



## A STUDY OF FNAC OF HEAD AND NECK LESIONS AT A TERTIARY CARE CENTRE

### Medical Education

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### ABSTRACT

**Introduction:** Fine Needle Aspiration Cytology (FNAC) is a simple and a rapid diagnostic technique in cytopathology. It is now being considered as a valuable diagnostic aid because of the early availability of results, its simplicity, minimal trauma and complications. Ancillary techniques such as flow cytometry, cytogenetics, and cell block preparations with immunocytochemistry can be applied for the further characterization of tumours. Aim of this study was to study various head and neck lesions using FNAC technique. **Methods:** The present study was conducted in Department of Pathology, Atal Bihari Vajpayee, Government Medical College, Vidisha, Madhya Pradesh, in the year 2020 to 2022 and included 122 patients with palpable head and neck lesions. OPD as well as IPD patients with head and neck swellings which were referred to pathology department for FNAC. **Results:** The present study there were included total 122 cases of palpable head and neck lesions from various departments comprising of OPD as well as IPD patients. Age group of patients ranged from 1 year to 72 years. Maximum no. of patients were in the age group of 21-30 years (30.3%). Out of 122 patients 76 (62.3%) were females and 46 (37.7%) were males. Site wise distribution of head and neck FNAC shows lymph nodes lesion (58.2%) as the predominant site of FNAC followed by soft tissue and miscellaneous (17.2%), thyroid lesions (14.8%), and salivary glands (9.8%). **Conclusions:** FNAC as a rapid, relatively cheap diagnostic tool now-a-days with overall high accuracy rate in differentiating non-neoplastic lesions from neoplastic lesions. It saves cost and time to reach to final diagnosis. It is therefore concluded that FNAC is a useful tool in diagnosis of head and neck lesions with good certainty.

### KEYWORDS

Fine needle aspiration cytology (FNAC), Ultrasound Sonography (USG), Lymphadenopathy, Metastasis, Squamous cell carcinoma, computed tomography (CT).

### INTRODUCTION

Fine Needle Aspiration Cytology (FNAC) is a simple and a rapid diagnostic technique in cytopathology. It is now being considered as a valuable diagnostic aid because of the early availability of results, its simplicity, minimal trauma and complications. Ancillary techniques such as flow cytometry, cytogenetics, and cell block preparations with immunocytochemistry can be applied for the further characterization of tumours. In addition, their benefits include the lack of sedation or general anaesthesia.<sup>1</sup>

The differential diagnosis in a patient presenting with head and neck mass is often extensive and will vary with age, gender and site. These head and neck masses are evaluated by a detailed clinical history and examination followed by investigations like USG and CT of the region and excisional biopsy in certain cases. The common pathologies encountered in the head and neck region presenting as a lump are lymphadenitis, metastatic carcinoma, lymphoproliferative lesions, thyroid swellings (goitre, nodules and cysts and carcinoma), salivary gland swellings (sialadenitis, adenomas and carcinomas) and the skin and soft tissue lesions like lipoma, epidermal (keratinous, dermoid) cysts, benign adnexal tumours, etc.<sup>2</sup>

With the increasing costs of medical facilities, any technique which speeds up the process of the diagnosis and limits the physical/psychological trauma to the patients, will be of tremendous value.<sup>1</sup> Fine Needle Aspiration Cytology (FNAC) is a reliable, simple, safe, rapid and inexpensive method of establishing the diagnosis of lesions and masses at various sites and organs.<sup>10</sup>

FNAC of head and neck region is a well accepted technique with quite high specificity. Psychological and economical advantage of an immediate diagnosis in outpatient clinic being definitely present. Ancillary techniques done on cytology like flow cytometry, cytogenetics, cell block preparation, immunocytochemistry have a further advantage as a tool in diagnosis.<sup>3</sup> Aim of this study was to study various head and neck lesions using FNAC technique.

