis was further correlated & compared with the histopathological diagnosis made from sections stained with H&E. **Results:** The type of lesion was TBLN in 183, CNSL in 91, NTGL in 22, ANSL in 12, metastasis in 45, lymphoma in 17 and leukemia in 2 cases. Out of 400 patients, males were 188 and females were 212. Most common site was found to be cervical region followed by submandibular lymph nodes with inguinal being the least common site. Cytological features of tuberculosis was epitheloid cell granulomas with necrosis in 101, epitheloid cell granulomas without necrosis in 42, and necrosis in 40 patients. Overall AFB positivity was 31.14% of tuberculous cases. The difference was significant ($P < 0.05$). Hodgkins lymphoma, non hodgkins lymphoma, and leukemia showed 100% sensitivity and specificity. There was sensitivity- 100 %, specificity- 96.97%, PPV- 90.48%, NPV- 100 %. **Conclusion:** FNAC is simple, safe, self- reliable, cost effective and less time- consuming outpatient procedure especially in centres where advanced diagnostic techniques are not yet available. It can be used as an initial diagnostic tool for lymphadenopathies.

Keywords: lymphadenopathy, FNAC, Biopsy

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INTRODUCTION

A common occurrence in clinical settings is lymphadenopathy. The clinical symptoms of lymphadenopathy might mimic those of other illnesses, making the diagnosis of enlarged lymph nodes based only on clinical judgment difficult.¹ Tissue biopsy is the most accurate diagnostic technique for identifying the reason for lymph node enlargement, but its use is restricted by its expense and invasiveness.²

Aspiration of lymph nodes was reported early in 1904 by Grieg and Gray for the diagnosis of Trypanosomiasis. In 1921, Guthrie described the application of FNAC in the diagnosis of lymph node lesions. It serves as an excellent clue to the underlying disease.³ The cytological features frequently correlate well with histologic features of the same lesion. Ready identification of metastasis or recurrence, is considered as a valuable diagnostic aid.⁴ When it comes to identifying viral illnesses, granulomatous lymphadenitis, reactive lymphoid hyperplasia, and

metastatic cancer, FNAC has demonstrated excellent diagnostic accuracy. FNAC, however, may not be as accurate in diagnosing patients with primary lymphoproliferative diseases.⁵ According to early findings, patients with low-grade non-Hodgkin lymphoma and Hodgkin lymphoma (HL) experienced substantial false-negative rates from FNAC. More recent research has shown that 85–90% of patients can be correctly diagnosed with lymphoma with FNAC, especially when ancillary procedures are used in addition to morphological assessment.⁶ The present study was conducted to assess diagnostic utility of fine needle aspiration cytology in lymphadenopathy.

MATERIALS & METHODS

A retrospective study was conducted on 400 patients of lymphadenopathy for a period of 6 months at Department of Pathology at Government Medical College Jammu. The patients were subjected to FNAC using 23-25 G needle & 10 ml syringe and Franzens handle. The material obtained was fixed in alcohol,

stained with Giemsa, Pap stain and Z N stain. Biopsy samples were stained with H&E. The aspiration smears were studied to arrive at a probable diagnosis. In the available cases FNAC diagnosis was further

correlated & compared with the histopathological diagnosis made from sections stained with H&E. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Frequency of various Neoplastic & Non neoplastic lesions on FNAC

Type of lesion	No. of cases	Percentage
TBLN	183	45.75%
CNSL	91	22.75%
NTGL	22	5.5%
ANSL	12	3 %
Metastasis	45	11.25%
Lymphoma	17	3.8%
Leukemia	02	0.05 %
Total	372	100%

Table I, graph I shows that type of lesion was TBLN in 183, CNSL in 91, NTGL in 22, ANSL in 12, metastasis in 45, lymphoma in 17 and leukemia in 2 cases.

