

ORIGINAL ARTICLE

Spectrum of Pathologies on Fine Needle Aspiration Cytology Evaluation of Peripheral Lymph Nodes at Tertiary Care Center in SMIMER, Surat: A Retrospective Study

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ABSTRACT

Aims and Objectives: Fine-needle aspiration cytology (FNAC) as the first line of investigation has assumed importance in diagnosing a variety of disease processes as it is rapid, simple, reliable, minimally invasive, and cost-effective procedure which can be used in outpatient setting. Lymphadenopathy is one of the most common clinical presentations of patients attending the outpatient department. This study was performed to find out the pattern of diseases in lymph node and to understand burden of disease in society.

Materials and Methods: A retrospective study of 200 cases of lymphadenopathy presenting to the Department of Pathology for 1 year from November 2018 to November 2019 was taken up for our study. FNAC was performed using a 22–24-gauge needle and 10 ml syringe. Two of the prepared smears were fixed in alcohol and stained with H&E and PAP stain. Two smears were air-dried, one was stained with giemsa stain and the other kept unstained to be used for ZN staining.

Results: Most common lesion found in our study was tubercular lymphadenitis, followed by reactive lymphadenitis and granulomatous lymphadenitis.

Conclusion: Our study highlighted the various cytomorphological patterns of lymphadenopathy and revealed a huge burden of tuberculous lymphadenitis in this region.

Keywords: FNAC, lymph node, lymphadenopathy, tuberculous/granulomatous lymphadenitis, reactive lymphadenitis, metastatic lymphadenitis

INTRODUCTION

Lymphadenopathy is one of the most common clinical presentations of patients attending the outpatient department. Lymphadenopathy can be primary or secondary manifestation of underlying diseases which may be neoplastic or non-neoplastic.¹ FNAC is rapid, simple, reliable, minimally invasive, and cost-effective procedure which can be used in outpatient setting.² Tuberculosis is the most common cause of lymphadenopathy in developing countries such as India and should be considered in every case of granulomatous lymphadenopathy unless proved otherwise. FNAC can be used as a safe alternative to excision biopsy.³ FNAC has been used extensively for the diagnosis of primary and secondary lymphadenopathy. The present study was undertaken to determine the role of FNAC in the evaluation of cytomorphological features of various lymph node lesions. The study highlights the epidemiological patterns and cytomorphological spectrum of lymph

node lesions along with study of pattern of tuberculosis and its burden in society.

MATERIALS AND METHODS:

This retrospective observational study of 200 cases of lymphadenopathy presenting to the Department of Pathology, SMIMER, Surat for 1 year from November 2018 to November 2019 was taken.

FNAC was done in department of pathology on palpable lymph node swelling after getting informed consent from the patient. The study was conducted on the total numbers of 200 patients. All age groups of both sexes with lymph node enlargement were included in study. Patients who already had histopathological diagnosis of the swelling were excluded from the study.

FNAC was performed using a 22–24-gauge needle and 10 ml syringe. Two of the prepared smears were

fixed in alcohol and stained with H&E and PAP stain. Two smears were air-dried, one was stained with giemsa and other kept unstained to be used for ZN staining whenever a cytological diagnosis of granulomatous disease was made and also in cases with abundant necrosis and suppuration. Age and sex distribution along with various pathologies diagnosed were entered in data.

RESULTS

A total of 200 cases were obtained in the cytopathology section over a period of 1 year from November 2018 to November 2019.

Table 1 shows the cytological diagnosis in 200 patients with lymphadenopathy. Most common lesion found in our study was tubercular lymphadenitis in 78 cases (39%), followed by reactive lymphadenitis in 54 cases (27%), granulomatous lymphadenitis in 35 cases (17.5%), acute suppurative lymphadenitis in 12 cases (6%), suppurative granulomatous in 11 cases (5.5%), non-Hodgkin’s lymphoma in 7 cases (3.5%), metastatic carcinoma in 2 cases (1%), and Hodgkin’s lymphoma in 1 case (0.5%).

