Emerging Medical Science (EMS)
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Original Article

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Histopathological Diagnoses of Lymphadenopathy from Excisional Biopsies: A Retrospective Study at a Tertiary Care Center

Girija Sankar Naik [1], Bismaya Kumar Rout [2], Himansu Shekhar Mishra *[3]

[1]Associate Professor, Department of Surgery, DRIEMS Institute of Health Science and Hospital, Cuttack, Odisha, India.
[2]Assistant Professor, Department of Surgery, Shri Jagannath Medical College and Hospital, Puri, Odisha, India.
[3]Assistant Professor, Department of Surgery, SCB Medical College and Hospital, Cuttack, Odisha, India.

*Corresponding Author: Dr. Himansu Shekhar Mishra; *himansumishra83@gmail.com*

Received: 08 March 2025; **Revised:** 19 April 2025; **Accepted:** 23 April 2025; **Published:** 25 April 2025

Abstract

Background: Lymph nodes, distributed throughout the human body, are critical components of the immune system and are routinely evaluated for pathological changes. These nodes are susceptible to infection and neoplastic transformation. Lymphadenopathy, characterized by abnormal lymph node size and/or number, is a common clinical finding. Reactive lymphadenitis and granulomatous lymphadenitis represent frequent etiologies of lymphadenopathy. Excisional biopsy followed by histopathological examination remains the definitive diagnostic modality for lymph node disorders. ***Methods:*** A retrospective, descriptive, cross-sectional study was conducted, encompassing all patients who underwent lymph node biopsies at SCB Medical College and Hospital, Cuttack between January 2023 and December 2024. Histopathology reports of all lymph node biopsies performed at this period were included in the analysis. ***Results:*** Tuberculous lymphadenitis was the predominant diagnosis, constituting 53.2% (n=251) of the 120 analyzed cases. A higher prevalence of tuberculous lymphadenitis was observed in female patients (52%) compared to male patients (48%), although the difference was not statistical significant. Malignant diagnoses represented the second most frequent category, accounting for 17% of cases. ***Conclusions:*** The evaluation of lymphadenopathy necessitates appropriate diagnostic procedures, including fine needle aspiration cytology (FNAC), core needle biopsy, and/or excisional biopsy, to establish an accurate diagnosis. The histopathological spectrum of lymph node biopsies encompasses a range of conditions from benign reactive hyperplasia to tuberculosis and malignancy.

Keywords: ***Lymph node biopsy, Histopathology, Tuberculous lymphadenitis, Malignancy.***

Introduction

Lymph nodes, a ubiquitous component of the lymphatic system, are strategically distributed throughout the human body, including the axillary, abdominal, cervical, thoracic, and inguinal regions, with an estimated count of approximately 800 in adults. These lymphoid organs are integral to immune surveillance and are routinely assessed for pathological alterations, the nature of which is contingent upon the intensity and type of the immunological response [1]. Lymph nodes possess the potential for both infectious and malignant transformation. Lymphadenopathy, a clinical manifestation characterized by an increase in lymph node size and/or number, is commonly categorized as either localized or generalized, with localized presentations being more frequent. In India, lymphadenopathy is a prevalent clinical entity, rendering lymph node biopsy a crucial diagnostic procedure for the detection of infections and malignancies [2]. Reactive and granulomatous lymphadenitis are among the most frequently observed causes of lymphadenopathy [3]. Lymph node biopsy plays a vital role in identifying malignant involvement in cases of lymphadenopathy [4]. Tuberculosis stands out as the most common infectious etiology of lymphadenopathy, particularly in underdeveloped and developing nations, potentially linked to socioeconomic factors [5,6]. Excisional biopsy followed by histopathological analysis is the established gold standard for diagnosing lymph node pathologies [7]. This study aimed to perform a histopathological analysis of lymph node biopsies at a tertiary healthcare facility.

