

## Role of Fine needle aspiration cytology in Head and neck lesions

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### Abstract

**Introduction** The common head and neck lesions encountered in routine daily practice are from lymph nodes, salivary glands, soft tissue tumors, and thyroid. The beginning inexpensive diagnostic procedure that the clinician can think is the Fine needle aspiration cytology (Fnac). It is simple, easy and diagnosis can be obtained in few hours.

**Materials and Method:** Our study is a prospective study which included Fnac technique on 50 cases of head and neck lesions. From lymph nodes, soft tissues, salivary gland. However thyroid lesions were excluded from the study. The study was done for 1 year from 2016 January to 2016 December in Adichunchanagiri Institute of Medical Sciences, Pathology department.

**Results:** Reactive/ non-specific lymphadenitis was the common diagnosis obtained in 19 cases. Followed by metastatic deposits in the lymph nodes in 16 cases. Tuberculous (TB) lymphadenitis was in 8 cases. Salivary gland neoplasm's in 3 case, and 3 cases of non-neoplastic salivary gland lesions out of which sialadinitis in 2 case and sialadinosis in 1 case. 1 case of epidermal cyst.

**Conclusion:** Fnac is a simple diagnostic tool to diagnose most important clinical conditions like metastatic deposits and TB lymphadenitis. Compared to other expensive mode of diagnosis in this modern medicine era, Fnac still plays a very important vital role in finding the occult malignant neoplasms.

**Keywords:** Lymph node, Fine needle aspiration cytology (Fnac), Metastatic deposits, Reactive lymphadenitis, Tuberculous

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### Introduction

The common head and neck lesions encountered in routine daily practice are from lymph nodes, salivary glands, soft tissue tumors, and thyroid. These lesions may be inflammatory or neoplastic. Neoplastic can be either benign or malignant. Some of them can be a developmental anomaly too. These head and swellings come to the notice of the patients easily. The beginning inexpensive diagnostic procedure that the clinician can think is the Fine needle aspiration cytology (Fnac). It is simple, easy and diagnosis can be obtained in few hours. Hence it is a globally accepted diagnostic procedure.<sup>(1)</sup>

The procedure can be repeated, can be done for multiple swellings, and can be done even on the debilitated patients too. Incidence of head and neck malignancies is 23% of all cancers in males and it accounts for 6% in females. Fnac is the procedure without any complications of anaesthetic drugs.<sup>(2)</sup>

The common pathologies encountered in head and neck lesions are Reactive (Specific or Non specific) lymphadenitis, Metastatic deposits, Lymphomas, Thyroid lesions which may be Goitre, Hashimotos thyroiditis or malignancies. Coming to the salivary gland common lesions seen are Sialadinosis, Sialadinitis, Pleomorphic adenoma and other malignant tumors. The other less common lesions are Bronchial cyst, Thyroglossal cyst, Cystic hygroma, and carotid body tumors.<sup>(3)</sup>

Lymph node enlargement are common lesions, in that metastatic deposits to lymph node accounts to

65.7% to 80% and lymphomas in a lymph node range from 2 to 15.3%.<sup>(4)</sup>

### Materials and Method

Our study was done on 50 patients who came with a request of Fnac from our clinical departments like medicine, paediatrics, surgery and ENT. We included all head and neck lesions from lymph node, salivary gland, skin, soft tissues. Thyroid lesions were excluded from the study. The study was done for 1 year from 2016 January to 2016 December over a period of one year in Adichunchanagiri Institute of Medical Sciences, Pathology department. Detailed clinical history of the patient was taken during aspiration. We used 10 ml syringe with 22 gauge needle, Fnac was done under aseptic precautions without any local anaesthesia. The material obtained was immediately fixed in 90% alcohol for routine haematoxylin and eosin stain and few were air dried for giemsa stain.

