

## Original Research Article

# Peripheral lymphadenopathy and FNA: a two-year evaluation at a tertiary care centre

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## ABSTRACT

**Background:** Lymphadenopathy is an age old affliction of mankind and a very common presentation in clinical practice. The main purpose of an FNA biopsy of abnormal peripheral lymph nodes is to determine whether further surgical excision of the lymph node is indicated for histopathological examination. The aim of the present study was to evaluate the role of fine needle aspiration cytology in patients with superficial lymphadenopathy and to correlate with histopathology wherever possible.

**Methods:** A two-year study was undertaken at the Central Diagnostic Laboratory at A.J. Institute of Medical Sciences, Mangalore. Patients of all age groups referred to the Central Diagnostic Laboratory for FNA of superficial lymph nodes were included in the study. All the slides of the cases were reviewed and impression recorded.

**Results:** Out of 200 cases, 73% were non neoplastic, 27% were neoplastic. Cases occurred most commonly in age group of 21-30 years. The male to female ratio was 1.7:1 and most common site of lymph node aspiration was cervical lymph node in (n =107) 53.5% cases. Reactive hyperplasia was the most common non- neoplastic cause of lymphadenopathy seen in 34.5% cases and metastasis to lymph node was the most common cause of neoplastic lymphadenopathy seen in 22% of the cases. The sensitivity was 90%, specificity was 100% and accuracy was 96.2%.

**Conclusions:** FNA is a very efficient, simple, safe, inexpensive and economical test for detecting the various causes of lymphadenopathy.

**Keywords:** FNA, Histopathology, Lymphadenopathy, Metastasis

## INTRODUCTION

FNA provides a simple and inexpensive test for diagnosis of common lymphadenopathies like reactive hyperplasia, infections, granulomatous lymphadenopathies and metastatic diseases.<sup>1</sup> In cases of reactive lymphoid hyperplasia's and infectious lymphadenopathies fine needle aspiration can significantly reduce the number of open biopsies. In infectious and granulomatous lymphadenopathies, if an infectious agent is identified, not only the cause of lymphadenopathy is determined, but

also microbiological studies can be performed on the aspirated material which can help the clinicians to choose appropriate antimicrobial therapy. FNA is a well-established method for the diagnosis of metastatic malignancies in lymph nodes. It confirms the presence of metastatic disease and also gives clues about the nature and origin of the primary tumour. In patients with previously documented malignancy presenting with enlarged lymph nodes, FNA can obviate further surgery performed merely to confirm the presence of metastasis. FNA of lymph nodes is very useful in confirmation of

diagnosis in advanced inoperable cancers.<sup>2</sup> Although the role of FNA in initial diagnosis, sub classification and management of patients with lymphomas may be limited, it aids in the initial suspicion of the disease; detection of residual disease, recurrences and progression of low grade to high grade lymphoma and helps in staging the disease. Availability of prior FNA report facilitates the subsequent histological diagnosis and classification of lymphomas.<sup>3</sup> Ancillary techniques, including cell block preparations, immunocytochemistry, quantitative immunophenotyping using flow cytometry, and molecular techniques to determine clonality and cell lineage are applied to FNA material, all enhance the accuracy of diagnosis.<sup>4</sup> The lymphomas that are diffuse by nature and are composed of one cell type with characteristic flow cytometric pattern are best amenable to unequivocal diagnosis by FNA.<sup>3</sup> Although FNA is not a replacement for open biopsy, in each and every case of lymphadenopathy it can help to establish a workable diagnosis and reduce the number of total biopsies. In the present study we have tried to make a scientific study and analysis through FNA, of the incidence, nature and types of lymphadenopathy with respect to age, sex, and site of distribution.

## METHODS

The material for this study was obtained from FNA's done at the Central Diagnostic Laboratory at A.J Institute of Medical Sciences, Mangalore on 200 patients who presented with superficial lymphadenopathy between July 2013 and July 2015.

### Inclusion criteria

Patients of all age groups that were referred to the Central Diagnostic Laboratory at A. J. Institute of Medical Sciences for FNA of superficial lymph nodes during the study period.

FNAC that was provisionally thought to be non-lymphoid in origin, that later turned out to be that from a lymph node.

### Exclusion criteria

- FNA of deep lymph nodes.
- USG/CT scan guided FNA of lymph node.
- FNAC that was provisionally thought to be of lymph node origin that later turned out to be non-lymphoid origin.
- Inadequate aspirate.

