

## Original Research Article

# A comparative study of diagnostic efficacy of fine needle aspiration cytology to open biopsy in cervical lymphadenopathy in a tertiary care hospital, Kanchipuram district, India

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### ABSTRACT

**Background:** Lymphadenopathy is a very common clinical manifestation of many diseases, defined as an abnormality in the size or character of lymph nodes, caused by the invasion or propagation of either inflammatory cells or neoplastic cells into the node. Objectives of this study were to evaluate the diagnostic efficacy of the fine needle aspiration cytology of cervical and axillary lymphadenopathy as compared to open biopsy for histopathological examination. A comparative study of diagnostic efficacy of FNAC cervical and axillary lymphadenopathy as compared to open biopsy for histo-pathological examination was carried out on the patients with cervical and axillary lymph adenopathy coming to OPD in Karapaga Vinayaga Medical College and Hospital, Madhuranthagam.

**Methods:** All patients selected as per inclusion and exclusion criteria underwent FNAC of lymph node followed by open biopsy of same lymph node.

**Results:** The results revealed that, the overall diagnostic accuracy was 82.00% with accuracy of 91.70% for tuberculous lymphadenitis and 80.00% for metastatic carcinoma with positive predictive value of 100.00%. In 50.00% of the patients, enlarged tuberculous lymph nodes were matted. Cervical group of lymph nodes were the most commonly affected group of lymph nodes (79.00%). In the present study diagnostic accuracy for metastatic carcinoma was 80.00% and for squamous cell carcinoma was 100.00%. It must be stressed that when the fine needle aspirate appears purulent or when tuberculosis is clinically suspected, specimen should be stained for acid fast bacilli.

**Conclusions:** It improves diagnostic capability of FNAC. If FNAC is positive surgeon can proceed to treat the neck without excisional biopsy of the enlarged lymph nodes. Supraclavicular lymphadenopathy rarely represents curable disease and these nodes can be excised for histological confirmation. FNAC should be followed by open biopsy if negative. The use of flow cytometry, tumour markers, immunocytochemistry of FNA specimen have excellent potential for cytological based diagnosis.

**Keywords:** FNAC (fine needle aspiration cytology)

### INTRODUCTION

Lymphadenopathy is a very common clinical manifestation of many diseases. It is defined as an abnormality in the size or character of lymph nodes,

caused by the invasion or propagation of either inflammatory cells or neoplastic cells into the node. It results from vast array of disease process whose broad categories are "MIAMI".<sup>1</sup> This represents malignancies, infections, autoimmune disorders, miscellaneous and

iatrogenic causes. Among the serious illness that can present with lymphadenopathy most concerning to the patient and physician is the possibility of an underlying malignancy.<sup>2</sup>

Though the presentation of lymphadenopathy is common its diagnosis is sometimes difficult, requires battery of test. Awareness of lymphatic anatomy, drainage patterns, regional differential diagnosis, a thorough history including key factors such as age, location, duration, patient exposure is essential.<sup>3</sup>

Open biopsy followed by histopathological examination is the final answer for the diagnosis of the lymphadenopathy. But this procedure has got its limitations like, poor patient compliance, consumption of time, co-operation of anesthetist, surgeon, proper operating facilities and risk of anaesthesia and surgery.<sup>4</sup> A physician reluctance to perform excisional biopsy is based on the fact that the procedure may increase the risk of inducing tumour spread.<sup>5</sup>

The morbidity of the procedure and the hindrance of subsequent therapy because of scarring or vascular impairment are also the reasons for caution. However, this above-mentioned fact is debatable.<sup>6</sup>

Considering all the pitfalls of open biopsy FNAC is rapid inexpensive and safe procedure that can be done at the time of the patients first presentation and immediately after regional physical examination. The technique is simple, rapid, relatively pain free and safe.<sup>7</sup> The Differential diagnosis lies usually between reactive hyperplasia, malignant lymphoma and metastatic disease. FNAC is ideally suited for the investigations of these swellings and aspirated material may be used in ancillary investigations such as immunocytochemistry to support the diagnosis of cytology on FNAC.<sup>8</sup>