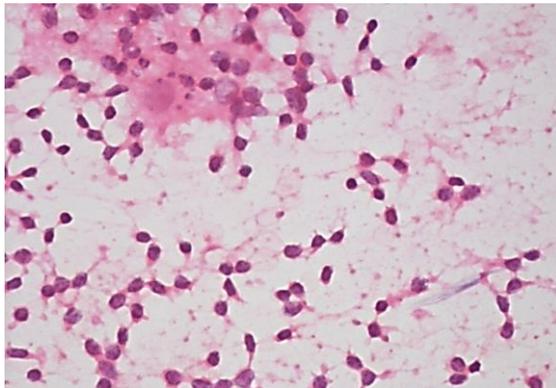
### Results

The study was done on 50 patients. Out of which 32 patients were male and 18 patients were female with male to female ratio of 1.7:1. Age of the patients was between 8 to 65 years. Reactive / non specific lymphadenitis was the commonest diagnosis obtained in our study which was seen in 20 cases. Followed by metastatic deposits in 16 cases. Tuberculous (TB) lymphadenitis was seen in 8 cases. Salivary gland malignant neoplasms in 3 case, non-neoplastic salivary gland lesions of sialadinitis was obtained in 2 case and

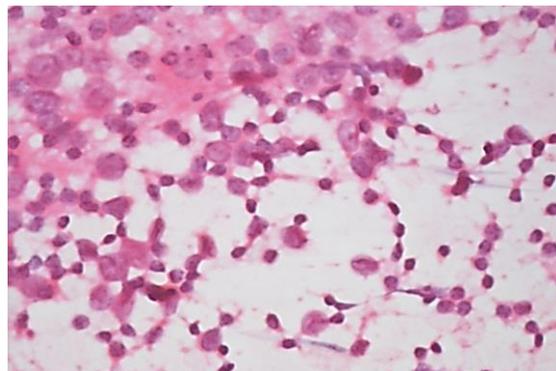
sialadinitis in one case. One case of epidermal cyst was diagnosed.

**Table 1: Table showing distribution of cases and percentage**

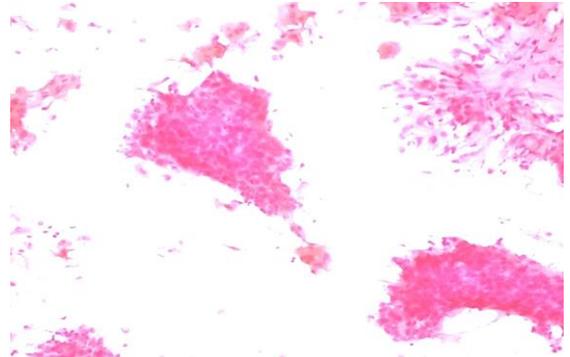
Lesions	Number of cases	Percentage
Reactive lymphadenitis	19	38%
Metastatic deposits	16	32%
TB lymphadenitis	8	16%
Salivary malignant neoplasms	3(2+1)	6%
Low grade MEC	2	-
Acinic cell carcinoma	1	-
Sialadinitis	2	4%
Sialadinosis	1	2%
Epidermal cyst	1	2%



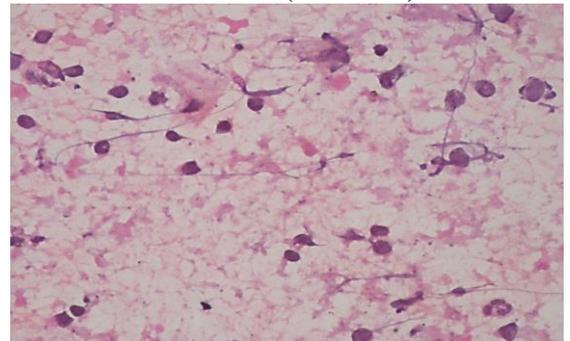
**Fig. 1: Reactive lymphadenitis with a tingible body macrophage.(40 x H&E)**



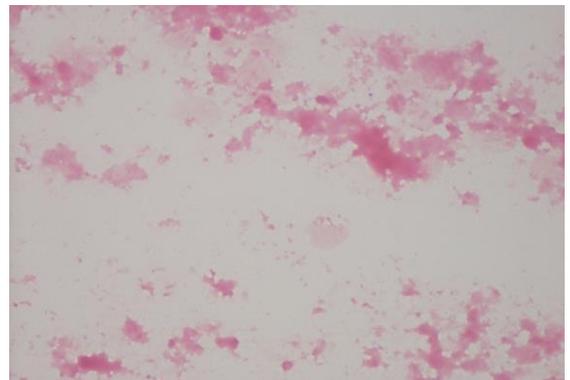
**Fig. 2: Reactive lymphadenitis with a tingible body macrophage and scattered lymphocytes.(40 x H&E)**



