

Spectrum of Lymph Node Lesions by Fine Needle Aspiration Cytology in a Tertiary Health Centre southern part of Assam: A Retrospective Analysis

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Abstract:

Background: Fine needle aspiration cytology (FNAC) is a simple, rapid, cost effective and reliable technique tool for the assessment and diagnosis of lymph node enlargement. Lymphadenopathy is of great clinical significance and the underlying cause may range from a treatable infectious aetiology to malignant neoplasms. Their frequent involvement in regional and systemic diseases and easy accessibility make the cytomorphological study of lymph nodes a regular activity for pathologists.

Materials and methods: This was a retrospective study. The data pertaining to the details of the patients who underwent fine-needle aspiration (FNA) evaluation of superficial and deep lymph nodes from the period 1st June 2020 to 31st May 2021 at Silchar Medical College and Hospital, Silchar was analysed. FNAC was conducted with 22-24 Gauge disposable needles, smears were air dried or wet fixed using 95% alcohol and stained with MGG stain in air dried slides and Papanicolaou's (Pap) staining wet dried slides. Zeil-Neelsen staining was done whenever required.

Results: In this study, a total of 853 patients underwent evaluation of peripheral lymphadenopathies. 597 were male patients (69.99%) outnumbering females i.e. 256 (30.01%). The majority of patients were in age group of 0-40 years. Out of aspirations from lymph nodes, the most frequent cause of lymphadenopathy was found to be reactive lymphadenitis with 321 cases (37.63%). The next frequent diagnosis was Chronic Granulomatous Inflammation with 255 cases (29.89%) followed by metastatic lymphadenopathy in 216 cases (25.32%), Acute Suppurative Lymphadenopathy 38 cases (4.45%) lymphoma in 19 cases (2.23%), 4 (0.47%) cases were undiagnosed.

Conclusion: FNAC is a safe, simple & inexpensive definite diagnostic procedure to render a prompt diagnosis for lymphadenopathy, especially in lymph node aspirates where biopsies are not done routinely.

Key words: FNAC, Reactive lymphadenitis, Granulomatous lymphadenitis, Lymphadenopathy, Metastatic lymphadenitis.

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I. Introduction

Lymph nodes are an important part of the immune system. Lymph nodes become enlarged in a wide spectrum of diseases, including infection and malignancy. Cytological examination of FNA smears can determine whether lymphadenopathy is due to reactive hyperplasia, infection, metastatic malignancy or malignant lymphoma. Lymphadenopathy refers to the nodes which are abnormal in size, consistency and number.¹ It is one of the commonest clinical presentations of patients attending the Out Patient Department. The degree and pattern of morphological changes are dependent on the inciting stimulus and the intensity of the response. Thus, lymphadenopathy may be an incidental finding and/ or primary or secondary manifestation of underlying diseases which may be neoplastic or non- neoplastic.² FNAC as 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.³ FNAC has an important role in the evaluation of peripheral lymphadenopathy and it can be used as a safe alternative to excision biopsy.⁴ In developing countries, almost two third of the cases are due to tuberculosis. Tuberculous lymphadenopathy is the commonest form of extrapulmonary tuberculosis.⁵ Our experience of the diagnostic utility of FNAC in the assessment of lymphadenopathy is presented. The study highlights the epidemiological patterns and cytomorphological spectrum of lymph node lesions in this southern region of Assam.

II. Materials and Methods

It is a type of retrospective study conducted in the Department of Pathology, Silchar Medical College and Hospital for a period of 1 year with 853 cases including both male and female of any age.

Study Design: retrospective study

Study Location: Department of Pathology, Silchar Medical College and Hospital, Cachar, Assam, India.

Study Duration: 01/06/2020 to 31/05/2021

Sample Size: 853 cases

Subject selection- Any patient referred to the Dept of Pathology (Cytology Section) with palpable peripheral lymph nodes either for first time or as a repeat procedure.

Inclusion criteria:

1. Patient of any sex
2. Patient of any age

Exclusion criteria

1. Patient not giving consent for the procedure
2. Inadequate smears.

A brief clinical history followed by physical examination was done and the findings were noted. Reports any other investigations done for the present clinical condition were also recorded.

