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## RESEARCH ARTICLE

### FINE NEEDLE ASPIRATION CYTOLOGY OF CERVICAL LYMPHADENOPATHY- A STUDY OF 510 CASES

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#### ABSTRACT

**Objective:** Cytological examination of Fine needle aspiration cytology (FNAC) smears can determine whether lymphadenopathy is due to reactive hyperplasia, infection, metastatic malignancy or malignant lymphoma. FNAC a simple, and reliable technique can be used as a routine OPD procedure for establishing etiology of cervical lymphadenopathy. In this study we describe cytomorphological patterns of FNAC of cervical lymph nodes and it's utility in establishing diagnosis.

**Methods:** This study was carried out at Rural Government Medical College and Hospital on 510 clinically diagnosed cases of cervical lymphadenopathy over a period of two and half years. FNAC was carried out in all these patients. Biopsy and special stains were done in selected cases. Patients included in the present study were in the age group of 3 months to 80 years with male: female ratio of 1.2: 1.

**Results:** 127/510 (24.90%) cases were of tubercular lymphadenitis, 102/510 (20%) cases show Metastatic tumours, 118/510 (23.13%) hyperplastic lymph nodes, 55/510 (10.78%) acute lymphadenitis, 56/510(10.98%) chronic granulomatous lymphadenitis and 11/510 (0.22%) Lymphoma. Tubercular lymphadenopathy was seen more commonly in third and fourth decades together comprising of 70/127 (55.12%) cases. 86/102 (84.31%) cases of metastatic tumours were in the age group of 31- 60 yrs. Highest incidence of metastatic malignancy was seen in the seventh decade (38.23%).

**Conclusions:** The most frequent causes of cervical lymphadenopathy are reactive lymphadenitis, metastatic malignancies and tuberculosis. FNAC alone can help in establishing the diagnosis in large number of cases. It is a highly effective diagnostic procedure in the pre operative evaluation and management of cervical lymph node masses.

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## INTRODUCTION

Cervical lymph nodes drain the lymphatic's from head and neck<sup>[1]</sup>. Lymphadenopathy is the most common cause of swelling in the neck and is one of the commonest presentations in inflammatory and neoplastic disorders. Etiological diagnosis of enlarged lymph nodes is of immense importance to the clinician as well as to the patients. Fine needle aspiration cytology (FNAC) is a procedure in which a fine needle is used to remove a sample of cells from a suspicious mass for diagnostic purposes.<sup>[2]</sup> At the primary level, FNAC is used as triage to distinguish between cases of lymphadenopathy with a high or a low level of suspicion of significant disease by the most simple and the least invasive and least costly method.<sup>[3]</sup>

## MATERIALS AND METHODS

This study was carried out at Rural Government Medical College and Hospital on 510 cases of cervical lymphadenopathy over a period of two and half years from

Jan 2011 to June 2013. In each case detail history, clinical presentation of cervical lymph nodes and clinical examination along with necessary routine as well as special investigations if indicated were carried out. Aspiration was done as OPD procedure using 21-23 gauge needles. Three to four smears were obtained by multiple passes. Smears are dipped immediately in the ethyl alcohol solution for minimum of 30 min for PAP staining. Air dried smears are stained with May-Grunwald Giemsa. Extra air-dried slides were kept ready for Zeihl-Neelsen 20% staining for acid-fast bacilli (AFB) whenever tuberculosis was suspected clinically. The diagnoses were classified according to various cytomorphological patterns<sup>[4]</sup> and correlated with patient's age. In 34 cases cytology and histopathology correlation was available.

## RESULTS

Fine needle aspiration cytology was done on 510 patients with palpable lymph node masses in the cervical neck region. Their Age and sex distribution is shown in Table 1. There was male predominance and maximum number of cases (23.34%) were in age group of 21-30 years. Jugulodigastric group of lymph

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**Table 1. Age and sex distribution of cervical lymph node lesions**

Age Group (yrs.)	No. Of Cases				Total	Percentage
	Males		Females			
	No.	%	No.	%		
0-10	44	15.82	28	12.06	72	14.12
11-20	52	18.70	26	11.21	78	15.29
21-30	45	16.19	74	31.90	119	23.34
31-40	44	15.82	35	15.09	79	15.49
41-50	26	09.35	19	08.19	45	08.82
51-60	20	07.19	27	11.64	47	09.21
61-70	43	15.46	21	09.05	64	12.55
71-80	04	01.47	02	00.86	06	01.18
Total	278	100.00	232	100.00	510	100.00

