Role of fine Needle aspiration cytology in head and neck swelling

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**ABSTRACT**

**BACKGROUND:** Fine Needle Aspiration Cytology (FNAC) is a simple, quick and inexpensive method in the head and neck region. It also affords a practicable and means of rationally planning surgery and causes minimal trauma to the patient and carries no risk of complications. **Aims & Objective:** The aim of this study was to see the frequency of various pathological conditions detected on FNAC in patients presenting with head and neck swellings and to evaluate the role of FNAC in diagnosis of head and neck swellings. **MATERIALS AND METHODS:** This study was conducted in Department of Pathology, Medical College, Baroda from November 2008 to October 2009 which included 500 patients with head and neck swellings presenting to Outpatient clinics. Fine Needle Aspiration Diagnosis was correlated with detail of relevant clinical findings and investigation. **RESULTS:** Maximum incidence was observed in the age group 31-40 years with higher incidence among males. Out of 500 cases, 319 cases of Lymph node lesions were diagnosed of which non-specific lymphadenitis was the commonest diagnosis (150 cases (47%)) followed by Tuberculous lymphadenitis (78 cases (25%)). 114 cases of thyroid lesions were diagnosed, in which incidence rate of benign thyroid lesions was (86.4%). 21 cases of salivary gland lesions were found, among which pleomorphic adenoma was common (17 cases (80%)). **CONCLUSION:** It was concluded that non-specific lymphadenitis is the commonest condition in patients presenting with neck swellings. FNAC is a simple, safe and inexpensive tool for the assessment of patients with head and neck swellings. It could differentiate the infective process from neoplastic one and avoids unnecessary surgeries.

**Keywords:** Head and Neck Swellings, Fine Needle Aspiration Cytology (FNAC), Tuberculous lymphadenitis

**INTRODUCTION**

A lump is the most likely clinical problem to be encountered in the neck.\textsuperscript{1} The evaluation of a neck mass is a common clinical dilemma and a condition to which clinicians routinely encounters.\textsuperscript{2} The common pathologies encountered in the neck presenting as a lump are lymphadenopathies (specific and non-specific, acute and chronic), metastatic carcinoma, lymphoma, thyroid swellings (goitre, nodules and cysts) and salivary gland swellings (sialadenitis, cysts, adenomas and carcinomas). The less common pathologies presenting as swelling in the neck are carotid body tumour, bronchial cyst, thyroglossal cyst, cystic hygroma, pharyngeal pouch and lumps of skin appendages.\textsuperscript{1} Fine needle aspiration cytology is a simple, quick and inexpensive method that is used to sample superficial masses like those found in the neck and is usually performed in the outpatient clinic. It causes minimal trauma to the patient and carries virtually no risk of complications. Masses located within the region of the head and neck, including salivary gland and thyroid gland lesions can be readily diagnosed using this technique.\textsuperscript{3,4} It is both diagnostic and therapeutic in a cystic swelling.\textsuperscript{5} Fine needle aspiration cytology is helpful for the diagnosis of salivary gland tumours where it can differentiate between a malignant and a benign tumour with over 90% accuracy.\textsuperscript{5} FNAC is particularly helpful in the work-up of cervical masses and nodules because biopsy of cervical adenopathy should be avoided unless all other diagnostic modalities have failed to establish a diagnosis.\textsuperscript{1} Fine needle aspiration cytology does not give the same architectural detail as histology but it can provide cells from the entire lesion as many passes through the lesion can be made while aspirating.\textsuperscript{6} The purpose of this study was to see frequency of distribution of various pathological conditions detected on FNAC in patients presenting with head and neck swellings and to evaluate the role of FNAC in their diagnosis.

