

**Original Article**

# FINE NEEDLE ASPIRATION CYTOLOGY AS A DIAGNOSTIC PROCEDURE IN HEAD AND NECK SWELLINGS

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## ABSTRACT

**Background:** Fine Needle Aspiration Cytology (FNAC) is simple, quick, inexpensive and minimally invasive technique used to diagnose different types of swellings located in the head and neck.

**Aims:** To assess the incidence of different sites, age, sex and distribution of inflammation.

**Material & Methods:** A prospective study was conducted from July 2007 to November 2009. Fine Needle Aspiration Diagnosis was correlated with detail of relevant clinical findings and investigation. Total 100 cases were studied.

**Results:** Highest incidence was found in the age group 11-20, and 41-50. Females were most common victims with female male ratio of 11.5: 1. Head and Neck swelling is common finding now a days and Fine Needle Aspiration Cytology is most common diagnostic procedure for such type of cases and most common method to differentiate between benign and malignant lesion. As diagnostic procedure we came to know regarding the most common lesion involved in head and neck region.

**Conclusion:** Fine Needle Aspiration Cytology is easy, simple, safe and non invasive procedure for diagnosis of head and neck swelling and easy way for surgeon whether to decide surgery or not.

**Key Words:** Head and Neck Swellings, Fine Needle Aspiration Cytology.

## INTRODUCTION

In 1930, the Annals of Surgery published the first report on the value of needle aspiration cytology as a means of obtaining a tissue

diagnosis. Not much attention was paid to the subject, because safe surgical biopsy techniques were developed, which also provided a definitive diagnosis. With increasing experience

the accuracy of aspiration diagnosis matched that obtained by conventional open biopsy. The simultaneously occurring phenomenon of spiralling costs of medical care and hospitalization set the stage for the worldwide acceptance of fine needle aspiration cytology as a safe, simple, rapid and effective technique of obtaining an accurate tissue diagnosis.<sup>1</sup>

Masses in the head and neck are especially good targets for needle aspiration because many are superficially located or otherwise accessible to puncture. FNAC leaves no scar and seeding of the needle tract has proved to be no more than theoretical possibility. Head and Neck sites account for approximately one half of all body sites aspirated. The large number of Head and Neck aspirates reflects the high incidence of head and Neck cancer in this country. The largest numbers of aspirates are from cervical lymph node enlargements, metastatic squamous carcinoma being the most common lesion encountered. However inflammatory disease of the lymph nodes is all represented.<sup>1</sup>

The prime objective of study was to assess the diagnostic accuracy of FNAC in the Head and Neck tumors, to assist the surgeon in selection of the patient for surgery and palliative therapy and to help the surgeon in detecting the metastasis and staging of the certain tumors.

## MATERIAL AND METHODS

The present study included 100 cases of Head and Neck swellings, performed predominantly either as outdoor procedure or as pre-operative assessment in our institute during 07/07/07 to 09/11/09. Fine Needle Aspiration Diagnosis was correlated with detail of relevant clinical findings and investigation. Patients were explained about the procedure and its indication. Maximum efforts were been made to re-assure the patient as to the safety, simplicity of the procedure and minimal discomfort.

After aspiration, smear preparation is done and then fixation by hematoxylineosin stains. The details regarding history of the patient, personal details of the patient, local examination findings, laboratory and other investigations, clinical diagnosis and microscopic findings were recorded on predesigned questionnaire. Data entry and analysis was undertaken by Epi-Info software (version 6.04).

## RESULTS

**Table 1: Age wise Distribution of cases**

Age (Years)	No. of cases	Percentage
1-10	06	6
11-20	22	22
21-30	20	20
31-40	18	18
41-50	22	22
51-60	06	06
61-70	03	03
> 70	03	03
Total	100	(100.0)

Out of studied population of 100, 43 were male and 57 were female. So 14% higher incidence in female was observed. Maximum incidence observed in the group of 11 to 20 years and 41 to 50 years age group that is adolescents and middle age group.

