

# FNAC: A Suitable Tool for Assessment of Cervical Lymphadenopathy

H K Velankar, Y Dabholkar, S Bhalekar, A Shetty, A A Saberwal, R Bidaye

## Citation

H K Velankar, Y Dabholkar, S Bhalekar, A Shetty, A A Saberwal, R Bidaye. *FNAC: A Suitable Tool for Assessment of Cervical Lymphadenopathy*. The Internet Journal of Otorhinolaryngology. 2014 Volume 17 Number 1.

DOI: [10.5580/IJORL.22070](https://doi.org/10.5580/IJORL.22070)

## Abstract

FNAC is a useful tool for the assessment of patients with cervical lymphadenopathy and a cost-effective alternative to open biopsy. To assess the frequency of various pathological conditions detected on FNAC in patients presenting with cervical lymph node enlargement, we did a prospective study in patients presenting with significant cervical lymphadenopathy (> 1cm) of more than four weeks duration. Tuberculous cervical lymphadenitis was the commonest diagnosis followed by reactive lymphadenitis. Amongst the malignant group, metastasis from squamous cell carcinoma was the commonest. FNAC had an accuracy of more than 90% in the diagnosis of the cervical lymph node swellings.

## INTRODUCTION

Fine needle aspiration cytology (FNAC) has become the investigation of choice in diagnosing cervical lymphadenopathy as it is, simple, rapid and minimally invasive. FNAC is useful in differentiating reactive hyperplasia/inflammatory conditions from granulomatous disorders and malignancy. It helps in the decision making process while managing the patient medically or surgically.

## AIM & OBJECTIVE

To assess the frequency of various pathological conditions detected on FNAC in patients presenting with cervical lymph node enlargement.

## MATERIALS AND METHODS

The present study on 401 patients of lymphadenopathy was conducted in an urban tertiary care hospital. Informed consent was taken from all patients. FNAC of the enlarged lymph nodes was performed following thorough clinical evaluation. The criterion of selection of patients was significant cervical lymphadenopathy (> 1cm) of more than four weeks duration. The study subjects included male and female patients of all age groups. A detailed history was elicited related to the neck swelling, any associated fever, weight loss, alcohol intake, smoking, tuberculosis in the family, unprotected sexual exposure, homosexuality, drug abuse, blood transfusion. FNAC was performed with a 10 cc

piston syringe coupled with a fine 22, 23, or 25 gauge needle. An ultrasound was used for guidance when required. 10ml syringe was used as it produces a good negative pressure. A syringe holder was used in small mobile lymph nodes as it leaves one hand free, to immobilize and to feel the target lesion. This allows more precision in placing the needle. The cervical lymph node is secured firmly between fingers, and with suction applied, 2-6 passes are made into the node. Suction is released before exiting the node or as soon as the material appears at the hub of the needle. The aspirated material was placed on the glass slides. In all cases alcohol fixed smears were made and stained with Hematoxylin and eosin stain (H & E). Whenever tuberculous lymphadenitis was suspected clinically, additional slides were made & stained with Ziehl-Neelsen stain.

**Inclusion & Exclusion Criteria:** The criterion of selection of patients was significant Cervical Lymphadenopathy (> 1cm) of more than four weeks duration. Cases in which there was failure to establish a diagnosis on FNAC, were excluded from the study but were subsequently subjected to formal surgical biopsy.

## RESULTS

In the present study a total of 401 patients presenting with cervical lymphadenopathy over the period of one year were clinically assessed and investigated by laboratory tests and FNAC. Out of 401 cases, 39 cases were excluded from the

study because of failure to establish a diagnosis on FNAC, but were subsequently subjected to formal surgical biopsy.

There were no complications or adverse events with FNAC reported during the study. Among the remaining 362 patients, 171 were male (47.2%) and 191 were female (52.8%). The mean age of the subjects was 31 years and ranged from 1 year to 84 years.

The diagnosis on FNAC was tuberculous lymphadenitis in 190 subjects (52.4%), reactive lymphadenitis in 131 subjects (36.1%), metastatic lymphadenitis (squamous cell carcinoma) in 27 subjects (7.4%), non-specific granulomatous lesion in 10 subjects (2.7%) and 2 cases each of Hodgkins lymphoma and papillary carcinoma metastasis were also noted. Reactive lymphadenitis was most commonly seen in the pediatric age (<12 years) group with 22 of 33 cases (66.6%). Tuberculous lymphadenitis was most commonly seen in the 3rd decade while highest incidence of squamous cell carcinoma was noted in the 7th decade.

Out of 190 patients diagnosed with tuberculous lymphadenitis, 112 were vegetarians while 78 were non-vegetarians.

## **DISCUSSION**

Lymph nodes are the bastions of immune defense. The cervical lymph nodes produce lymphocytes (specialized immune cells) that not only detect but also fight pathogens in the body. Whenever there is an infection in the sinuses, respiratory tract, and throat or elsewhere in the body, the cervical lymph nodes swell and produce larger than normal quantities of lymphocytes. Reactive lymphadenitis is more common in infants and young children since they are prone to upper respiratory tract infections and also their immature immune systems are less adept in fighting off bacteria and viruses.