Graph I Frequency of various Neoplastic & Non neoplastic lesions on FNAC

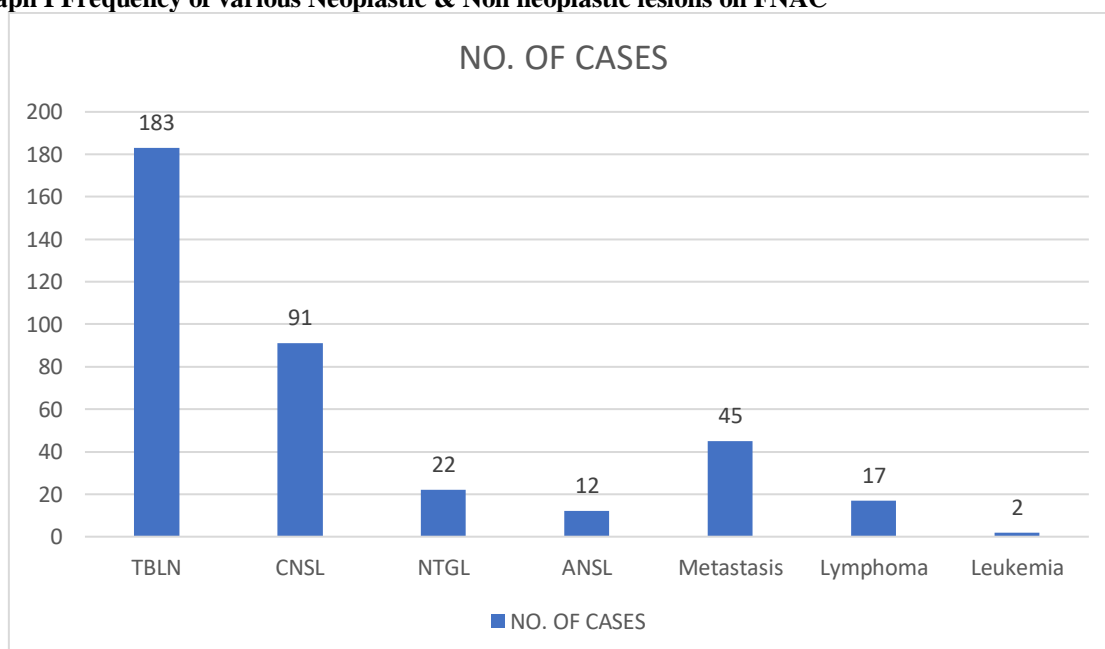


Table II Distribution of patients

Total-		
Gender	Male	Female
Number	188	212

Table II shows that out of 400 patients, males were 188 and females were 212.

Table III Assessment of parameters

Parameters	Variables	Number	P value
Site	Cervical	232	0.04
	Submandibular	69	
	Axillary	35	
	Inguinal	11	
	Generalized	45	
	Others	8	
Cytological features of tuberculosis	Epitheloid cell granulomas with necrosis	101	0.05
	Epitheloid cell granulomas without necrosis	42	

	Necrosis	40	
Microscopic patterns of tuberculosis associated with AFB positivity	Epitheloid cell granulomas with necrosis	14%	0.02
	Epitheloid cell granulomas without necrosis	7%	
	Necrosis	79%	

Most common site was found to be cervical region followed by submandibular lymph nodes with inguinal being the least common site. Cytological features of tuberculosis was epitheloid cell granulomas with necrosis in 101, epitheloid cell granulomas without necrosis in 42, and necrosis in 40 patients. Overall AFB positivity was 31.14% of tuberculous cases. The difference was significant ($P < 0.05$).

Table IV Diagnostic co-relations of FNAC

Cytology diagnosis	Histopathology diagnosis							Total
	TBLN	CNSL	NTGL	METASTASIS	LYMPHOMA		LEUKEMIA	
					HL	NHL		
TBLN	34	00	01	00	00	00	00	35
CNSL	04	18	00	00	00	00	00	22
NTGL	01	01	05	00	00	00	00	07
METASTASIS	00	02	00	07	00	00	00	09
HL	00	00	00	00	08	00	00	08
NHL	00	00	00	00	00	02	00	02
LEUKEMIA	00	00	00	00	00	00	02	02
Total	39	21	06	07	08	02	02	85

Table IV shows diagnostic co-relations of FNAC.

Table V Sensitivity & specificity of FNAC correlation with biopsy in various lesions

Type of lesion	Sensitivity	Specificity
Tuberculous granulomatous lymphadenitis	87.2 %	97.8 %
Chronic non-specific lymphadenitis	85.71 %	93.75 %
Non tuberculous granulomatous lymphadenitis	83.3 %	97.5 %
Metastasis	100 %	97.4 %
Hodgkins lymphoma	100 %	100 %
Non hodgkins lymphoma	100 %	100 %
Leukemia	100 %	100 %

Table V shows that Hodgkins lymphoma, Non hodgkins lymphoma, and Leukemia showed 100% sensitivity and specificity.

Table VI FNAC and Histopathological results according to the status of malignancy

FNAC	HISTOPATHOLOGY		
	BENIGN	MALIGNANT	TOTAL
BENIGN	64	00	64
MALIGNANT	02	19	21
TOTAL	66	19	85

Table VI shows sensitivity- 100 %, specificity- 96.97%, PPV- 90.48%, NPV- 100 %.

