COMPARATIVE STUDY BETWEEN FNAC AND CYTOPUNCTURE FINDINGS IN CERVICAL LYMPHADENOPATHY

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ABSTRACT

BACKGROUND
The aim of this study was to compare diagnostic accuracy of Cytopuncture with Fine Needle Aspiration Cytology (FNAC) in cervical lymphadenopathy.

MATERIALS AND METHODS
This is a prospective study conducted on 100 patients between January 2017 and December 2017 in a tertiary care center. Patients with cervical lymphadenopathy were subjected to both FNAC & Cytopuncture after clinical examination. The two techniques were compared for the five objective parameters, using Mair’s point scoring system.

RESULTS
A total of 100 cases of various diagnostic findings were subjected to statistical analysis. Common clinical diagnosis observed in the study was chronic cervical lymphadenitis—58%, acute cervical lymphadenitis—24%, secondaries in neck—12%, TB lymphadenitis—6%. On comparing FNAC and cytopuncture, both the techniques yielded comparable results in granulomatous lymphadenitis, metastatic deposits, nonspecific lymphadenitis, and in malignancy, but cytopuncture was diagnostically inferior in acute inflammatory lesion and in reactive lymphadenitis.

CONCLUSION
FNAC and cytopuncture shows comparable results for granulomatous lymphadenitis, metastatic deposits, nonspecific lymphadenitis and in malignancy for all 5 parameters, but cytopuncture was diagnostically inferior in acute inflammatory lesion and in reactive lymphadenitis.

KEYWORDS
Cytopuncture, FNAC, lymphadenopathy.


BACKGROUND
The base line investigation being used in the diagnosis of head and neck swelling is Fine-Needle Aspiration Cytology (FNAC). But the negative pressure during aspiration causes bloody smears and it is detrimental to both cell concentration and cell morphology of the specimen, leading to an unsatisfactory specimen and improper cytological interpretation.4,5 Fine needle non aspiration cytology (FNNAC) also called cytopuncture or fine needle capillary sampling is an alternative to FNAC developed in the 1980s by Brifford et al in France.5 It has been reported that the problem of inadequate and bloody specimens in aspiration can be avoided by using a fine needle and capillary pressure to suck cells into the needle lumen. FNNAC avoids active aspiration and relies on capillary tension to suck the tissue sample into the needle bore; this reduces bleeding and minimizes trauma to thyroid tissue.

However, will the fine needle non aspiration technique yield adequate material for a cytologic diagnosis was the question in doubt. In addition majority of the referenced studies included only thyroid lesions. There are many conflicting studies regarding the superiority of FNNAC to FNAC. Some studies have reported that FNNAC reduced bleeding and obtained higher quality samples; other reports have indicated that the diagnostic adequacy of FNAC was higher than FNNAC or that both methods were equally efficient.6-14 Studies on the accuracy, sensitivity, specificity, negative predictive value (NPV), and positive predictive value (PPV) of both techniques based on histopathology have also been inconclusive. Hence this study was undertaken to compare the diagnostic accuracy and quality
of cytopuncture with that of FNAC in cervical lymph node lesions.

MATERIALS AND METHODS
The study population comprised of all patients who presented with cervical lymphadenopathy on outpatient basis at the Department of Otorhinolaryngology, Vijayanagar Institute of Medical Sciences, Ballari from January 2017 to December 2017. The study received the ethical clearance from the in-house hospital ethical committee.

After clinical examination, study subjects were subjected to both FNAC and Cytopuncture.

Inclusion Criteria
All patients with clinically significant cervical lymphadenopathy between 1 year and 70 years of age belonging to both sexes were included in this study.

Exclusion Criteria
Clinically insignificant cervical lymphadenopathy.

The details of both techniques were explained to the patient and consent was obtained from each case before performing the procedure.

All the study subjects underwent both procedures. Both procedures were done using 23 gauge needle. Fine needle aspiration was performed using a 10 ml syringe, while the non-aspirate technique was done without syringe or holder.

The smears were analysed using a scoring system developed by Mair et al. Five parameters used for scoring were background blood or clot, amount of cellular material, degree of cellular degeneration, degree of cellular trauma and retention of appropriate architecture (Table 1).

Mean and SD value was calculated for continuous variables and proportions for categorical variables. Mean between two groups were analysed by using Student’s t test unpaired. Diagnostic accuracy was calculated. Association between groups was done with chi-square test. A P value of >0.05 was considered statistically significant.

All the results were tabulated and were statistically interpreted by IBM SPSS VERSION 20 for windows.

RESULTS
The total number of cases in which both the techniques were available for comparison was 100. All the 100 cases included in our study showed a wide variety of lesions. They were grouped depending upon the cytological diagnosis. Each of these groups were analysed and compared for the five objective parameters in the two techniques (Table 1).

Our study included patients in the age group of 1 year to 70 years (Figure 1). There were 61 males and 39 females, with a male to female ratio of 1.5:1. (Figure 2)

Common clinical diagnosis observed in the study was chronic cervical lymphadenitis-58%, acute cervical lymphadenitis-24%, secondaries in neck-12%, Tb lymphadenitis-6% (Figure 3).

Table 1: Method of point allocation

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Quantitative description</th>
<th>Point score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Background blood or clot</td>
<td>Large amount; great compromise to diagnosis</td>
<td>0</td>
</tr>
<tr>
<td>Amount of cellular material</td>
<td>Moderate amount; diagnosis possible</td>
<td>1</td>
</tr>
<tr>
<td>Degree of cellular degeneration</td>
<td>Minimal; diagnosis easy; specimen of “text book” quality</td>
<td>2</td>
</tr>
<tr>
<td>Degree of cellular trauma</td>
<td>Sufficient for cytodiagnostics</td>
<td>1</td>
</tr>
<tr>
<td>Retention of appropriate architecture</td>
<td>Moderate; some preservation of e.g., follicles, papillae, acini, flat sheets, syncyti...</td>
<td>2</td>
</tr>
</tbody>
</table>

Figure 1
Study subjects were grouped into various cytological diagnosis (Table 2). It is observed that while FNAC gave a cytological diagnosis for all 100 cases, cytopuncture did not show any cellularity to make a diagnosis in 6 cases.

