

# A Clinicopathological Study of Cervical Lymphadenopathy

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**Abstract:** *The prime function of lymph node is to deal with antigen, whether this be in the form of organisms or other particulate material, or even soluble antigen. Lymph nodes are strategically placed along the drainage of tissue and body fluids; they are most numerous in those areas which are in direct contact with the exterior of the individual. The analysis of lymph node enlargement in the neck and predicting their clinical behaviour is not an easy task. There can often be diagnostic dilemmas as the diseases that affect the cervical lymph nodes mostly resemble each other. These diseases also include neoplastic lesions, where accurate diagnosis is the key to appropriate management. The study intends to find out systematically the various pathological conditions presenting with enlarged lymph nodes in the neck, also the various modes of clinical presentation and behaviour of these conditions. Relevant investigations have also been studied.*

**Keywords:** Cervical lymphadenopathy, FNAC, histopathological examination, Lymph nodes

## 1. Introduction

Enlargement of cervical lymph nodes is a common clinical condition encountered by the clinicians. As the enlargement of the lymph nodes more than 1cm indicates a clinical manifestation of regional or systemic disease and serves as an excellent clue to the underlying disease.

Persistent enlargement of the lymph node necessitates detailed investigations to reveal an underlying pathology. Although reasonably accurate diagnosis can be made clinically, histopathological examinations are mandatory to establish and confirm the diagnosis. These can be overcome by doing FNAC, as it is obtained easily and quickly which is simple and cheap and requires only a specialist input (cytologist).

The commonest causes for cervical lymphadenopathy are tuberculous lymphadenitis which is a common manifestation of extra pulmonary tuberculosis, secondaries in the cervical lymph nodes, lymphomas and nonspecific lymphadenitis.

In India, tuberculosis is a major health problem due to enormous social and economic constraints. The human

immunodeficiency virus (HIV) epidemic has been associated with an increase in the total incidence of TB and an increased proportion of military, disseminated, and extra pulmonary TB cases including lymphadenitis.

The gold standard biopsy modality in the workup of a neck mass is fine needle aspiration (FNAC). This procedure should always be done before the consideration of any open procedures. FNA can be used for both cytology and culture (in cases in which a suspected infectious neck mass does not respond to conventional antibiotic therapy).

## 2. Literature Survey

### Anatomy of Cervical Lymph Nodes

The human body contains approximately 800 lymph nodes out of which 300 lymph nodes are present in the neck. The various lymph nodes in the neck are organised into levels based on the triangles of the neck. The various triangles help in the localisation of mass lesions and in defining the drainage patterns of lymph nodes as well.

### Levels of Cervical Lymph Nodes

#### Surgical Landmarks

**Level I** - Submental and submandibular triangles

Relations: Superior-lower border of the body of the mandible  
Posterior-posterior belly of digastric  
Inferior-hyoid bone

**Level II**- Upper jugular lymph nodes

Relations: Superior-base of skull  
Posterior-posterior border of sternocleidomastoid muscle  
Anterior-lateral limit of sternohyoid  
Inferior-hyoid bone

**Level III- Middle jugular lymph Nodes**

Relations: Superior-hyoid bone  
Posterior-posterior border of sternocleidomastoid muscle  
Anterior-lateral limit of sternohyoid  
Inferior-cricothyroid membrane<sup>18</sup>

**Level IV- Lower jugular lymph nodes**

Relations: Superior-cricothyroid membrane  
Posterior-posterior border of sternocleidomastoid muscle  
Anterior-lateral limit of sternohyoid  
Inferior-clavicle

**Level V- Posterior triangle lymph nodes**

Relations: Posterior-anterior border of trapezius muscle  
Anterior-posterior border of sternocleidomastoid muscle  
Inferior-clavicle

