

# International Journal of Medical and Pharmaceutical Research

Online ISSN-2958-3683 | Print ISSN-2958-3675 Frequency: Bi-Monthly Available online on: https://ijmpr.in/

Original Article

# Spectrum of Lymphadenopathy of FNAC-A Study from Tertiary Care Hospital

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Received: 28-09-2025 Accepted: 13-10-2025 Available online: 30-11-2025

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# ABSTRACT

**Background:** Lymphadenopathy is a common clinical presentation with a wide range of etiologies. Fine-needle aspiration cytology (FNAC) is a rapid, minimally invasive diagnostic tool widely used for evaluating lymph node-lesions. **Aim:** To evaluate the spectrum of lymphadenopathy on FNAC and determine the distribution of various cytological diagnoses in patients presenting to a tertiary care center.

**Methods:** The present study was done during the period between January 2022 to December 2024 in the department of Pathology, Dr. Vasantrao Pawar Medical College, Nashik. All the cases of lymphadenopathy underwent fine needle cytology procedure were included in the study. Cytological diagnoses were categorized and analyzed.

**Results:** Reactive lymphadenitis was the most common diagnosis, followed by granulomatous lymphadenitis. The most common type of lesion was Reactive lymphadenitis with case 72 cases (42.8%) followed by Chronic granulomatous lesion with 42 cases (25%). Metastatic malignancies seen in 17 cases out of 168 (10.1%), acute suppurative lesion noted in 14 cases (8.3%), cold abscess found in 1.7%. Study showed slightly predominance in females as compared to males. involved.

**Conclusion:** FNAC remains highly effective for initial evaluation, especially in distinguishing benign from malignant lesions, guiding further management.

**Keywords**: FNAC, Lymphadenopathy, Malignancy, Lymphadenitis, Granulomatous lesion.

## INTRODUCTION

Human beings have approximately 600 lymph nodes. Lymph nodes are encapsulated kidney shaped organ composed of lymphoid tissues that are distributed throughout the body along the course of lymphatic vessel and play an important role in the body defense against microorganism and spread of tumor cells (1).

Lymph nodes are most widely distributed, easily accessible and an integral component of the immune system. Their involvement is a common presentation and frequently examined for diagnostic purpose in the clinical practice (2).

Lymphadenopathy is the commonest clinical presentations of all age groups. The etiology can vary from an inflammatory process, infective to a malignant condition (3).

Fine needle aspiration cytology (FNAC) is the study of cells and tissues obtained by sampling of a palpable superficial lesion or imaging guidance of deep-seated lesion with the help of small gauge needle. Fine Needle Aspiration cytology (FNAC) is an easy to perform, rapid, cost effective and reliable technique (4).

Most common tool used in the present day is Fine needle aspiration cytology. FNAC is used routinely as a first line of investigation for evaluating of patients with lymphadenopathy.

Lymphadenopathies are lymph nodes with abnormal size, consistency and number (5). The morphological changes are dependent on the primary stimulus and the intensity of the immune response of body. Lymphadenopathy can be found as an incidental finding and/or it can occur as response to underlying diseases which may be neoplastic or non-neoplastic origin (6).

The underlying etiology of lymphadenopathy can be diagnosed by good clinical history and examination, radiological examination, cytology, histology and other lab investigations. FNAC offers an immediate, preliminary, reliable, minimally invasive and cost-effective diagnostic modality to find out the cause of lymphadenopathy.

# AIMS AND OBJECTIVES

The present study was done to analyse the cytomorphological pattern of various diseases process involving the lymph node. To study the non-neoplastic and neoplastic lesions of enlarged lymph nodes by FNAC in patients presenting with lymphadenopathy.

# MATERIAL AND METHODS

The present study was done during the period between January 2022 to December 2024 in the department of pathology, Dr. Vasantrao Pawar Medical College, Nashik. All the cases of lymphadenopathy underwent fine needle cytology procedure were included in the study.

Clinical details were obtained and proper aseptic precautions and consent were taken before the procedure. 10ml syringe and 23/24-gauge needles were used for the aspiration procedure. 10ml syringe creates a negative pressure and 23/24-gauge needles yields good material with minimal blood. We have fixing the swelling between two fingers and needle was introduced in the swelling. Then to and fro motion was done with creation of negative pressure in the syringe simultaneously to yield material.

