



CYTOLOGICAL AND HISTOPATHOLOGICAL CORRELATIVE STUDY OF LYMPH NODES IN A TERTIARY CARE HOSPITAL

Pathology

Dr Muthukumar M	Senior Resident, Pathology, Sri Muthukumaran Medical College Hospital & Research Institute
Dr Prema Devi E	Associate Professor, Pathology, Sri Muthukumaran Medical College Hospital & Research Institute
Dr Jaishree T	Senior Resident, Pathology, Sri Muthukumaran Medical College Hospital & Research Institute
Dr Saraswathy M	Professor And Head, Pathology, Sri Muthukumaran Medical College Hospital & Research Institute
Dr Sarumathy G*	Assistant Professor, Pathology, Sri Muthukumaran Medical College Hospital & Research Institute. *Corresponding Author

ABSTRACT

Context: Lymph nodes are one of the most frequently sampled tissues and lymphadenopathy are first evaluated by fine needle aspiration cytology¹. Lymphadenopathy is one of the commonest presentations in surgical department with varied etiology ranging from Reactive, Inflammatory condition to malignancy.

Aims: The aim of present study was to evaluate the correlation between the cytological and histopathological diagnosis of lymph node FNAC and Biopsies and to evaluate the sensitivity, specificity and predictive value of FNAC of lymph nodes diagnosed as tuberculosis and metastatic carcinoma.

Settings and Design: The study is done in SMMCHRI for a period of one year which included a total of 174 patients referred from surgical department who underwent FNAC of lymph nodes, out of which 89 patients had lymph node biopsies for histopathological evaluation.

Methods and Material: Aspiration smears and histopathological slides were evaluated and results were calculated for sensitivity, specificity and predictive value of FNAC and henceforth Cytological and Histopathological correlation is studied.

Statistical analysis used: Sensitivity, Specificity, Predictive value and Diagnostic accuracy are calculated

Results: Reactive lymphadenitis was seen in 35 patients followed by tubercular granulomatous lymphadenitis in 26 patients and malignant lesions in 28 patients. Correlating the findings, we could achieve 100% sensitivity and 96.9% specificity for tubercular lymphadenopathy and 100% and 98.6% for metastatic deposits respectively.

Conclusions: We have found FNAC as a satisfactory tool in diagnosis of tubercular and malignant lymphadenopathy. FNAC when used in conjunction with clinical, radiological and laboratory investigations can be a cost-effective method for the diagnosis of lymphadenopathy

KEYWORDS

FNAC, Metastatic carcinoma, Tubercular lymphadenitis

INTRODUCTION

Lymphadenopathy is one of the commonest presenting symptoms of all age groups. The aetiology can vary from simple inflammatory reactive lesion to malignant condition². Therefore, lymphadenopathy requires further evaluation for which FNAC has been a suitable investigation to confirm reactive or infective pathology and to rule out malignancies. The use of FNAC has been accepted as a widely practiced minimally invasive technique, which is safe, simple, rapid and relatively painless³. FNAC has emerged as an advanced diagnostic tool to differentiate reactive hyperplasia/inflammatory conditions, granulomatous disorders, metastasis and lymphomas⁴. We are reporting histopathological correlation of 89 cases of lymphadenopathy with FNAC.

SUBJECTS AND METHODS

Duration of Study

This was a 1-year retrospective study from November 2020 to November 2021

Inclusion Criteria

All patients referred to Department of Pathology for Lymph node FNAC

Exclusion Criteria

Non lymph node sample on FNAC and inadequate material even after repeated aspiration attempts were excluded from the study.

Aspiration of lymph nodes was done under aseptic precautions using 22-23-gauge needle and 5 ml syringe. Following aspiration, the nature and adequacy of the aspirated material was assessed and several smears were prepared. Smears were immediately fixed by air drying and in 100% alcohol, followed by four different stains including Giemsa stain, Papanicolaou stain, Ziehl-Neelsen stain and Hematoxylin

- Eosin stain.

Lymph node biopsies were received in 89 patients and the biopsy specimens were subjected to histopathological examination after fixing in 10% formalin. Histopathological examination was done and the results were correlated with the cytological reports to evaluate efficacy of the procedure.

The reactive hyperplasia of lymph node was suspected by observing mixed lymphoid tissue and macrophages with tingible bodies along with absence of Reed Sternberg cells. Granulomatous lesions were recognized cytologically by the observation of aggregates of epithelioid cells with or without multinucleated giant cells. An amorphous necrotic background suggestive of caseous necrosis leads to diagnosis of tuberculosis. If Tuberculosis was suspected, slides were stained with Ziehl-Neelsen method to detect acid fast bacilli (AFB) directly.