### MATERIAL AND METHODS

The present study was conducted in Department of Pathology, Atal Bihari Vajpayee, Government Medical College, Vidisha, Madhya Pradesh, in the year 2020 to 2022 and included 122 patients with palpable head and neck lesions. OPD as well as IPD patients with head and neck swellings were referred to pathology department. A detailed clinical history and important clinical findings were noted. After explanation of procedure and taking informed consent of patient, FNAC was done using 5 cc or 10 cc disposable syringes and 22/23 gauge needle taking all aseptic precautions. Both aspiration and non-aspiration techniques were used wherever necessary. At an average four to six smears were prepared for a lesion by cytopathologist depending on the size and location of the lesion following standard guidelines. Wet smears were fixed in 95% alcohol and were stained with PAP stain while air dried smears were stained with Giemsa stain. Zeihl-Neelsen staining was done in suspected tubercular lesions for acid fast bacilli. Cytological diagnosis was given depending upon the cytomorphology. Excisional biopsy specimens were fixed in 10% neutral buffered formalin processed by paraffin embedding and stained with haematoxylin and eosin stain.

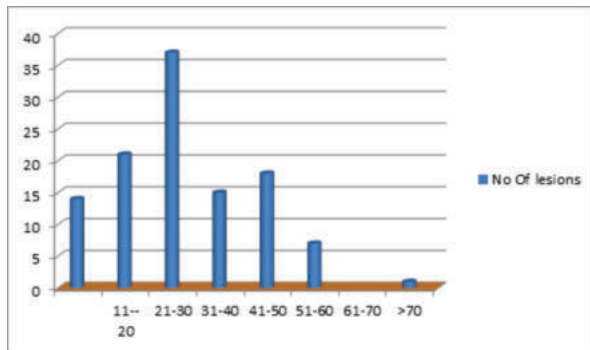
### RESULTS

In the present study there were included total 122 cases of palpable head and neck lesions from various departments comprising of OPD as well as IPD patients. Age group of patients ranged from 1 year to 72 years. Maximum no. of patients were in the age group of 21-30 years (30.3%) [table no 1] and least no. of patients were seen in age group of above 70 years. Out of 122 patients 76 (62.3%) were females and 46 (37.7%) were males. Site wise distribution of head and neck FNAC [table no 2] shows lymph nodes lesion (58.2%) as the predominant site of FNAC followed by soft tissue and miscellaneous (17.2%), thyroid lesions (14.8%), and salivary glands (9.8%). Out of 71 (58.2%) cases of lymph node lesions [table no 3], reactive lymphadenitis (31%) was the predominant cause of lymphadenopathy followed by tuberculous lymphadenitis in 29.6% cases. In malignant lesions, metastatic malignancy was the predominant finding (9.9%) and one case (1.4%) of lymphoma was found [table no 3]. Amongst 18 (14.8%) cases of thyroid lesions [table no 4], inflammatory lesions including Hashimoto's thyroiditis, chronic lymphocytic thyroiditis

were found in 33.3 % of cases. Benign lesions including colloid goiter and benign neoplastic lesions constituted 66.7 % of cases. In salivary glands lesions, sialadenitis was observed in 58.3 % of cases. Benign neoplasm included 25% cases of pleomorphic adenoma and two cases 8.3 % cases of benign cystic lesion . 1 case of acinic cell carcinoma was reported.[table no 5]. FNAC of soft tissue and miscellaneous constituted 21 cases (17.2 %) with varied pathological lesions like lipoma (9.5 %), epidermal cyst (28.6 %), other benign cystic lesions (28.6 %) and malignant neoplasm consisting of squamous cell carcinoma .[table no 6 ]