The sex and age distribution of the patients with lymphadenopathy are shown in Tables 2 and 3. Age of the patients ranged from 0 to 90 years. Majority (74.3%) of the patients were in the age group of 10–40 years, with a peak (76 patients) in the age group 21–30 years. Only 25 patients were aged <10 years, only one case more than 70 year age. Metastatic deposits were more common in the elderly age group (fifth to sixth decade). Tuberculous and granulomatous lymphadenopathies were more common in the 10 to 40 year age group.

There were 99 male and 101 female patients, with a male to female ratio of 1:1.02.

Table :1 Distribution of fine needle aspiration cytology diagnosis of cases of lymphadenopathy

Cytological diagnosis	Cases	%
Tuberculous lymphadenitis	78	39
Reactive lymphadenitis	54	27
Granulomatous lymphadenitis	35	17.5
Metastatic carcinoma	2	1
Hodgkin’s lymphoma	1	0.5
Non -Hodgkin’s lymphoma	7	3.5
Acute suppurative (abcess)	12	6
Suppurative granulomatous (cold abcess)	11	5.5
Total	200	100

Tubercular lymphadenitis was the most common finding in our study. ZN stain was done in all the cases and was positive in 32 cases (41.02%). We observed various cytomorphological patterns of tubercular lymphadenitis. (1) Granuloma with necrosis was seen in 68 cases (87.17%) with or without acid-fast Bacilli (AFB). Out of that, in 59 cases, numerous clusters of epithelioid cells were present, and in 9 cases, only a few clusters of epithelioid cells were present. (2) Necrosis alone was seen in 10 cases (12.82%) and all of these were positive for AFB on ZN stain. In developing country like INDIA, where tuberculosis is very common, the granulomatous lymphadenitis should be treated as due to tuberculosis if not otherwise specified.

Metastatic deposits of lymph node from squamous cell carcinoma & adenocarcinoma were found. Metastatic deposits are most commonly found in the cervical lymph nodes .

Table 2: Age and Sex distribution of patients of lymphadenopathy

Age	Tuberculous	Reactive	Granulo- matous	Metastatic	Hodgkin’s lymphoma	NonHodgkin’s lymphoma	Acute suppurative	Suppurative Granulomatous	Total
n	78	54	35	2	1	7	12	11	200
Sex									
Male	38	28	12	1	1	4	7	8	99
Female	40	26	23	1	0	3	5	3	101
Age									
0-10	2	17	3	0	0	2	1	0	25
11-20	18	11	11	0	1	0	2	2	45
21-30	36	13	13	0	0	2	8	4	76
31-40	17	7	8	0	0	1	0	2	35
41-50	2	2	0	0	0	0	1	3	08
51-60	3	2	0	1	0	0	0	0	06
61-70	0	2	0	1	0	1	0	0	04
71-80	0	0	0	0	0	1	0	0	01
81-90	0	0	0	0	0	0	0	0	00

DISCUSSION

Aspirates were benign in 95% cases; metastatic deposits were found in 1% and lymphomas in 4%. Similar findings were obtained by other authors such as Poonamwoike (83%)¹⁶, Ahmed et al (benign cases

86.4%)⁷, Khan et al 92%¹⁴, Fatima et al 73.2%²⁴. In our study, the majority of the patients were in the age group 21–30 years. This correlated with the study by Sachin a badge¹⁷, where maximum numbers of cases were seen in the age group of 21–40 years⁴. Tubercu-

lous lymphadenitis was the most common lesion and was reported in 78 cases (39%).

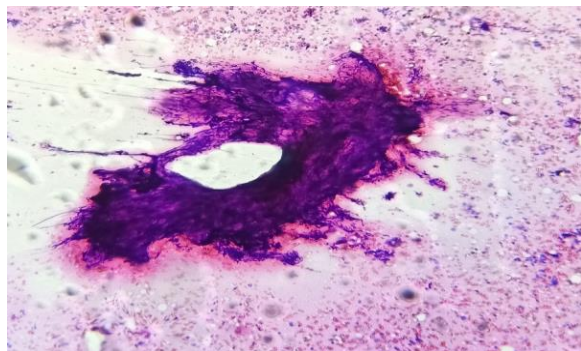


Figure 1: Tuberculous lymphadenitis showing- Tuberculous lymphadenitis caseous necrosis