This allows a definitive diagnosis to be made sparing more expensive radiological investigations and surgical intervention. FNAC can not only confirm the presence of metastatic disease but also gives the clues regarding the nature and origin of primary tumour.<sup>9</sup>

In patients with enlarged lymph nodes and previous documented malignancy FNAC can obviate the further surgery performed merely to confirm the presence of metastasis.<sup>10</sup> Also, it helps in diagnosis of diffused cervical lymphadenopathy in HIV where open biopsy might prove costly resulting in increased morbidity. However, the most difficult areas in diagnosing lymph node disease by FNAC are concerning differentiation of low grade lymphoma from reactive hyperplasia and subtyping of lymphoma.<sup>11</sup>

For FNAC of lymph nodes to become diagnostically successful in lymphoproliferative disorders, the many myths concerning the difficulty of diagnosing the lymph node disease by FNAC must be abandoned.<sup>12</sup>

FNA specimens, but they have excellent potential for cytological based diagnosis. Hence the present study is undertaken to discuss the diagnostic efficacy of FNAC, its limitations and place in clinical practice.<sup>13</sup>

## METHODS

A comparative study of diagnostic efficacy of fine needle aspiration cytology of cervical and axillary lymphadenopathy as compared to open biopsy for histopathological examination was carried out in Karpaga Vinayaga Medical College and Hospital, Madhuranthagam with a sample size of 50 patients.



**Figure 1: FNAC picture.**

### Source of data

Patients with cervical and axillary lymph adenopathy coming to outpatient department of Karpaga Vinayaga Medical College and Hospital, Madhuranthagam.

### Inclusion criteria

- Age 3 to 80 years
- All axillary and cervical lymphadenopathy (firm to hard in consistency)
- Enlarged non-tender lymph nodes more than 1.5 cm in diameter.

### Exclusion criteria

- Enlarged lymph nodes less than 1.5 cm in diameter
- All other neck swellings other than cervical lymphadenopathy
- Acute lymphadenitis i.e. tender, soft in consistency with signs of inflammation.

## RESULTS

A total of 50 patients having cervical and axillary lymphadenopathy underwent fine needle aspiration cytology followed by open biopsy of same enlarged diseased lymph node for histopathological confirmation in Karpaga Vinayaga Medical College and Hospital, Madhuranthagam.

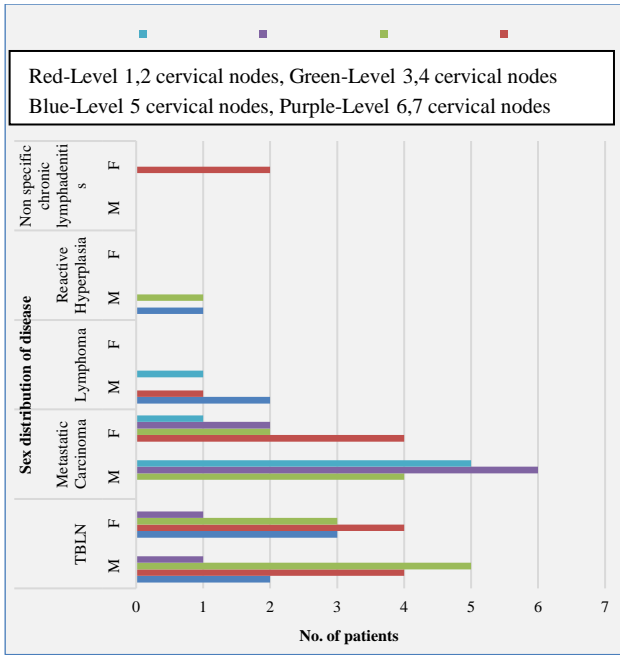


Figure 2: Prevalence of disease.

All patients were selected in the study as per inclusion and exclusion criteria. In the present study, overall diagnostic accuracy was 80.00% for metastatic carcinoma and 100.00% for squamous cell carcinoma. In the present study, accuracy was of 91.70% for tuberculous lymphadenitis.

Table 1: Overall diagnostic efficacy of FNAC (n = 50).