The average age is significantly less in the present study as compared to study carried out by William. In his study average age of males with cervical lymphadenopathy was 60 years while for females it was 55 years. However in our study the average age of both males and females was significantly lower at around 31 years. The probable reason for this being the increased prevalence of tuberculous

lymphadenitis in our country compared to the western world where metastatic lymphadenitis is more common [1]. Koch's disease frequently involves young children and adults. This has resulted in the mean age of presentation being lower in our study.

A definite diagnosis was achieved with FNAC in 362 patients, out of a total of 401 patients.

Of these, 331 (91.4%) were benign lesions while 31(8.6%) were malignant lesions.

At 190 cases (52.4%) Tuberculosis formed the largest group in our findings. In the study performed by Bhattacharya et al(2), the authors concluded that FNAC was very useful in the diagnosis of tuberculosis as it could clinch the diagnosis by demonstrating epitheloid granuloma with or without caseation even in the absence of Acid Fast Bacilli (AFB). The authors also noted that the diagnosis of tuberculosis is possible even in the absence of typical epitheloid granuloma on FNAC in suppurative abscesses which may still show high AFB positivity and the presence of necrotic features. In a study of 1396 cases of FNAC of cervical lymphadenopathy, Ramesh Kumar[3] found it a very useful diagnostic test. The most common benign lesion in this study was tuberculosis (54%). Bezabih et al found FNAC helpful in averting more invasive surgical procedures for the diagnosis of tuberculous lymphadenitis [4]. They recommended the use of Ziehl Neelsen stain for identification of acid-fast bacilli as an adjunct to increase the diagnostic accuracy of FNAC for tuberculous lymphadenitis. In a study by Akmal Jamal et al, on the frequency of Hodgkin's lymphoma in 500 Pakistani patients with cervical lymphadenopathy, 40 were diagnosed as Hodgkin's lymphoma (32 male and 8 female) [5]. Amongst them in 8 patients it was difficult to differentiate it from tuberculosis clinically. Kim et al reported that PCR (Polymerized Chain reaction) test for mycobacterial DNA study on aspirated material is 100% specific and sensitive test for the diagnosis of tuberculosis but this test is not performed in our set up [6].

The percentage of cervical lymph nodes which were tuberculous was 58.94% in predominantly vegetarians, seen to be higher than the 46.4% found in the predominantly non-vegetarians diet patients. In a study of 620 Asian immigrants with tuberculosis Finch P J et al, observed that the predominantly vegetarian diet in a particular ethnic group in immigrant south London Asians acted as a risk factor [7]. The authors further concluded that the increased

susceptibility to tuberculosis of Hindus, particularly Hindu women, may be related to a culturally acquired immunodeficiency caused by vegetarianism and associated vitamin deficiency. Vegetarians are known to have lower serum concentrations of Vitamin D [8]. A link between vitamin D deficiency and impaired host defense against tuberculosis has been postulated before [9]. The link between tubercular lymphadenopathy and vitamin D needs to be explored further.

Egea A M et al. in their study on FNAC of lymph nodes, reported 55.1% cases of reactive or non-specific lesions [10]. Our study reported 131 cases (32.6%) with the highest incidence in the pediatric age group. Reactive glands were mostly small (around 1cm in size) while tubercular and malignant glands were larger. Lesions diagnosed as reactive are usually benign but warrant further clinical examination for the evidence of any infective foci in head and neck. In young adults chronic inflammatory lesions can be suspected to be of tuberculous origin especially if there is past history of tuberculosis or they coexist with lesions in the lungs. In such cases if FNAC doesn't yield a diagnosis, the lymph node should undergo biopsy, and the material sent for bacteriological examinations and culture study [6].

The diagnostic accuracy of FNAC in metastatic disease varies from 87% to 97.9% and for lymphomas is 82%. The sensitivity of FNAC for metastatic lymph nodes has varied from 97.9% to 100%, whereas the specificity has been found to be 100% [11, 12].

Metastases of unknown origin (MUO) are a clinical diagnostic challenge and often present as cervical lymphadenopathy. In our study, 31 out of 362 cases (8.5%) were lymph nodal metastasis from primary squamous cell carcinoma in the head neck region. Metastatic malignant lesions were more common in males (85%). In metastatic cervical lymphadenopathy, FNAC not only helps to detect the lesion but also gives some clue to the physician about the location of the primary tumor. FNAC is not only useful from a diagnostic point of view but also helpful in assessing the prognosis.

Lymphomas were just 2 (0.5%) of the entire group. Though their prevalence is low, they pose a great diagnostic challenge. In both Hodgkin's lymphoma and tuberculosis, matting of the cervical lymph nodes is common feature but softening and abscess formation is a characteristic feature of the latter. Once the lymphoma is diagnosed one should go for the stage of the disease and its appropriate investigation.