Methods

This is a retrospective, descriptive and a cross-sectional study of all the patients with lymph node biopsies seen in SCB Medical College and Hospital, Cuttack between January 2023 and December 2024.As the study was retrospective duration-based design, patients for whom the biopsy samples were available in two years from 2023-2024 were included in the study. Histopathology reports of lymph node biopsies of patients were included in the study. Soccio demographic and clinicopathological data were also be obtained from the same. A statistical test was applied to analyse the histopathological data.

Results

The total number of cases of lymph node biopsies available was 469 over the period of two years from January 2023 to December 2024. The diagnosis of lymph node biopsies was categorised into seven diagnoses. Out of the total 120 cases, females account for 62 (51.6%) cases while males account for 58 (48.3%) cases. The male to female ratio for the same is 0.8:1. The most common diagnosis is of tuberculous lymphadenitis which accounted for 77 (64.2%) of the total 120 cases. Tuberculous lymphadenitis was most commonly observed in females (67.7%) as compared to males (60.3%). Cancer cases which accounted for 21 (17.5%) cases formed the second most common diagnosis in which females accounted (17.7). This was followed closely by 17 cases (14%) of granulomatous lymphadenitis (Table 1).

Table 1: Diagnosis of lymph node biopsies.

Diagnosis	Count	%	Male	%	Female	%
Tuberculous lymphadenitis	77	64.2	35	60.3	42	67.7
Cancer	21	17.5	10	17.2	11	17.7
Reactive	17	14.2	10	17.2	7	11.3
Bacterial infection	2	1.7	1	1.7	1	1.6
Histiocytic necrotizing Lymphadenitis	2	1.7	1	1.7	1	1.6
Cat scratch	1	0.8	1	1.7	0	0.0
Total	120	100	58	100	62	100