In each case the clinical history, the clinical examination findings and relevant investigation results were noted. FNA smears were air dried and wet fixed in 95% ethyl alcohol and stained with May Grunwald Giemsa and Papanicolaou stain respectively. The slides were reviewed and the impression recorded.

Lymph nodes of the patients who underwent subsequent surgical biopsy were fixed in 10% formalin and subjected to gross examination. Biopsy specimens were routinely processed to obtain 3 micrometre paraffin sections, which were stained with Haematoxylin and Eosin stains.

Special stains like Ziehl Neelsen stain, PAS were done whenever indicated. Histopathological study was done separately and then results of cytological and histopathological study were correlated to evaluate efficacy of the procedure.

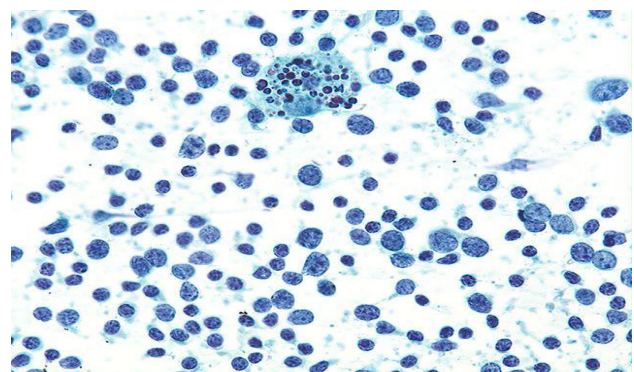
## RESULTS

The youngest patient in this study was 4 years old and the oldest was 78 years old. 19.5% of the patients belonged to 21-30 years age group, which was the age group in which most patients were involved. There were 126 males (63 %) and 74 females (37%) in the present study. The male to female ratio was 1.7:1.

Majority of the patients presented with localized lymphadenopathy accounting for 196 cases and the remaining 4 cases presented with generalized lymphadenopathy.

The most common site of lymph node aspiration was cervical lymph node in 53.5% of the cases (n=107 cases) followed by supraclavicular lymph nodes in 11.5% of the cases (n = 23 cases). Submandibular lymph node was affected in 10.5% of the cases (n= 21), inguinal lymph node in 10.5% (n= 21), axillary lymph node in 7% (n= 14), submental lymph node in 4.5 % (n = 9), pre-auricular lymph node in 1.5% (n= 3) and post auricular lymph node in 1% (n= 2).

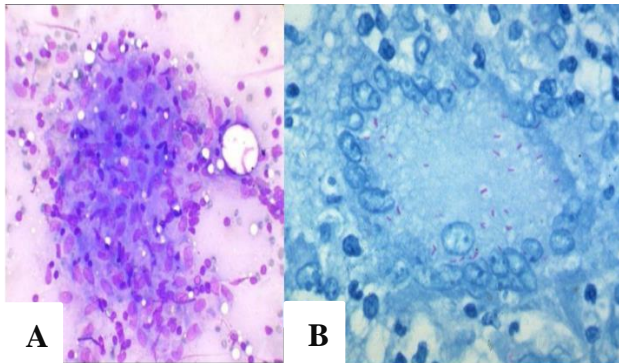
Of the 200 cases, 146 cases (73%) were diagnosed as non-neoplastic lesions, 54 cases (27%) were diagnosed as neoplastic lesions.



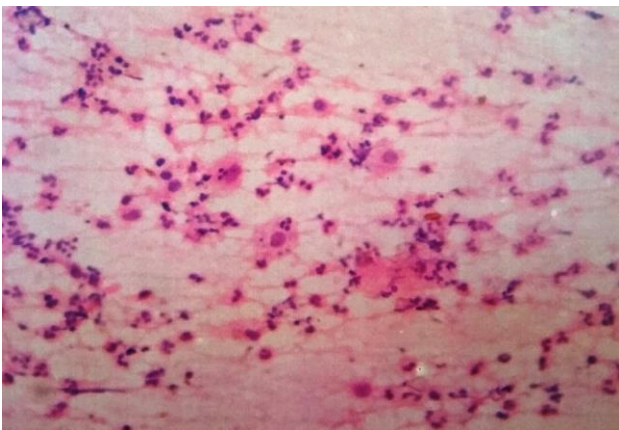
**Figure 1: FNA smear of reactive hyperplasia. (MGG x100). Note polymorphous population of lymphocytes and tingible body macrophages.**

Non neoplastic cases comprised of reactive hyperplasia in 34.5 % (Figure 1) of the cases followed by tuberculous lymphadenitis (Figure 2A, B) which accounted for 24.5

