



CYTOMORPHOLOGICAL SPECTRUM OF LYMPH NODES

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ABSTRACT Patients who visit the medical outpatient departments frequently have lymphadenopathy. A simple and quick diagnostic procedure is fine needle aspiration cytology (FNAC). The FNAC provides early guidance on the recommended treatment plan. **Aim:** To study the diverse cytological spectrum of lymph node lesions and to assess prevalence of various etiologies and demographics connected to distinct lymphadenopathies. **Methods:** All peripheral lymphadenopathies that had been seen by the cytology department for FNAC over the course of one year, from October 2021 to October 2022 were included in the study. A retrospective study investigation was conducted. **Inclusion Criteria:** Patients of all age groups and both genders who underwent FNAC of enlarged lymph node were included in the study. **Exclusion Criteria:** Patients with non-palpable and sub centimetric lymph nodes were excluded in the study. Sites other than lymph nodes were also excluded. **Variables:** Age, sex, anatomical group of lymph nodes, laterality, single or multiple groups of lymph nodes and diagnostic spectrum of lesions were taken into consideration.

KEYWORDS : Benign, Neoplastic, Reactive, Granulomatous, Metastasis, Lymphadenopathy, FNAC.

INTRODUCTION

Fine needle aspiration cytology (FNAC) has a pivotal role in the evaluation of peripheral lymphadenopathy and it can be used as an alternative to excision biopsy.¹ Results obtained by FNAC are quick as compared to histopathological diagnosis. It is an easy, quick and appropriate test for diagnosing lymphadenopathy.² The spectrum of diseases varies from an inflammatory process to neoplastic lesions. Cytological examination of FNAC smears can determine whether lymphadenopathy is due to reactive hyperplasia, infection, metastatic malignancy or malignant lymphoma.³ Lymphadenopathy may be an incidental finding or primary or secondary manifestation of underlying diseases which may be neoplastic or non-neoplastic. FNAC for the diagnosis of lymphadenopathy averages 90% with a specificity of 95%.⁴ The high degree of accuracy, low cost and minimally disruptive nature of the procedure makes FNAC a highly desirable alternative to open biopsy for investigation of lymphadenopathy.

Materials and Methods: The retrospective study was done at the department of pathology of V.N. Desai Municipal General hospital Mumbai for one year from October 2021 to October 2022. 191 cases of peripheral lymphadenopathy were examined, and only those that were palpable on examination were included. For every patient a brief history, physical examination and evaluation of relevant investigations, if available, was noted. A 10ml syringe and a needle of 23 gauge were used to do the FNAC technique. The aspirated material was immediately smeared on slides. Few slides were quickly submerged in 95% ethanol, and the rest were air dried. Giemsa stain was routinely applied to the air-dried smears, while PAP was applied to the alcohol fixed smears. A pathologist examined each stained smear and the diagnosis was made using clinico-cytological correlation and cytological characteristics. At the end of the study data was analyzed.

RESULTS

Table-1: Distribution Of Cases According To Age & Sex.

AGE	MALE	FEMALE	TOTAL
0-10	12	14	26
11-20	22	24	46
21-30	11	50	61
31-40	11	15	26
41-50	4	15	19
51-60	4	4	8
Above 60	1	4	5
TOTAL	65 (34%)	126 (66%)	191

The study included 191 cases with palpable lymph nodes that underwent the FNA procedure. Ages of patients ranged from 1 year to 80 years age.

61 cases which formed the majority of patients, were between the ages of (21 – 30) years, followed by 46 cases which were between the ages of (11 – 20) years. 26 cases were seen between (0 – 10) years and (31-40) years of age.

Out of 191 patients, 65 or (34%) were male and 126 or (66%) were female. In this study, a male: female ratio of 1:1.93 indicated female predominance.

Males were most frequently affected in the age range of 11 to 20 years (22 cases), whereas females were impacted a decade later in the age range of 21 to 30 years (50 cases). Lymphadenopathy was predominant in females than in males.