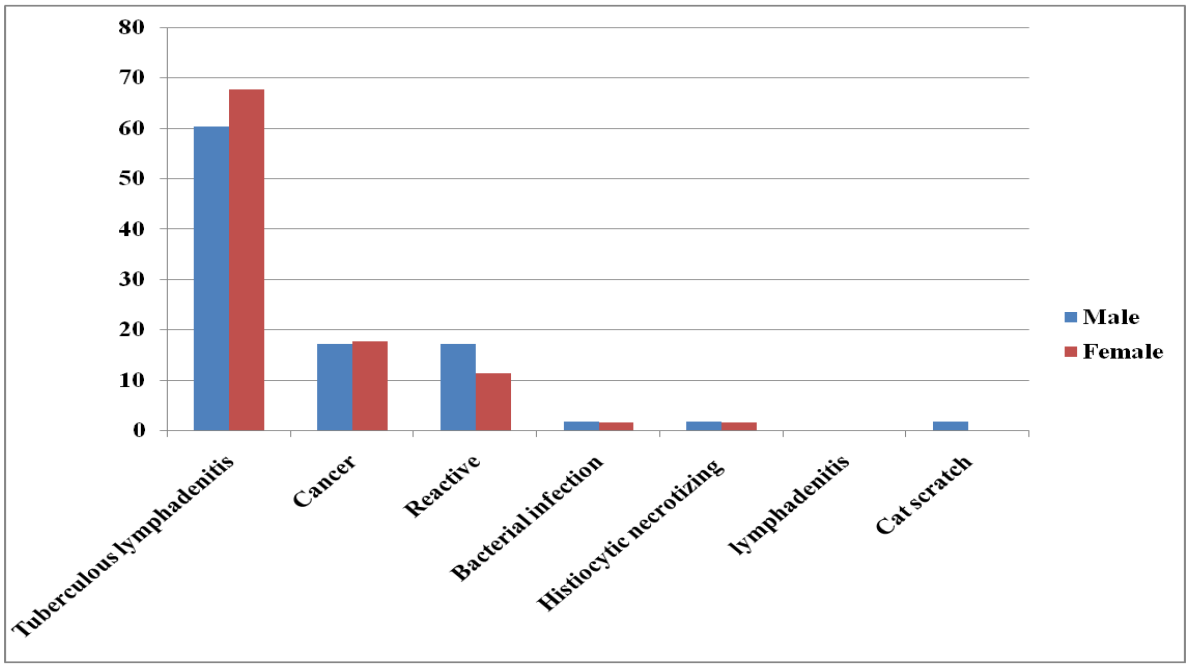

Figure 1: Diagnosis of lymph node biopsies

Out of the total 469 cases of lymph node biopsies, 316 (67.38%) cases were reported at the cervical location. Tuberculous lymphadenitis that accounted for 184 (39.23%) cases at cervical were found to be most at cervical location. This was followed by 14 (2.99%) cases of cancer which were most prevalent at inguinal/groin location which accounted for a total 26 (5.54%) cases (Table 2).

Table 2: Diagnosis of lymph node biopsies based on location.

Location	Count	Tuberculous lymphadenitis	Cancer	Reactive	Bacterial infection	Histiocytic necrotizing lymphadenitis	Cat scratch
Cervical	80	57	10	11	1	1	0
Axillary	18	8	5	4	1	0	1
Neck	7	4	1	1	0	0	0
Inguinal/ groin	7	3	3	0	0	1	0
Abdomen	7	4	2	1	0	0	0
Chest thorax	1	1	0	0	0	0	0
Total	**120**	**77**	**21**	**17**	**2**	**2**	**1**

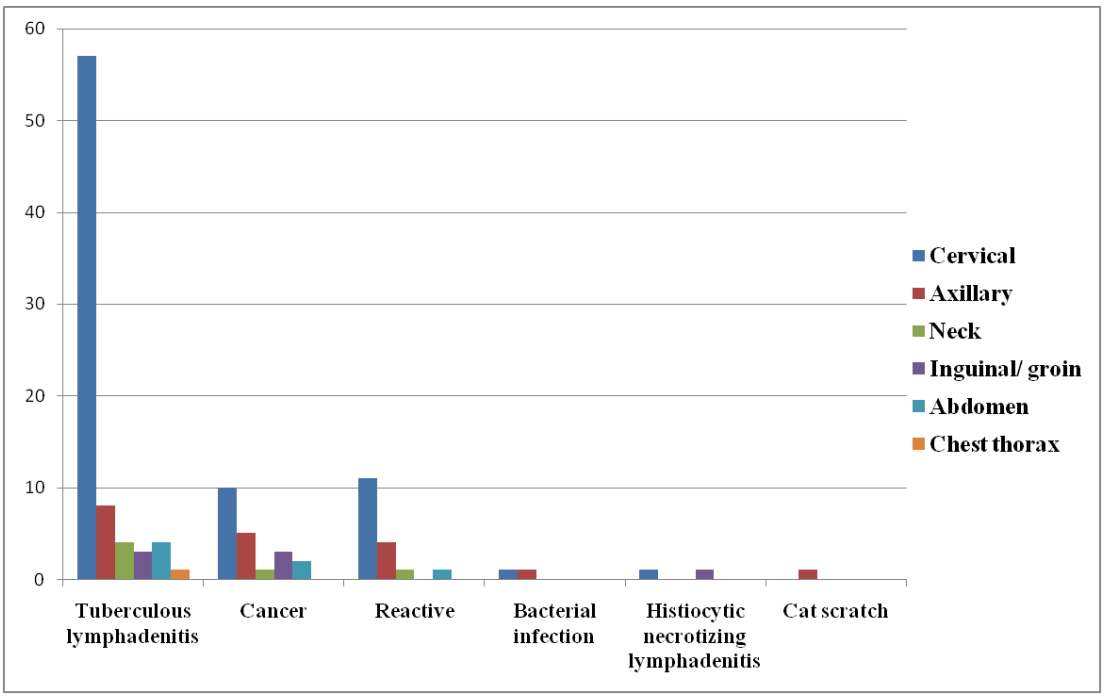

Figure 2: Diagnosis of lymph node biopsies based on location.