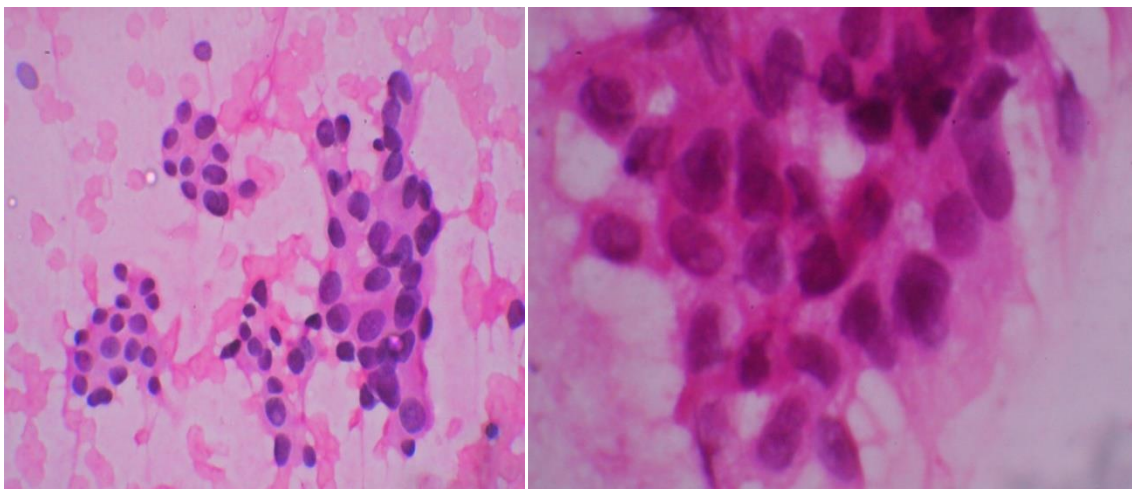


Figure 1: Photomicrograph showing squamous cell carcinoma secondaries

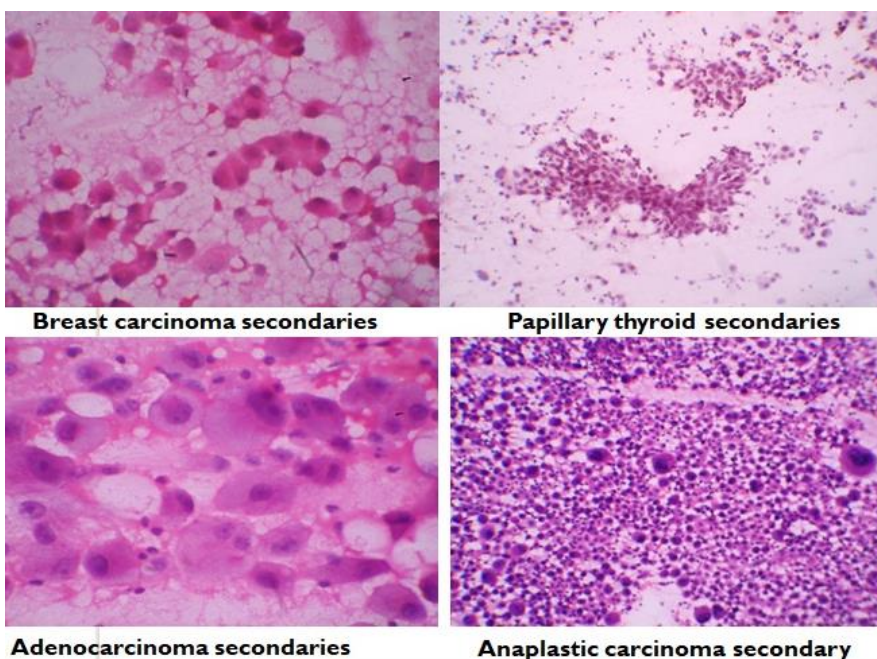


Figure 2: Photomicrograph showing secondaries of various malignancies

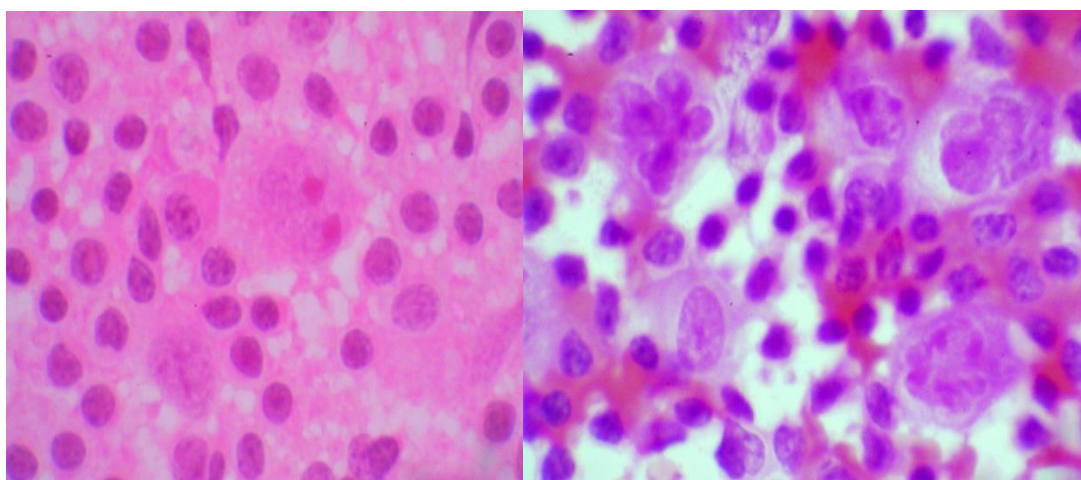


Figure 3: Variants of Reed Sternberg cells (RS cells)

DISCUSSION

Cytological smears are essential for diagnosing malignancies that have spread to lymph nodes because, in cases of occult carcinoma, this may be the only way to find the source tumor.⁷ However, the majority of these patients have a clinically diagnosed primary tumor, and FNAC is frequently utilized to monitor these patients.^{8,9} While the majority of metastatic carcinomas may be distinguished exclusively by their cytomorphological traits, the features of several tumors can overlap, making the accurate diagnosis of the original tumor more difficult.¹⁰ The present study was conducted to assess diagnostic utility of fine needle aspiration cytology in lymphadenopathy.

We found that 85 cases were available for histopathology correlation. Faro et al¹¹ ascertained the diagnostic value of FNAC in assessing frequent causes of peripheral lymphadenopathy. Over the course of five years, 86 individuals with FNAC and histology or cell block preparation of the same lymph nodes were recruited. As gold standards, histology and cell blocks were used to calculate the test's accuracy, sensitivity, specificity, and predictive values. The scores for sensitivity, specificity, positive, and negative predictive were, in order, 91.5%, 81.1%, 87.5%, and 71.4%. FNAC's test accuracy was 83.7%. FNAC is a trustworthy tool for identifying and evaluating lesions in peripheral lymph nodes.