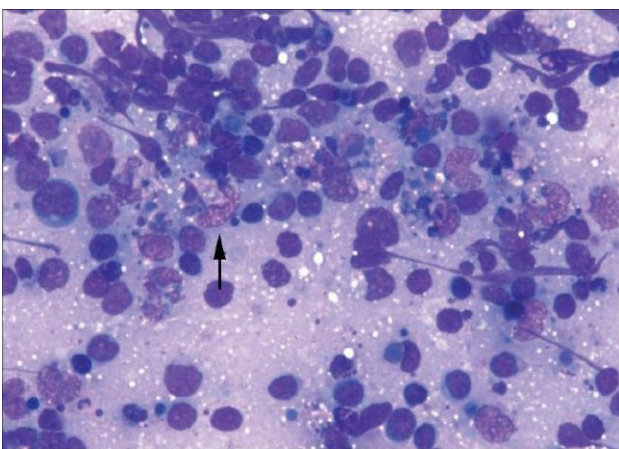
% of the cases, 8.5% cases were of granulomatous lymphadenitis, 4.5 % cases were of suppurative lymphadenitis (Figure 3), 0.5 % cases were of Kikuchi's disease (Figure 4) and 0.5% were of Kimura's disease.



**Figure 2: A) FNA smear of tuberculous lymphadenitis. (MGG x 400) granuloma consisting of epithelioid cells. 2B) Smear showing numerous acid fast bacilli (oil immersion x1000).**

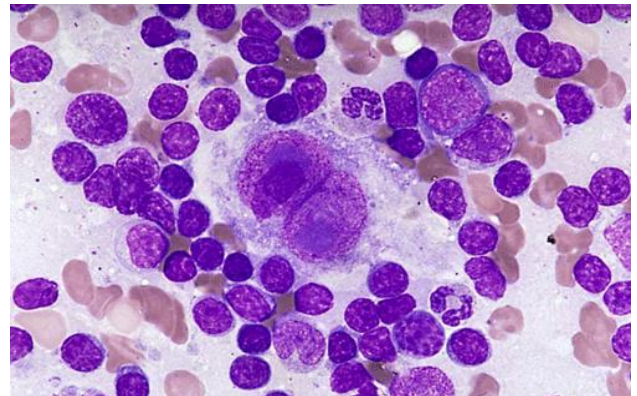


**Figure 3: FNA smear of suppurative lymphadenitis: aspirate shows acute inflammatory cells, cellular debris and tingible body macrophages (MGG x 100).**



**Figure 4: FNA smear: Kikuchi's disease (MGG x 100). Note karyorrhectic debris and histiocytes with crescent-shaped nuclei.**

The 54 (27%) neoplastic lesions comprising of 10 (5%) cases of lymphoma included 4% cases of Non-Hodgkin's lymphoma and 1% case of Hodgkin's lymphoma (Figure 5) and 44 (22%) cases of metastases to lymph node.



**Figure 5: FNA smear of Hodgkin's lymphoma. Note Reed Sternberg cell (MGGx400).**

Histopathological correlation was available in 27 cases of which, 17 cases which were benign on cytology and also turned out to be benign on histopathology. 1 case which was benign on cytology turned out to be malignant on histopathology. 9 cases which were malignant on cytology were also proved to be malignant on histopathology.

The overall sensitivity, specificity and accuracy of fine needle aspiration cytology in the diagnosis of superficial lymphadenopathy in the present study were 90%, 100% and 96.2% respectively (Table 1).

**Table 1: Comparative analysis of cytological diagnosis by histopathological diagnosis.**

Cytological Diagnosis	Histopathological diagnosis		Total
	Benign	Malignant	
Benign	17 (TN)	1 (FN)	17
Malignant	0 (FP)	9 (TP)	9

TN-True Negative; FN-False negative; FP-False positive; TP-True positive

**DISCUSSION**

The male to female ratio was 1.7:1 and this was comparable to studies done by Haque MA, Talukdar SI et al, Rakshan M, Rakshan A et al and Hirachand S et al, all of which showed a male preponderance.<sup>5-7</sup>

The most common age of presentation with lymphadenopathy was the 3<sup>rd</sup> to 4<sup>th</sup> decades as in other studies done by Rajasekaran et al.<sup>8</sup>

Non-neoplastic lesions were more prevalent than neoplastic lesions in the present study and this was



similar to studies done by Haque MA, Talukdar SI et al and Hirachand S et al.<sup>5-7</sup> The most common non neoplastic lesion was reactive hyperplasia followed by tuberculous lymphadenitis.<sup>7</sup>

