

Original Article

Fine Needle Aspiration Cytology (FNAC) Lymph Node – A Diagnostic Tool for Histopathological Diagnosis in a Tertiary Care Teaching Hospital

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ABSTRACT

Background: Fine Needle Aspiration Cytology (FNAC) is used to evaluate the nature of the lesion. Lymphadenopathy in head and neck region have wide spectrum etiology vary from benign reactive hyperplasia to tubercular granulomatous lesion to malignancy. The present study was undertaken to evaluate the sensitivity, specificity and predictive value in tuberculosis and metastatic carcinoma. **Methods:** A total of 70 patients out of 180 patients at Geetanjali Medical College & Hospital, Udaipur, Rajasthan, who underwent FNAC were evaluated by histopathological examination for correlation. Aspiration smears and histopathological slides were evaluated and results were calculated for sensitivity, Specificity and predictive value. **Results:** Reactive lymphadenitis was seen in 37 patients followed by tubercular granulomatous lymphadenitis in 17 patients and malignant lesions in 16 patients. Histology revealed 16 patients of tubercular lymphadenitis, 41 of reactive changes, 11 of metastasis in lymph nodes and 5 of lymphomas. Correlating the findings, we could achieve 100% sensitivity and 96.7% specificity for tubercular lymphadenopathy and for metastatic it was 98.5% and 100% respectively. **Conclusions:** We have discovered FNAC an agreeable instrument in the conclusion of tubercular and harmful lymphadenopathy. FNAC utilized as a part of conjunction with clinical discoveries, radiological and research center examinations can be a financially savvy strategy for the determination of lymphadenopathy.

Section – Pathology

Keywords: FNAC, Lymphadenopathy, Metastatic carcinoma, Tubercular lymphadenitis

INTRODUCTION

Fine Needle Aspiration method was portrayed surprisingly by Greig and Gray in 1904. Since the mid-1960's, it has been progressively utilized and a high level of precision has been accomplished.^[1] Lymphadenopathy is one of the commonest displaying side effects of all age bunches going to out entryway. The etiology can change from basic incendiary receptive sore to a dangerous condition. Therefore, lymphadenopathy requires further evaluation.

FNAC has been a suitable investigation to rule out malignancies and to confirm reactive or infective pathology.^[2,3] The use of fine needle aspiration cytology (FNAC) in the investigation of lymphadenopathy has become an acceptable and widely practiced minimally invasive technique, which is safe, relatively painless, simple and rapid. FNAC is highly cost effective and accurate as a first line investigative technique. With the recent advances in ultrasound and CT scan technologies, focal lesions can be aspirated using this procedures.^[4] Fine needle aspiration cytology (FNAC) has developed as a progressed indicative tool to separate receptive hyperplasia/incendiary conditions, granulomatous scatters and lymphomas. This indicative methodology has increased impressive Importance in the administration of patients with lymphadenopathy more than quite a while. We are detailing histopathological relationship of 180 instances of lymphadenopathy with FNAC.

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METHODS

This prospective study was conducted at Geetanjali Medical College & Hospital, Udaipur, Rajasthan during a

period of one year. Out of 180 patients, only 70 patients were enrolled in our study.

Aspiration of lymph nodes was done under aseptic precautions using 22-23-gauge Needle and 10 ml syringe.

Lymph node biopsies were received in 70 patients and the biopsy specimens were subjected to histopathological examination after fixing in 10% formalin. Histopathological examination was done and the results were correlated with the cytological reports to evaluate efficacy of the procedure.

The receptive hyperplasia of lymph node was suspected by watching blended lymphoid tissue and macrophages with unmistakable bodies alongside nonappearance of Reed Sternberg cells. Granulomatous sores were perceived cytologically by the perception of totals of epithelioid cells with, and without, related multinucleated mammoth cells. An amorphous necrotic background suggestive of caseative necrosis leads to conclude the diagnosis of tuberculosis. If TB was suspected slides were stained with Ziehl-Neelsen method to detect acid fast bacilli (AFB) directly. The eventual diagnosis of granulomatous inflammation by FNAC was confirmed either by surgery and/or by clinical investigations.

