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Histopathological evaluation of clinically significant lymphadenopathy: An observational study of 60 cases

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Abstract

Introduction: Lymphadenopathy is one of the commonest clinical presentation. Considering the plethora of disease, it is essential to confirm whether lymph node lesion is neoplastic or non-neoplastic in order to decide further workup and management. Diagnostic lymph node biopsy from the most atypical node is performed which helps pathologist to reach diagnosis.

Materials and Methods: This was a hospital-based descriptive study with the objective to determine the histopathological spectrum of lymphadenopathy. Lymph node biopsies were subjected to detailed histopathological examination. Diagnosis was made on the basis of light microscopy, special histochemical stains and immunohistochemistry where ever applicable.

Results: Out of 60 cases, maximum cases were above 60 years with male to female ratio 1.1:1. Most common group for lymph node biopsy was cervical (52%) and least common was supraclavicular (3%). In our study, non-neoplastic and neoplastic lesions comprised of 60% (36 cases) and 40% (24 cases). Aetiology among the non-neoplastic lesions included non-specific reactive lymph node hyperplasia, tuberculous lymphadenitis and other granulomatous lesions while Non Hodgkin lymphoma, Hodgkin lymphoma and metastasis were the commonest cause in neoplastic lesions.

Conclusion: Infection remains an important cause of lymphadenopathy in clinical practice in developing countries. Non-specific reactive lymph node hyperplasia was predominant cause of lymphadenopathy in our study. The present study emphasize the importance of lymph node biopsy as a valuable diagnostic tool which provide an accurate and concise diagnosis in most of the cases and planning the management.

Keywords: Biopsy, lymph node, non-neoplastic pathology, neoplastic pathology

Introduction

The lymph nodes (LNs) play a vital role in the immune system, with a job to effectively and efficiently deal with foreign substances ^[1]. Lymph, an ultra-filtrate of blood, traverses from the afferent lymph vessels, through the sinuses, and out the efferent vessels. The sinuses are studded with macrophages, which remove 99% of all delivered antigens ^[2]. As lymph nodes deal with antigens, their histology reflect the activity of the immune system.

Lymphadenopathy is a common presentation encountered in clinical practice and is a component of wide spectrum of diseases. It can present as abnormal size, consistency or number of lymph nodes and caused due to infiltration either by inflammatory or neoplastic cells. Diagnosis can be made based on clinical history, physical examination, fine needle aspiration cytology (FNAC) and biopsy. FNAC is used to establish the etiological diagnosis of lymph node lesions but the limitation includes inability to diagnose suspected or grey zone of various lesions and lymphohematogenous malignancy. So, excision biopsy and histopathological examination of the lymph node remains the 'Gold standard' for diagnosis. Peripheral lymph nodes are easily detectable & accessible for biopsy ^[3-4].

Out of total lymphadenopathies, 75% belong to localized category, 50% of which occur in head and neck regions. Generalized lymphadenopathies, which constitute 25% of total lymphadenopathies, involve two or more non-contiguous regions ^[5].

Hence, this study was undertaken to study the different histopathological spectrum of lymph node biopsies and its correlation with demographic details.

Materials and Methods

The present study was carried out in Department of Pathology, Pt BDS PGIMS, UHS, Rohtak over the duration of one year and included 60 cases of lymph node biopsies. Detailed clinical history like age, sex, site, presenting complaints and clinical diagnosis were noted. All type of lymph node specimens and all age groups were included in the study except inadequate samples and poorly preserved tissue.

Lymph node biopsies were received in 10% neutral buffered formalin. The gross morphological features like size of node, shape, colour, consistency, presence of necrosis and matting were noted and sections taken from each. The specimens were processed in automated tissue processor and 4-5 micron thick paraffin embedded sections were taken and stained by Haematoxylin and eosin (H&E). Special stains including Ziehl Neelsen (ZN), periodic acid Schiff (PAS) and reticulin were used wherever indicated. Immunohistochemistry was performed whenever required. Each slide was carefully examined and the histopathological patterns of lymph node biopsies were reported and categorized.