Based on age grouping, the age group of 21-30 contained (26.65%) cases of lymph node biopsies, out of which (17.06%) cases were of tuberculous lymphadenitis. Overall, in every age group, the maximum number of cases was of tuberculous lymphadenitis (53.52%) out of the total 120 cases of lymph node biopsies.

Discussion

Lymphadenopathy is a prevalent clinical presentation encountered in routine medical practice. Definitive diagnosis through excisional biopsy and subsequent histopathological evaluation facilitates timely and appropriate management of enlarged lymph nodes [1]. This retrospective analysis of lymph node biopsies conducted over four years at a tertiary care center aimed to characterize the spectrum of histopathological findings. The study population exhibited a female predominance, with a male-to-female ratio of 1:1.7, consistent with observations from prior investigations reporting a similar gender distribution in lymph node biopsy cohorts [1,3,5,9,10].

Tuberculous lymphadenitis constituted approximately 65% of all analyzed lymph node biopsies, representing the most prevalent pathological finding. This observation aligns with data reported from several tropical and developing nations [11-14]. Conversely, a study conducted in Maharashtra by Damle *et al.*[1] did not identify tuberculosis as the predominant lymph node pathology. The elevated prevalence of tuberculosis lymphadenitis in underdeveloped and developing countries may be attributable to suboptimal living conditions [6]. Furthermore, our analysis revealed a higher incidence of tuberculous lymphadenitis in female patients compared to males, a trend consistent with findings in other populations [15].

Our investigation revealed that malignancy was the second most frequent diagnosis (17.7%), subsequent to tuberculosis, with reactive lymphadenitis occurring in 14.5% of cases. This contrasts with several studies, including those by Kamat *et al.*[3] and Rahman *et al.*[10] which reported reactive lymphadenitis as the second most common finding after tuberculosis. Conversely, other research, notably in some African regions (Moore *et al.*,[7] Oluwole *et al.*,[16] and Sibanda *et al.*,[17] identified reactive changes as the most prevalent, followed by tuberculosis. Furthermore, Rahman *et al.*[10] and Shrestha *et al.*[13] reported malignancy as the fourth most common cause of lymphadenopathy, differing from our finding of it being the second most frequent. In our cohort, cervical lymph nodes were the most common site of lymphadenopathy (67.38%), a finding consistent with multiple studies within India and internationally [9,13,18-20]. Axillary lymph nodes were the second most frequently involved site, aligning with global reports [18-20]. Among cervical lymph node biopsies, tuberculous lymphadenitis was the most common histopathological diagnosis in our study, followed by reactive disease, whereas a study by Al-Tawfiq *et al.*[21] in Saudi Arabia reported reactive disease as the most frequent. The highest incidence of lymphadenopathy was observed in the 21-30-year age group, with tuberculous lymphadenitis also most commonly affecting this demographic, corroborating finding from other studies [6,10,11,20]. The limitations of this study include its single-center design and its retrospective nature, which relied on pre-existing patient data.

Conclusion

Enlarged lymph nodes should undergo FNAC, truecut biopsy and/or excisional biopsy for correct diagnosis. The diagnostic spectrum ranges from benign reactive to TB and also malignancies.

Declarations

Ethical Approval and Consent to participate

Not applicable as retrospective nature of study. Consent for publication: Not applicable as retrospective nature of study.

Availability of supporting data

Upon request to the corresponding author.

Competing interests

Nil

Funding Statement

Nil

Authors contributions

All authors made substantial contributions to the reported work, including in the areas of conception, study design, execution, data collection, analysis, and interpretation. They participated in drafting, revising, and critically reviewing the article, gave final approval for the version to be published, agreed on the journal for submission, and accepted responsibility for all aspects of the work.

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