The cytological determination was related with histopathological examination of sample submitted. Metastatic carcinoma was analyzed cytologically by nearness of double populace made out of harmful epithelial cells and blended lymphoid tissue.

RESULTS

A total of 180 patients were included in our study who visited at GMCH clinical laboratory for FNAC of lymph node during Jan 2015 to Dec 2015. Of the 180 patients whose FNAC was done, 70 patients underwent excisional biopsy. Out of 70 patients, 45 patients (64.3%) presented with cervical lymph node enlargement, 10 patients (14.3%) presented with submandibular swelling, 7 patients (10%) with inguinal lymph node enlargement, 5 patients (7.1%) with axillary and 3 patients (4.3%) with Infra auricular lymph node enlargement. The age group of 80 patients ranged from 2 years to 80 years with a mean of 36 years, of which 64 were males and 16 were females (Table 1).

Benign lymphadenopathy was the most common presentation of lymphadenopathy of the head and Neck region amounting to 75% (n-51) of all. Among benign lesions, non-specific reactive lymphadenitis was the most common findings of enlarged lymph nodes of the Neck region amounting to 50% (n-37), followed by tubercular granulomatous lymphadenitis amounting to 25% (n-20). Of the 25% (n-17) malignant lesions, 16.25% (n-11) were metastatic carcinoma and 8.75% (n-5) patients were suspected of lymphoma. Among 5 lymphoma cases, 4 were Non-Hodgkin's Lymphoma and 1 case was diagnosed as Hodgkin's lymphoma.

Table 1: Age and sex distribution of patients for lymph node FNAC.

| Age Groups (years) | Number of patients | Male | Female | Percentage |
|--------------------|--------------------|------|--------|------------|
| 0-10 | 10 | 8 | 2 | 5.5% |
| 11-20 | 20 | 16 | 4 | 11.0% |
| 21-30 | 25 | 20 | 5 | 13.9% |
| 31-40 | 45 | 33 | 12 | 20.0% |
| 41-50 | 35 | 27 | 8 | 19.4% |
| 51-60 | 25 | 20 | 5 | 13.9% |
| 61-70 | 10 | 8 | 2 | 5.5% |
| >70 | 10 | 8 | 2 | 5.5% |
| Total | 180 | 140 | 40 | |

Of the 70 cases subjected to FNAC and histological diagnosis revealed 16 patients of tubercular lymphadenitis, 41 of reactive changes, 11 of metastasis in lymph nodes and 5 of lymphomas (Table 2).

Table 3 shows the sensitivity, specificity, positive and negative predictive value of FNAC for tubercular granulomatous diagnosis. A definitive diagnosis of tuberculosis was confirmed by AFB positivity in FNAC material and clinical features. Table 4 shows the sensitivity, specificity, positive and negative predictive value of FNAC for metastasis of malignant cells in lymph node.

DISCUSSION

Lymphadenopathy is an enlargement of lymph node with altered consistency. It is a clinical manifestation of regional or systemic disease and serves as an excellent clue to the underlying disease. Cervical lymphadenopathy may be the initial finding or may arise later on with other symptoms. In the context of granulomatous disorders, the possible Etiology is wide and the use of FNAC with other ancillary tests (microbiological, immunohistochemical, radiological, biochemical and special staining techniques) is useful for obtaining a definitive diagnosis. Lymphadenopathy often signifies the spectrum of other serious illnesses like lymphoma, acquired immunodeficiency syndrome, or metastatic cancer. FNAC as a first line screening method has been recommended in suspected malignancy.^[5,6]

Granuloma may be encountered in both Hodgkin's disease and non-Hodgkin's lymphoma, particularly T-cell lymphoma. Occasionally, lymph nodes containing metastatic carcinoma may also show features of granuloma. It has been suggested to be due to either necrotic material or surface antigen. Previous reports have been described in metastatic nasopharyngeal carcinoma, seminoma and malignant melanoma.^[6,7]

A series by Khurana et al highlighted the difficulties encountered in making a definitive diagnosis of malignant neoplasm that mimics, or occurs, in association with granuloma.^[8] Granulomatous inflammation found in lymph nodes draining carcinomas is a recognized phenomenon.^[8,9]

The background cell population needs to be scrutinized if a malignant lymphoma is suspected.

