Original Research Article

A Prospective Clinicopathological Study on Cervical Lymphadenopathy in a Tertiary Care Hospital

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Abstract

Background: Cervical lymphadenopathy is one of the most frequent clinical presentations encountered in surgical and medical practice, with causes ranging from benign infections to serious malignancies. Accurate diagnosis is essential to guide timely management and prevent morbidity. In regions like India, where tuberculosis remains endemic, evaluating the clinicopathological spectrum of cervical lymphadenopathy is vital for patient care.

Aims: To determine the incidence of cervical lymphadenopathy across different age groups, identify its various etiologies, correlate clinical findings with pathological diagnoses, and assess diagnostic and treatment outcomes in a tertiary care setting.

Methodology: This prospective observational study included 200 patients aged >12 years presenting with cervical lymphadenopathy at a tertiary care hospital over 22 months. Detailed clinical history, examination, and investigations including CBC, ESR, chest X-ray, Mantoux test, ultrasonography, FNAC, and excisional biopsy (where indicated) were performed. HIV testing and relevant serologies were included when necessary. FNAC and histopathology formed the basis of diagnosis. Patients were managed according to etiology and followed for treatment response. Data were analyzed using descriptive statistics and diagnostic correlations.

Results: The study showed a male predominance (53.5%) with a mean age of 33.1 years. The most affected age group was 21–40 years (54%). The right side of the neck was most commonly involved (46%). Systemic symptoms included fever (48%), weight loss (42%), and night sweats (38%). FNAC revealed tubercular lymphadenitis in 42%, reactive lymphadenopathy in 31%, metastatic deposits in 11%, and lymphoma in 7%. Final diagnoses confirmed tuberculosis as the leading cause (43%), followed by reactive lymphadenopathy (35%) and malignancy (22%). Overall, 80% of patients showed clinical improvement following appropriate therapy.

Conclusion: Cervical lymphadenopathy in this population was predominantly due to tuberculosis, highlighting the importance of FNAC as a rapid, reliable diagnostic tool. Early diagnosis and targeted treatment resulted in favorable outcomes, underscoring the significance of structured clinical and pathological evaluation.

Keywords: Cervical lymphadenopathy, FNAC, Histopathology, Tubercular lymphadenitis.

Introduction

Cervical lymphadenopathy refers to the enlargement of lymph nodes in the cervical region and is one of the most common clinical presentations encountered in routine medical and surgical practice. It can be a manifestation of a wide range of pathological processes, including infections, autoimmune diseases, and malignancies—both primary and metastatic.

The accurate diagnosis of the underlying cause of cervical lymphadenopathy is essential to initiate appropriate treatment and avoid unnecessary morbidity. [1] The cervical lymph node region is anatomically complex and closely associated with vital structures in the head and neck. Given its diverse etiology, the evaluation of cervical lymphadenopathy poses a diagnostic challenge.

Clinical examination, coupled with relevant investigations such as fine needle aspiration cytology (FNAC), excisional biopsy, and imaging studies, plays a crucial role in differentiating benign from malignant causes. [2] A prospective clinicopathological study enables real-time data collection and analysis, contributing to a better understanding of disease patterns, demographic

correlations, and histopathological spectrum in the local population. This study aims to provide comprehensive insights into the various causes of cervical lymphadenopathy and evaluate their clinicopathological correlation, especially in the setting of a tertiary care hospital catering to a diverse patient population.

Aims: To investigate the incidence of cervical lymphadenopathy across different age groups. To identify the various causes of cervical lymphadenopathy and to correlate clinical diagnoses with pathological findings. Finally to examine the appropriate diagnostic approaches and treatment modalities for cervical lymphadenopathy.

Objective: The objective of this study is to conduct a comprehensive evaluation of cervical lymphadenopathy within a tertiary care setting. By identifying the underlying causes, we aim to initiate appropriate and effective treatment to reduce associated morbidity.

Methodology: This was a prospective observational clinicopathological study conducted in the Department of General Surgery at Government General Hospital, Guntur, undertaken to evaluate the causes, clinical features, diagnostic approach, and management of cervical lymphadenopathy in patients presenting to a tertiary care hospital for a period of 22 months.

