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Histopathological Spectrum of Lymph Node Lesions: A Retrospective Study.

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ABSTRACT

Lymphadenopathy is a common clinical finding with a wide range of underlying etiologies, including reactive, infectious, and neoplastic causes. Histopathological examination remains the gold standard for accurate diagnosis and management of lymph node lesions. To analyze the histopathological spectrum of lymph node lesions in a tertiary care center and to determine the frequency and distribution of various types of lesions. A retrospective study was conducted in the Department of Pathology over one year, involving 50 lymph node biopsy specimens. Detailed clinical history and demographic data were collected. Specimens were processed using routine histopathological techniques and stained with hematoxylin and eosin (H&E). Special stains like Ziehl-Neelsen and PAS were used when required. Lesions were categorized into non-neoplastic and neoplastic types. The most common age group affected was 21–30 years (28%). Males (56%) were more affected than females (44%). The cervical region was the most frequently involved site (60%). Reactive lymphadenitis (30%) was the most common histopathological finding, followed by tuberculous lymphadenitis (28%), metastatic carcinoma (12%), and non-Hodgkin's lymphoma (12%).Reactive and tuberculous lymphadenitis are the most common causes of lymphadenopathy. Histopathological evaluation is essential for timely and accurate diagnosis.
Keywords: Lymphadenopathy, Histopathology, Lymph Node Lesions

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INTRODUCTION

Lymph nodes are integral components of the immune system, acting as filters for foreign particles and playing a critical role in the body's defense mechanisms. Enlargement of lymph nodes, or lymphadenopathy, is a common clinical finding encountered in various medical settings [1]. It may arise due to a wide range of etiologies, including reactive hyperplasia, infectious processes, granulomatous inflammation, and malignancies such as lymphomas and metastatic carcinomas. Histopathological examination remains the gold standard in evaluating lymph node lesions, providing definitive diagnosis and guiding appropriate clinical management [2, 3].

A comprehensive analysis of the histopathological patterns of lymph node lesions offers valuable insights into the regional disease burden and helps in understanding the prevalence of specific pathologies in different demographic groups. Retrospective studies of lymph node biopsies are particularly useful in identifying trends, especially in resource-limited settings where tuberculosis and other granulomatous diseases remain prevalent, alongside a rising incidence of malignancies [4, 5].

This retrospective study aims to evaluate the histopathological spectrum of lymph node lesions in a tertiary care center, highlighting the frequency, distribution, and characteristics of various lesions. The findings will assist clinicians and pathologists in enhancing diagnostic accuracy and formulating effective treatment strategies based on local disease epidemiology.

METHODOLOGY

This retrospective study was conducted in the Department of Pathology at a tertiary care center over a period of one year. The study included lymph node biopsy specimens received for histopathological examination during the study duration. A total of 50 lymph node specimens were analyzed. Prior ethical clearance was obtained from the institutional ethics committee before initiating the study.

The inclusion criteria consisted of all patients who underwent lymph node biopsy and whose complete clinical history and relevant laboratory investigations were available. Inadequate or autolyzed specimens and cases with incomplete clinical data were excluded from the study. The demographic details, clinical presentation, site of lymphadenopathy, and provisional diagnosis were obtained from hospital records.

The lymph node specimens were fixed in 10% formalin, processed using routine histopathological techniques, and stained with hematoxylin and eosin (H&E). Special stains such as Ziehl-Neelsen (ZN) stain for acid-fast bacilli and Periodic Acid-Schiff (PAS) stain were used wherever necessary to confirm the diagnosis, particularly in cases suspected of tuberculosis or fungal infections.

All slides were examined under a light microscope by experienced pathologists. The lesions were categorized into non-neoplastic (reactive, granulomatous, and specific infections), benign neoplastic, and malignant (primary and secondary) lesions. The data obtained were compiled, tabulated, and statistically analyzed to assess the frequency and distribution of various histopathological patterns of lymph node lesions.

RESULTS

Table 1: Age-wise Distribution of Cases (n = 50).

Age Group (Years)	Number of Cases	Percentage (%)
0 – 10	6	12%
11 – 20	10	20%
21 – 30	14	28%
31 – 40	8	16%
41 – 50	5	10%
> 50	7	14%
Total	**50**	**100%**

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Table 2: Gender-wise Distribution of Cases (n = 50).

Gender	Number of Cases	Percentage (%)
Male	28	56%
Female	22	44%
Total	**50**	**100%**

Table 3: Site of Lymph Node Involvement (n = 50).

Site	Number of Cases	Percentage (%)
Cervical	30	60%
Axillary	8	16%
Inguinal	6	12%
Mesenteric	4	8%
Supraclavicular	2	4%
Total	**50**	**100%**

Table 4: Histopathological Diagnosis of Lymph Node Lesions (n = 50).