Table 2: FNAC and histopathological correlation for lymphadenopathy.

| Cytological diagnosis | Reactive Hyperplasia | Tubercular Lymphadenitis | Metastatic Carcinoma | Non-Hodgkin's Lymphoma | Hodgkin's Lymphoma | Total |
|--------------------------|----------------------|--------------------------|----------------------|------------------------|--------------------|-------|
| Reactive Hyperplasia | 37 | 0 | 0 | 0 | 0 | 37 |
| Tubercular Lymphadenitis | 2 | 15 | 0 | 0 | 0 | 17 |
| Metastatic Carcinoma | 1 | 0 | 10 | 0 | 0 | 11 |
| Non-Hodgkin's Lymphoma | 0 | 0 | 0 | 4 | 0 | 4 |
| Hodgkin's Lymphoma | 0 | 0 | 0 | 0 | 1 | 1 |
| Total | 41 | 16 | 11 | 4 | 1 | 70 |

Table 3: Statistical analysis for tubercular lymphadenitis by FNAC.

| FNAC diagnosis | Histopathological diagnosis | | Total | Predictive value |
|----------------|-----------------------------|----------|-------|-------------------|
| | Positive | Negative | | |
| Positive | 18 | 1 | 19 | (Positive) 90.0% |
| Negative | 0 | 51 | 51 | (Negative) 100.0% |
| Total | 18 | 52 | 70 | |

Table : Statistical analysis for metastasis in lymph node by FNAC.

| FNAC diagnosis | Histopathological diagnosis | | Total | Predictive value |
|-------------------------|--|----------|-------|-------------------|
| | Positive | Negative | | |
| Positive | 11 | 1 | 12 | (Positive) 92.3% |
| Negative | 0 | 58 | 58 | (Negative) 100.0% |
| Total | 11 | 59 | 70 | |
| Sensitivity/Specificity | 100% (sensitivity) 96.7% (specificity) | | | |

FNAC is the study of cellular samples obtained through a fine needle under negative pressure. The technique is quick, relatively painless and economical. It can provide unequivocal diagnosis in most of the situations. The lesion arising in lymph nodes can be found in patients ranging from an early to advanced age.^[10]

Despite its limitations and pitfalls, FNAC appears to be a good first line method for investigating the cervical lymphadenopathy. The well-defined role of FNAC in the investigation of lymphadenopathy has previously been studied.

In the present series, sensitivity of FNAC in the various pathologies of lymph nodes ranged from 90% to 100%. Reactive hyperplasia constituted the largest number followed by tubercular lymphadenitis among benign lesions. Cytological features of the aspirate are important for the diagnosis of tubercular lymph nodes. We could achieve 100% sensitivity and 96.7% specificity for tubercular lymphadenopathy.

As was the observation of Rajwanshi, et al.^[11] FNAC does pose problems in diagnosing lymphomas, but in our series the sensitivity and specificity with regard to lymphomas was 100%, while that for metastatic it was 98.5% and 100% respectively. These findings are similar to the results of Engzell, et al, Gupta, et al and Ross, et al.^[12-14] A diagnostic test is considered satisfactory if its sensitivity and specificity are around 90%.

CONCLUSION

We have discovered FNAC a satisfactory tool in the analysis of tubercular and harmful lymphadenopathy. The

effortlessness and speed of the technique make it most appropriate for use on outpatient premise even in fringe doctor's facilities and dispensaries. FNAC utilized as a part of conjunction with clinical discoveries, radiological and research centre examinations can be a practical technique for the analysis of lymphadenopathy.

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