Results

In our study, maximum cases were above 60 years of age (30%). [Table 1] Most of the biopsies were received from cervical region 31(51.6%) followed by axillary region 7(11.6%), abdominal region 11(18.3%), inguinal region 09(15%) and 02(3.3%) from supraclavicular region [Table 2; Fig 1]. Out of 60 cases, 32(53.3%) were males and 28(46.6%) were females with a M: F ratio of 1.14:1 with slightly male predominance [Table 3].

Considering HPE examination as gold standard, cases were categorized into non-neoplastic and neoplastic aetiology, which showed 36(60%) cases to be of non-neoplastic aetiology and 24(40%) cases of neoplastic aetiology [Table 4]. Among non-neoplastic lesions, reactive hyperplasia [Fig 2] was the most common accounting 27 cases (45%) and mostly seen in females 16(26.7%). In our study, granulomatous lymphadenitis [Fig 3] was the second most common cause of lymphadenopathy. Tuberculosis was the most frequent cause accounting for 9 cases (15%) of granulomatous lesions. AFB was positive in 4 cases (44.4%).

Among neoplastic lesions, primary neoplasm of lymph nodes were seen in 24 cases (40%)[Fig 4]. Out of which 6 cases of Hodgkin's lymphoma and 13 cases of Non-Hodgkin's lymphoma were diagnosed. Metastatic neoplasm [Fig 5] contributed 8.3% of malignant lesions. Among the various types of tumour metastasizing the lymph nodes, squamous cell carcinoma was the commonest.

Discussion

"Lymphadenopathy" refers to nodes that are abnormal in size, consistency or number. Clinically it can be classified as (i) Generalized lymphadenopathy- if the lymph nodes are enlarged in two or more non-contiguous areas (ii) Localized

lymphadenopathy- if only one area is involved [10-11]. Lymphadenopathy is a common clinical problem, and biopsies are done to determine the aetiology of nodal enlargement. Various reports document tuberculosis and infectious aetiology as major causes of lymph node enlargement [3, 4] whereas malignancies as a predominant cause in the developed countries [11-12]. The histopathological examination of lymph node remains the 'Gold standard' for diagnosis of lymph node diseases [13-14]. Cervical lymph nodes are commonly involved in all types of lymphadenopathy, in adults as well as in children. This is because these lymph nodes draining the most commonly affected and inflamed region of the body as well as due to easy accessibility of the cervical lymph node for biopsy. In our study, the maximum number of lymph node biopsies were from cervical group of lymph nodes (67%). This observation was consistent with most of the studies done by Vachhani *et al.* [6], Olu-Eddo *et al.* [15] and Saraswat *et al.* [16]. In present study non-neoplastic lesions (60%) were much more common than neoplastic lesions (40%) and these results were in concordance with Kamat *et al.* [17] (88.92%), Rahman *et al.* (70.2%) [18], Saraswat *et al.* [16] (90.9%), Vacchani *et al.* [6] (75%) and Rao *et al.* [19] (56%). [Table 5]. Reactive lymphadenitis (45%) was the predominant pattern in non-neoplastic lesions. This may be attributed to reactive hyperplasia in lymph nodes due to infectious aetiology or can be a draining site of malignant lesion, which do not shows metastatic deposit due to early diagnosis and surgical excision. This finding were in agreement with study of Moore *et al.* [4] who found 47.8% of reactive lesions in their study. Within non-neoplastic cases, tuberculosis was the second most common pattern constituting 20.24% of cases in our study but several authors have reported tuberculosis as the predominant cause of lymph node enlargement [16-18]. Among neoplastic lesions (40%), there were 19 cases (32%) of lymphoma. Out of which 6 cases (10%) were Hodgkin's lymphoma and 13 cases (21.7%) were Non-Hodgkin's lymphoma. Remaining 8.3% accounted as metastatic lesions. Malignancies are the predominant cause of lymphadenitis in developed countries than developing countries like India because of the ethnicity and genetic factors. Our results are comparable with the studies done by Roy *et al.* [8], Mohan *et al.* [20] and Sinclair *et al.* [21] constituted 44.5%, 63.29% and 25.9% respectively. The higher incidence of lymphomas in our study may be attributed to the factor that it has been done in a tertiary care institute. Various causes of lymphadenopathy observed and documented by histopathological evaluation in the current study were comparable to other studies conducted in India and abroad. It is necessary to diagnose the lymph node lesion to decide and plan an appropriate treatment modality. The present study emphasize the importance of lymph node biopsy as a valuable diagnostic tool which provide an accurate and concise diagnosis in most of the cases and planning the management.