Procedure methodology: This study was a retrospective review of FNAC of lymph node lesions between June 2020 and May 2021. Data was retrieved from the records of the Department of Pathology, Silchar Medical College and Hospital, Silchar, Assam, India. FNAC was performed on 853 cases of palpable and /deep lymphadenopathy. A brief clinical history followed by meticulous physical examination was done and the findings were noted. FNAC was performed using 22-24 Gauge needles attached to 20 ml syringes. One to two passes were given and the aspirated material was smeared onto glass slides. Smears were fixed in 95% ethyl alcohol and stained with Papanicolaou stain. Leishman stain was done on air dried smears.. In cases where fluid was aspirated on FNAC, the fluid was centrifuged and smears were made from the sediment followed by the above staining methods. The cytological diagnosis for each case was based on cytomorphology and available clinical information. The diagnoses were categorized broadly as Chronic Granulomatous lymphadenitis, Reactive lymphadenitis, acute suppurative lymphadenopathy, metastatic lymphadenopathy and lymphomas. The stained smears were observed under microscope by at least two expert cytopathologists correlating the cytomorphological features and clinical features. Orell was followed for categorizing different lymph node lesions.⁶

Statistical Analysis: Significant data were entered into a computer. Descriptive statistical analysis has been carried out in the present study. The results were summarized in frequency distribution tables and were interpreted based on the study objectives. The results of categorical data are presented in number (%).

Statistical software: SPSS version 18 were used for analysis of data and Microsoft Excel and Word have been used to generate graphs and table.

III. Results and Observation

A total number of 853 patients were studied. Among them, 597(69.99%) patients were male and 256(30.01%) were female patients (Table 1). The age of the patients ranged from 0 to 80 years (Table 2).Cervical lymph nodes were enlarged in 592 cases out of 853 cases(69.4%) followed by submandibular lymph nodes in 88 cases (10.3%), supraclavicular lymph nodes in 61 cases (7.2%), axillary in 51 cases (5.98%) , inguinal in 32 cases (3.8%), submental in 29 cases(3.4) (Table 3). Out of 853 cases, the most frequent cause of lymphadenopathy was found to be Reactive Lymphadenitis with 321 cases (37.63%). The next frequent diagnosis was chronic granulomatous lymphadenitis with 255 cases (29.89%) followed by metastatic lymphadenopathy in 216 cases (25.32%) 38 cases, acute suppurative lymphadenitis was seen in 38 cases (4.45%), malignant lymphoma in 19 cases(2.23%) & undiagnosed in 4 cases(0.47%) (Table 4).

Table 1: Gender wise distribution of patients(n=853)

Gender	Number of cases	Percentage
Male	597	69.99%
Female	256	30.01%

Table 2: Age wise distribution of patients(n=853)

Age group in years	Number of cases	Percentage
0-20	421	49.35%
21-40	341	39.98%
41-60	61	7.15%
61-80	30	3.52%

Table 3: Sites of lymph node involvement(n=853)

Site	Number of cases	Percentage
Cervical	592	69.4%
Submandibular	88	10.3%
Supraclavicular	61	7.1%
Axillary	51	5.98%
Inguinal	32	3.8%
Submental	29	3.4%

Table 4: Cytological diagnoses of lymph node aspirations(n=853)

Diagnosis	Number of cases	Percentage
.Reactive lymphadenitis	321	37.63%
Chronic granulomatous lymphadenitis	255	29.89%
.Metastatic lymphadenopathy	216	25.32%
Acute suppurative lymphadenitis	38	4.45%
Malignant lymphoma	19	2.23%
Undiagnosed	4	0.47%