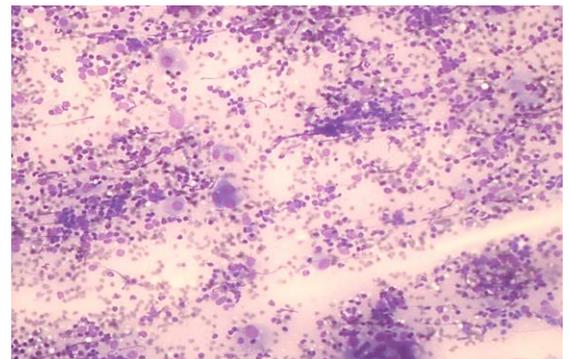
**Fig. 3: Metastatic deposits of squamous cell carcinoma.(40 x H&E)**



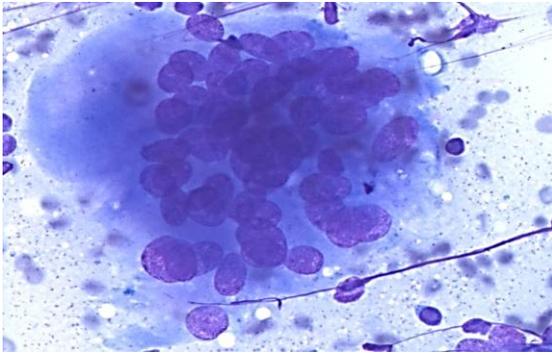
**Fig. 4: Tuberculous Lymphadenitis with scattered epithelioid cells and caseous necrosis.(40 x H&E)**



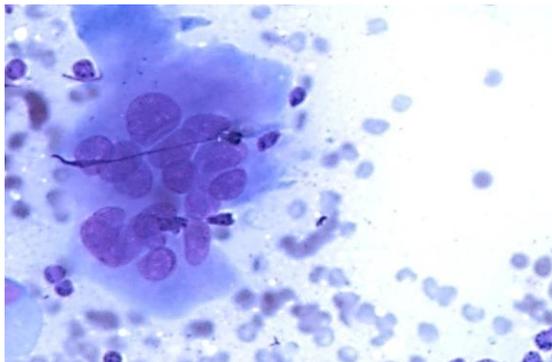
**Fig. 5: Tuberculous Lymphadenitis with caseous necrosis. (40 x H&E)**



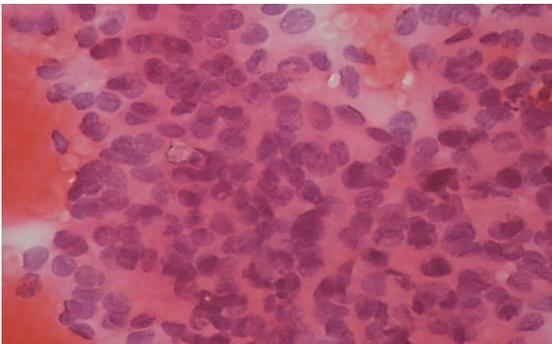
**Fig. 6: Langerhans cell histiocytosis with numerous histiocytic giant cells. (10 x H&E)**



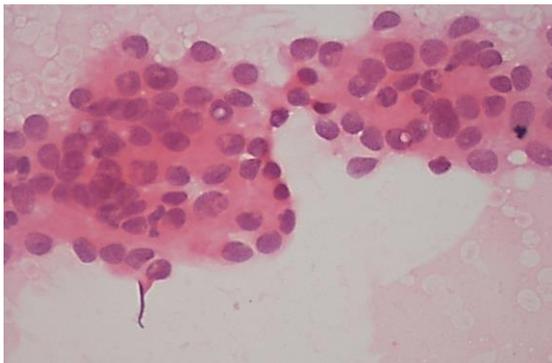
**Fig. 7: Langerhans cell histiocytosis with histiocytic giant cells. (40 x Giemsa)**



