

## A Clinicopathological Study of 100 Cases of Cervical Lymphadenopathy

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### **Abstract:**

**Introduction:** Cervical lymphadenopathy is one the most common presenting complaint in the surgical OPD. Fine needle aspiration cytology (FNAC) has emerged as an important tool in the initial diagnosis and management of patients with lymphadenopathy due to early availability of results, simplicity of the test and minimal trauma to the patient. It is a safe, quick, reliable and cost-effective test for routine diagnosis of lymphadenopathy.

**Aims and Objectives:** To compare the FNAC findings with that of the histopathology in an attempt to highlight the diagnostic accuracy and reliability of FNAC of lymph nodes.

**Materials and Methods:** The present study was a prospective study carried out in the department of General Surgery, Osmania General Hospital, Hyderabad, Telangana State, over a period of 21 months. The study group consisted of 100 consecutive patients, both out-patient as well as in-patients who presented with chief complaints of cervical lymphadenopathy.

Fine needle aspiration cytology (FNAC) was done in all 100 patients. Excision biopsy was done in 84 cases. FNAC and biopsy findings were compared with clinical diagnosis.

**Results:** Benign lesions were more common in cervical lymph nodes than malignant ones. Tuberculosis was the most common of all affecting predominantly the posterior group. Younger age and female predominance was seen in tuberculosis. Malignancies were more common in older age group. The overall accuracy of FNAC in diagnosis of cervical lymphadenopathy was found to be 82%.

**Conclusions:** Fine needle aspiration cytology has higher accuracy for diagnosing tuberculous lymphadenitis, lymphomas, and secondary deposits. It has lesser accuracy for diagnosing chronic non-specific lymphadenitis. Thus, FNAC was found to be simple, cost effective, reliable and cheap method for diagnosis in cases of cervical lymphadenopathy.

**Keywords:** Cervical lymph adenopathy, FNAC, Tuberculosis, Secondaries, Biopsy

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### **I. Introduction**

Neck swelling is one the most common presenting complaint in the surgical OPD and cervical lymphadenopathy is the most common neck swelling. Inflammation of the cervical nodes is exceedingly common, more so in the rural population of developing and under-developed countries.

Lymphadenopathy refers to any disease process involving lymph nodes that are abnormal in size and consistency. Cervical lymphadenopathy is defined as any cervical lymph nodal tissue more than 1cm in diameter.<sup>[1]</sup> It may affect any age group, however the possible cause for such adenopathy varies in each age group. Lymphadenitis commonly occurs in children and young adults, but in older population, it is often due to secondary metastasis.

Fine needle aspiration cytology (FNAC) has emerged as an important tool in the initial diagnosis and management of patients with lymphadenopathy due to early availability of results, simplicity of the test and minimal trauma to the patient. It is a safe, quick, reliable and cost-effective test for routine diagnosis of lymphadenopathy. It remains the prime mode for differentiating between benign and malignant lesions of cervical nodes. In suspicious cases, biopsy is advised. If an accurate diagnosis is made at the time of presentation, an effective treatment can be instituted resulting in better patient outcome.

The diagnosis of metastatic tumour to lymph nodes is highly crucial as it would be the sole criteria for searching the primary tumour especially in cases of occult primary.<sup>[2]</sup>

However, there are instances where cytomorphological features overlap, requiring a biopsy for diagnosis. Therefore, the main aim of this study was to compare the FNAC findings with that of the histopathology in an attempt to highlight the diagnostic accuracy and reliability of FNAC of lymph nodes.

### **II. Materials And Methods**

The present study was a prospective study carried out in the department of General Surgery, Osmania General Hospital, Hyderabad, Telangana State, over a period of 21 months from December 2013 to September

2015. The study group consisted of 100 consecutive patients, both out-patient as well as in-patients who presented with chief complaints of cervical lymphadenopathy.

Fine needle aspiration cytology (FNAC) was done in all 100 patients. Excision biopsy was done in 84 cases. In all the cases a pathological diagnosis was obtained.

The clinical findings of all the cases which presented during this period were entered and the investigations were tailored to each patient's clinical findings, to confirm the diagnosis. The required base line investigations, fine needle aspiration cytology, excision biopsy, ear, nose and throat examination were carried out and treatment was advised accordingly. Since cervical lymphadenopathy is a common disease which presents to the department of surgery, a prospective study was conducted for the same. All the patients were asked to attend the surgical outpatient department for follow up after discharge and necessary advice was given.

### III. Results

In the present study all the cases were from rural areas and from poor socioeconomic status.