Histopathological Type	Number of Cases	Percentage (%)
Reactive Lymphadenitis	15	30%
Tuberculous Lymphadenitis	14	28%
Suppurative Lymphadenitis	4	8%
Non-Hodgkin's Lymphoma	6	12%
Hodgkin's Lymphoma	3	6%
Metastatic Carcinoma	6	12%
Total	**50**	**100%**

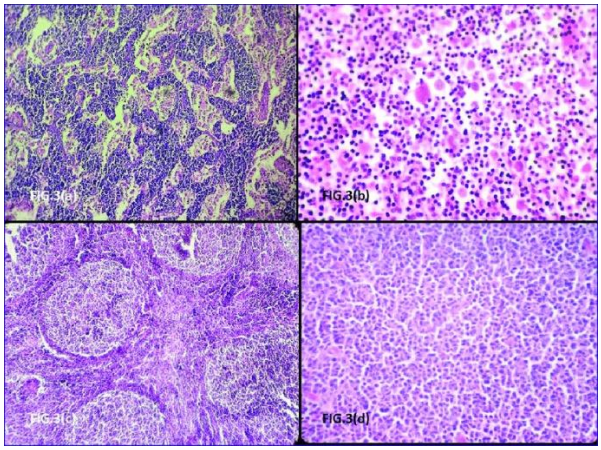

Figure 1: Lymph node lesions (a) HPE-sinus histiocytosis (H&E; x400)

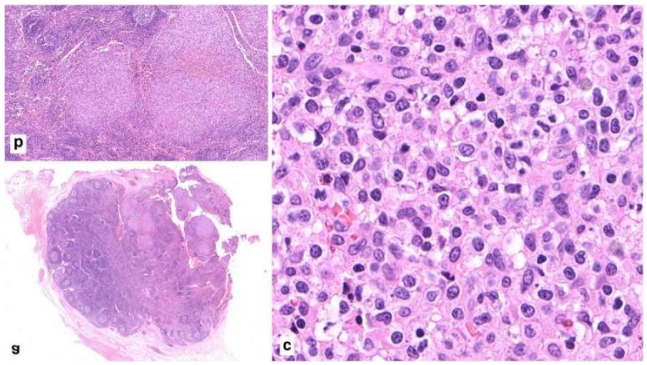

Figure 2: Lymph node lesions – Histopathology

DISCUSSION

The present retrospective study was conducted to analyze the histopathological spectrum of lymph node lesions in a tertiary care center over a period of one year, with a sample size of 50 cases. Lymphadenopathy remains a common clinical presentation with a wide range of underlying etiologies, ranging from benign reactive conditions to malignancies. Histopathological examination remains the cornerstone in establishing a definitive diagnosis and guiding appropriate treatment.

In the current study, the age distribution revealed that the majority of patients belonged to the 21–30 years age group (28%), followed by the 11–20 years group (20%). This finding is consistent with previous studies which have reported a higher incidence of lymphadenopathy in the younger population, likely due to increased prevalence of reactive and infectious conditions in these age groups. The age distribution pattern suggests that clinicians should maintain a high index of suspicion for both infective and neoplastic causes in younger patients presenting with lymphadenopathy [6-8].

Gender distribution showed a male predominance (56%) over females (44%). This male predominance is in line with several other studies and may be attributed to a higher exposure to outdoor environments and occupational hazards among males, leading to increased susceptibility to infections and other inflammatory conditions. However, the difference is not very large, indicating that both genders are significantly affected.

Cervical lymph nodes were the most commonly involved site (60%), followed by axillary (16%) and inguinal (12%) regions. This distribution is expected, as cervical lymphadenopathy is frequently associated with upper respiratory tract infections, tuberculosis, and malignancies of the head and neck region. Similar trends have been observed in various national and international studies, emphasizing the need to thoroughly evaluate cervical lymphadenopathy, particularly in regions where tuberculosis is endemic.

Histopathologically, the most common diagnosis was reactive lymphadenitis (30%), followed closely by tuberculous lymphadenitis (28%). This indicates that reactive changes due to non-specific infections or inflammatory processes are the most frequent cause of lymphadenopathy in this study population. Tuberculosis continues to be a major health burden in developing countries and remains a leading cause of granulomatous lymphadenitis. The high incidence of tuberculous lymphadenitis in this study is consistent with similar findings reported in other Indian studies, reflecting the endemic nature of tuberculosis in this region [8].

Among neoplastic lesions, metastatic carcinoma and non-Hodgkin's lymphoma were seen in 12% of cases each, followed by Hodgkin's lymphoma in 6% of cases. This finding indicates that malignancies form a significant proportion of lymph node lesions. Metastatic lymphadenopathy was primarily observed in older patients, reinforcing the importance of considering secondary involvement in elderly individuals with persistent lymphadenopathy. Lymphomas, both Hodgkin's and non-Hodgkin's, are also critical diagnoses that require prompt recognition and management [9, 10].

In conclusion, this study highlights the diverse histopathological spectrum of lymph node lesions, with reactive and tuberculous lymphadenitis being the most common. However, a notable percentage of cases were due to malignancies, underscoring the necessity of timely biopsy and histological evaluation in patients with unexplained lymphadenopathy. The findings also emphasize the role of pathologists and clinicians in early detection and accurate diagnosis to ensure appropriate and timely treatment, particularly in regions with high infectious disease prevalence.

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