**Table 2. Distribution of various lesions of cervical lymph nodes on FNAC**

Sr. No.	Cytological diagnosis	No. of cases	Percentage
	Non neoplastic lesions		
I.	1) Reactive lymph nodes	118	23.13%
	2) Acute lymphadenitis	55	10.78%
	3) Chronic granulomatous lymphadenitis	56	10.98%
	4) Tuberculous lymphadenitis	127	24.90%
II.	Lymphoma		
	1) Hodgkin's lymphoma	02	0.40%
	2) Non-Hodgkin's lymphoma	09	1.77%
III.	Metastatic tumours	101	20.00%
IV.	Inadequate smears	41	08.04%
	Total	510	

**Table 3. Cytological patterns of tubercular lymphadenitis**

Cytological pattern	No. of cases	%
Caseation necrosis only (CN)	11	08.66
Caseation necrosis and epithelioid cell granuloma (CN+ECG)	99	77.95
Epithelioid cell granuloma only (ECG)	12	09.35
No caseation necrosis, no epithelioid cell granuloma (NCNG)	05	03.94
Total	127	100.00

**Table 4. Cytohistopathological Correlation of lesions**

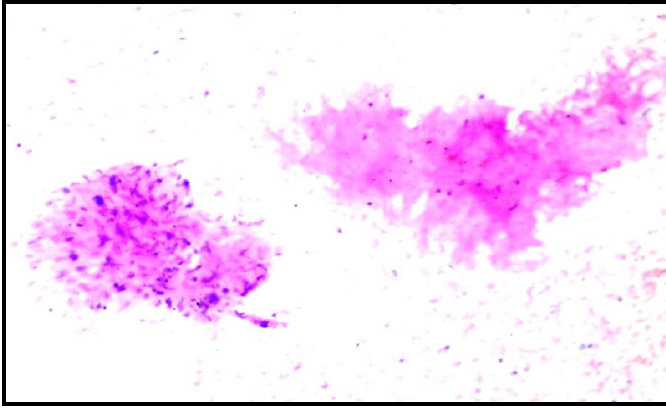
Cytological diagnosis	No. of cases with HPE	Histopathological diagnosis					
		TBL	RLH	HL	NHL	SCC	AdenoCa.
Reactive lymphadenitis	08	01	06	01	-	-	-
Granulomatous Lymphadenitis	06	04	02	-	-	-	-
Tubercular lymphadenitis	06	06	-	-	-	-	-
Hodgkin's lymphoma	02	-	-	02	-	-	-
Non Hodgkin's lymphoma	03	-	-	-	03	-	-
Squamous cell Carcinoma	05	-	-	-	-	05	-
Adenocarcinoma	04	-	-	-	-	-	04
Total	34	11	08	03	03	05	04

node lesions were most common. The various causes of cervical lymphadenopathy were classified according to cytomorphological patterns<sup>[4]</sup> and their frequency of occurrence in relation with different age groups was shown. Tuberculous lymphadenopathy was the commonest (24.90%) followed by reactive lymphadenopathy (23.13%) and metastatic lymphadenopathy (20%). One case was identified as the 'leukemic lymphadenopathy' and included in 'metastatic lymphadenopathy' category. Cytomorphologically tuberculous lesions were classified into four groups as described by S. Satyanarayana et al.<sup>[5]</sup> 'Caseation necrosis and epithelioid cell granuloma' (CN+ECG) was commonest cytomorphological type of tuberculosis forming 77.95% of cases (Figure 1 and Figure 2). Total AFB positivity was 91.34%. In metastatic group, squamous cell carcinoma was commonest forming 78.43% of cases (Figure 3). In 34 cases with cyto-histopathological correlation, 1 case was false negative, it was

