RESEARCH

Diagnostic Value of Fine Needle Aspiration Cytology in the Assessment of Cervical Lymphadenopathy

Bhatta Sushama*[1], Singh Samir[2], Regmi Chalise Sangita [3]

[1]Department of Pathology, KIST Medical College, Kathmandu, Nepal
[2]Department of Biochemistry, KIST Medical College, Kathmandu, Nepal
[3]Department of ENT, KIST Medical College, Kathmandu, Nepal

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ABSTRACT

Background: Cervical lymphadenopathy is one of the most frequent clinical manifestations of patients attending outpatient department. The etiology of cervical lymphadenopathy varies from inflammatory condition to malignant lesion. Fine needle aspiration cytology (FNAC) is a safe, easy and quick diagnostic technique. It has become the first line of investigation in the evaluation of lymphadenopathy. The objective of this study was to evaluate the spectrum of lesions in cervical lymphadenopathy and role of FNAC in the diagnosis of cervical lymphadenopathy.

Methods: This study was conducted over a period of two years (May 2015 to May 2017). 206 patients with cervical lymphadenopathy were included in the study.

Results: Most of the cases were non-neoplastic (91.74%) whereas (8.26%) cases were neoplastic. The most common cause of non-neoplastic lymphadenopathy was reactive lymphadenitis. Histocytological correlation was done in 32 cases. The diagnostic accuracy of FNAC for metastatic carcinoma and reactive lymphadenitis was 100% and 93.75% respectively.

Conclusions: FNAC is a safe, cost effective and reliable procedure to diagnose the causes of cervical lymphadenopathy.

Keywords: Fine needle aspiration cytology, Histopathology, Lymphadenopathy

***Corresponding Author:** Dr. Sushama Bhatta, Department of Pathology, KIST Medical College, Kathmandu, Nepal, E-mail: sushmabhatta@gmail.com

INTRODUCTION

Lymphadenopathy is the enlargement of lymph node and lymphadenitis is the inflammation of lymph node. Cervical lymph node measuring more than 1 cm is known as cervical lymphadenopathy. It could be due to infection, autoimmune disease or malignancy.[1] The management of these various lesions differ, hence it is important to determine the etiology. Fine needle aspiration cytology (FNAC) has important role in the diagnosis of these lesions.

FNAC is a technique used to obtain cells, tissues and /or fluid through a thin needle attached with disposable syringe for the diagnosis of masses.[2] FNAC is widely practiced and acceptable diagnostic procedure which is easy, safe, quick and provides a reliable diagnosis, hence it is used as a first line investigative method.[3,4,5,6] The small number of cells that are obtained from the lymph node during FNAC is often sufficient for the diagnosis.[6] The results of FNAC are comparable with those of histopathology and the aspirate has characteristics of a micro-biopsy.[7] FNAC can easily differentiate between neoplastic and non-neoplastic lesions.[8,9]

This study was conducted to evaluate the cytopathological patterns of cervical lymphadenopathy and role of FNAC in the diagnosis of cervical lymphadenopathy.

MATERIALS AND METHODS

This was a retrospective study conducted at KIST Medical College over a period of 2 years (May 2015 to May 2017).Two hundred six patients of all age groups and both sexes who attended pathology department for FNAC of cervical lymphadenopathy were evaluated. Lymph node biopsy was done in 32 patients.

The records were collected from computer database. The fine needle aspiration slides were stained with Wright stain, Papanicolaou (PAP) stain and Ziehl Neelsen (ZN) stain for Acid fast bacilli. Histopathology slides were stained with Hematoxylin and eosin (H & E) stain. The slides were reviewed and the results were classified as non-neoplastic and neoplastic lesion. Histo-cytological correlation was done in 32 patients. Serum Adenosine deaminase (ADA) level was evaluated by Erba Chem 7 semi autoanalyzer. Data analysis was carried out using the Statistical Package for Social Science (SPSS, version 17) for Windows.

RESULTS

Out of 206 patients with cervical lymphadenopathy, 108 (52.43%) were male and 98 (47.57%) were female. The ratio of male and female was found to be 1.1:1. The age range of the patients was 3-84 years. The disease was more frequently seen in the age group of 21-40 years (Table 1). Upper cervical lymph nodes were involved in maximum cases (112 cases, 54.4%). The FNAC results showed 189 cases (91.74%) as non-neoplastic and 17 cases (8.26%) as neoplastic . Reactive lymphadenitis was the most common non-neoplastic lesion (112 cases, 54.36%) followed by tuberculous lymphadenitis (74 cases, 35.92%) and metastatic carinoma was the most common neoplastic lesion (13 cases, 6.32%) (Table 2, Fig 1). Reactive lymphadenitis was common in the age group of 0-20 years with male preponderance whereas tuberculous lymphadenitis was common in the age group of 21-40 years with female preponderance. Overall AFB positivity in the FNAC was 32.4 %.