**Fig. 8: Langerhans cell histiocytosis with grooved nuclei. (40 x Giemsa)**



**Fig. 9: Acinic cell carcinoma with vacuolated cytoplasm. (40 x H&E)**



**Fig. 10: Acinic cell carcinoma. (40 x H&E)**

## Discussion

Fine needle aspiration cytology is one of the most accessible technique for head and neck lesions. The most common diagnosis obtained in our study was of Reactive lymphadenitis in 38% (19 cases) of cases. The age group between 8 and 15 years were commonly affected. Among these 20 cases, 1 case was diagnosed in Fnac as Langerhans cell histiocytosis. It was seen in a 10 months aged baby girl with multiple lymph nodes in the cervical region. The smears showed clusters of histiocytes with convoluted grooved nuclei, plenty of foreign body giant cells were seen with many eosinophils and neutrophils in the background.

Metastatic deposits in lymph node was diagnosed in 32% (16 cases). It was common in the age group of 50 to 75 years and common in males compared to females. The most common malignancy encountered was that of squamous cell carcinoma deposits. The smear from these cases were highly cellular and showed pleomorphic squamous epithelial cells arranged in loose cohesive clusters and singles. These cells were highly pleomorphic with very high N:C ratio and prominent nucleoli. Background showed keratinous material with necrosis. However few of the malignant squamous cell carcinoma deposits showed cystic change where we aspirated a fluid material in Fnac. Few of the cases were adenocarcinoma where cells were arranged predominantly in glandular pattern with vacuolated cytoplasm. Most of the metastatic tumors were from gastro intestinal tract which was found out with necessary investigations and clinical findings. Few cases were from laryngeal carcinoma too.

TB lymphadenitis was diagnosed in 16% (8 cases) of total cases. It was seen in all the age groups. The smears showed epithelioid cells, granulomas and caseating necrosis. However AFB was negative in Fnac smears. Histopathology of biopsy specimen also showed well formed granulomas with caseous necrosis and acid fast bacilli was positive in histopath slides.

6% (3 cases) were salivary gland neoplasms of which 2 were low grade mucoepidermoid carcinoma, 1 was acinic cell carcinoma.

Smears from the mucoepidermoid carcinoma cases showed mucus, intermediate and squamous cells. The nucleus were relatively bland with prominent nucleoli in few cells, Background showed debris dirty marerial. These cases were confirmed in histopathology.

Smears from the cases of acinic cell carcinoma revealed highly cellular smears arranged in microacinar pattern. The cell had abundant fragile finely vacuolated cytoplasm with oncocytes like appearance. Nucleus was round with bland chromatin and moderate anisokaryosis. Many stripped nuclei were seen in the background with acinar cells attached to fibro vascular stroma.

A positive histopathological correlation was obtained for these 2 cases of low grade

mucoepidermoid carcinoma and 1 case of acinic cell carcinoma. So the diagnostic accuracy for malignant salivary tumors was 100% in Fnac.

Non neoplastic lesions of salivary gland were 4%. 2 Cases diagnosed with sialadinitis and 2% (1 case) with sialadinosis.

Sialadinitis showed scant aspirate and few ductal epithelial cells, few of them showing reactive changes. Plenty of fibrous material were seen in the background with variable number of lymphocytes.

Sialadinosis revealed hyperplastic normal salivary acini attached to the fibro vascular stroma. Many naked nuclei were seen in the background.

A single case of epidermal cyst was obtained. The lesion was present behind the ear in a 30 year aged male patient. The aspirate obtained was scant grey white fluid material. The smears showed both nucleate and anucleate benign squamous epithelial cells in a keratinous background material.

Fnac is a simple inexpensive method to diagnose the most significant lesions encountered in clinical practice.

Though open biopsy is gold standard in lymph node lesions, Fnac is a simple out-patient procedure where diagnosis is obtained fast and reduces the cost of hospitalization to the patients. It is the technique which has high degree of accuracy. However doubtful lesions should always be correlated in biopsy specimen study. Further immunohistochemistry and other molecular diagnostic methods helps in arriving the definite diagnosis.<sup>(6)</sup>

There no complications of Fnac procedure in head and neck lesions. There are no reported cases of spread of tumor through sinus tract in cases of malignancy.