In few cases when lymph nodes were too small and slippery non aspiration technique was used with only needle. Non aspiration technique is known to yield good material with very less haemorrhage.

Material then take on the slide and smears were prepared. Both wet and air-dried smears were made. Wet smears were stained with haematoxylin and eosin and dry smears with Leishman stain and Giemsa stain. Ziehl Neelson (ZN) staining for acid fast bacilli was done wherever required.

Lymph node lesions were classified based on their morphological criteria.

- 1. Reactive lymphadenitis Polymorphous population of lymphocytes with or without tingible body macrophages.
- 2. Granulomatous lymphadenitis Clusters or scattered epithelioid cells and giant cells without necrosis.
- 3. Acute Necrotizing lymphadenitis Only necrosis without cells
- 4. Suspicious lesion- Atypical cells present
- 5. Metastatic malignancy- Metastatic cells present

# **RESULTS**

There were total of 174 cases out of which 6 were unsatisfactory aspirate so we have included 168 cases of lymphadenopathy. In 12 cases (6.02%) aspirate was inadequate or unsatisfactory. So total cases with adequate and satisfactory aspirate for diagnosis were 156 (92.8%). Age group ranges from 10 months to 85 years of age. Most common age group affected with lymphadenopathy was 3<sup>rd</sup> decade. Most were located in neck and most of these were cervical group of lymph nodes. Around 64.8% lesions were located in cervical group of lymph node followed by submandibular group with 14.2% and least seen in preauricular group with 1.1%. The most common type of lesion was Reactive lymphadenitis with case 72 cases (42.8%) followed by Chronic granulomatous lesion with 42 cases (25%). Metastatic malignancies seen in 17 cases out of 168 (10.1%), acute suppurative lesion noted in 14 cases (8.3%), cold abscess found in 1.7%. Study showed slightly predominance in females as compared to males.

Reactive lymphadenitis was more common finding in children and young adults. Granulomatous lesions, necrotizing inflammation and tuberculosis were more common in adults. We have seen no cases of lymphomas. Most of metastatic malignancies were seen in individuals more than 60 years. Among metastatic malignancies most were poorly differentiated. Out of metastatic 17 cases there were 10 cases of metastatic squamous cell carcinomas and seven metastatic adenocarcinomas.

Table.1 Age wise distribution of Lymphadenopathy

Age	Total	Percentage (%)
<10	16	9.52
11-20	29	17.26
21-30	43	25.59
31-40	23	13.69
41-50	14	8.33
51-60	17	10.11
61-70	20	11.90
>70	6	3.57
Total	168	

Table.2 Gender wise distribution of Lymphadenopathy

Age	Male	Female
<10	5	3
11-20	2	5
21-30	16	18
31-40	13	24
41-50	23	15
31-40 41-50 51-60	11	7
61-70	7	9
61-70 >70	4	6
Total	81	87

Table.3 Distribution Cytomorphological diagnosis of Lymphadenopathy

Sr.No.	Cytological Diagnosis	Total	Percentage (%)
1	Inadequate/Inconclusive	12	7.14
2	Reactive lymphadenitis	72	72.85
3	Acute suppurative Lymphadenitis	14	8.33
4	Granulomatous Lymphadenitis	42	25
5	Cold Abscess	03	1.78
6	Suspicious	08	4.76
7	Metastatic malignancy	17	10.11
8	Tota	168	

Table.4 Site wise distribution of lymphadenopathy

Sr.No.	Site	Total	Percentage (%)
1	Cervical	103	61.30
2	Submental	08	4.76
3	Supraclavicular	11	6.54
4	Submandibular	22	13.09
5	Preauricular	02	1.19
6	Postauricular	04	2.38
7	Axillary	09	5.35
8	Abdominal	01	0.59
9	Inguinal	07	4.16
10	Multiple Site	01	0.59
	Total	168	

Table.5 Cytological lesion wise distribution

Cytological diagnosis	No. of cases	% of cases
Benign	131	83.97
Malignant	25	16.03
Total	156	100

# **Table.6 Distribution of metastatic lesion**

Cytological Metastatic diagnosis	No. of cases	% of cases
Squamous cell carcinoma	13	52
Adenocarcinoma	8	32
Other	4	16
Total	25	100