The diagnosis of lymphoma was suspected by monotonous lymphoid population with necrosis and mitoses. The cytological diagnosis was correlated with histopathological examination of specimen submitted. Metastatic carcinoma was diagnosed cytologically by presence of malignant epithelial cells along with mixed lymphoid tissue.

RESULTS:

A total of 174 patients were included in our study who had FNAC of lymph nodes, out of which 89 patients underwent excisional biopsy. Out of 89 patients, 50 patients (62.5%) presented with cervical lymph node enlargement, 12 patients (15%) presented with submandibular swelling, 8 patients (10%) with inguinal lymph node enlargement, 15 patients (7.5%) with axillary and 4 patients (5%) with Infra auricular lymph node enlargement. The age group of 89 patients ranged from 2 years to 80 years with a mean of 37 years, of which 66 were males and 23 were females (Table 1)

Table 1: Age and sex distribution of patients for lymph node FNAC.

Age group	Number of patients	Male	Female	Percentage
0-10	11	9	2	6.32
11-20	26	21	5	14.94
21-30	35	19	16	20.11
31-40	45	30	15	25.86
41-50	22	15	7	12.64
51-60	15	10	5	8.6
61-70	10	6	4	5.7
>70	10	5	5	5.7
Total	174	115	59	
Percentage		66.09	33.91	

Benign lymphadenopathy was the most common presentation of lymphadenopathy of the head and Neck region amounting to 68.6% of all. Among benign lesions, non-specific reactive lymphadenitis (Fig 1) was the most common findings of enlarged lymph nodes of the Neck region amounting to 39%, followed by tubercular granulomatous lymphadenitis (Fig 2) amounting to 29.2%. Of the 31.4% malignant lesions, 16.85% were metastatic carcinoma (Fig 3, 4) and 14.6% patients were suspected of lymphoma. (Fig 5)

Among 13 lymphoma cases, 8 were Non-Hodgkin's Lymphoma and 5 cases were diagnosed as Hodgkin's lymphoma. Of the 89 cases subjected to FNAC and histological diagnosis revealed 26 patients of tubercular lymphadenitis, 35 of reactive changes, 15 of metastasis in lymph nodes and 13 of lymphomas (Table 2)

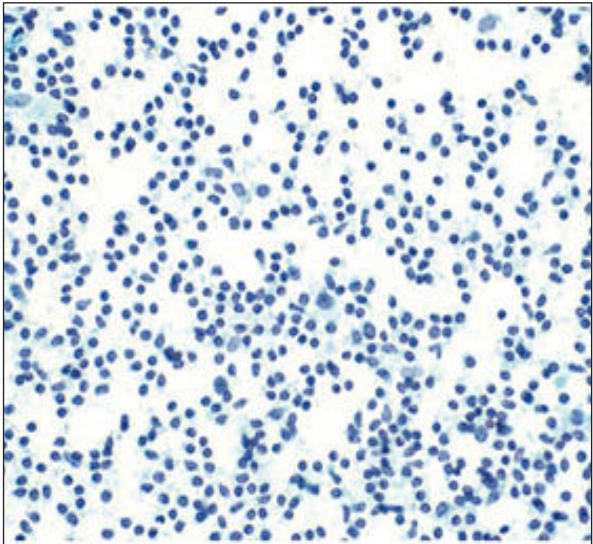


Fig 1: Reactive Lymphadenitis – Cervical lymph node

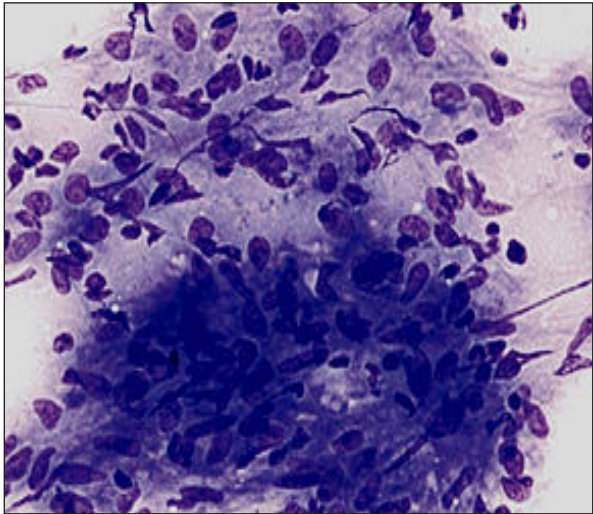


Fig 2 : Granulomatous Lymphadenitis – Cervical Lymph node – Giemsa (40X)