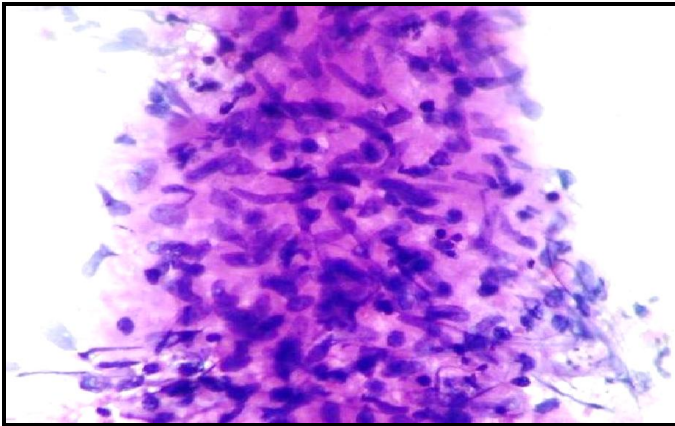
case of reactive lymphadenitis and tuberculous lymphadenitis (Table 4). The sensitivity of diagnosing malignant lesions by FNAC in the present study was 93.33% and the specificity was 100%. The overall accuracy rate was 97.06%.

## DISCUSSION

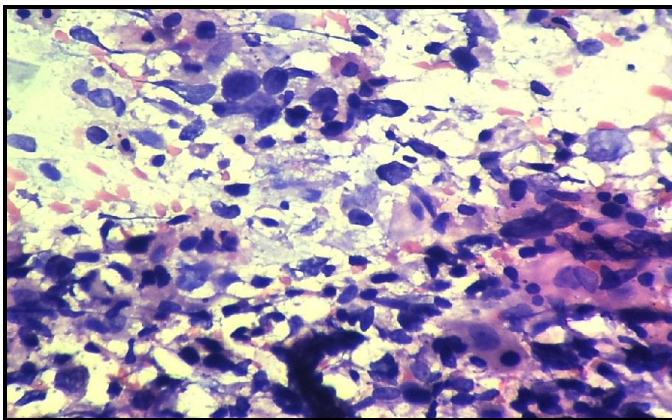
FNAC forms an important tool to aid in the diagnosis of cervical lymphadenopathy. Maximum number of cases in present study was recorded in the age group of 21- 30 years, which is comparable with those of other studies by A. B. Pandav et al<sup>[6]</sup> and S. Rajshekaran et al.<sup>[7]</sup> We found one false negative case in the cytodagnosis of reactive lymphadenitis, which turned out to be Hodgkin's lymphoma. Tuberculosis lymphadenopathy constituted the commonest lesion followed by reactive lymphadenitis and metastatic malignancies, which is correlating with most of the studies of Indian



**Figure 1. Photomicrograph showing caseous necrosis and a granuloma in caseating tubercular lymphadenitis (H & E, x40)**



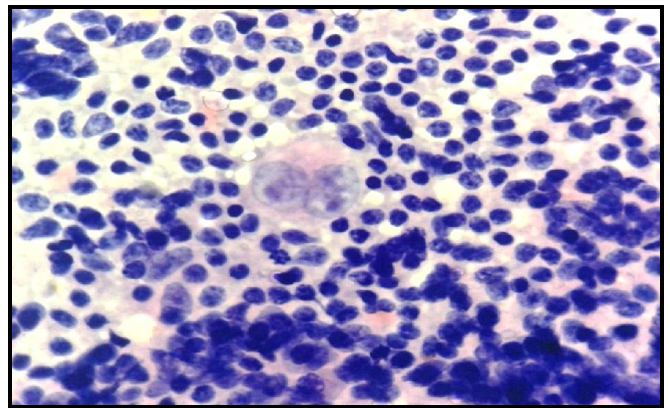
**Figure 2. Photomicrograph showing a cluster of loosely cohesive epithelioid histiocytes with characteristic pale, elongated nuclei and few lymphocytes forming granuloma in tubercular lymphadenitis (H & E, x100)**



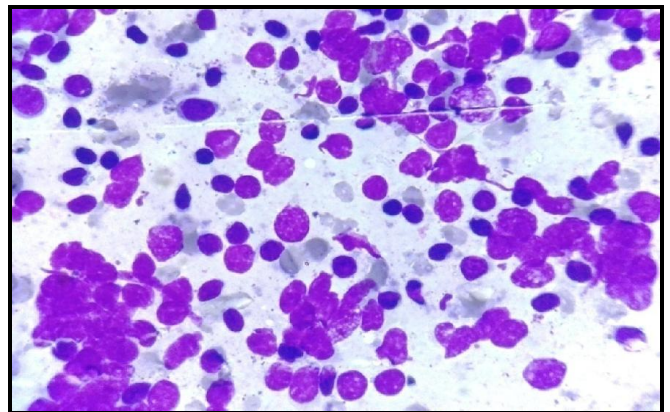
**Figure 3. Photomicrograph showing squamous cells with abundant keratinized cytoplasm in well differentiated squamous cell carcinoma. Nuclear atypia in some cells helps in the diagnosis (H & E, x40)**