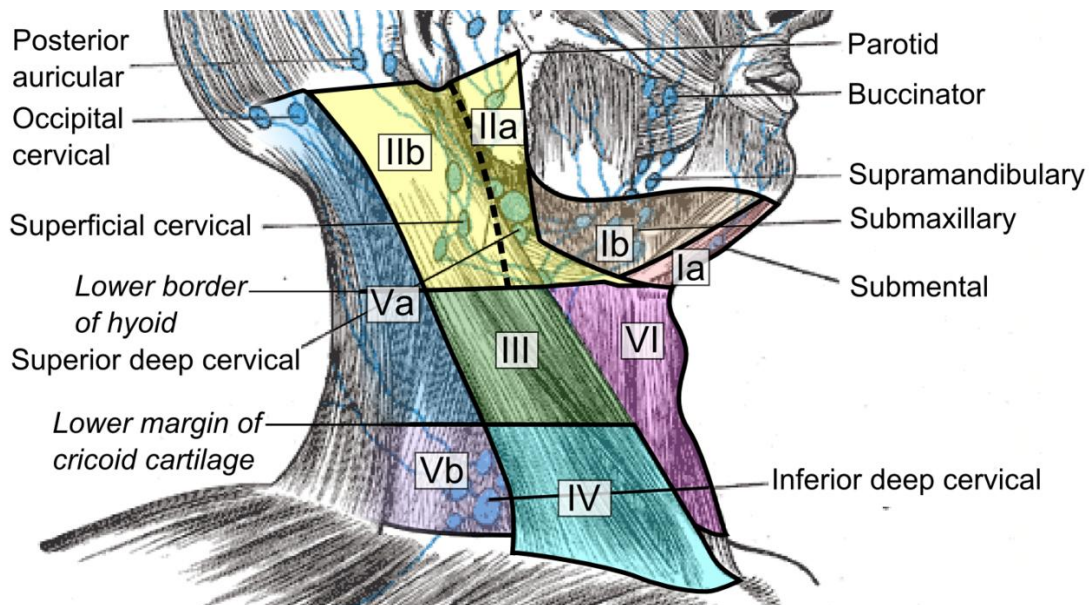
**Level VI- Anterior compartment of the neck**

Relations: Superior-hyoid bone  
Inferior-suprasternal notch  
Lateral-medial border of carotid sheath on either side

**Level VII- Superior mediastinal lymph nodes**

Relations: Superior-suprasternal notch  
Inferior-innominate artery

Recently, Level VII has been included in the thoracic group of lymph nodes.

**Patients & Methods**

The present study was carried out in the Department of General Surgery, Kamineni Institute of Medical Sciences, Narketpally. The study includes 100 patients who were admitted during the period from October 2019 – September 2021.

**Inclusion Criteria:**

- 1) Patients presenting with palpable cervical lymph node enlargement of >1cm of >3 weeks duration
- 2) Patients more than 8 years of age
- 3) Patients of both genders

**Exclusion Criteria:**

- 1) Patients less than 8 years of age.
- 2) Patients where FNAC and/or Biopsy of node could not be carried out.
- 3) Patients not willing to undergo any investigations are excluded

**3. Results**

In the present study, 100 cases were selected in the Department of General Surgery, outpatient and inpatient department in the surgical wards of Kamineni Institute of Medical Sciences, Narketpally, Nalgonda from the period of October 2019- September 2021.

**Table 1:** Histopathological Diagnosis based on FNAC, n=100

Histopathological diagnosis	Number of cases	Percentage
Tuberculosis	53	53
Reactive lymphadenopathy	27	27
Secondaries	14	14
Hodgkin's lymphoma	1	1
Non-hodgkin's lymphoma	5	5

Amongst cervical lymphadenopathy cases, majority were tuberculosis, followed by reactive lymphadenopathy cases, and the least being lymphomas.

**Table 2:** Gender Distribution, n=100

Gender	Number of cases	Percentage
Male	58	58
female	42	42

Cervical lymphadenopathy- Male:Female ratio is 1.38:1

**Table 3:** Age Distribution in Both Genders

Age Group (years)	Male	Female	Total
8-20	6	8	14
21-30	19	13	32
31-40	14	8	22
41-50	7	6	13
51-60	7	3	10
>60	5	4	9

Most of the patients presenting with cervical lymphadenopathy were amongst the age group 21-30 years (32%), followed by 31-40 years age group. very few cases presented within the age groups of >60 years

**Table 4:** Distribution of Cases according to Presenting Symptoms, n=100

Symptoms	Number of Cases
Neck Swelling	100
Pain	15
Fever	19
Cough	13
Loss of Appetite	12
Loss of Weight	17
Difficulty in swallowing	2
Change in voice	1