TEST	HPR (+)	HPR (-)	Total
FNAC +	41	00	41
FNAC -	09	00	09
Total	50	00	50

50 patients with a definite diagnosis made on FNAC were analyzed for age and sex distribution. Tuberculosis lymphadenitis was seen more commonly in third and fourth decade 34.83% each. Its incidence declined with the advancing age.<sup>14</sup>

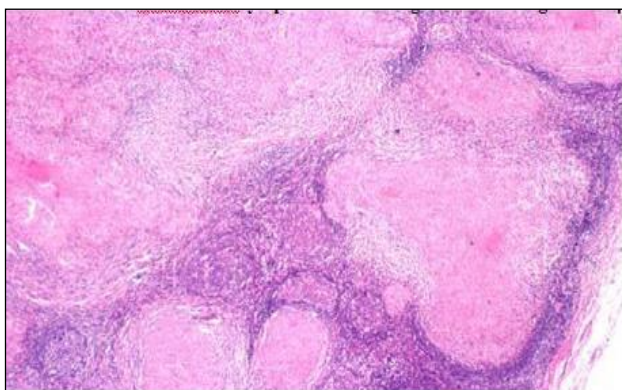


Figure 3: Histopathology of Tuberculosis of cervical lymph node showing caseation.

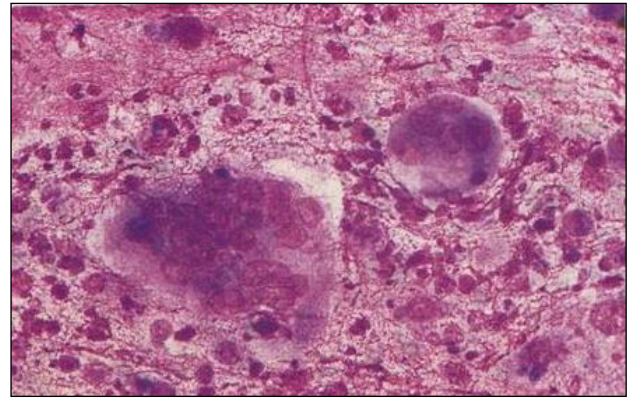


Figure 4: FNAC of Tuberculous lymph node: showing multinucleate giant cells.

FNAC is a very useful diagnostic tool in patients having significant lymphadenopathy. The metastatic carcinomas, especially squamous cell carcinoma and tuberculous lymphadenopathy can be diagnosed by FNAC with a high degree of accuracy.<sup>15</sup>

However, the differentiating features are not well demarcated in reactive hyperplasia and Non-Hodgkin's lymphoma.<sup>16</sup> Metastatic carcinoma was more in patients over the age of 35 years. Lymphoma was distributed in all age groups without predilection, however, the number of cases are too small in the present study to actually comment on its incidence.<sup>17</sup> Incidence of reactive hyperplasia could not be commented upon as there are only 2 patients with definite diagnosis of reactive hyperplasia.<sup>18</sup>

The most difficult areas in diagnosis of lymph node disease by FNAC is differentiating low grade lymphoma from reactive hyperplasia.<sup>19</sup> Lack of tissue architecture can be overcome on FNAC samples by subjecting them to dual parameter flow cytometry, T-cell, B-cell tumour markers and immunocytochemistry analysis.<sup>20</sup>

Males showed preponderance of lymphoma (as 4 cases are male), metastatic carcinoma (head and neck origin) to lymph nodes, whereas tuberculosis showed almost equal preponderance.<sup>21</sup>

## DISCUSSION

FNAC entails using a narrow gauge (22-23G) needle to collect the sample of a lesion for microscopic examination. It allows a minimally invasive, rapid diagnosis of tissue but it does not preserve the histological architecture which limits its ability to make a definitive diagnosis.<sup>22</sup> However, rapid diagnosis by FNAC can shorten or avoid hospital admission, speed a patient's route to an appropriate specialist.<sup>23</sup> This study was undertaken to evaluate the role of FNAC in clinically significant cervical and axillary lymphadenopathy. Symptoms and signs although indicative of the etiology of lymphadenopathy cannot be substituted for a



morphological diagnosis.<sup>24</sup> Until recently, excision of diseased enlarged lymph node for histopathological examination was the final answer for the diagnosis.<sup>25</sup> With the advent of FNAC in recent years, it has provided the clinician with an additional, safe, reliable, quick and inexpensive method for the diagnosis of lymphadenopathy.<sup>26</sup>