Table- 2: Cytological Spectrum Of Non-neoplastic Lesions In Lymph Nodes

Non-neoplastic lesion	Total No. of cases	Male	Female
Reactive lymphadenopathy	78	28	50
Necrotising lymphadenitis	37	12	25
Granulomatous lymphadenitis	30	10	20
Necrotising granulomatous lymphadenitis	18	06	12
Suppurative lymphadenitis	16	04	12
Total	179 (93.71%)	60 (33.51%)	119 (66.48%)

The non-neoplastic lesions constituted majority of cases seen in 179 (93.71 %) patients as compared to neoplastic lesions seen in 6 (3.14%) cases.

In non-neoplastic lesions, reactive lymphadenopathy was the most frequent diagnosis with 78 (43.57 %) cases, followed by other lesions (Table 2).

The next common lesion was necrotising lymphadenitis, seen in 37 (20.67 %) cases. The other less common lesions included granulomatous lymphadenitis 30 (16.75 %) followed by necrotising granulomatous lymphadenitis 18 (10%) while suppurative lymphadenitis with 16 (8.9 %) cases, was the least common lesion.

Table-3: Cytological Spectrum Of Neoplastic Lesions In Lymph Nodes.

Neoplastic lesions	No. of cases

A) Primary malignant lesions	3
I) Hodgkin's lymphoma	1
II) Non-Hodgkin's lymphoma	2
B) Metastatic lesions	3
I) Metastatic papillary thyroid carcinoma	1
II) Metastatic squamous cell carcinoma	1
III) Metastatic carcinoma	1
C) Others (Inadequate)	6
Total	12 (6.28%)

There were 3 cases of metastasis to lymph nodes noted in this study namely metastatic papillary thyroid carcinoma, metastatic squamous cell carcinoma and metastatic carcinoma. Primary malignancies of the lymph node included 2 cases of Non-Hodgkins lymphoma (1.04%) and 1 case of Hodgkin's lymphoma (0.52%).

In six cases the FNAC procedure did not yield adequate material to diagnose the cause of lymphadenopathy.

Table 4: Distribution Of Lymph Node Groups Involved.

Lymph node groups involved	Total no. of cases
Cervical	94
Axillary	6
Inguinal	3
Intra-parotid	2
Occipital	1
Postauricular	1
Total	107

The cervical lymph nodes were the anatomical group of lymph nodes that were most frequently affected. Of the 107 cases, 94 (88%) had enlarged cervical lymph nodes. Other lymph node groups included 6 cases where axillary lymph nodes (5.6%) 3 cases where inguinal lymph nodes (2.8%), 2 cases where intra-parotid lymph nodes (1.86%), 1 case where occipital lymph nodes (0.93%) and 1 case where postauricular lymph nodes (0.93%) were involved.

Table 5: Regional Distribution Of Cervical Lymph Nodes

Region involved	No. of cases
Level – I	4
Level – II	36
Level – III	23
Level – IV	20
Level – V	10
Total	93

Lymph nodes can be classified into numbered groupings based upon anatomical landmarks found in neck dissection.

In our study 4 of the cervical lymphadenopathy cases had Level I (submental IA and submandibular IB) involvement; 36 cases forming the majority had level II (upper internal jugular nodes); 23 cases had level III (middle jugular nodes); 20 cases had level IV (lower jugular nodes) and 10 cases had involvement of level V lymph nodes (posterior triangle nodes).

DISCUSSION

Aspiration of lymph nodes was first done in 1904 by Grieg and Gray in a patient suffering from sleeping sickness.⁵ Whereas, it was Dudgeon and Patrick, who first used FNAC in diagnosing tuberculous lymphadenitis in 1927.⁶

FNAC plays a crucial role in diagnosing both benign and malignant lesions of peripheral lymphadenopathy cases while proving as a valuable screening test.⁷

In this study, we examined the cytomorphological data of 191 instances of palpable lymph node swellings that underwent FNA procedure. The study conducted by Tilak et al revealed that the lesion arising in lymph nodes can be found in patients of different age groups, ranging from an early to advanced age.⁸ As is the case in our study where we found that the youngest patient was 3 months old and the oldest one was 80 years old.