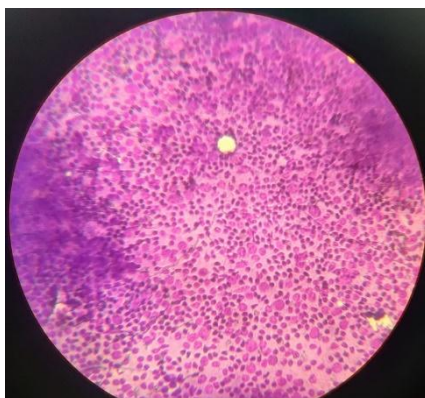


Figure 1: Polymorphous population of lymphoid cells in reactive lymphadenitis.(400X,MGG)



Figure2: chronic granulomatous lymphadenitis showing epithelioid cell granuloma(400X.MGG)

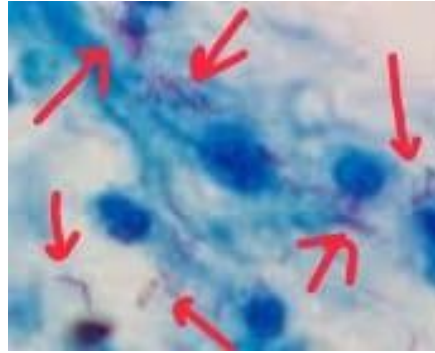


Figure 3: Red arrows showing Acid Fast Bacilli positivity in granulomatous lymphadenitis(1000X,Z-N stain)

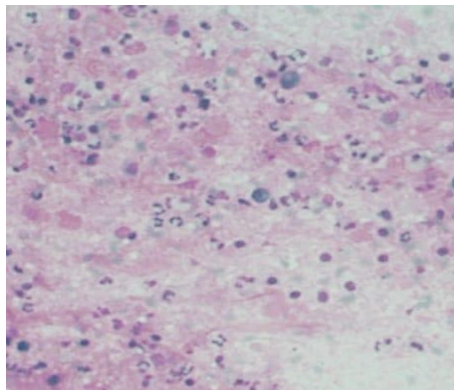


Figure 4: Predominantly neutrophilic infiltration in Acute Suppurative Lymphadenitis(400X,MGG)

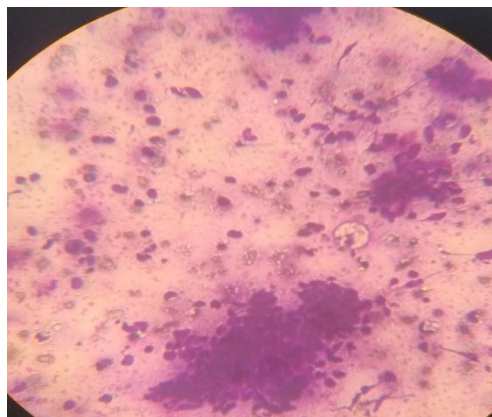


Figure 5: Metastatic deposit of squamous cell carcinoma(100X,MGG)

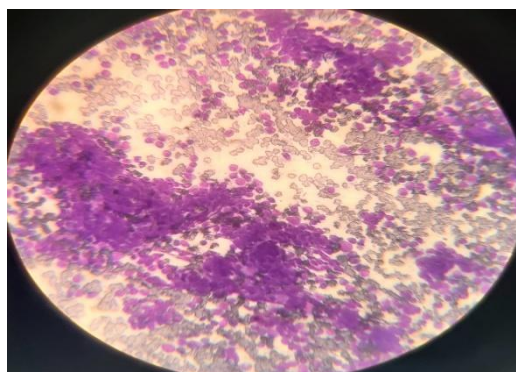


Figure 6: Monomorphous cell population in non-Hodgkin's lymphoma (400X,MGG)

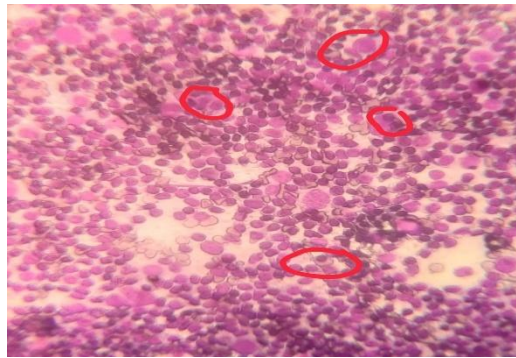


Figure 7: Polymorphous cell population including lymphocytes, neutrophils, plasma cells, eosinophils, histiocytes & scattered Reed Sternberg cells(R-S cells) in Hodgkin's lymphoma(400X, MGG)