**Table No. 6:** Levels of Lymph Node Distribution, n =100

Site	Tubercular	Reactive	Lymphomas	Secondaries	Total
Level I	9	10	0	0	19
Level II	14	6	3	7	30
Level III	7	1	0	4	12
Level IV	5	3	1	1	10
Level V	18	7	2	2	29
Total	53	27	6	14	100

In Tuberculosis- most cases presented with level v lymph nodes; also being most common etiology of lymph nodal enlargement

- 1) In Reactive lymphadenitis- most cases presented with level i lymph nodes
- 2) In Lymphomas- most cases presented with level ii lymph nodes
- 3) In Secondaries- most presented with level ii lymph nodes

**Table 7:** Solitary/Discrete/Matted Presentations of Lymph Nodes, N=53

Presentations	Number of Cases
Solitary	6
Matted	30
discrete	64

Most cases of tubercular cervical lymphadenitis presented with discrete lymph nodes on clinical examination

**Table No. 8:** Chest X-Ray Findings in Tubercular Cervical Lymphadenitis, n=53

Chest X-Ray Findings	Number of Cases	Percentage (%)
Positive	5	9.43
Negative	48	90.57

Most cases of tubercular cervical lymphadenitis had no findings on chest x-ray

**Table 9:** Involvement of Other Groups of Lymph Nodes, n=10

Lymph Node Group	Tubercular Cervical Lymphadenitis (%)	Reactive Lymph Node (%)	Lymphomas (%)
Cervical+ Inguinal	2	1	1
Cervical+ Axillary	2	4	0
Cervical+ Inguinal+ Axillary	0	0	12

- 1) In tb- 3.7% of cases presented with cervical and axillary lymphadenopathy
- 2) In rl-14.8% of cases presented with cervical and axillary lymphadenopathy
- 3) In lymphomas- 33.3% of all cases had cervical, axillary and inguinal lymphadenopathy

**Table 10:** Neoplastic Vs Non-Neoplastic Lesions, n=100

Type of Lesion	Number of Cases
Non neoplastic	80
Neoplastic:	
1) Primary	6
2) Secondaries	14

Majority of lesions presenting as cervical lymphadenopathy are non-neoplastic

**Table 11:** Main Types of Lymphomas, n=6

Types of Lymphomas	Number of Cases
Non-hodgkin's lymphoma	5
Hodgkin's lymphoma	1

Most lymphoma cases were non-hodgkin's lymphoma- 83.3

**Table 12:** Distribution of Primary in Malignant Secondaries of Neck, N=14

Primary Site of Malignancy	Histopathological Pattern	Number of Cases
Oesophagus	Squamous cell carcinoma	4
Larynx	Squamous cell carcinoma	2
Stomach	Adenocarcinoma	2
Thyroid	Papillary carcinoma	2
Unknown	Squamous cell carcinoma	3
	Adenocarcinoma	1
Total		14

Amongst the secondaries- most primary sites occurred from the oesophagus

**Table 13:** Sensitivity & Specificity of FNAC in Diagnosing Tuberculous Cervical Lymphadenitis, N=100

FNAC	Number of Cases
True positive	40
False positive	0
True negative	14
False negative	37
Total	100

Sensitivity= TP/TP+FN= 75.5%

Specificity= TN/TN+FP= 100%

**Table 14:** Sensitivity & Specificity of FNAC in Diagnosing Reactive Lymphadenitis

FNAC	Number of Cases
True positive	27
False positive	5
True negative	0
False negative	68
Total	100

Sensitivity= 100%

Specificity= 93.1%

**Table 15:** Sensitivity & Specificity of FNAC in Diagnosing Secondaries in Cervical Lymph Nodes

FNAC	Number Of Cases
True positive	13
False positive	0
True negative	1
False negative	86
Total	100

Sensitivity= 92.8%

Specificity= 100%

**Table 16:** Sensitivity & Specificity of FNAC in Diagnosing Lymphoma in Cervical Lymph Node

FNAC	Number of Cases
True positive	5
False positive	0
True negative	1
False negative	94
Total	100

Sensitivity= 83.3%

Specificity= 100%

## 4. Discussion

Discussion is mainly based on analysis and observations made regarding presenting symptoms, signs, clinical behaviour, events in 100 cases of cervical lymph node enlargements, investigations, management and postoperative treatment given to patients attending to Kamineni Institute of Medical Sciences, Narketpally, Nalgonda, Telangana, during the period of October 2019-September 2021.