Study done by Rajyalakshmi et al in Kakinada found that out of 360 cases of head and neck tumors, 39% were from soft tissue, 38% were from lymph node and 19% were of salivary gland origin. 4% of adnexal lesions were also noticed.<sup>(1)</sup> Tissue biopsy and immunohisto chemistry was done where ever necessary. Out of 360 cases. They obtained biopsy of 106 cases out of which only 11 cases showed negative correlation.

Study done by Sreedevi et al<sup>(2)</sup> also coincided with our study where out of 304 cases studied. 50% of head neck lesions were from lymph node and in that common lesion seen was reactive lymphadenitis next was thyroid lesions. In thyroid lesions the commonest diagnosis they arrived was of goiter and hashimotos thyroiditis. The salivary gland lesions they encountered was pleomorphic adenoma and one case of basal cell adenoma. They did not document any malignant salivary gland tumor. Whereas in our study we got 3 cases of salivary gland malignancies. The soft tissue lesions they documented was of epidermal cysts and lipoma.

The number of cases studied coincided with our study of 50 cases in a study done by Yoshida et al<sup>(3)</sup>

where they found that TB lymphadinitis was seen in 36%, reactive lymphadinitis in 18% of cases. Followed by malignant neoplasms and non neoplastic lesions.

Anne R Wilkinson et al in the year 2012 did study on Fnac diagnosis of lymph node malignancies and concluded that diagnostic accuracy of metastatic lesions were 97%, for lymphomas it was 82% with a sensitivity of 97% and specificity of 100%.<sup>(4)</sup>

A study on paediatric malignant neoplasms done in Nigeria<sup>(5)</sup> also showed that Fnac should be included in routine investigations since paediatric head and neck tumors had high sensitivity, specificity and positive predictive value for malignancies. They found that cytological sensitivity of Fnac was more for head and lesions (100%) compared to the abdominal cavity malignancies (90%).

Rathore and team in Panacea conducted the study on head and neck masses on 756 cases. Lymph node swellings were more common followed by thyroid, skin and soft tissue lesions. Salivary gland lesions were least noticed in their study.<sup>(6)</sup>

A study was conducted in Cambridge University in 2006 by Shykhon and team and concluded that repeat FNAC is a very useful procedure in case of non diagnostic cervical lymph node aspirates.<sup>(7)</sup>

Jasmin and team in the year 2013 did study on 450 cases of head and neck lesions, out of which 69% were from lymph nodes, 20% from thyroid, 6% from salivary gland, and 6% from soft tissue lesions.<sup>(8)</sup>

**Table 2: Showing comparison of distribution of head and neck lesions between our study and other national and international studies**

	Lymph node %	Salivary gland %	Soft tissue %
Our study	86	12	2
Rajyalakshmi <sup>(1)</sup>	38	19	39
Sreedevi <sup>(2)</sup>	50	10	10
Rathore <sup>(7)</sup>	75	15	10
Jasmin <sup>(8)</sup>	69	6	6

This table explains the comparison of our study and other studies in distribution of lesions. It is observed that lymph nodes are the commonly encountered lesions. Followed by Salivary gland and than soft tissue lesions. However in study done by Rajyalakshmi<sup>(1)</sup> the soft tissue lesions are more compared to salivary gland lesions.

### Conclusion

From present study it is concluded that reactive lymphadinitis is the most common head and neck lesion s encountered followed by metastatic deposits in that majority were from squamous cell carcinoma from gastro intestinal origin and TB lymphadinitis in our routine Fnac technique.

Fine needle aspiration cytology is a simple quick inexpensive diagnostic tool to diagnose most of the important clinical conditions like metastatic deposits, TB lymphadenitis, salivary gland malignancies. Compared to other expensive mode of diagnosis in this modern medicine era, Fine needle aspiration cytology still plays a very important vital role in finding out the occult malignant neoplasms hidden in the body. It is the first line basic investigation that can be done and reduces unnecessary burden, expenditure, hospitalization, and psychological trauma to the patients. Fn ac is a prerequisite before any surgical operative procedure like open biopsy and invasive surgeries and reduces hospitalization and psychological trauma to the patients.

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