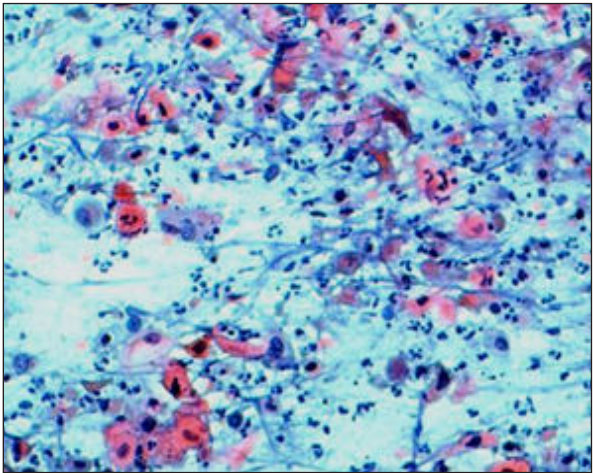


Fig 3 : Metastatic Squamous cell carcinoma deposit in Lymph node – Pap stain (20X)

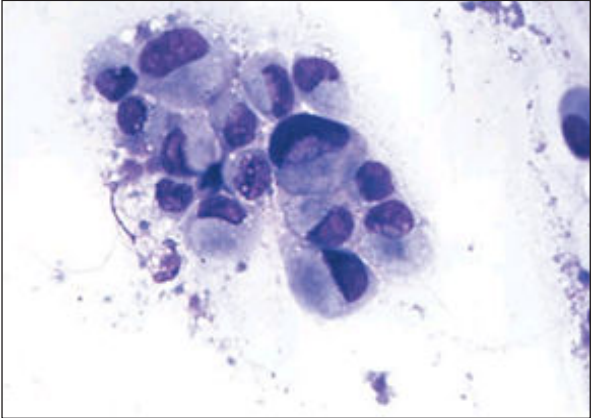


Fig 4 : Metastatic Adenocarcinoma

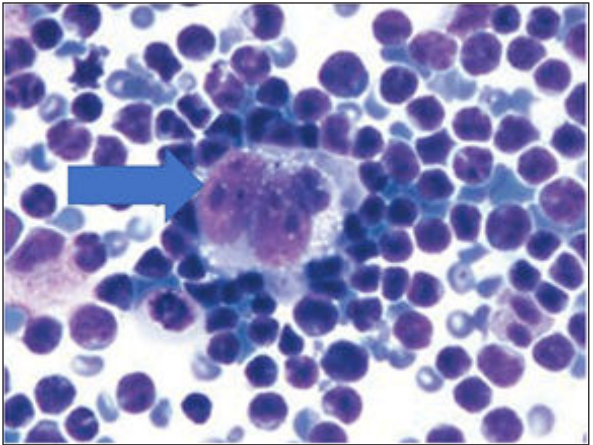


Fig 5 : Hodgkin's lymphoma

Table2:FnacAnd Histopathological Correlation For Lymphadenopathy

Cytological diagnosis						
HPE diagnosis	RL	TL	Met	NHL	HL	Total
Reactive Lymphadenitis	35	0	0	0	0	35
Tubercular Lymphadenitis	2	24	0	0	0	26
Metastatic Carcinoma	1	0	14	0	0	15
NHL	0	0	0	8	0	8
Hodgkin's Lymphoma	0	0	0	0	5	5
Total	38	24	14	8	5	89

Table 3 shows the sensitivity, specificity, positive and negative predictive value of FNAC for tubercular granulomatous diagnosis. A definitive diagnosis of tuberculosis was confirmed by AFB positivity in FNAC material and clinical features. Table 4 shows the sensitivity, specificity, positive and negative predictive value of FNAC for

metastasis of malignant cells in lymph node. Table 5 shows the comparison for discordant cases.

Table 3: Statistical analysis for tubercular lymphadenitis by FNAC.

FNAC Diagnosis	Positive HPE correlation	Negative HPE correlation	Total	Predictive value
Positive	24	2	26	92.3%
Negative	0	63	63	100%
Total	24	65	89	
Sensitivity/Specificity	100%	96.92%		

Table 4: Statistical analysis for metastasis in lymph node by FNAC.