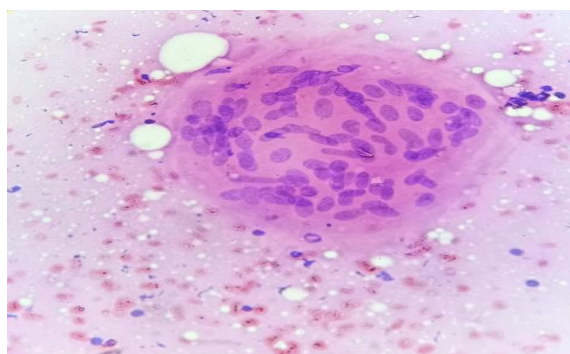


Figure 2: 10x showing granuloma on 10x

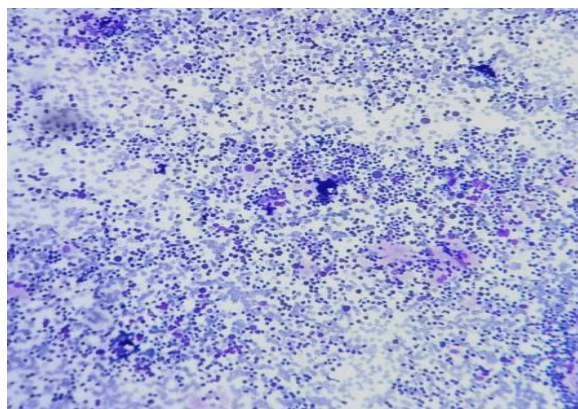


Figure 3: Reactivelymphadenitis on 10x



Figure 4: Acute suppurative showing necrosis

This correlated with the study by Khajuria et al. (52.3%)⁵, Sachin a badge (48.70%)¹⁷ and Poonamwoike (54.40%)¹⁶.

In our study, it was seen more frequently in the second and third decades of life with a female preponderance (male: female = 1:1.02) which correlates with Sachin a Badge¹⁷ and Ramanand Duraiswami¹⁹.

ZN staining for AFB was positive in 41.02% cases in our study. Ng et al. reported positivity in 41.6% cases and Ahmed et al. in 46% cases^{6,7}. In our study, necrosis alone was seen in 10 cases and all of these (100%) were positive for AFB correlates with the study of Sachin a badge¹⁷. FNA from a tubercular abscess contains more AFBs than early tuberculosis lymph nodes⁸. It appears that the chances of finding AFB are greater when pus or caseous material is aspirated while the aspiration of caseous material is almost always indicative of tuberculosis and merits an active search for AFB⁹. The characteristic necrotic background comprising eosinophilic granular material containing nuclear debris was described as “tubercular diathesis.” Those cases lacking the typical finding and showing scattered epithelioid cells with or without granuloma or only necrotic material with neutrophilic infiltration were diagnosed as tuberculous lymphadenitis when this tubercular diathesis was found cytologically even though AFB were absent in these smears¹⁰. In developing countries where mycobacterial infection is prevalent and resources for medical care are limited, FNAC provides a simple, efficient, and cost-effective alternative to diagnose tuberculous lymphadenopathy⁸. Granulomatous lymphadenitis was seen in 35 cases (17.50%). Majority of the patients were aged <30 years. Similar age distribution was found by Hemalatha et al. and Ng et al^{11,6}.

Granulomatous lymphadenitis can be classified as non-infectious and infectious. Non-infectious causes include sarcoidosis and sarcoi-like reaction. Infectious causes can be classified as suppurative and non-suppurative. Suppurative granulomatous disorders include tularemia, cat scratch disease, and Yersinia. Non-suppurative granulomatous disorders include tuberculosis, Bacillus Calmette–Guérin, toxoplasma, lepra Bacilli, brucellosis, and syphilis^{12,13}.