Table 1: Age wise distribution of lymph node biopsies.

	Total	<10 Years	11-19 Years	20-29 Years	30-39 Years	40-49 Years	50-59 Years	>60 Years
Our study	60	1 (1.6%)	8 (13.3%)	7 (11.7%)	10 (16.7%)	10 (16.7%)	6 (10%)	18 (30%)
Vachhani <i>et al.</i> [6]	100	3 (3%)	7 (7%)	15 (15%)	28 (28%)	21 (21%)	19 (19%)	7 (7%)
Krishnetreya <i>et al.</i> [7]	75	3 (6.7%)	7 (9.28%)	14 (13.7%)	8 (10.6%)	20 (26.6%)	11 (14.6%)	10 (13.3%)
Roy <i>et al.</i> [8]	1050	354 (35%)						
Mbata <i>et al.</i> [9]	141	26 (20%)	24 (18.46%)	25 (19.23%)	16 (12.3%)	22 (16.92%)	5 (3.85%)	12 (9.23%)
Al Aliza [10]	130	31 (21.98%)	21 (14.9%)	26 (13.44%)	17 (12%)	14 (9.92%)	13 (9.22%)	19 (13.47%)

Table 2: Site wise distribution of cases

	Total	Cervical	Axillary	Abdominal	Inguinal	Supraclavicular	Others
Our study	60	31 (51.6%)	07 (11.6%)	11 (18.3%)	9 (15%)	2 (3.3%)	0
Vachhani <i>et al.</i> [6]	100	50 (50%)	25 (25%)	18 (18%)	7 (7%)	0	0
Al Aliza [10]	130	121 (93%)	6 (4.6%)	0	2 (1.5%)	0	1 (0.7%)
Mbata <i>et al.</i> [9]	141	64 (45.4%)	28 (19.9%)	0	19 (13.47)	12 (8.51%)	18 (12.76%)

Table 3: Gender wise distribution of cases

	Total	Males	Females	M: F
Our study	60	32	28	1.4:1
Vachhani <i>et al.</i> [6]	100	52	48	1:0.92
Krishnetreya <i>et al.</i> [7]	75	61	14	4.35:1
Roy <i>et al.</i> [8]	1010	638	372	1.7:1
Al Aliza [10]	130	54	76	1:1.4
Mbata <i>et al.</i> [9]	141	60	81	1:1.3

Table 4: Histopathological benign and malignant lesions.

	No of cases	%age of cases
Non neoplastic	36	60%
Neoplastic	24	40%
Total	60	100%

Table 5: Comparison of Distribution of Various Lesions

	Roy A <i>et al.</i>	Kamat GC 13	Rahman MA <i>et al.</i> [14]	Present study
Reactive change	6.8%	30.73%	30.89%	45%
Non-specific lymphadenitis	21.6%	2.20%	-	15%
Non-Hodgkin lymphoma	32.1%	3.27%	11.52%	21.7%
Hodgkin lymphoma	12.4%	0.40%	5.76%	10%
Metastatic carcinoma	8.5%	7.37%	12.57%	8.3%

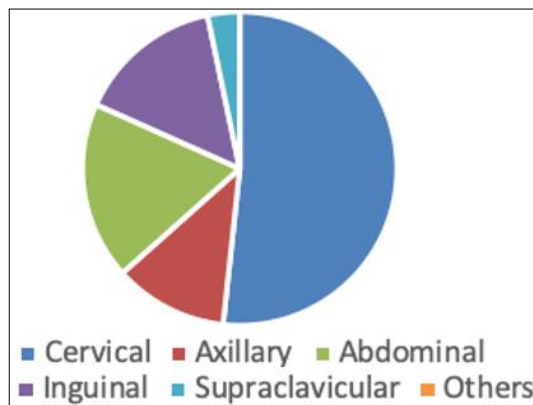


Fig 1: Site wise distribution of cases of lymphadenopathy (pie diagram)