FNAC Diagnosis	Positive HPE correlation	Negative HPE correlation	Total	Predictive value
Positive	14	1	15	93.33 %
Negative	0	74	74	100%
Total	14	75	89	
Sensitivity/ Specificity	100%	98.66%		

Table 5: Comparison of Cytological and Histopathological Diagnosis for Discordant cases

S.no	Cytology Diagnosis	HPE Diagnosis	Morphological Feature	Reasoning
1	Reactive Lymphadenitis	Tuberculous lymphadenitis	Granuloma along with necrosis	No granuloma in FNAC smears obtained
2	Reactive Lymphadenitis	Metastatic AdenoCarcinoma	Malignant Cells present in Glandular arrangement	No Malignant cells in the Smears obtained

DISCUSSION:

Lymphadenopathy is an enlargement of lymph node with altered consistency. It is a clinical manifestation of regional or systemic disease and serves as an excellent clue to the underlying disease.

Cervical lymphadenopathy may be the initial finding or may arise later on with other symptoms. In the context of granulomatous disorders, the possible aetiology is wide and the use of FNAC with other ancillary tests (microbiological, immunohistochemical, radiological, biochemical and special staining techniques) is useful for obtaining a definitive diagnosis^{5,6}. Lymphadenopathy often signifies the spectrum of other serious illnesses like lymphoma, acquired immunodeficiency syndrome, or metastatic cancer. FNAC as a first line screening method has been recommended in suspected malignancy.^{7,8}

Granuloma may be encountered in both Hodgkin's disease and non-Hodgkin's lymphoma, particularly T-cell lymphoma. Occasionally, lymph nodes containing metastatic carcinoma may also show features of granuloma. It has been suggested to be due to either necrotic material or surface antigen.⁹ Previous reports have been described in metastatic nasopharyngeal carcinoma, seminoma and malignant melanoma.^{8,9}

A series by Khurana et al highlighted the difficulties encountered in making a definitive diagnosis of malignant neoplasm that mimics, or occurs, in association with granuloma.¹⁰ Granulomatous inflammation found in lymph nodes draining carcinomas is a recognized phenomenon.¹⁰⁻¹² The background cell population needs to be scrutinized if a malignant lymphoma is suspected.

FNAC is the study of cellular samples obtained through a fine needle under negative pressure. The technique is quick, relatively painless and economical. It can provide unequivocal diagnosis in most of the situations.¹³ The lesion arising in lymph nodes can be found in patients ranging from an early to advanced age.¹⁴

The importance of performing an FNAC in patients with cervical lymphadenopathy prior to an excisional biopsy helps to assess the diagnosis of metastatic tumors of the head and neck. Furthermore, direct open biopsy prior to cytology may lead to a significantly higher local treatment failure rate, which in turn may be associated with an

adverse effect on survival.^{15,16} The accuracy of FNAC in the diagnosis of lymphoma has previously been questioned.¹⁷ The factors that influence the diagnostic specificity and sensitivity of FNAC in the diagnosis of lymphoma include necrosis in involved nodes, the presence of dual pathology, and sclerosis/fibrosis in involved nodes leading to insufficient diagnostic material.^{18,19}

Despite its limitations and pitfalls, FNAC appears to be a good first line method for investigating the cervical lymphadenopathy. The well-defined role of FNAC in the investigation of lymphadenopathy has previously been studied.

In the present series, sensitivity of FNAC in the various pathologies of lymph nodes ranged from 90% to 100%. Reactive hyperplasia constituted the largest number followed by tubercular lymphadenitis among benign lesions. Cytological features of the aspirate are important for the diagnosis of tubercular lymph nodes. We could achieve 100% sensitivity and 96.9% specificity for tubercular lymphadenopathy. As was the observation of Rajwanshi, et al.²⁰ FNAC does pose problems in diagnosing lymphomas, but in our series the sensitivity and specificity with regard to lymphomas was 100%, while that for metastatic it was 100% and 98.6% respectively. These findings are similar to the results of Engzell, et al, Gupta, et al and Ross, et al.²¹⁻²³ A diagnostic test is considered satisfactory if its sensitivity and specificity are around 90%.

CONCLUSION

We have found FNAC a satisfactory tool in the diagnosis of tubercular and malignant lymphadenopathy. The simplicity and rapidity of the procedure make it most suitable for use on outpatient basis even in peripheral hospitals and dispensaries. FNAC used in conjunction with clinical findings, radiological and laboratory investigations can be a cost-effective method for the diagnosis of lymphadenopathy²⁴.

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