The cytologically diagnosed cases were divided into 4 groups, which were as follows:

1. Tubercular lymphadenitis.
2. Chronic non-specific lymphadenitis. (Chr NSL)
3. Secondary deposits
4. Hodgkin's Lymphoma

The maximum incidence was that of tubercular lymphadenitis, which was seen in 74 cases (74 %), followed by chronic non-specific lymphadenitis in 12 cases (12 %). Secondaries were present in the neck in 10 cases (10 %) and the least number of cases were seen in the category of Hodgkin's lymphoma, 4 cases (4 %).

**Table 1** Age distribution of 100 cases

Age (years)	Tuberculous	Chronic NSL	Secondaries	Hodgkin's	Total
1-10	1	1	1	-	3
11-20	23	-	-	-	23
21-30	32	2	-	-	34
31-40	11	2	2	2	17
41-50	6	5	5	1	17
51-60	1	2	2	-	5
61-70	-	-	1	-	1
>71	-	-	-	-	-
<b>Total</b>	<b>74</b>	<b>12</b>	<b>10</b>	<b>4</b>	<b>100</b>

The maximum incidence of tuberculous cervical lymphadenopathy was seen in the age group of 21-30 years. The age groups 11-30 years accounted for 55 cases (72.4 %) of tubercular lymphadenitis. The maximum incidence of chronic non-specific lymphadenitis was found in the age group of 41 – 50 years (5 cases, 41.7 %). The incidence of secondaries in the age group of 41-50 years was 5 cases (50 %) similarly the age of incidence of Hodgkin's disease was highest among 31- 40years (2 cases, 50 %).

Females contributed to slightly higher number of cases, the male to female ratio being 1:1.08 There were 48 male patients (48 %) and 52 (52 %) female patients.

Tuberculosis was more common among females, 44 cases while there were 30 cases of tuberculosis in males. In males there were 8 and 6 cases of chronic non-specific lymphadenitis and secondaries respectively. In female patients both were seen in 4 cases each. The male to female ratio in tuberculosis was 1: 1.3, in secondaries it was 1.5:1 and in chronic non-specific lymphadenitis it was 2:1. All the 4 cases of Hodgkin's disease diagnosed in the study were males.

The distribution of cases among the nodal levels of the neck was as follows: It was found that maximum number of cases involved the jugulodigastric group (45 %) the second highest number involved the supraclavicular group (17 %) and posterior triangle (17 %). Tuberculosis commonly involved the jugulodigastric (50 %) of cases, chronic non-specific lymphadenitis affected the posterior group (41.7 %) of cases, secondaries commonly affected the jugulodigastric nodes (50 %) of the cases. Hodgkin's lymphoma commonly affected the posterior group and supraclavicular nodes.

**Table 2** Clinical mode of presentation

Symptoms	Swelling	100
	Pain	46
	Fever	38
	Cough	8
	Sinus	5
	Others	21
Consistency	Firm	84

	Hard	11
	Variable	6
	Rubbery	3
	Soft	2
Matting	Present	64
	Absent	36
Fixity	Present	22
	Absent	78
No. of nodes	1-2	64
	3-4	11
	5-6	13
	7-8	2
	Multiple	6

The most common presenting symptom was swelling in the neck. The other important and common complaints were associated pain over the swelling and fever in 46 and 38 cases respectively. The commonest clinical finding was enlarged firm swelling and majority of the lymph glands were mobile. Matting was present in 64 cases. The maximum number of nodes was between 1-2.

The right side was affected in 24 cases (24 %) and left side was affected in 45 cases (45 %). Bilateral presentation was seen in 31 cases (31 %).

**Table 3** Correlation of clinical diagnosis with FNAC

Clinical diagnosis	Tuberculosis	Chr NSL	Secondaries	Hodgkins	FNAC not done	Total
Tuberculosis	62	6	2		4	74
Chr. NSL	3	7	2			12
Secondaries	1	0	9			10
Hodgkins	-	-	-	4		4
Total	66	15	11	4	4	100

Correlation of clinical diagnosis and FNAC in cases of tuberculosis was as follows:

Clinically there were 74 cases of tuberculosis out of which true positives (TP) diagnosed on FNA were 62 and false positives (FP)/FNA negative were 12. There were 4 cases which were false negative (FN) and 12 cases that were true negative (TN) on FNAC.

Sensitivity was 91.1 %, Specificity was 50 %, Positive predictive value (PPV) was 83.7 % and Negative predictive value (NPV) was 75 %. The P value is <0.001 which is significant.

**Table 4** Correlation of clinical findings with biopsy

Clinical diagnosis	Tuberculosis	Chr NSL	Secondaries	Hodgkins	Biopsy not done	Total
Tuberculosis	64	5	1		4	74
Chr. NSL	2	8	2			12
Secondaries	0	0	10			10
Hodgkin's	-	-	-	4		4
Total	66	13	13	4	4	100

Correlation of clinical diagnosis and biopsy in cases of tuberculosis was as follows:

Clinically there were 74 cases of tuberculosis out of which true positives (TP) diagnosed on biopsy were 64 and false positives (FP)/FNA negative were 10. There were 2 cases which were false negative (FN) and 24 cases that were true negative (TN) on FNAC.