The majority of cases in this study were in the 21–30 age range, which was consistent with other studies conducted by Patil et al⁹, Dharmalingam et al⁷, bhutta et al⁹, Pavithra et al¹⁰, Dukare et al¹¹, Pandav et al¹², Rajshekaran et al¹⁰, and Chandanwale et al²⁰. Whereas in the

study of Pandit AA et al¹³ most of the patients 146 (51.05%) were in the age group of 21-40 years. In study done by Biradar et al¹³ and Gupta et al¹⁶ and most of the patients were belongs to age group (0- 20) years.

Our study showed a slight female preponderance, which was consistent with Sharma et al's²⁷ and Pavithra et al's¹⁰ findings that females were more frequently affected, with male: female ratios of 0.87:1 and 1:1.18, respectively. In contrast, research by Patel et al., Pandav et al.¹², Hirachand et al²¹, Biradar et al³⁰, Gupta et al²⁶, Khajuria et al¹⁷, Dharmalingam et al⁷, vashishta et al²⁴ and Tilak et al⁷. revealed that males were more adversely affected than females.

The majority of lymph nodes affected (87.85%) were those in the cervical region, followed by those in the axillary region (5.6%). The same results were also noted by Pavithra et al¹⁰. (85.27%), Biradar et al³⁰, Chandanwale et al²⁰ (96.72%), Vashisht et al²⁴ (74.25%), with (87.2) % cases Chaurasia et al¹⁵ and Sharma et al¹⁵ with 83.09% cases, Kocchar et al¹⁴. (80.22%) and Mohanty et al²⁵. (66.48%) are more notable studies.

Tuberculous lymphadenitis was the most common lesion reported in 85(44.50%) cases. Which is in accordance with study performed by Sharma P et al¹⁵ (56.93%).

Most of our cases were in age group 21-30 years with female preponderance (Male: female ratio of 1:2.03). Female preponderance of tuberculous lymphadenitis has been observed by Pavithra et al, Fatima et al and Chand et al. This may be due to malnutrition and overall low living standards among females in this area.

Malignant lymphomas were less in our study constituting only 3 cases (1.57%). Similar observations were seen in other studies Annam et al¹⁹, Fatima et al¹⁸, Biradar et al³⁰, Hirachand et al²¹ and Khajuria et al¹⁷.

Lymph node aspirates in 1.57% cases showed metastatic deposits including metastatic squamous cell carcinoma (Figure No.8), metastatic papillary thyroid carcinoma (Figure No.6), poorly differentiated metastatic carcinoma (Figure No.7).

In the present study 3.14% of cases were unsatisfactory to report due to less cellularity or no cellularity. This is in accordance with Honey Bhasker Sharma et al¹².

In India, tuberculous lymphadenitis is one of the most common causes of lymphadenopathy encountered in clinical practice, with sharp contrast to its very low frequency of 1.6% in developed countries²⁸.

CONCLUSION

The most frequent cause of lymphadenopathy in the retrospective analysis of 191 cases was found to be tuberculosis, with reactive lymphadenitis coming in second.

The lymph nodes most frequently impacted were those in the cervical region. Based on their cytological findings, Necrotising lymphadenitis pattern of tuberculous lymphadenitis was the most often observed pattern. Female preponderance was seen in present study as compared to male.

In order to identify different benign and malignant lymphadenopathies, FNAC is a very helpful, quick, affordable, and technically straightforward procedure. It may be beneficial for promptly identifying infectious, inflammatory, and malignant diseases. FNAC plays an important role in the early identification and therapy of tuberculous lymphadenitis in places like India, avoiding the need for surgical intervention.