**Table 1: Incidence of head and neck lesions according to age.**

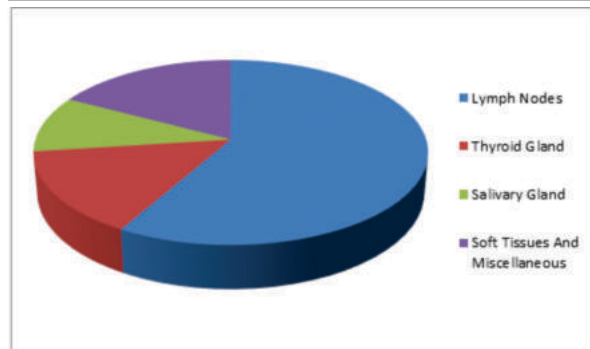
Age Group (Years)	No Of lesions	Percentage (%)
<10	14	11.5
11 -20	21	17.2
21-30	37	30.3
31-40	15	12.3
41-50	18	14.8
51-60	7	5.7
61-70	9	7.4
>70	1	0.8
Total	122	100



**Graph 1: Incidence of head and neck lesions according to age.**

**Table-2: Distribution Of Head & Neck Lesions [cases=124]**

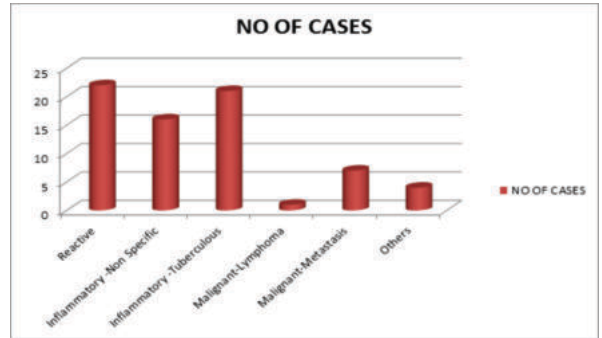
SITE	NO OF CASES	% (PERCENTAGE)
Lymph Nodes	71	58.2
Thyroid Gland	18	14.8
Salivary Gland	12	9.8
Soft Tissues And Miscellaneous	21	17.2
TOTAL	122	100 %



**Graph 2: Distribution Of Head & Neck Lesions**

**Table 3: Distribution Of Various Lymph Node Lesions (cases = 71)**

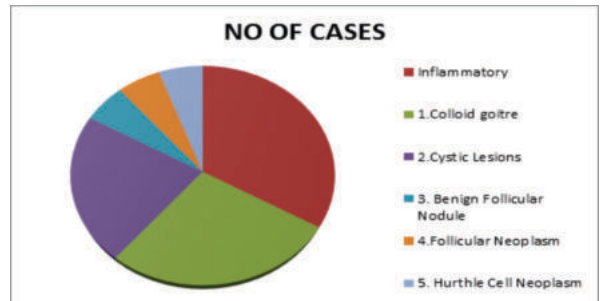
LESIONS		NO OF CASES	% (PERCENTAGE)
Reactive		22	31
Inflammatory	Non Specific	16	22.5
	Tuberculosis	21	29.6
Malignant	Lymphoma	1	1.4
	Metastasis	7	9.9
Others		4	5.6
Total		71	100%



**Graph 3: Distribution Of Various Lymph Node Lesions**

**Table-4: Distribution Of Various Thyroid Lesions [n= 18]**

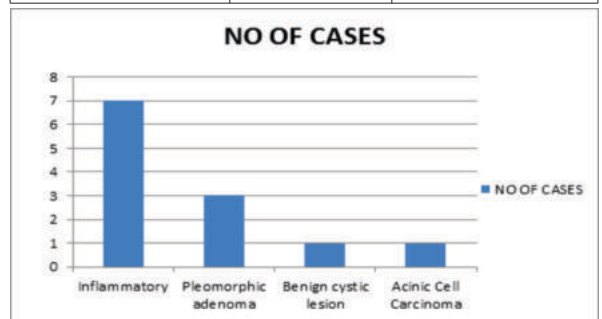
Thyroid lesions	NO OF CASES	% (PERCENTAGE)
Inflammatory	6	33.3
Benign		
1.Colloid goitre	5	27.8
2.Cystic Lesions	4	22.2
3. Benign Follicular Nodule	1	5.6
4.Follicular Neoplasm	1	5.6
5. Hurthle Cell Neoplasm	1	5.6
Malignant	0	0
TOTAL	18	100 %