Sensitivity was 96.9 %, Specificity was 70.5 %, Positive predictive value (PPV) was 86.4 % and Negative predictive value (NPV) was 92.3 %. The P value is <0.001 which is significant.

Tuberculosis had the highest distribution in this study (74 cases) and all the cases responded well to treatment. The patients with tubercular lymphadenitis received short course chemotherapy according to the RNTCP. All the patients responded well to the drugs, they were followed for a period of 6 months to one year. The cases with chronic nonspecific lymphadenitis underwent excision and all 12 cases recovered well. All the cases of secondaries and Hodgkin's disease were referred to speciality cancer hospital.

**Table 5** Comparison of FNAC with Biopsy findings in present study

Diagnosis		Sensitivity	Specificity	PPV	NPV
Tuberculosis	FNAC	91.1	50	83.7	75
	Biopsy	96.9	70.5	86.4	92.3
Chr NSL	FNAC	63	94.2	58.3	93.1
	Biopsy	69.2	98.8	90	66.6
Secondaries	FNAC	76.9	100	100	96.7
	Biopsy	100	100	100	100

Lymphoma	FNAC	100	100	100	100
	Biopsy	100	100	100	100

#### IV. Discussion

This study involved 100 cases presenting with cervical lymphadenopathy. All the patients in the study were from poor socioeconomic studies and all of them were from rural background.

Almost all the patients were agricultural workers, or helpers to the agriculturists, they stayed in overcrowded houses, were poorly nourished and their personal hygiene was well below the optimal level.

Most common presentation of the cervical lymphadenitis was swelling in the neck. 74% patients were diagnosed as tuberculous etiology.<sup>[3]</sup> Lymphadenitis is the most common extra pulmonary manifestation of tuberculosis. Tuberculous lymphadenitis is considered to be the local manifestation of systemic disease. In countries like India, which bears a disproportionately large burden of world tuberculosis rates, high index of suspicion is needed for diagnosis. Over the last two to three decades, FNAC emerged as the simple outpatient diagnostic procedure for evaluation and replaced lymph node biopsy for histopathology.

#### Age incidence:

In the present study, of the 100 patients, 74 patients were diagnosed to have tuberculosis and 72.4% i.e., 55 cases were of the age group of 11-30 years. Pandit et al<sup>[4]</sup> conducted a retrospective study of tuberculous cervical lymphadenitis, of which the mean age of presentation was 21-30 years, of which peak incidence was 23-26 years of age. In the study by Rakshan et al<sup>[5]</sup> the mean age was 26 years, where as in the retrospective study of Naranget al<sup>[6]</sup> the mean age of presentation was 25 years. The findings of our study compare well with these studies.

#### Gender predilection:

In the present study, the male to female ratio is 1:1.4 as compared to the 1: 1.33 in the research committee of the tuberculosis association of India study. In contrast to pulmonary tuberculosis which has higher incidence in older age group and male predilection, tuberculous lymphadenitis has a higher incidence among younger age group and female population. Nanda et al<sup>[7]</sup> observed a female preponderance of 1.1:1 in his epidemiological study. The other studies which produced similar results were Sing et al<sup>[8]</sup> with female preponderance of 1.42:1 and Khajuria et al<sup>[9]</sup> with female preponderance of 0.7.

#### Clinical distribution:

In the present study, symptom-wise, it was noticed that most common presenting complaint in patients with cervical lymphadenopathy is swelling in the neck, 100% of the patients had presented with this complaint, the next most common complaint was pain, which was present in 46% of the patients. Pain as a presenting symptom was followed closely by association of the swelling with fever which was noticed in 38% of the patients.

Clinically, the consistency of the swelling was firm in 84%, followed by hard swelling seen in 11% of patients. Variable consistency was seen in 6% of cases. Matting was seen in 64% cases. Fixity was seen in only 22% cases. Patients presented with mostly 1-2 nodes (64%), however, multiple nodes were seen in 6%.

All the patients who diagnosed to have tuberculosis in this study were treated with short course chemotherapy, for a period of 6 months. All the patients were followed for a period of six months to one year, in this present study there were no recurrence or relapses noted. The results of the series match with the second East African trial [1974]<sup>[10]</sup> in which the sputum conversion rate was 100%.

#### Common presentation:

In the present study, the common complaint with which the patient came to the OPD was swelling in the neck seen in 100% of patients. Closely following this was pain seen in 46%, fever in 38% of patients. However, painless swelling was the most common presentation.