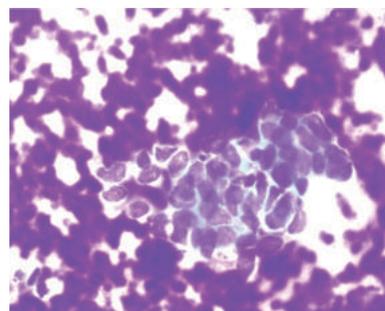


Figure 1: Poorly Differentiated Metastatic Carcinoma (Giemsa Stained; ×40)

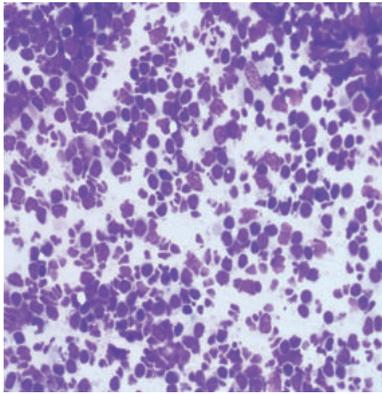


Figure 2: Reactive Lymphadenitis (Giemsa Stained ×40)

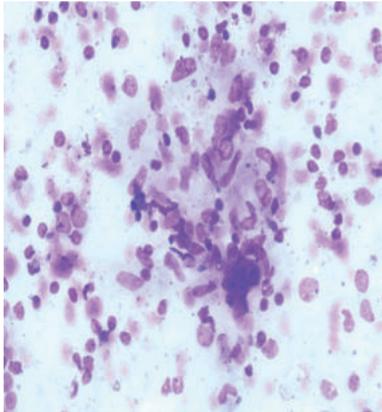


Figure 3: Granulomatous Lymphadenitis (Giemsa Stained ×40)

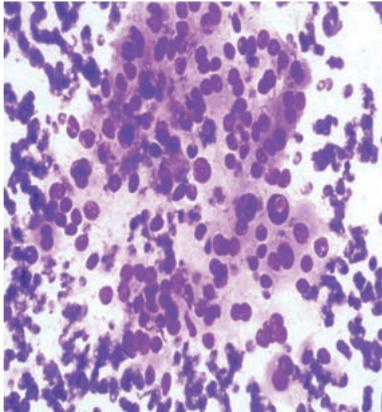


Figure 4: Papillary Carcinoma Metastatis (Giemsa Stained; ×40)

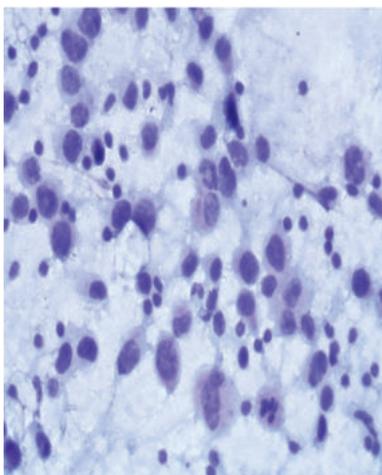


Figure 5: Poorly Differentiated Metastatic Carcinoma (Pap Stain; ×40)

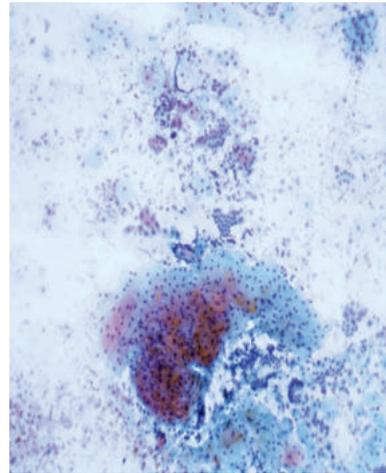


Figure :6 Metastatic Squamous Cell Carcinoma (Pap ×40)

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