A rare finding in 2 cases was metastasis from papillary carcinoma of thyroid. The thyroid gland was not enlarged and the lymph nodes presented with an occult primary in both the cases. In the era of routine ultrasonography examination, occult papillary carcinoma is defined as papillary carcinoma with clinically apparent node metastasis but showing a primary lesion that is microscopic or overlooked by ultrasonography. Patients with occult papillary thyroid carcinoma underwent a total thyroidectomy with lymph node clearance and had an overall favorable outcome.

## CONCLUSION

Tuberculous lymphadenitis is the commonest condition in patients presenting with cervical lymph node swellings followed by reactive lymphadenitis in India. Squamous cell carcinoma metastasis is the commonest amongst the malignant group. FNAC is an easy and valuable tool for the assessment of patients with cervical lymph node swellings and a convenient alternative to open biopsy. It achieves more than 90% accuracy in diagnosis of the cervical lymph node swellings and helps in guiding further management. Knowledge about the pattern of lymphadenopathy in a population facilitates pathological reporting and helps the clinician in making focused investigation and planning the treatment course.

## References

- 1) Setal chauhan, Rathod Dharmendra et al, FNAC of Swellings of Head and Neck Region, Indian Journal of Applied Basic Medical Sciences, Year : 2011, 13B (17), 1-6
- 2) Bhattacharya, S., CV. Raghuvver and P. Adhikari, 1998. FNAC diagnosis of Tuberculosis an eight year study at Banglore. Indian J. Med. Sci 52(11): 498-506.
- 3) Rameshkumar K. Tuberculosis lymphadenitis in children- role of fine needle aspiration cytology. J Assoc Physicians India 1999; 47(10): 76-79
- 4) Bezabih M, Mariam DW, Selassie SG. Fine needle aspiration cytology of suspected tuberculous lymphadenitis. Cytopathology 2002 Oct; 13 (5): 284-90
- 5) Jamal A, Khaton S, Junejo A, Rasool B. Frequency of Hodgkin's Lymphoma in Patient with Cervical Lymphadenopathy Presenting in a Public Hospital in Pakistan. J LUMHS. 2008; 173-178.
- 6) Kim, S.S., S.M. Chung, J.N. Kim, M.A. Lee and E.H. Ha, 1996. Application of PCR from the fine needle aspirates for the diagnosis of cervical tuberculous lymphadenitis. J. Korean Med. Sci., 11(2): 127-132
- 7) Finch PJ, Millard FJ, Maxwell JD. Risk of tuberculosis in immigrant Asians: culturally acquired immunodeficiency? Thorax. 1991 Jan; 46(1):1-5.
- 8) Hunt SP, O'Riordan JL, Windo J, et al.: Vitamin D status in different subgroups of British Asians. BMJ 1976, 2:1351-1354.
- 9) Davies, P. D. O. "A possible link between vitamin D deficiency and impaired host defence to Mycobacterium

tuberculosis." *Tubercle* 1985; 66 (4): 301-306.

10) Egea AS, Gonzalez MAM et al. Usefulness of light microscopy in lymph node fine needle aspiration biopsy, *Acta Cytologica* 2002 Mar-April; 46(2): 364-8.

11) Alam K, V Maheshwari, N Haider, F Siddiqui, A Jain, A Khan. "Fine needle aspiration cytology (FNAC), a handy

tool for metastatic lymphadenopathy." *The Internet Journal of Pathology* 10(2)(2009): 1528-8307.

12) Hirachand S, Lakhey M, Akhter J, Thapa B. Evaluation of fine needle aspiration cytology of lymph nodes in Kathmandu Medical College, Teaching hospital. Kathmandu Univ Med J (KUMJ). 2009; 7(26):139–42.

**Author Information**

**Haritosh K Velankar, M.S (ENT), DORL, MBBS**

Professor and Head, Department of ENT, Padmashree Dr. D. Y. Patil Medical College  
Mumbai, India  
drharitosh@yahoo.co.in

**Yogesh Dabholkar, M.S(ENT), DORL, DNB**

Professor, Department of ENT, Padmashree Dr. D. Y. Patil Medical College  
Mumbai, India  
ygsh@yahoo.com

**Sharad Bhalekar**

Associate Professor, Department of ENT, Padmashree Dr. D. Y. Patil Medical College  
Mumbai, India  
Sharadbhalekar2@gmail.com

**Adip Shetty**

Assistant Professor, Department of ENT, Padmashree Dr. D. Y. Patil Medical College  
Mumbai, India  
shettyadip@gmail.com

**Akanksha A. Saberwal**

PG Resident, Department of ENT, Padmashree Dr. D. Y. Patil Medical College  
Mumbai, India  
dr.akanksha.s@gmail.com

**Rohan Bidaye**

PG Resident, Department of ENT, Padmashree Dr. D. Y. Patil Medical College  
Mumbai, India