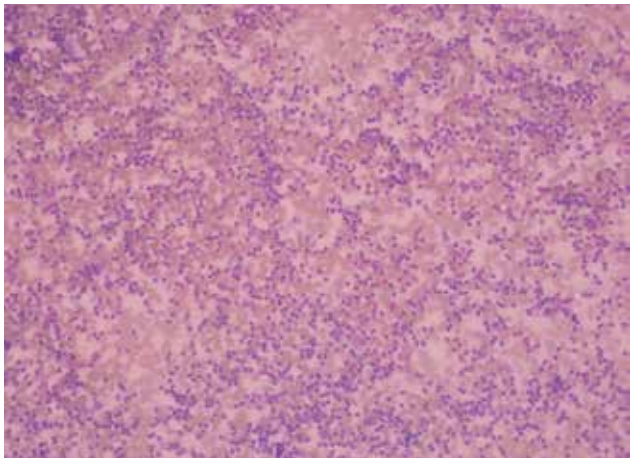
Out of 74 patients of tuberculous lymphadenitis, Serum adenosine deaminase (ADA) was done in 20 patients. Elevated levels of Serum ADA were found in 12 patients (60 %). Malignant lesions were common in the patients of more than 40 years of age, 14 cases (82.35%). Maximum neoplastic lesions were found in the age group of 41-60 years (Table 3). Histopathological diagnosis was available in 32 cases (27 non-neoplastic and 5 neoplastic lesions). Out of 27 non-neoplastic lesions, 25 were correctly diagnosed on histopathological examination. 2 cases of reactive lymphadenitis were diagnosed as lymphoma on histopathological examination. Diagnostic accuracy of reactive lymphadenitis was 93.75%. The diagnostic accuracy for metastatic carcinoma was 100% as all 5 cases showed exact histopathological correlation.

Table 1: Distribution of cases in various age groups

Age (years)	Male	Female	Total	%
0-20 yrs	45	27	72	34.95
21-40 yrs	36	47	83	40.29
41-60 yrs	21	18	39	18.93
61-80 yrs	5	5	10	4.85
>80 yrs	2	0	2	0.98
Total	109	97	206	100

Table 2: Cytopathological diagnosis of cervical lymphadenopathy

FNAC diagnosis	Number of patients (%)
Non neoplastic	
Reactive lymphadenitis	112 (54.36%)
Tuberculous lymphadenitis	74 (35.92%)
Suppurative lymphadenitis	03 (1.45%)
Neoplastic	
Metastasis	13 (6.32%)
Lymphoma	04 (1.95%)
Total	**206 (100%)**



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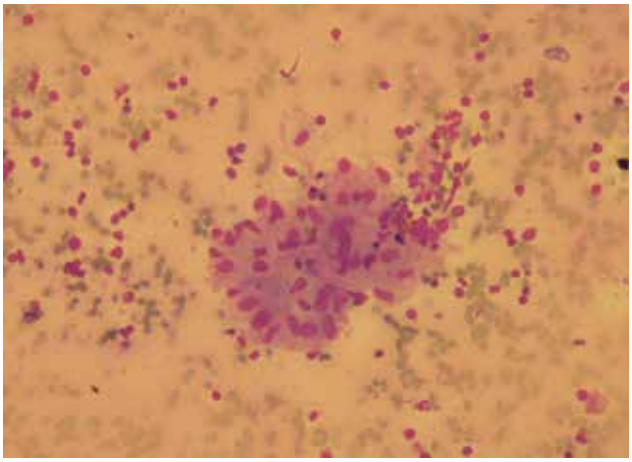

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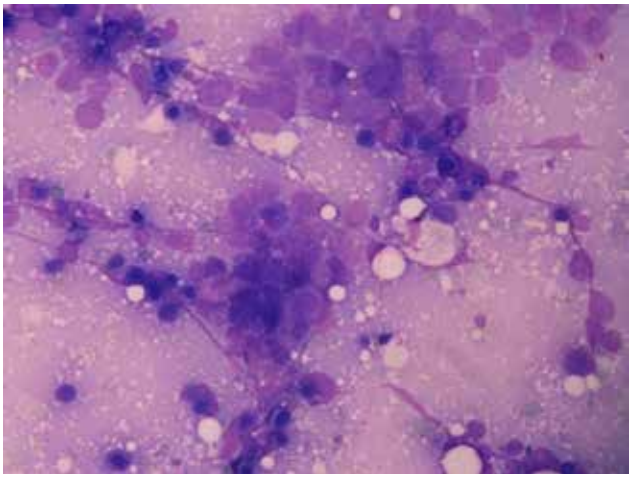

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Fig 1. A. Reactive lymphadenitis, B. Tuberculous lymphadenitis showing epithelioid granuloma, C. Metastatic carcinoma (Wright stain x100)