In developing countries like India where tuberculosis is the major problem and facilities for the biopsy are not readily available at the primary health care level, FNAC can be very useful in providing a diagnosis.<sup>27</sup> It also reduces pressure on financial resources necessary for surgical procedures like open biopsy for diagnosis confirmation. In our study we attempted to evaluate the diagnostic efficacy and its limitation in the clinical practice.<sup>28</sup>

All our patients as per inclusion criteria were subjected to FNAC followed by open biopsy of the same diseased enlarged. In the present study of 50 patients of cervical and axillary lymphadenopathy (23 out of 50) patients had tuberculous lymphadenopathy which was the most common diagnosis in our study (46.00%) with an accuracy of 91.70% on FNAC with histopathological correlation. The sensitivity of FNAC for diagnosing tuberculous lymphadenopathy is 91.70% in the present study, which is comparable to similar studies.<sup>29</sup> The study done by Gupta K.A. (1990) has also reported accuracy of 76.78% for tuberculous lymphadenopathy to an histological correlation.<sup>30</sup> A similar study done by Bhargava P has reported accuracy of 98.50% for tuberculous lymphadenopathy to histological correlation.<sup>31</sup> The study done by Sarda AK reported accuracy of 96.00% for tuberculous lymphadenopathy.<sup>32</sup> In the present study accuracy for tuberculous lymphadenopathy is 91.70% which is comparable with most of the studies.<sup>33</sup> In the present study tuberculous lymphadenitis has a peak incidence in age group of 19-50 years with almost same male to female ratio with decline in incidence of increasing age.<sup>34</sup>

In 50.00% of patients, enlarged tuberculous lymph nodes were matted. Mantoux reaction of 10 mm or more was observed in 40.00% of patients.<sup>35</sup> The characteristic feature of tuberculous lymphadenitis on cytology examination are the presence of epitheloid cell clusters, caseation necrosis and typical Langhan's giant cells.<sup>36</sup> In doubtful cases Ziehl-Neelsen staining is helpful in demonstrating the presence of acid-fast bacilli. In the present study 2 cases on Ziehl-Neelsen staining were positive of acid-fast bacilli which helped in giving diagnosis of tuberculous lymphadenopathy. Problem arises in definite diagnosis in tuberculous lymphadenitis cases when Langhan's giant cell, and epitheloid cells are not seen in the smear or when smear contains only caseous material or pus.<sup>37</sup> Hence in our study we had 2 false negative reports on FNAC for tuberculous lymphadenopathy being reported as reactive hyperplasia and nonspecific chronic lymphadenitis.<sup>38</sup> There was no

false positive report in the present study. In the present study cervical group was most common affected with tuberculous lymphadenopathy with 19 out of 24 cases in cervical group (79.04%). The distribution of tuberculosis lymph nodes was 46.00% showing it to be most common cause of lymphadenopathy in the present study.

## CONCLUSION

In the present study, overall diagnostic accuracy was 80.00% for metastatic carcinoma and 100.00% for squamous cell carcinoma. In the present study, accuracy was of 91.70% for tuberculous lymphadenitis. Open biopsy for histological confirmation is gold standard. It has its limitations because it distorts the surgical planes and may increase risk of induction of tumour spread especially in metastatic upper and middle cervical lymph nodes which are potentially curable with radiotherapy or node dissection. In cases of metastasis of unknown origin to cervical and axillary lymphadenopathy, FNAC is useful adjunct to diagnostic procedures and can point to primary depending upon the cell type. FNAC can assess correctly high-grade Non-Hodgkin's lymphoma.

Finally, we conclude that, FNAC is simple self-reliable, cost effective diagnostic tool for lymphadenopathies but the limitation of the procedure should be kept in mind. If FNAC is negative, it does not rule out the disease and should be followed by open biopsy for histopathological confirmation.

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