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Cytomorphological Spectrum of Lymph Node Swellings:A Tertiary Care Hospital Study in Gurugram

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Abstract
Introduction: *An increase in the number and size of lymphoid follicles with proliferation of lymphocytes is known as lymphadenopathy. It commonly occurs as a response to a new antigen.*
Aims & Objectives: 1) *To evaluate the diagnostic role of FNA in patients with lymphadenopathy.* ***2)*** *To study the cytomorphological spectrum associated with lymphadenopathy.*
Material and Methods: *A total of 230 cases presented with lymph node swellings over 2 year span. FNA was done by 22-24 FG needle as per requirement and standard protocol was followed for fixation and staining. Special staining was done wherever required.*
Results: *The enlarged lymph nodes most commonly presented in 2nd decade in benign lesions. In malignant category, it was 6th decade, with cervical group of lymph nodes being the most commonly involved. Reactive lymphadenitis was the most common benign pathology. Squamous cell carcinoma metastasis was the most common malignant condition. The overall sensitivity and specificity of FNAC of lymph node swellings was 100% and 95% respectively.*
Conclusion: *FNAC is one of the first-line investigations for the evaluation of lymphadenopathy. It is very useful, minimal invasive, cost effective and accurate approach in diagnosing various lymph node lesions and helpful in the workup of patients with nodal enlargement.*

Keywords: *Lymphadenopathy, FNAC, Cytomorphology, Diagnostic evaluation.*

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I. Introduction

Lymph nodes are encapsulated centre of the antigen presentation and lymphocyte activation, differentiation and proliferation. They generate mature antigen primed T and B lymphocyte and filter particles including microbes from the lymph by the action of numerous phagocytic macrophages.[1] Fine needle aspiration cytology (FNAC) is the study of cells and other tissue components obtained by sampling of a palpable superficial lesion or radiologically localized deep seated lesion through a small gauge needle. FNAC is used routinely as a first line of investigation in the evaluation of patients with lymphadenopathy. Enlarged lymph nodes are one of the oldest indications for FNAC. This diagnostic modality has gained considerable importance in the management of patients with lymphadenopathy over several years.[2,3] Lymphadenopathy is one of the commonest clinical presentations of all age groups attending Out Patient Departments. The etiology can vary from an inflammatory process to a malignant condition[2].

II. Materials And Methods

A total of 230 patients were included in our study, referred from the department of ENT, Medicine, Pediatrics, Surgery, Respiratory Medicine and Tuberculosis of SGT Medical college, Hospital and Research centre, Gurugram. Inclusion Criteria: 1) All patients clinically diagnosed with lymphadenopathy were included. 2) Palpable or accessible lymph nodes measuring >0.5cm in diameter were aspirated. Exclusion Criteria: 1) Inadequate material aspirated. 2) Blood only aspirated. 3) Any swelling clinically or radiologically considered to be lymph node, but turned out to be something else were excluded.

III. Results And Discussion

The patients selected were tabulated for the study in the age group of <20 to >60. The youngest patient was 1 month old and oldest was 90 years old. The maximum patients (97) were in 2nd decade (42.2%). {Table 1}Most commonly involved lymph nodes were cervical 146 (63.48%), followed by axillary (19 cases) (8.43%)

out of which 2 cases were found to be metastatic breast carcinoma and least involved region was parotid, only 1 (0.43%) case. {Table 2}

Out of 230 cases, 119 (51.74%) cases were diagnosed with Reactive lymphadenopathy. 80 (34.8%) cases were diagnosed with granulomatous lymphadenitis out of which 39 (16.96%) cases were diagnosed to have tubercular lymphadenitis. Tubercular abscess formation was seen in 27 (11.74%) cases whereas 7 (3.40%) cases were diagnosed as granulomatous lymphadenitis. 6 (2.61%) cases were reported as caseating and 1 (0.43%) case was of necrotising type of tubercular lymphadenitisis. 4 (1.73%) cases were diagnosed with lymphomas, out of which 3 (1.31%) cases were of non-hodgkin lymphoma while only 1 (0.43%) case of Hodgkin lymphoma. 27 (11.73%) cases were metastatic out of which 22 (9.57%) cases were metastatic squamous cell carcinoma, 3 (1.31%) cases were adenocarcinoma and 2 (0.87%) cases were metastatic breast carcinomas. {Table 3,4}

Cytological correlation on FNAC and histopathological diagnosis shows out of cytologically diagnosed 6 cases of reactive lymphadenitis only 4 cases were diagnosed as chronic non-specific reactive lymphadenitis on histopathology. Out of the remaining two cases which were diagnosed as reactive lympgadenitis on cytology but were not diagnosed so on histopathology, it was found that in 1 case the cell aspirate included mostly germinal centre cells and was reported as Non-Hodgkin's lymphoma. Germinal center cells may be very large in some cases of reactive follicular hyperplasia. If the aspirate derives from such large germinal center, the proportion of large cells (centroblasts, dendritic reticulum cells) and the number of mitosis may be impressive to suggest malignant lymphoma.[3] In other case the tissue submitted was fragmented and no comment could be made on it. Thus, it was reported as non diagnostic. Out of 5 cases of granulomatous lymphadenitis, 2 cases were diagnosed as granulomatous lymphadenitis and 3 cases as tubercular lymphadenitis on histopathology. These cases were not diagnosed as tubercular on cytology because of negativity of Acid Fast Bacilli. 3 cases of Non-Hodgkin's lymphoma and 1 case of Hodgkin's lymphoma were diagnosed same cytologically and histopathologically. All the metastatic lesions (15 cases) were diagnosed as metastatic on histopathology. {Table 5}