IV. Discussion

FNAC is an important diagnostic tool to aid in the diagnosis of lymph node lesions. The technique is relatively painless and economical. It can give unequivocal diagnosis in most of the conditions. FNAC is inexpensive, safe and quick and reduces the need for surgical biopsy⁷. The procedure is performed in the outpatient clinic. Aspiration of lymph nodes was first done by Grier and Gray in 1904, in a patient with sleeping sickness⁸. It was Dudgeon and Patrick in 1927, who first used FNAC in diagnosing tuberculous lymphadenitis⁹. Lymphadenopathy is an abnormal increase in size and altered consistency of lymph nodes. It is a clinical manifestation of regional or systemic disease and serves as an excellent clue to the underlying disease. Lymphadenitis is an inflammation of the lymph nodes, resulting in lymph node swelling and tenderness. In the present study, an attempt has been made to study cytomorphological spectrum of lymph node lesions on FNAC. In this study, maximum number of cases were recorded in the age group 0-20 years (49.35%) & 21-40 years (39.98%). While the maximum number of cases in other studies were recorded in age group 10-19 years¹⁰⁻¹² and in age group 21-30 years^{3,13-16}. The present study revealed that the most common group of lymph node involved were cervical nodes which is in accordance with other studies done by Sharma et al¹⁰, Kochhar et al¹⁷, Pavithra et al³. In the current study, Reactive lymphadenitis was the most common lesion was reported in 321 cases(37.63%). This result was comparable to other studies, where its incidence ranged from 18.9% to 42%¹⁷⁻²². Chronic granulomatous lymphadenitis constituted 255 number of cases (29.89%),out of which maximum cases were Tubercular lymphadenitis confirmed by Z-N staining. In this study, we considered the presence of scattered epithelioid cells with or without granulomas or only necrotic material with neutrophilic infiltration as tuberculous lymphadenitis, inspite of AFB being absent in these smears²³. Lymph node aspirates in 216 cases (25.32%) showed metastatic lymphadenopathy predominantly squamous cell carcinoma. Similar results were obtained in the study conducted by Pavithra et al³. The high incidence of squamous cell carcinoma may be due to the high incidence of smoking and tobacco chewing in this area. Acute suppurative lymphadenitis was observed in 38 cases (4.45%) in our study which is in accordance with other studies done by Kochhar et al¹⁷ (4%), Patra et al²⁴(5.8%) and Sharma et al¹⁰(6.11%).Malignant lymphomas were less in our study constituting 19 cases(2.23%). Similar observations were seen in Sharma et al¹⁰(2.72%), Fatima et al⁷(5.2%) and Hirachand et al²⁰(6.1%). Non-Hodgkin's Lymphoma was reported in 12(1.41%) out of 19 lymphoma cases whereas 7 cases (0.82%) of Hodgkin's lymphoma were reported. In the current study 4 numbers of cases (0.47%) were undiagnosed as we were unable to comprehend the smears and patient did not come for repeat procedure. FNAC provides a simple, reliable and convenient method for the initial diagnosis and management of lymphadenopathy. FNAC has a valuable role in diagnosing neoplastic and non-neoplastic lesions. It helps in detecting metastatic diseases and also gives the clue regarding the origin of the primary tumor.

V. Conclusion

FNAC of lymph nodes is an excellent method which can be considered as a first line mode of investigation. It is a simple, safe and inexpensive mode of investigation. In our study, it was found that cervical lymph node was most commonly involved with the help of this simple procedure we could find that reactive lymphadenitis was the most common cause of peripheral lymphadenopathy, followed by chronic granulomatous lymphadenitis. Metastases to lymph nodes were much higher than lymphoma. But in cases of malignant lesions further evaluation becomes necessary to detect the primary site in case of metastasis and the type of lymphoma for proper patient management.

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