Khan et al<sup>[11]</sup> in his study observed that all the patients came to the OPD with complaints of swelling in the neck. Desai et al<sup>[12]</sup> also observed that all their patients (100%) cases presented with neck swelling.

#### Most common nodes affected in tuberculosis:

According to the present study, the most common group of lymph nodes affected in tuberculosis was the posterior group, accounting to 74%. Second in involvement were jugulodigastric nodes, which accounted to 14.86%. Maharajan et al,<sup>[13]</sup> and Khan et al<sup>[14]</sup> found the posterior group involved in 42 % and 43.8 % respectively. Our findings were comparable to these studies.

### **Hodgkin's Lymphoma:**

In the present study, highest incidence of Hodgkin's lymphoma was found between 31-40 years (2 cases, 50% of cases), followed by age groups 1-10 and 41 – 50 years (1 case each, 25% each). This is comparable to the findings of Ramani et al<sup>[15]</sup> who found the median age of presentation of Hodgkin's lymphoma in India as 34 years which is lower than that seen in the west. In the present study, all the cases of Hodgkin's disease were seen in males only. This is in agreement with the findings of the study by Siddiqui et al<sup>[16]</sup> where they reported a male predominance of 3.3:1

### **Secondaries/Metastasis:**

In the present study of 100 cases, the incidence of metastatic deposits was found to be 10%, including occult primary. The clinical diagnosis was made based on nodes which were hard in consistency, immobile and fixed. Hence, the FNAC diagnosis turned out to be 90% of clinical diagnosis. Ahmed et al<sup>[17]</sup> in their study observed an incidence of 12 % for secondaries. Hirachand et al<sup>[18]</sup> showed an incidence of 12 % which is comparable to the present study.

### **Gender predilection for secondaries:**

In the present study, there was a slight male preponderance of 1.5: 1 among the cases of metastatic lymphadenopathy. The high male incidence could be related to tobacco abuse, exposure to sunlight, and possibly genetic factors. Jagtap et al<sup>[19]</sup> have reported 1.8:1 male to female ratio for secondaries in neck nodes which is comparable to present study.

### **Clinicopathological correlation:**

In our study 96 patients underwent FNAC, 4 patients refused to undergo any form of investigation. Out of the 65 cases that were diagnosed to have tuberculosis on biopsy, 64 of them were diagnosed clinically to have tuberculosis. In our study, Hodgkin's lymphoma was diagnosed clinically in 100% of the cases, while 100% of the metastatic lesions were provisionally diagnosed to have a malignancy based on clinical grounds. Only 66.6% of the patients with non-specific lymphadenitis were correctly diagnosed. In the present study the histological diagnosis was taken as the final diagnosis.

The sensitivity and specificity for tuberculosis on FNAC in the present study were 91.1 % and 50 % respectively. Egea et al<sup>[20]</sup> have observed the sensitivity and specificity as 94 % and 96 % and Thakur et al have reported it as 80 % and 93.8 %.<sup>[21]</sup>

Comparing the sensitivity and specificity of FNAC for diagnosing secondaries, in our study we found the values to be 69.2 % and 98.8 % respectively. Wilkinson et al<sup>[22]</sup> observed values of 97 % and 100 %.

Comparing the sensitivity and specificity of FNAC for diagnosing lymphoma, in our study the sensitivity and specificity, both were 100 % which compares well with the study of Malakar et al<sup>[23]</sup> where it was 100 % for both.

Comparison of the diagnostic accuracy of FNAC with other studies is as follows:

In the present study, the overall accuracy of FNAC in diagnosis of cervical lymphadenopathy was found to be 82%. The findings of the present study were compared with other studies. In the retrospective study by Hafez et al<sup>[24]</sup> the accuracy was found to be exactly the same as the present study. Gupta et al<sup>[3]</sup> reported similar results of 83% accuracy. However, in the study by Hirachand et al<sup>[18]</sup> the results were slightly higher showing 92.8 % accuracy.

## **V. Conclusions**

Lymphadenopathy is a clinical manifestation of regional as well as systemic disease, which serves as an excellent clue to diagnosis. It can arise either from benign or malignant causes. In our study, tuberculosis was found to be the most common cause of lymphadenopathy, followed by chronic non-specific lymphadenitis. Benign lesions are more common than malignant lesions in lymph nodes. Tuberculosis affects younger age group whereas, malignancies affect older age groups. The common group of lymph nodes affected in tuberculosis was posterior triangle nodes, followed by jugulodigastric nodes.

Fine needle aspiration cytology has higher accuracy for diagnosing tuberculous lymphadenitis, lymphomas, and secondary deposits. It has lesser accuracy for diagnosing chronic non-specific lymphadenitis. Thus, FNAC was found to be simple, cost effective, reliable and cheap method for diagnosis in cases of cervical lymphadenopathy.

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