**MATERIALS AND METHODS**

In this study, FNAC was performed in 500 patients presented with lesions in the head and neck regions, in Department of Pathology, Medical College, Baroda from November 2008 to October 2009. All patients were asked about history related to head & neck swelling and relevant questions to the etiological cause along with present, past, and family history of tuberculosis and history of sexual exposure for syphilis and AIDS. Patients were explained about the procedure and its advantages.
and their written consent was taken. Fine Needle Aspiration Diagnosis was correlated with detail of relevant clinical findings and investigation. The area to be aspirated was cleaned with spirit and a 22-23-gauge needle was inserted at convenient angles to the lesions and multiple hits were made within the lesion, with sufficient negative pressure; the needle was removed and the pressure was applied to the area of aspiration to avoid bleeding or hematoma formation. The technique was performed in the outpatient department with minimal trauma to the patient without any risk of complication. The aspirated material was smeared on minimum two clean glass slides and later, they were either wet-dried or air-dried as per the staining procedure adopted. Smears were stained by Giemsa and Hematoxylin & Eosin stain. Statistical Analysis: Data was analysed by statistical software Medcalc.v.11.5.0.0. Percentages were calculated for estimating frequency of various pathological conditions detected on FNAC in patients presenting with head and neck swellings.

RESULTS
The present study of 500 cases, included patients from 1 to 90 years, in which 52% were males and 48% were females. Maximum incidence was observed in the age group 31-40 years with higher incidence among males. Among the diagnostic outcome, higher incidence of lesion was in the neck region than in the head region. Out of 500 cases, 272 cases (55%) were inflammatory in nature while remaining 228 (45%) cases were of neoplastic nature. (Table 1)

Table 1: Distribution among inflammatory and neoplastic lesions

<table>
<thead>
<tr>
<th>Lesions</th>
<th>No.</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inflammatory</td>
<td>Non-specific</td>
<td>150</td>
</tr>
<tr>
<td>Neoplastic</td>
<td>Tuberculosis</td>
<td>78</td>
</tr>
<tr>
<td>Metastatic</td>
<td>87</td>
<td>27</td>
</tr>
<tr>
<td>Lymphoma</td>
<td>4</td>
<td>01</td>
</tr>
<tr>
<td>Total</td>
<td>319</td>
<td>100</td>
</tr>
</tbody>
</table>

Out of 114 cases of thyroid lesions, 97 cases (86.4%) were having benign neoplastic lesions. Totally, 12 cases (11.0%) were having inflammatory lesions. One case each of medullary carcinoma, anaplastic carcinoma, and follicular carcinoma with metastasis were noted in our study out of 3 cases (2.6%) of malignant thyroid lesions.

Figure 1: FNAC smear of follicular carcinoma from thyroid swelling

Among 500 cases, 21 cases of salivary gland lesions were found. In this benign pleomorphic adenoma was common and was found in 17 cases (80%).

Figure 2: Various percentage distribution of various salivary gland lesions found.

Out of 500 cases, 46 cases of various Soft Tissue & Miscellaneous lesions were obtained. Among this benign cystic lesions were common and accounted for 74%.

Table 3: Various Soft Tissue & Miscellaneous lesions diagnosed

<table>
<thead>
<tr>
<th>Lesions</th>
<th>No.</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lipoma</td>
<td>10</td>
<td>22</td>
</tr>
<tr>
<td>Benign Cystic lesion</td>
<td>34</td>
<td>74</td>
</tr>
<tr>
<td>Ameloblastoma</td>
<td>02</td>
<td>04</td>
</tr>
<tr>
<td>Total</td>
<td>46</td>
<td>100</td>
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DISCUSSION
In this study, FNAC was performed in swellings of the head and neck regions of the 500 patients to find out the relative frequencies of various pathologies presenting as lump in the neck. The results achieved in the present study were compared with different
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National and International studies. In the present study, slightly higher number of lesions was found in males (261 cases (52.2%)) than in females (239 cases (48%)). These findings were similar to the study by Setal et al 2 who found that there were 55% male and 45% females while studies by Fernandes H et al9 and Vijay Tilak et al10 found higher lesions in females. Lymph node involvement was common than other lesion accounting for 63.8% which was similar to the findings by Setal Chauhan et al1 while study by Fernandes et al 13 and Vijay et al 10 found that thyroid lesions were more common 56.45% and 43.63% respectively. Non-specific Lymphadenitis was the commonest diagnosis (150 cases (47%)) followed by Tuberculous lymphadenitis (78 cases (25%)) and malignancy was found in 27% of cases.