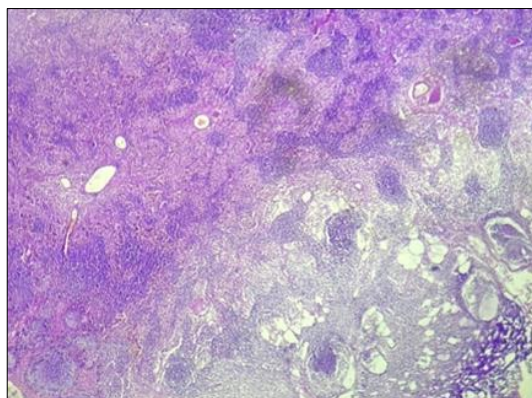


Fig 2: Reactive lymphadenitis: Photomicrograph showing variable enlarged follicles with prominent germinal centre & mantle zone (100X H&E)

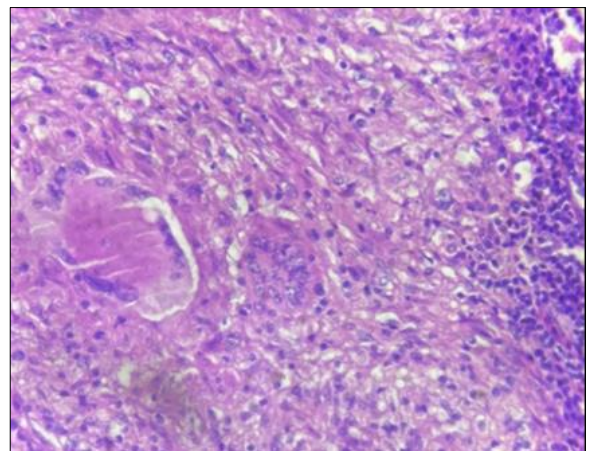


Fig 3: Granulomatous lymphadenitis: Photomicrograph showing granuloma containing haphazard arrangement of epithelioid cells & giant cell in centre which is surrounded by a rim of mononuclear cells (400X H&E)

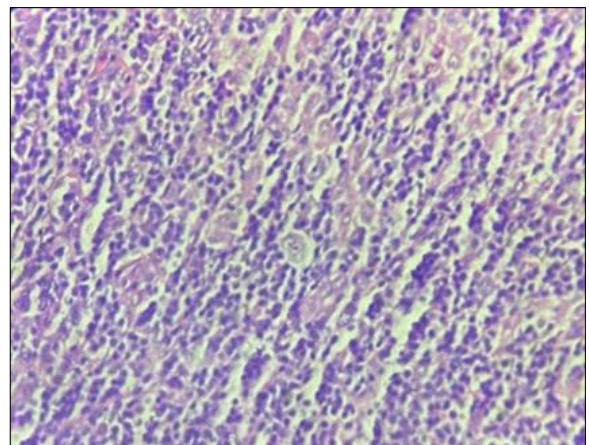


Fig 4: Lymphoma: Photomicrograph showing monotonous population of lymphoid cells with vesicular nuclei & prominent nucleoli. (400X H&E)

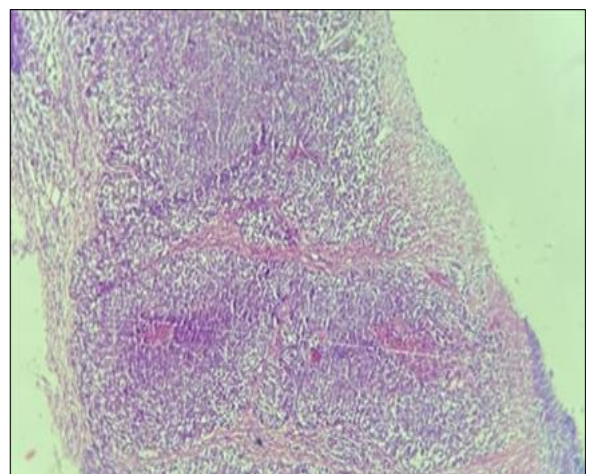


Fig 5: Metastatic deposits: Photomicrograph showing alteration in lymph node architecture along with metastatic deposits (100X H&E)

Conclusion

Our study showed that lymphadenopathy can be a manifestation of many regional and systemic disorders and histopathological evaluation along with immune markers of such lymph nodes aids in establishing an early definitive diagnosis thus reducing morbidity and influencing overall prognosis of the patient.

Conflict of Interest

None

Source of Funding

None

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