#### DISCUSSION

Lymph nodes are an integral component of the immune system and lymphadenopathy is a common presentation in the clinical practice. Enlarged lymph nodes are easily accessible for FNAC hence, this procedure is having important role in the diagnosis of these lymphadenopathies. It plays a significant role in developing countries like India, as it is relatively a safe as well as cost-effective procedure, simple to perform with minimal invasion. FNAC is an important diagnostic tool in diagnosis of lymph node lesions. Lymphadenopathy is a clinical manifestation of local and systemic diseases which serves as an excellent clue to the underlying diseases process. (7)

We have conducted a retrospective study in the department of Pathology over a period of 2 years and 174 cases were studied with most of the cases got satisfactory aspirate we got 6 unsatisfactory with 3.4% which is in accordance with most literature. (8, 9, 10) Therefore, total 168 cases were included in the study.

The age group included in the study is ranges from 10 months to 85 years which showed correlation with other studies done by Rakhshan M et al (11) Ishar T et al (12) Manjunath BS et al (13) Bharathi K et al (14) and Hirachand S et al (15).

In this study, the most common age group was 3rd decade, which is correlating with study of Narang et al (16) Pandit et al (17), Rakhshan M et al (11) Hirachand S et al (15).

Out of 168 cases 79 were male and 89 were female cases with ratio 1:1.1 which showed similar finding in Nidhi et al (18) and Ageep et al (19).

In this study the commonest lymph node affected was cervical lymph node with 109 cases (64.88%) followed by submandibular lymph node with 24 cases, 14.28% followed by Supraclavicular region lymph node with 13 cases, 7.73% and least 2 cases from preauricular lymph node. Similar findings seen with studies by Pandit et al (17), Nidhi et al (18), Kochar et al (20) as commonest site of involvement was cervical lymph node.

Out of those 168 cases, 128(76.19%) were reported as benign lesion. Similar results were seen in a study by Ahmad et al (21). Out of this benign lesion most common cytological interpretation is Reactive Lymphadenitis with 72 cases (42.85%). Reactive hyperplasia is a common nonspecific form of lymphadenopathy due to a variety of causes ranging from bacterial, viral or nonspecific aetiology. Similar findings are seen in various studies by Chawala N, Kocchar AK et al, Mohanty et al, Adhikari P et al. (10, 20, 22, 23)

Reactive hyperplasia is followed by Granulomatous Lymphadenitis with 42 cases (25%) then metastatic lesion with 17 cases (10.11%). Similar findings are seen in various studies by Swaroopa MJ (3), Hirachand et al (15) and Vimal S et (24). In present study acute suppurative lesion constitutes 8.33% which is comparable with few other studies (15, 25). Out of 42 cases of granulomatous lymphadenitis, 45.23% were tuberculous lymphadenitis showing epitheloid granuloma, caseous necrosis and AFB positivity. Similar findings noted by study done by Sorokhaibam B et al. (26) and Ashwini HN (4).

In the study, benign lesions (83.97%) are commoner than malignant (16.03%). Results are correlating with other study. (3, 15)

In the present study 8 cases were suspicious for malignant neoplasm. Similar reports were observed by Kochar A et al and Qadri SK et al (1, 20).

In present study out of 25 metastatic cases, the commonest diagnosed metastatic malignancy was Squamous cell carcinoma contributing 52% followed by adenocarcinoma with 32%. Results show concordance with various studies. (1, 3, 20, 26).

There were no cases of lymphomas in our study. Similar findings are noted in a study by Reddy et al. (8). 3 cases of cold abscess were seen in present study.

# **CONCLUSION**

The present study highlighted the various cytomorphological patterns of lymphadenopathy. The knowledge of cytomorphological pattern of various lesions of lymph node helps in better approach to the diagnosis and this study also highlights. FNAC Lymph node places a focus on diagnosing inflammatory treatable conditions and malignant neoplastic conditions, which leads to early treatment.

Lymph nodal enlargement is noted in a wide spectrum of diseases, including infections and malignancies. Management of lymphadenopathy is depending on the etiopathology, which can be studied by collecting material through fine-needle aspiration cytology. Fine needle aspiration cytology (FNAC) of lymph node has become an integral part of the initial diagnosis and management of patients with lymphadenopathy due to early availability of results, simplicity, and minimal trauma with cost effectivity. FNAC is used as a primary screening tool to determine lymphadenopathy due to inflammation or infection or malignancy.

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