El Hag et al11 carried out a similar study in Saudi Arabia over a period of 5 years which included 225 patients which showed reactive/non-specific lymphadenitis to be the commonest cause of neck masses accounting for 33% of cases. Tuberculous lymphadenitis was found to be the next most common pathology constituting 21% of cases followed by malignant swellings found in 13% of cases while other studies by Gunvanti B. Rathod et al12 and Tariq et al1 found that Tuberculous lymphadenitis was found to be the most common pathology of lymph node lesions accounting for 42.12% and 36% of cases respectively followed by reactive/non-specific lymphadenitis constituting 18% and 19.3% of cases and metastatic carcinoma found in 14% and 21.5% of cases. In our study malignancy was found in only 27% cases while Cheng13 in his study found malignancy to be the cause in 50% of cases. This shows an epidemiological variation between the developed and developing countries. Infections like TB are more commonly found in developing countries while malignancies as cause of neck swellings are more common in developed countries. Stevenson14, in his study of 120 patients, carried out at Christchurch, New Zealand; found that 28% of the swellings are malignant which is similar to the pattern of disease in developed countries. Similarly, studies done in developing countries have consistently shown Tuberculous and Reactive/Non-specific lymphadenitis to be the most common cause. Out of 500 cases, 114 cases (23%) cases were of thyroid lesions with female preponderance 104 cases (91%), male to female ratio 1:10 and Maximum incidence of thyroid lesions was found in the age group of 31-40 years. Benign lesion were more common in third decade while malignant lesion more common in fifth decade while Charry et al15 in their study found that maximum incidence was between 20 and 40 years and male to female ratio was 4:1. Other Studies by Y.M Sirpal16 and Nazma Afroz17 also found maximum incidence of thyroid lesions in females. Among 21 cases of salivary gland lesions, Pleomorphic adenoma was found to be common in 17 cases (80%). Studies done by Gunvanti B. Rathod et al12 and Setal Chauhan et al1 also found that Pleomorphic adenoma was the commonest of salivary gland. Mucoepidermoid carcinoma was found in 55% of cases while studies by Solanky Piyush K et al18 found Mucoepidermoid carcinoma in 10% cases and Cohen M.B19 reported 35% mucoepidermoid carcinoma among salivary glands. Thus the greatest application of thyroid FNAC is the nonsurgical alternative provided in the investigation of goitre, thus eliminating the need for a purely diagnostic thyroidectomy. Additionally, the method may serve a therapeutic function since the evacuation of fluid in cystic lesions may be followed by involution of the lesion. Sometimes False positive diagnoses by FNAC can be caused by regenerative epithelial hyperplasia and squamous metaplasia in salaladenitis while False negative diagnoses can be due to faulty technique, Central cystic, Hemorrhage or necrotic area devoid of diagnostic cells, Small malignant lesion adjacent to dominate mass. But overall, the procedure was simple and rapid obviating the need of surgical intervention.

CONCLUSION

It was concluded from the present study, that non-specific lymphadenitis is the commonest problem in patients presenting with neck swellings in our set-up, followed by Tuberculous lymphadenitis and malignant neoplasms especially metastatic carcinoma. Moreover, nowadays, with increasing cost of medical facilities, any technique which speeds up the process of diagnosis, limits the physical and psychological trauma to the patient, and saves the expenditure of hospitalization, will be of tremendous value. It may also help the surgeon to select, guide, and modify surgical planning in patients requiring surgery. Our study found that FNAC is a simple, quick, inexpensive, and minimally invasive technique to diagnose different types of head and neck swellings. It could differentiate the infective process from neoplastic one and avoids unnecessary surgeries. Thus, FNAC can be recommended as a first line of investigation in the diagnosis of head and neck swellings.

REFERENCES

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