Based on Mair's point scoring system, (Table 3) there was no statistically significant difference between FNAC and cytopuncture in the five objective parameters (Figure 4, 5, 6, 7, 8).

### Table 2

<table>
<thead>
<tr>
<th>Cytological Diagnosis</th>
<th>FNAC</th>
<th>Cytopuncture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute inflammatory lesion</td>
<td>24</td>
<td>23</td>
</tr>
<tr>
<td>Granulomatous lymphadenitis</td>
<td>19</td>
<td>8</td>
</tr>
<tr>
<td>Metastatic deposits</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Non specific lymphadenitis</td>
<td>9</td>
<td>13</td>
</tr>
<tr>
<td>Reactive lymphadenitis</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>Malignancy</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Nil cellularity</td>
<td>0</td>
<td>6</td>
</tr>
</tbody>
</table>

### Table 3

<table>
<thead>
<tr>
<th>Parameter</th>
<th>FNAC</th>
<th>Cytopuncture</th>
<th>Statistical analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Background blood or clot</td>
<td>Large amount: 0, Moderate amount: 1, Minimal: 2</td>
<td>Sufficient: 1, Nil: 0</td>
<td>6.32, P&lt;0.04</td>
</tr>
<tr>
<td>Amount of cellular material</td>
<td>Abundant: 2, Sufficient: 1, Minimal: 2</td>
<td>Moderate: 1, Sufficient: 1, Minimal: 2</td>
<td>6.22, P&lt;0.04</td>
</tr>
<tr>
<td>Degree of cellular degeneration</td>
<td>Marked: 0, Moderate: 1, Minimum: 2</td>
<td>Sufficient: 2, Minimal: 2</td>
<td>6.26, P=0.04</td>
</tr>
<tr>
<td>Degree of cellular trauma</td>
<td>Marked: 0, Moderate: 1, Minimum: 2</td>
<td>Sufficient: 2, Minimal: 2</td>
<td>6.21, P&lt;0.04</td>
</tr>
<tr>
<td>Retention of appropriate architecture</td>
<td>Minimal: 0, Moderate: 1, Normal: 2</td>
<td>Sufficient: 2, Minimal: 2</td>
<td>6.15, P&lt;0.04</td>
</tr>
</tbody>
</table>
DISCUSSION

Enlarged lymph nodes are accessible for FNAC and are of importance specially to diagnose secondary or primary malignancies. It plays a significant role in developing countries like India, as it is a cheap procedure, simple to perform and has almost no complications. The diagnosis given on the cytological material is often the only diagnosis accepted and sometimes there is no further correlation with histopathology, especially in cases of advanced malignancies. It also provides clues for occult primaries and sometimes also surprises the clinician who does not suspect a malignancy. Aspiration cytology was first performed by Martin and Ellis in 1930 for diagnosis of a tumour. This needle aspiration technique was improved later by Franzen et al. in 1955 by introduction of a special syringe holder (Kate et al. 1998). The cellular yield in cytopuncture depends on capillary action and not on negative suction and so it is likely to produce less haemorrhage (Dey and Ray 1993).

Although many studies have compared the efficiency of FNAC and FNNAC techniques in evaluating thyroid nodules, there is hardly one study regarding in evaluation of cervical lymphadenopathy.

It is well known that the smear quality may affect the cytological diagnosis of cervical lymphadenopathy. For assessing the quality of smears two important criteria are “Background blood or clot” and “amount of cellular material”. Cytopuncture may produce better cellular material and cause less haemorrhage than FNAC. The needle can be moved freely in any desired direction in the non-aspiration technique and also causes less blood contamination and it is less painful. The FNNAC also allows a better perception of tumor consistency.

The present study was undertaken to assess the efficacy of FNNAC in the diagnosis of cervical lymphadenopathy and to debate the need for both the techniques in every case.

In the present study of 100 aspirates from cervical lymphadenopathy, commonest clinical diagnosis observed in the study was chronic cervical lymphadenitis – 58%, (Fig 3).

On comparing FNAC and FNNAC, both the techniques yielded comparable results in granulomatous lymphadenitis, metastatic deposits, non-specific lymphadenitis, and in malignancy, but cytopuncture was diagnostically inferior in acute inflammatory lesion and in reactive lymphadenitis (Table 5).

Finally, some studies reported that FNNAC combined with FNAC can obtain better quality cellular material, while other studies reported that a better diagnostic accuracy can be achieved by combining both techniques.

In a similar study conducted by Srikanth et al, lymphadenopathy with highly cellular lesions like reactive hyperplasia and metastatic malignancy, both the techniques yielded comparable cellular material. In non-specific lymphadenitis, the non-aspiration technique was significantly better than aspiration technique with regard to background blood, amount of cellular material and retention of appropriate architecture.

CONCLUSION

Although FNAC and cytopuncture shows comparatively similar results for granulomatous lymphadenitis, metastatic deposits, non-specific lymphadenitis and in malignancy for all 5 parameters, cytopuncture was diagnostically inferior in accuracy among acute inflammatory lesions and in reactive lymphadenitis. It is felt that the choice of technique of fine needle sampling employed for cytdiagnosis is left to the preference of the surgeon.

REFERENCES