**Table 2: Distribution of cases according to region of head & neck**

Head Region	No. (%)	Neck region	No. (%)
Frontoparietal	01 (10.0)	Cervical Lymph node	41 (45.6)
Occipital	02 (20.0)	Thyroid	26 (28.9)
Parotid	04 (40.0)	Submandibular	14 (15.6)
Auricular	03 (30.0)	Supraclavicular	04 (4.4)
Palate/Oral Cavity	Nil	Nape of neck	04 (4.4)
		Sub mental	01 (1.1)
Total	10	Total	90

Higher incidence if lesion in neck region observed as compared to Head Region. Parotid (40.0%) region was highest in head region whereas cervical lymph node (45.6%) in neck region.

**Table 3: Distribution of cases according to the inflammatory and neoplastic lesion**

Organ	Inflammatory	Neoplastic	
		Benign	Malignant
Lymph node	31(63.3)	07(19.4)	11(73.3)
Thyroid	05(10.2)	20(55.6)	01(6.7)
Salivary gland	03(6.1)	04(11.1)	03(20.0)
Soft tissues & miscellaneous	10(20.4)	05(13.9)	Nil
Total	49	36	15

Out of 100 cases 49 cases were inflammatory in nature while remaining 51 were of neoplastic nature, out of which 36 were benign and 15 were

malignant. Incidence of malignancy was higher in lymph node (73.3%).

soft tissue lesions and miscellaneous lesions, sebaceous was common which accounts 33%.

**Table 4: Distribution of cases according to various lesions**

Organs and Lesions	No. (%)
<b>Thyroid (n=26)</b>	
Simple Colloid goitre	10 (38)
Nodular Colloid goitre	02 (8)
Diffuse Hyper Plastic goitre	01 (4)
Grave's disease	02 (8)
Hashimoto Thyroiditis	03 (11)
Thyroiditis	02 (8)
Follicular neoplasm	05 (19)
Papillary carcinoma	01 (4)
<b>Salivary gland lesions (10 cases)</b>	
Sialadenitis	02 (20)
Parotitis	01 (10)
Pleomorphic adenoma	03 (30)
Mucoepidermoid Carcinoma	01 (10)
Warthin Tumor	01 (10)
Adenoid Cystic Carcinoma	01 (10)
Low grade salivary gland Carcinoma	01 (10)
<b>Lymph node (n=49)</b>	
Reactive node	07 (14)
Non-specific Inflammatory	05 (10)
Non-specific Tuberculosis	26 (53)
Metastatic	07 (15)
Lymphoma	01 (02)
Lympho proliferative lesion	03 (06)
<b>Soft tissue &amp; miscellaneous (n=15)</b>	
Benign Spindle cell tumor	02 (13)
Lipoma	03 (20)
Benign cystic Lesion	04 (27)
Branchial cyst	01 (7)
Sebaceous cyst	05 (33)

Out of 20 cases of thyroid lesions, 46% incidence rate of colloid goiter obtained. Simple colloid goiter is common among studied thyroid lesions. Among various salivary gland lesions, benign tumor Pleomorphic adenoma are common, it accounts 30% in present study. Among 49 cases of lymph node lesions, 53% of inflammation was tuberculous. Among various

## DISCUSSION

Factors essential to establish accurate evaluation of fine needle aspiration of cytology material are:

- The experience of pathologist and clinician.
- Their effort and attitude towards achieving perfection.
- Clinician's ability and willingness to accept the responsibility for positive, negative and equivocal report.
- Familiarity of pathologist with details of the clinical history, physical examination and the results of laboratory investigations.<sup>2</sup>

William<sup>3</sup> reported the average age of lymphadenopathy among male was 60 year and female 55 year. A reason probable, could be common involvement of lymph nodes by Koch's infection in our country and by secondary in Western countries. As Koch's involves young children and adult quite commonly it has resulted in reduced average age in present study as 33 years among male and 23 years among female.