In a region where tuberculous infection is common and other granulomatous diseases are rare, the presence of a granulomatous feature in FNAC is highly suggestive of tuberculosis. Acute suppurative was in 12 cases (6%) which correlates with study by Ramanand Duraiswami (4%)¹⁹, Patra et al (5%)³⁰, Kocchar et al (4%)²⁹. Reactive lymphadenopathy was in 54 (27%) cases. Which correlates with Khanet al. (28%)¹⁴, Poonam Woike (29%)¹⁶. Detailed clinical history and other relevant investigations were done

to find the etiologies of reactive lymphadenitis. Lymph node aspirates in 2 cases (1%) showed metas-

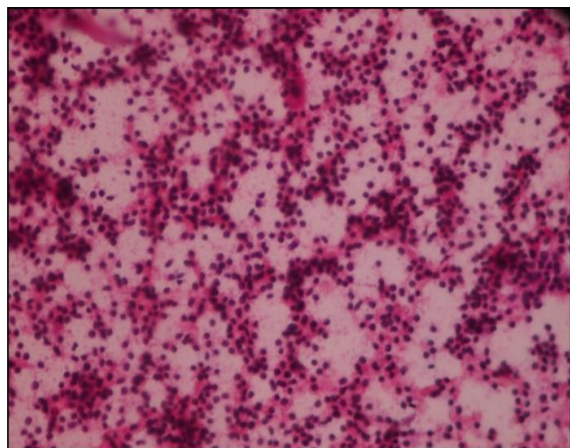


Figure 5: Non Hodgkin's lymphoma

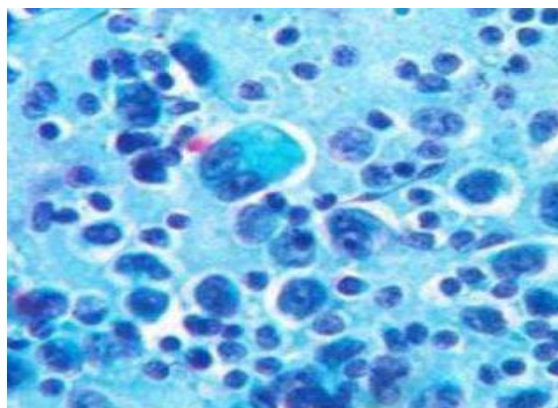


Figure 6: Hodgkin's lymphoma showing typical Reed-Sternberg cell, Pap x 40x

tatic deposits Which correlates with the studies by Sachin a Badge (3%)¹⁷. The high incidence of squamous cell carcinomas in majority study can be attributed to the high incidence of tobacco chewing and smoking in our region, study correlates with Mitra et al²⁵, Khajuria et al⁵, Hirachand et al³⁴, Wilkinsin et al²⁶. Lymphomas constituted only 4% cases in our study. This was in accordance with the study by Khan et al. (2%)¹⁴, Khajuria et al (2%)⁵, Giri et al (2.7%)³², Sharma et al (2.7%)³¹. Out of lymphoma cases, NHL is more common than HL which correlates with study by Sharma et al³¹, Patil R K¹⁸, Sachin a Badge¹⁷. Age of the patient and polymorphous population of cells and atypical cells should raise a suspicion of Hodgkin's lymphoma. Lymphomas that can be diagnosed definitely on FNAC include high-grade lymphomas such as small noncleaved lymphoma, lymphoblastic lymphoma, immunoblastic lymphomas, Hodgkin's lymphoma, diffuse large B-cell lymphoma, and myeloblastic and lymphoblastic leukemia/lymphoma¹⁵.

CONCLUSION

FNAC of lymph nodes is an excellent first-line investigation to determine the nature of lesion. It is quick, safe, minimally invasive, and reliable and is readily accepted by the patient. It is a useful tool in diagnosing both non-neoplastic and neoplastic lesions. ZN stain done in cases with granulomas, necrosis, or suppuration is highly valuable for routine diagnosing of tuberculosis. FNA of lymph node provides material for Cartridge based nucleic acid amplification test (CBNAAT) in cases of multidrug resistant tuberculosis (MDRT) which is the growing threat in health care and in prompt management of MDRT cases. In cases of primary malignant lesion and metastases, lymph node aspiration also provides material for special studies such as cyto-chemistry, immunopathology or culture. It is an economical and convenient alternative to open biopsy of lymph nodes. Our study highlighted the various cytomorphological patterns of Lymphadenopathy and revealed a huge burden of tuberculous lymphadenitis in this region and also as the reliable diagnostic tool avoiding unnecessary biopsy and surgery.

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