Statistical analysis of benign and malignant lesions from the data available shows 100% sensitivity, 95% specificity and 96.7% accuracy of FNAC in diagnosing lymph node lesions with 91% positive predictive value and 100% negative predictive value. {Table 6}

Our results correlated well with Hsu C et al[4], Shamshad AS et al[5], Narang RK et al[6], Adhikari P et al[7], Carter et al[8], Ishar T et al[9], Hemalatha A et al[10] and Balaji J et al[11].

Age	Frequency	Percent
<=20	97	42.2
21-30	57	24.8
31-40	19	8.3
41-50	19	8.3
51-60	16	7.0
>60	22	9.6
Total	230	100.0

Table 1. Age wise distribution of lymph node lesions (n=230)

Site	Frequency	Percent
Cervical	146	63.48
Submandibular	11	4.78
Submental	10	4.35
Pre-auricular	2	0.87
Post-auricular	13	5.65
Parotid	1	0.43
Occipital	4	1.74
Supraclavicular	11	4.78
Axillary	19	8.26
Inguinal	8	3.48
Multiple	5	2.17
Total	230	100.00

Table 2: Site Wise Distribution Of The Lymph Node Lesions

Cytological Diagnosis	Frequency	Percent
Granulomatous Lymphadenopathy	7	3.04%
Caseating Tubercular Lymphadenopathy	6	2.61%
Reactive Lmphadenitis	119	51.74%
Metastatic Adenocarcinoma	3	1.30%
Metastatic Breast Carcinoma	2	0.87%

Metastatic Squamous Cell Carcinoma	22	9.57%
Necrotising Tubercular Lymphadenitis	1	0.43%
Hodgkin Lymphoma	1	0.43%
Non-Hodgkin Lymphoma	3	1.30%
Tubercular Abscess	27	11.74%
Tubercular Lymphadenitis	39	16.96%
Total	230	100.00%

Table 3: Cytological Diagnosis (Fnac) Of Lymph Node Lesions

Cytopathological diagnosis	**No of cases**	**%age**	**Sex**		**Age**		
			Male	**Female**	**Mean**	**Min**	**Max**
Benign							
Reactive lymphadenitis	119	51.74%	64	55	22.50	.00	80.00
Granulomatous lymphadenitis	7	3.04%	4	3	27.29	12.00	70.00
Tubercular lymphadenitis	73	31.74%	38	35	24.86	.00	72.00
Malignant							
Hodgkin's lymphoma	1	0.43%	1	0	45.00	45.00	45.00
Non-Hodgkin's lymphoma	3	1.30%	1	2	37.00	21.00	50.00
Metastases	27	11.74%	21	6	60.59	39.00	90.00
Total	230	100.00%	129	101	28.16	.00	90.00

Table 4: Cytopathological Diagnosis Of Lymph Node Lesions On Fnac

CYTOLOGICAL DIAGNOSIS	**N**	**HISTOPATHOLOGICAL DIAGNOSIS**	**N**
Reactive lymphadenitis	6	Reactive lymphadenitis	4
		Non-Hodgkin's lymphoma	1
		Non diagnostic	1
Granulomatous lymphadenitis	5	Granulomatous lymphadenitis	2
		Tubercular lymphadenitis	3
Hodgkin's lymphoma	1	Hodgkin's lymphoma	1
Non-Hodgkin's lymphoma	3	Non-Hodgkin's lymphoma	3
Metastases	15	Metastases	15
Total	30		30

Table 5: Table Demonstrating Cytological And Histopathological Correlation In 30 Cases Submitted For Histopathological Examination

Statistical Indices	Percentage
Sensitivity	100%
Specificity	95.0%
Positive Predictive Value	91%
Negative Predictive Value	100%
Accuracy	96.7%

Table 6: Statistical Analysis Of The Diagnosis From The Data Available For Correlation

IV. Conclusion

Lymphadenopathy commonly occurs as a response to a new antigen and may occur due to inflammatory conditions, as well as primary and secondary neoplasms. The specific therapy can be started by the clinician when an early and accurate diagnosis is made on time, thus reducing morbidity and mortality. Cervical group of lymph nodes is the most common presentation in both benign and malignant conditions. Non-specific reactive lymphadenitis is the most common benign pathology associated with enlarged lymph nodes whereas metastasis is the most common malignant condition. FNAC not only offers tissue diagnosis but is also considered as a preliminary screening procedure for a number of clinical considerations e.g. lymphoma, leukemia, metastasis, tuberculosis and lymphadenopathy, not otherwise specified (NOS). The decision regarding biopsy from appropriate sites, if necessary, can be done to confirm the diagnosis. The sensitivity and specificity of FNAC is is 100% and 95% respectively with lot of various other advantages like rapid diagnosis, reliable, less traumatic, minimal complication, repeatability, economical and convenient and 100% correlating with histopathology in malignant lesions.

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