**Graph 4: Distribution Of Various Thyroid Lesions**

**Table-5: Distribution Of Various Salivary Gland Lesions [n= 12]**

SALIVARY GLAND LESIONS	NO OF CASES	PERCENTAGE (%)
Inflammatory	7	58.3
Benign		
1.Pleomorphic adenoma	3	25
2.Benign cystic lesion	1	8.3
Malignant		
Acinic Cell Carcinoma	1	8.3
TOTAL	12	100

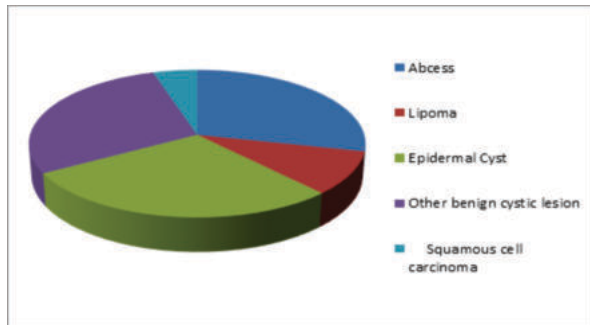


**Graph No 5: Distribution Of Various Salivary Gland Lesions**

**Table-6: Distribution Of Soft Tissue & Miscellaneous [n=21]**

	NO OF CASES	PERCENTAGE (%)
Inflammatory		
1.Abcess	6	28.6
Benign		
1.Lipoma	2	9.5

2.Epidermal Cyst	6	28.6
3.Other benign cystic lesion	6	28.6
Malignant		
1.Squamous cell carcinoma	1	4.8
TOTAL	21	100



**Graph 6 : Distribution Of Soft Tissue & Miscellaneous**

**DISCUSSION**

The present study was carried out in a tertiary care hospital to find out spectrum of various pathologies in head and neck lesions and to find out accuracy of FNAC as a rapid diagnostic tool among OPD and IPD patients. The study included patients from all age groups. Majority of patients were females in present study with female to male ratio of 1.7: 1. Muddegowda et al<sup>4</sup> and Kishor H. et. al.<sup>3</sup> also found similar results with female preponderance in their studies. Predominant site of FNAC was lymph node lesions (58.2%) followed by thyroid gland. In lymph node lesions reactive lymphadenitis was the most common pathological findings followed by tubercular lymphadenitis which is in concordance with Farooq, et al.<sup>5</sup>, Duraiswami R et al<sup>6</sup>, and Vimal S et al<sup>7</sup>, who also found reactive lymphadenitis as most common finding followed by tuberculous lymphadenitis in lymph node lesions. Among the malignant neoplasms, epithelial metastasis was found in 7 cases (9.9%) and one case of lymphoma was found.

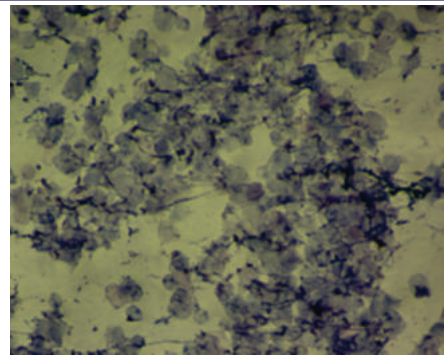
In soft tissue and miscellaneous lesions benign lesions were commonest finding including 6 cases (28.6%) of epidermal cyst, 2 cases (9.5%) of lipoma, 6 cases of abcess and 6 cases (28.6%) of other benign cystic lesions. one case of malignant neoplasm comprising of squamous cell carcinoma was reported. Bhagat et al<sup>8</sup> reported lipoma as the predominant benign tumor and squamous cell carcinoma as the commonest malignant neoplasm. In some of the cases cytology was inconclusive. The causes of unsatisfactory aspirates were smaller lesions, poor handling of material, inadequate aspirate.