Inclusion Criteria: Patients aged more than 12 years presenting with cervical lymphadenopathy irrespective of duration or laterality. Exclusion Criteria: Patients aged less than 12 years. Patients in whom FNAC or biopsy could not be carried out due to anatomical constraints or poor clinical condition. Patients with acute infective lymphadenitis, as their condition was transient and did not require further pathological workup.

Data Collection Procedure: A detailed evaluation was carried out for each patient using a structured proforma: Clinical History, Demographic details including age, sex, occupation, and residence, Duration of swelling, progression, associated symptoms (pain, fever, weight loss, night sweats, difficulty swallowing, voice changes, etc.). Past history of tuberculosis, chronic illnesses, malignancies, or similar episodes., History of recent infections or trauma. Clinical Examination: General physical examination, vitals, Local examination of the neck including location, size, consistency, tenderness, mobility, and number of lymph nodes. Systemic examination to rule out other primary lesions or associated findings.

Investigations: Routine hematological investigations (CBC, ESR), Chest X-ray and Mantoux test (especially if tuberculosis was suspected), Ultrasonography of the neck, Fine Needle Aspiration Cytology (FNAC) for all accessible nodes, Excisional biopsy in selected cases (non-diagnostic FNAC, suspected malignancy, atypical presentations), HIV testing and other relevant serologies if clinically indicated.

Pathological Evaluation: FNAC samples were analyzed and categorized as benign, granulomatous, reactive, suppurative, or malignant. Histopathological examination of biopsied lymph nodes was used for definitive diagnosis in relevant cases.

Treatment and Follow-Up: Treatment plans were formulated based on the final diagnosis (antibiotics, anti-tubercular therapy, surgical excision, or referral for oncology management). Patients were followed up to monitor resolution or progression of lymphadenopathy and treatment response.

Data Analysis: Data was recorded and maintained using Microsoft Excel. Statistical analysis was done using SPSS or similar software. Descriptive statistics (mean, standard deviation, frequency, and percentages) were used for demographic and clinical variables. Cross-tabulations and Chi-square tests were applied to evaluate associations between clinical findings and pathological outcomes. Diagnostic accuracy of FNAC was compared to histopathological results using sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV).

Results:

Table 1: Demographic Data of Patients in the Study

Variables	No of cases	Percentages
Male	107	53.5
Female	93	46.5
Mean age	33.1±18.2	
12 - 20 years	28	14
21 - 30 years	64	32
31 - 40 years	44	22
41 - 50 years	24	12
51 - 60 years	24	12
> 60 years	16	8

Table 2: Disease Characteristics of Patients in the Study

Site of Lymphadenopathy	No of cases	Percentages
Right side	92	46
Left side	82	41
Bilateral	26	13
Level 1	30	15
Level 2	48	24
Level 3	26	13
Level 4	16	8
Level 5	72	36
Level 6	8	4

Table 3: Complaints of Patients in the Study

Complaints	No of cases	Percentages
Pain	80	40
Fever	96	48
Weight loss	84	42
Night sweats	76	38
TB contacts	56	28

Table 4: Clinical Examination of Patients in the Study

Consistency	No of cases	Percentages
Firm nodule	92	46
Soft nodule	70	35
Hard nodule	38	19
Mobile	142	71
Fixed	58	29

Table 5: Investigations of Patients in the Study

Investigations	No of cases	Percentages
Mantoux Test Positive	108	54
Chest X ray Abnormal	60	30
HIV Status	16	8
FNAC		
TB Lymphadenopathy	84	42
Reactive Lymphadenopathy	62	31
Metastatic	22	11
Lymphoma	14	7
Inconclusive	18	9

Table 6: Final Diagnosis of Patients in the Study

Diagnosis	No of cases	Percentages
Tuberculosis	86	43
Reactive Lymphadenopathy	70	35
Metastatic	26	13
Hodgkins	7	3.5
Non-Hodgkins	11	5.5

Table 7: Management of Patients in the Study

Diagnosis	No of cases	Percentages
Tuberculosis	86	43
Reactive Lymphadenopathy	70	35
Metastatic	26	13
Hodgkins	7	3.5
Non-Hodgkins	11	5.5