authors.<sup>[6,8,9 &10]</sup> In our study most common cytological pattern of tuberculosis observed was presence of caseous necrosis and epithelioid cell granuloma (CN+ECG) which was observed in 77.95% of cases. This finding is consistent with work done by other workers such as Shenoy et al<sup>[11]</sup>, Vanishri et al<sup>[12]</sup> and Guru et al<sup>[13]</sup>. The pattern of AFB positivity in different cytomorphological pattern of tuberculous lymphadenopathy

was similar to other Indian studies.<sup>[14,15,16]</sup> Sometimes in absence of AFB positivity the diagnosis of highly suspicious of tuberculosis was given in these lesions with strong clinical suspicion, high ESR and chest X-ray findings. 8/510 cases in present study were comprised of HIV infection. The tuberculosis in HIV positive cases showed caseous necrosis, while granulomas were less and ill formed. Similar findings were found by Shenoy et al<sup>[11]</sup>. Metastatic malignancies comprised of third largest group in our study. Metastatic squamous cell carcinoma formed bulk of the lesion, accounting for 70.80% of all metastatic deposits. Thus SCC is the most common cytological type leading to metastasis. This finding correlates well with studies done by other workers such as Fatima et al,<sup>[10]</sup> Wilkinson et al,<sup>[17]</sup> and Alam et al.<sup>[18]</sup> In the present study only two cases of Hodgkin's lymphoma which were diagnosed on FNAC due to preserved Reed Sternberg (RS) cells (Figure 4).



**Figure 4. Photomicrograph showing typical large bilobed R-S cell with prominent eosinophilic nucleoli and large amount of cytoplasm in Hodgkin's lymphoma (H & E, x1000)**



**Figure 5. Photomicrograph of a FNAC smear from lymph node involved by leukemic infiltration showing large round cells with vesicular nuclei and a prominent nucleoli (MGG, x1000)**

In lymphoma group, with presence of RS cell, the cytological diagnosis of Hodgkin's lymphoma is easy. FNAC is helpful in diagnosis of Hodgkin's lymphoma though biopsy is recommended for confirmation and classification. The cytology of Leukemic lymphadenopathy (Acute Lymphoid Leukemia) revealed presence of large round cells with vesicular nuclei and prominent nucleoli and moderate amount of cytoplasm (Figure 5). Diagnostic accuracy in leukemic lymphadenopathy can be increased significantly by clinical

history, peripheral smear, bone marrow diagnosis and application of special cytochemical stains<sup>[19,20,21]</sup>. In this group there were no false positive cases.

### Conclusion

Fine needle aspiration cytology offers a simple method for diagnosis of neoplastic and non neoplastic lesions of Cervical lymph nodes. FNAC is a safe, quick and minimally invasive technique which can be performed as an outpatient department procedure which is readily acceptable by the patient. There is no need of anesthesia and results are obtained within short time. An accurate diagnosis can be made even in most remote areas, where other sophisticated diagnostic tools are not available. However it should be remembered that a positive diagnosis is valuable but a negative result may be non-contributory. In our study, the procedure was safe and complications were not reported. The most common non neoplastic lesion in lymph nodes was tubercular lymphadenitis and most common neoplastic lesion was metastatic tumor deposit. Squamous cell carcinoma was the most common lesion causing metastasis to lymph nodes. The histopathological correlation was available in 34 cases since most of the cases of tubercular lymphadenitis and metastatic tumor deposits in lymph nodes were therapeutically managed by the clinicians. The overall diagnostic accuracy of palpable cervical lymph nodes in relation to available histopathological correlation was 97.06%. The sensitivity and specificity were 93.33% and 100% respectively. The present study has made it clear that fine needle aspiration cytology is the best investigation one can ask for with a fairly good accuracy. Hence we conclude that fine needle aspiration cytology is a highly effective diagnostic procedure in the pre operative evaluation and management of cervical lymph node masses.

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