FNAC of thyroid lesions was the next common site in our study. Inflammatory lesions (33.3%) was the predominant finding in benign lesion followed by colloid goiter comprising of 5 (27.8%) cases. Female preponderance was observed in FNAC of thyroid lesion in our study with similar findings reported by Rathod et al<sup>9</sup> and Muddegowda et al.<sup>4</sup> In salivary gland lesions acute and chronic sialadenitis together comprised 58.3% followed by pleomorphic adenoma in 3 cases (25%) and benign cystic lesion in one cases.

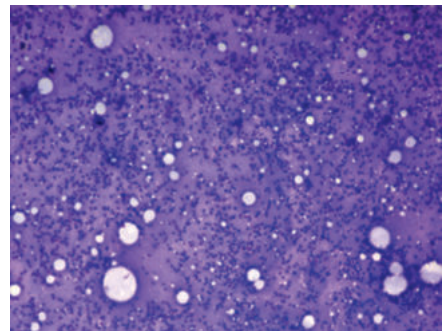
One case of malignant neoplasm was observed comprising of acinic cell carcinoma. Rathod et al<sup>9</sup> found inflammatory lesions as the commonest findings followed by benign neoplasms including pleomorphic adenoma while Bhagat et al<sup>8</sup> found benign pleomorphic adenoma as the predominant salivary gland lesion in their study.

In most of the national studies including present study inflammatory and non-neoplastic lesions were the predominant cause of head and neck masses.

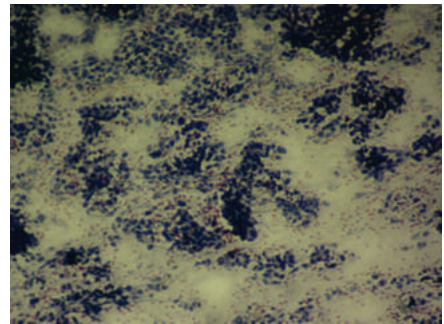
To avoid or minimize false positive results various factors including regenerative changes, metaplasia and others should be taken into considerations while reporting. False negative results may be due to cystic change, necrotic and hemorrhagic areas revealing insufficient diagnostic cellular yield. Repeat FNAC of solid areas as well as ultrasonography guided FNAC may minimize false negative results in such cases. In this study we observed that FNAC is a rapid, cost effective, highly accurate and feasible first line diagnostic tool in diagnosis and management of palpable head and neck lesions, though FNAC has certain limitations and pitfalls.



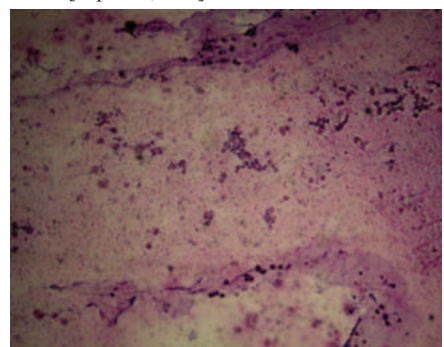
**Figure 1:** FNAC of Epidermal Inclusion Cyst showing many anucleated squamous cells [Pap stain, x 40].



**Figure 2:** FNAC of Reactive lymphadenitis showing polymorphous population of lymphoid cells [Pap stain, x 10].



**Figure 3:** FNAC of Metastatic Squamous cell carcinoma in lymph node showing sheets as well as scattered malignant squamous epithelial cells [Pap stain, x 40].



**Figure 4:** FNAC of Benign cystic follicular lesion showing few follicular epithelial cells, numerous colloidophages (colloid containing macrophages) against a colloid and haemorrhagic mixed background [Pap stain, x 40].

**CONCLUSION**

Though excisional biopsy is the gold standard for diagnosis of head and neck neoplastic lesion, the role of FNAC as a rapid, cheap diagnostic tool now-a-days with overall high accuracy rate in differentiating non-neoplastic lesions from neoplastic lesions is well established. It saves cost and time to reach to final diagnosis. It is therefore concluded that FNAC is a useful tool in diagnosis of head and neck lesions with good certainty.

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