Discussion

Demographic Characteristics: In our prospective study of 200 patients with cervical lymphadenopathy, males constituted 53.5% (n=107) and females 46.5% (n=93), with a mean age of 33.1 years. The most affected age group was 21–40 years (54%). Similar male predominance was reported by Chakrabarti et al. (2012) [1] and Sharma et al. (2018) [2], suggesting increased exposure to risk factors among males. However, Khanna et al. (2014) [3] and Ghosh et al. (2015) [4] found a slight female preponderance, showing geographic variability. The age distribution in our study parallels findings from Karki et al. (2019) [5] and Mondal et al. (2013) [6], who noted a higher incidence in the productive age group due to greater environmental exposure.

Clinical Presentation: Pain was present in 40% of patients, fever in 48%, weight loss in 42%, and night sweats in 38%. A positive TB contact history was documented in 28%. These findings are consistent with Maheshwari et al. (2013) [7] and Devi et al. (2016) [8] Adhikari RC [9], where systemic symptoms were significantly associated with chronic infectious or malignant causes.

Clinical Examination: Firm nodes were the most common (46%), followed by soft (35%) and hard (19%). Tenderness was present in 36% of cases, while 29% had fixed nodes, and matted nodes were seen in 23%.

This profile aligns closely with Singh et al. (2015) [10] and Bhatt et al. (2016) [11], who noted firm nodes as predominant in tuberculosis and matted nodes as indicative of granulomatous infections.

Investigations: Mantoux positivity was seen in 54%, chest X-ray abnormalities in 30%, and HIV positivity in 8% of patients. Our findings regarding Mantoux and X-ray findings are close to those reported by Khatri et al. (2014) [12] and Narayan et al. (2017) [13].

FNAC and Final Diagnosis: FNAC showed tubercular lymphadenitis in 42%, reactive lymphadenopathy in 31%, metastases in 11%, and lymphoma in 7%. Inconclusive results were seen in 9%. Final diagnoses revealed: Tuberculosis causes: 43%, Reactive Lymphadenopathy: 35%, Malignancy (metastasis + lymphoma): 22%. This pattern is consistent with Rajesh et al. (2015) [14] and Anuradha et al. (2017) [15], who also observed tuberculosis and infection as leading causes.

Management and Outcome: Reactive Lymphadenopathy cases were treated with antibiotics. Tubercular cases were given ATT. Lymphoma cases underwent chemotherapy and secondaries neck cases underwent modified radical neck dissection or functional neck dissection with radiotherapy. The overall improvement rate was 80%, with 11% needing further interventions and 9% lost to follow-up. Similar outcomes were described by Krishnaswamy et al. (2016) [16], highlighting the good prognosis with early diagnosis and proper management.

Conclusion

This prospective clinicopathological study of 200 patients with cervical lymphadenopathy highlights the significant burden and diverse etiologies of neck swellings in a tertiary care setting. The findings underscore a clear male predominance and a peak incidence in the 21–40 years age group, reflecting increased exposure to infectious and environmental factors in this population. Most patients presented with painless cervical swellings, and a considerable proportion exhibited systemic symptoms, emphasizing the need for thorough evaluation.

The pattern of lymph node involvement, predominance of firm nodes, and high Mantoux positivity collectively point toward tuberculosis as a major cause of cervical lymphadenopathy in endemic regions like India. FNAC proved to be a highly reliable and minimally invasive diagnostic tool, effectively identifying tubercular lymphadenitis, reactive changes, metastatic deposits, and lymphomas. The final diagnostic distribution reaffirmed tuberculosis as the most common etiology, followed by reactive and malignant causes.

Management outcomes were encouraging, with the majority of patients demonstrating clinical improvement following appropriate treatment—whether antitubercular therapy, antibiotics, or oncology-guided interventions. The relatively low rate of persistent disease further validates the effectiveness of structured diagnostic and therapeutic protocols. Overall, this study emphasizes the continued relevance of tuberculosis, the utility of FNAC, and the importance of early, targeted management to achieve favorable outcomes in patients presenting with cervical lymphadenopathy.

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