One case was misdiagnosed as reactive hyperplasia on cytology. On histopathology, this case was diagnosed as Non-Hodgkin’s lymphoma-Follicular subtype. Brandao et al, reported that the follicular lymphoma might present a particular difficulty in FNA specimens because neoplastic element itself was polymorphous (centrocytes and centroblasts), and there might be a significant

population of T lymphocytes and, less commonly, histiocytes.<sup>9</sup> Almost the same observations were reported by Dong HY et al, who concluded that the difficulty to distinguish follicular lymphoma from reactive hyperplasia was largely due to the fact that the interfollicular areas in follicular lymphoma might contain large number of small lymphocytes as well as histiocytes that aspirated with the neoplastic cells.<sup>10</sup> Most common neoplastic lesion was metastatic carcinoma in the present study which was comparable with other studies<sup>7,11</sup> (Table 2).

**Table 2: Comparison of frequency of cytological diagnosis in the present study and other studies.**

Lesions	Hirachand et al <sup>7</sup>	Khajuria R et al <sup>11</sup>	Present study
Non-neoplastic			
Reactive lymphadenitis	41.50%	37.20%	34.50%
Tuberculous lymphadenitis	28.00%	52.30%	24.50%
Granulomatous lymphadenitis	9.20%	-	8.50%
Suppurative lymphadenitis	3.00%	1.00%	4.50%
Neoplastic			
Metastatic carcinoma	12.30%	3.80%	22.00%
Lymphoma	6.00%	2.00%	5.00%

**Table 3: Site of FNA and type of metastasis to lymph node.**

Site	Cervical	Supra clavicular	Axillary	Inguinal	Submandibular	Submental	Total
Types of metastasis							
Mets from papillary carcinoma thyroid	1						1
Mets from SCC	14	4		2	8		28
Mets from adenocarcinoma	3	3	1				7
Mets from poorly differentiated carcinoma	1	1					2
Mets from IDC		1					1
Mets from small cell carcinoma	1					1	2
Mets from malignant melanoma			1	2			3
	20	9	2	4	8	1	44

mets: metastasis; SCC-Squamous cell carcinoma; IDC-infiltrating ductal carcinoma

Around 22% had metastasis to lymph node. Males (70.4%) were most commonly affected than females (29.5%). 31.8% of the patients were in the age group of 41-50 years which was the most common age group to be affected, followed by 27.2% of patients in the age group of 61-70 years. This was consistent with the studies conducted by Pandav et al.<sup>12</sup> Most of the patients in the present study had metastasis from squamous cell carcinoma (64%, n= 28) arising from upper aero-digestive tract, followed by adenocarcinoma (15%, n= 7), metastasis from malignant melanoma (7%, n=3), metastasis from small cell carcinoma (n=2, 5%), metastasis from poorly differentiated carcinoma (n=2,5%), metastasis from infiltrating ductal carcinoma (n=1, 2%), metastasis from papillary carcinoma of thyroid (n=1, 2%). Cervical lymph node was the most

commonly affected in 45% of patients followed by axillary lymph node which was affected in 20.4% of patients. Similar results obtained in study by Wilkinson et al.<sup>13</sup> Biopsy was available in 6 cases and histopathological correlation was achieved in all the cases (Table 3). In the present study localized lymphadenopathy was the most common accounting for 196 cases whereas generalized lymphadenopathy was the presenting feature in only 4 cases which included 2 cases of reactive hyperplasia, 1 case of tuberculous lymphadenitis and 1 case of non-Hodgkin’s lymphoma. Cervical lymphadenopathy was predominant site of aspiration of lymph node in our study (53.5%) and this was in cohesion with the studies conducted by Haque and Talukder, Pandit et al, Nasuti et al, and Van de Schoot et al, (Table 4).<sup>5,14-16</sup>

**Table 4: Comparison of the site distribution of lymph node FNA's in various studies.**

Site	Present study	Haque and Talukder	Pandit et al	Nasuti et al	Van de Schoot L et al
Cervical	53.5%	87.18%	65.03%		30.13%
Supraclavicular	11.5%		7.69%		13.69%
Submandibular	10.5%		8.39%		20.54%
Submental	4.5%				1.36%
Preauricular	1.5%				5.47%
Postauricular	1%		2.79%		4.10%
Axillary	7%	12.82%	11.53%	15.34%	8.21%
Inguinal	10.5%		4.54%	10.68%	13.69%

## CONCLUSION

In conclusion FNA of lymph node is a useful diagnostic tool in patients with peripheral lymphadenopathy thereby avoiding unnecessary surgery.

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