Incidence of lymphadenopathy was slightly higher in female in William<sup>3</sup> study. While in present study male preponderance observed. Arunkumar<sup>4</sup> study reported that higher female preponderance and decline in incidence with increasing age.

Gupta AK<sup>4</sup> reported the lymph node involvement of cervical site (62%), supraclavicular (16%) and others (22%). This study observed 84% cervical, 6% supraclavicular and others (10%) involvement of lymph nodes. Present study revealed that cervical lymph node was commonest site of involvement. The major salivary glands are developmentally and anatomically closely related to lymphoid tissue. Inflammatory and neoplastic diseases affecting perisalivary lymph nodes enter into the clinical differential diagnosis of salivary gland tumors.

**Table 5: Comparison Study of Relationship of Thyroid Lesions with age and Sex**

Study	Maximum Incidence (Years)			Female : Male Ratio
	Overall	Benign lesion	Malignant lesion	
Charry et al <sup>3</sup> 1980	20-40	-	-	4:1
Prasad et al <sup>22</sup> 1992	30-50	30-50	50-60	5:1
Present Study	30-50	30-50	50-60	11.5:1

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.

Most common cellular element of thyroid smears is usually the follicular cells, but spindle shaped stromal elements as well as a small number of lymphocytes and macrophages are also part of the normal cell population.

Above table shows that maximum incidence of thyroid swellings was found during age 30-50 years. Benign lesion were more common in third decade while malignant lesion more common in fifth decade and female to male ratio is significantly higher as compared to other study. In study of Charry et al<sup>5</sup>, maximum incidence between 20 years and 40 years. Cohen MB<sup>6</sup> reported 35% mucoepidermoid carcinoma among salivary glands and this study reported 10%. (Table 4)

### LIMITATIONS

False positive diagnoses can be caused by regenerative epithelial hyperplasia and squamous metaplasia in sialadenitis or Warthin's tumor and epithelial atypia and high cellularity can occasionally be worrying in pleomorphic adenoma.

False negative diagnoses can be due to faulty technique, Central cystic, hemorrhage or necrotic area devoid of diagnostic cells, Small malignant lesion adjacent to dominant mass, highly fibrotic lesion, Interpretative error.

### CONCLUSIONS

FNAC is ideal procedure for diagnosing the multiple swellings e.g. to detect metastasis with accuracy more than that of True cut biopsy.

FNAC is safe, simple, sensitive, specific, and suitable for almost all sites, skills required are learnt with some practice, saves time, money, hospital theatre time and bed space.

FNAC is very useful for pre-operative diagnosis of lymph node, thyroid gland, salivary gland, orbit and other swellings in head and neck region, and thus helps surgeon in selecting the patient for palliative or surgical management.

In case of follicular neoplasm, exact diagnosis of follicular carcinoma or follicular adenoma cannot be decided on FNAC alone.

### REFERENCES

1. Orell SR, Sterrett GF, Walters MN-I, Whitaker D: Fine Needle Aspiration Cytology. New York: Churchill Livingstone; 1992. P. 7-23.
2. Chinoy RF, Bhagwan IN, Shubadha VK, Fine Needle Aspiration Cytology of Head and neck lesions, Patient Education Handouts, Tata Memorial Hospital, April, 1995.
3. William L. Betsill, S I Hajdu: Percutaneous aspiration biopsy of lymph node. American Journal of Clinical Pathology; 1980, 73: 471-479.
4. Gupta AK, Nayar M, Chandra M: Reliability and limitations of fine needle aspiration cytology of lymphadenopathy, An Analysis of 1,262 cases, Acta Cytologica; 1991; 35: 773-83.
5. Charry AK: Role of FNA Biopsy in thyroid swelling; Indian Journal of Surgery; June 1980: 346-348.
6. Cohen MB, Fisher PE, Holly EA, Ljung BM, Lowhagen T, Bottles K: Fine needle aspiration biopsy diagnosis of mucoepidermoid carcinoma: Statistical analysis. Acta Cytologica; 1990: 34: 43-49.