In the present study, which studies 100 cases of cervical lymphadenopathy, 80 were non-neoplastic lesions and 20 were neoplastic lesions

Study	Incidence of Non-Neoplastic Lesions (%)	Incidence of Neoplastic Lesions (%)
Shafullah et al.	90.6	9.4
Syed Humayun et al.	90.6	9.4
Present Study	80	20

In the study made by Shafullah and Syed Humayun Shah et al., the incidence of non-neoplastic and neoplastic lesions were 90.6% and 9.4% respectively.

## Site Distribution of Cervical Lymphadenopathy:

This study utilised the Memorial Kettering Hospital Classification of neck lymph nodes from Level I to Level VII

It was observed that in tuberculosis:

Level V was most commonly affected- 33.9%

Level II- 26.4% In contrast, in secondaries- Level II group was most commonly involved- 50%

In lymphomas, similarly, Level II group was involved

Study	Site Distribution of Lymph Nodes
Jha BC et al.	LEVEL II
Baskota DK et al.	LEVEL V
Present Study	LEVEL V

In the Jha BC et al. series, Level II group was most involved in tuberculosis. The result of this study is comparable to the study made by Baskota DK et al. study, wherein tuberculosis Level V lymph nodes is most commonly involved

## Types of Lesions of Lymph Nodes:

Study	Matted	Discrete
Jha BC et al.	38.3%	
Present Study	30%	64%

In this present study, 30% showed matted lymph nodes in tuberculous lymphadenopathy.

64% showed discrete lymph nodes.

Jha BC et al. study showed matted lymph nodes in 38.3% of cases which is comparable with the present study.

## Chest X-Ray Positivity Signs:

Study	Chest X-Ray Positivity Signs
Aggarwal P et al.	28.3%
Jha BC et al.	16%
PRESENT STUDY	9.43%

Studies made by Aggarwal P et al. series showed 28.3% positive signs and Jha BC et al. series showed 16% positivity. Chest X-ray positive signs was seen in 9.43% of cases of present study.

## Non-Hodgkin's and Hodgkin's Lymphoma:

Study	NHL:HL Ratio
Peh SC and Shamie et al.	9:1
Raymond Alexandrian	5.02:1
PRESENT STUDY	5:1

In the present study. Non-Hodgkins lesion: Hodgkin's lesion ratio is 5:1

While findings by Peh SC and Shamie et al. had a ratio of 9:1

Raymond Alexandrian study had a ratio of 5.02:1, which has similar results as this present study.



**Role of FNAC in Cervical Lymphadenopathy:**

In the present study, the sensitivity and specificity of FNAC in detecting various lesions of cervical lymph node are shown:

Histopathological Diagnosis	Sensitivity (%)	Specificity (%)
Tubercular lymphadenitis	75.8	100
Reactive lymphadenitis	100	93.1
Malignant Secondaries	92.8	100
Lymphomas	83.3%	100

Study	Jha BC et al.	Dandapat MC et al.	Chao SS, Loh KS et al.	Prasad RR et al.
Tubercular Lymphadenitis	Sensitivity- 92.8%	Sensitivity- 83%	Sensitivity- 88% Specificity-96%	Sensitivity- 84% Specificity- 95%
Malignant Secondaries				Sensitivity- 97% Specificity- 99%
Hodgkin's Lymphoma				Sensitivity- 80% Specificity- 98%
Non-Hodgkin's Lymphoma				Sensitivity- 81% Specificity- 96%

In the present study, FNAC sensitivity for tubercular lymphadenitis is low as compared to above studies.

**5. Conclusion**

Cervical lymphadenopathy is a very common presentation of enlarged neck nodes in the general population. Overall, age at presentation was maximum between 12 years and 30 years. Most common histopathological types include:

- Tuberculous lymphadenitis
- Reactive lymphadenitis
- Malignant secondaries
- Lymphomas

In metastatic lymph node, method of diagnosis was Fine Needle Aspiration Cytology. Lymphomas were diagnosed by Fine Needle Aspiration Cytology and confirmed with excision biopsy. In the present study, Fine Needle Aspiration Cytology was found to be reliable and cheapest method of diagnosis without any significant morbidity and with good patient compliance.

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