We found that overall sensitivity was found to be 100% among benign lesions. However, among 21 malignant cases histopathological correlation was found in 19 cases only. We found that two cases were diagnosed as metastatic deposits on FNAC were found to be that of chronic non-specific lymphadenitis. These cases on FNAC showed predominance of lymphohistiocytic clusters with bi and multinucleation at places and were reported as metastatic deposits of nasopharyngeal carcinoma on FNAC. Ha et al¹² assessed the reliability and effectiveness of FNAC in the diagnosis of lymphadenopathy. Cytological characteristics were evaluated in 432 patients who underwent lymph node FNAC. Fifteen (3.5%) of the four hundred and thirty-two patients were diagnosed as inadequate by FNAC, with five (33.3%) of these diagnosed as metastatic carcinoma on histological examination. Of the 432 patients, 155 (35.9%) were diagnosed as benign by FNAC, with seven (4.5%) of these diagnosed histologically as metastatic carcinoma. A review of the FNAC slides, however, showed no evidence of cancer cells, suggesting that the negative results may have been due to FNAC sampling errors. An additional five samples regarded as benign on FNAC were diagnosed as non-Hodgkin lymphoma (NHL) by histological examination. Of the 432 patients, 223 (51.6%) were cytologically diagnosed as malignant, with 20 (9.0%) of these diagnosed as tissue insufficient for diagnosis (TIFD) or benign on histological examination. A review of the FNAC

slides of these 20 patients, however, showed that 17 (85.0%) were positive for malignant cells. The sensitivity, specificity, positive predictive value (PPV), negative predictive values (NPV), and accuracy of FNAC were 97.8%, 97.5%, 98.7%, 96.0%, and 97.7%, respectively.

The limitation of the study is the small sample size.

CONCLUSION

Authors found that FNAC is simple, safe, self-reliable, cost effective and less time-consuming outpatient procedure especially in centres where advanced diagnostic techniques are not yet available. It can be used as an initial diagnostic tool for lymphadenopathies.

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