Table 3: Cytopathological diagnosis in relation to age and sex

Age (years)	Sex	Reactive lymphadenitis	Tuberculous lymphadenitis	Suppurative lymphadenitis	Metastatic carcinoma	Lymphoma
0-20	M	38	9	0	0	0
0-20	F	21	4	1	0	1
21-40	M	16	18	1	0	1
21-40	F	19	24	1	0	1
41-60	M	5	10	0	5	1
41-60	F	12	4	0	2	0
61-80	M	1	3	0	2	0
61-80	F	0	2	0	2	0
>80	M	0	0	0	2	0
>80	F	0	0	0	0	0
Total (%)		112 (54.36%)	74 (35.92%)	3 (1.45%)	13 (6.32%)	4 (1.95%)

DISCUSSION

Lymphadenopathy is a clinical presentation of various diseases, the etiology of which be benign or malignant lesions.[10] FNAC has important role for the diagnosis of these lesions as enlarged lymph nodes are easily palpable.[11,12] This study was carried out to evaluate the spectrum of lesions in patients with cervical lymphadenopathy and role of FNAC in the diagnosis of these lesions.

Cervical lymphadenopathy can be found in patients with wide age range. In the present study, the age range was 3-84 years. The male to female ratio was 1.1:1. Thus there was slight male predominance. These finding were in agreement with other studies.[13,14] Some authors have reported slight female predominance.[15,16]

In our study most cases were observed in the age group of 21-40 years. Similar observation was made by Chandawale SS et al[17]and Kumar H et al.[18] We observed that neoplastic lesions were common in the patients above 40 years of age. The results correlated with the study of Sarda AK et al.[19] Malignant lesions are common in older age as elderly patients respond to infection with slight to moderate lymph node enlargement in contrast to children; hence elderly patients presenting with lymphadenopathy should be subjected to FNAC to rule out malignant lesion.[20]

In the present study, out of 206 cases, 189 (91.74%) cases were non-neoplastic and 17 cases (8.26%) were neoplastic. These findings correlated with other studies [7,13,21,22]. In our study the major cause of lymphadenopathy was related to inflammatory pathology which are common in developing countries.[13,15,16,22] Reactive lymphadenitis was the most common non-neoplastic lesion (112 cases, 54.36%) followed by tuberculous lymphadenitis (74 cases, 35.92%) in the present study which correlates with the study by Hirachand S et al.[13] Reactive lymphadenitis is a common finding as infections from head and neck drain into these nodes.[23] Some authors have reported tuberculous lymphadenitis as the most common cause of cervical lymphadenopathy.[15,16,22] In the present study overall AFB positivity was 32.4 %. Highest AFB positivity was seen in smears with only

necrosis or neutrophilic infiltrate (80%), whereas least AFB positivity was seen in smears with only epithelioid granulomas (3%). The findings correlated with the study of Nidhi P et al [15] who demonstrated 85.5 % AFB positivity in cases having caseous necrosis only and 3.2 % AFB positivity in smears having epithelioid granuloma without necrosis. Serum ADA was elevated in 60 % patients in the present study. In a study by Mugulkod P et al[24], serum ADA levels were raised in 83.3% cases. In the current study, metastatic carcinoma was the most common neoplastic lesion. Squamous cell carcinoma was found in majority of cases of metastatic carcinoma. Similar observations were reported by various authors[11,13] while Malhotra AS et al[14] found adenocarcinoma as the most common metastatic malignancy.

Regarding age group, it was observed that reactive lymphadenitis was the most common cause of lymphadenopathy in the age group of 0-20 years, whereas tuberculous lymphadenitis was more common in the age group of 21-40 years. Reactive lymphadenitis was predominantly seen in male while tuberculous lymphadenitis was predominant in female. This finding was in agreement with studies by Khajuria R et al.[11] The incidence of reactive lymphadenitis gradually falls 6th decade onwards and the incidence of malignant lesions rises.[25] Our study also shows higher numbers of malignancy in the age group of 41-60 years followed by 61-80 years.

In our study two cases of reactive lymphadenitis were diagnosed as lymphoma on histopathological examination. Thus the diagnostic accuracy of FNAC for reactive lymphadenitis was 93.75%. Keith VE et al[26] and Al-Mulhim AS et al[27] reported 88% and 100% diagnostic accuracy for reactive lymphadenitis. In our study, all cases of metastatic carcinoma were correctly diagnosed on histopathological examination; hence diagnostic accuracy for metastatic carcinoma was 100% which is in accordance with the study by Hirachand S et al.[13]

CONCLUSION

FNAC is quick, easy, safe, economical, relatively painless and reliable procedure for the investigation of cervical lymphadenopathy. It is useful to differentiate between neoplastic and non neoplastic lesions and thus helps in the management of such lesions in combination with clinical features and other laboratory findings.

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