



## A STUDY OF PALPABLE HEAD AND NECK SWELLINGS BY FNAC - A HOSPITAL BASED ANALYSIS IN A TERTIARY REFERRAL CENTRE

### Pathology

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### ABSTRACT

Head and neck masses commonly occur within the lymph nodes, thyroid, salivary glands and soft tissues mainly from the skin. FNAC is used as a first line of investigation in the diagnosis of such patients. It is an inexpensive, safe, outdoor procedure, with rapid reporting and requires minimal equipments.

**Aim:** The aim is to assess the prevalence of different types of palpable head and neck swellings and the utility of FNAC in diagnosis of head and neck lesions.

**Materials and Methods:** The present study included 932 cases of FNACs done on head and neck swellings performed as outdoor procedure at department of Pathology over a 24 months period. Data containing demographic details such as age and gender, cytological findings were retrieved and recorded. Patients with incomplete cytological results and demographic details were excluded from the study.

**Results:** There were 403 (43.24 %) females and 529 (56.76%) males (F:M ratio of 1 : 1.3 ). Age range of the patients was between 4 months to 88 years with mean age of 26.47 years. Highest number of cases was recorded in second and first decades of life with 233 (25.00%) cases and 197 (21.13%) cases respectively. Largest number of aspirates were from lymph nodes, followed by thyroid lesions. Among the lymph node aspirates reactive hyperplasia was the most common cytological finding, tuberculosis and granulomatous lymphadenitis together constitutes 28.64% cases. Colloid goitre was the common cytological diagnosis reported among the thyroid swellings. In malignant category, highest number of cases reported was metastatic carcinoma of lymph nodes.

**Conclusion:** FNAC is an excellent first line investigative method, for diagnosis of nature of palpable head and neck swellings. In addition to reactive lymphadenopathy, tuberculosis and metastatic carcinoma are important and common causes of cervical lymphadenopathy.

### KEYWORDS

Head and Neck, FNAC, Tuberculosis, Thyroid

### INTRODUCTION:

Palpable swelling at the head and neck region are common clinical presentations encountered by the otolaryngologists and head and neck surgeons. Because of multiple origins and etiological factors both surgeons and physicians are always in dilemma for accurate diagnosis of head and neck swellings. Head and neck masses commonly occur within the lymph nodes, thyroid, salivary glands and soft tissues mainly from the skin. It is evident that their early diagnoses provide the best chance of successful treatment<sup>1</sup>. To evaluate head and neck lesions FNAC was first introduced by Martin in 1930, since then it rapidly gained acceptance due to the easy accessibility of target sites and the minimally invasive nature of the method<sup>2</sup>. It is the most accepted and preferred method of obtaining biopsy material from a neck mass and has proven to be an invaluable aid to diagnosis<sup>1</sup>. At present, FNAC is being used as a first line of investigation in the diagnosis of patient presenting with palpable head and neck swellings. It is an inexpensive, safe, outdoor procedure, with rapid reporting and requires minimal equipment<sup>3,4</sup>. The procedure is repeatable, reduces the rate of exploratory procedure, and provides an early differentiation of benign from malignant pathology<sup>4,5</sup>. It is beneficial for early differentiation of benign from malignant pathology, as it greatly influences the treatment planning.

Initially, it was thought that FNAC causes cell trauma and alters the cell morphology. But, the technique of FNAC has undergone various modifications over a period of time and the expansion of FNAC in primary diagnosis of tumors in the last 30 years or so has been impressive and generally successful<sup>6</sup>. It can be both diagnostic and therapeutic in cystic swellings. FNAC does not give the same architectural detail as histology and it also leads to bloody aspirates in highly vascular organs like thyroid, but it can provide cells from the entire lesion as many passes through the lesion can be made while aspirating<sup>7</sup>.

In salivary gland tumours FNAC can differentiate between a malignant and a benign tumour with over 90% accuracy<sup>8</sup>. Cervical lymphadenopathy is one of common form of extrapulmonary tuberculosis accounting for 30 to 40% of cases and it may be the sole manifestation of tubercular infection with absence of associated constitutional features. Tuberculosis is widely prevalent in Jorhat district of Assam, especially among the tea workers for their poor socioeconomic status and overcrowding. FNAC will definitely serve

the purpose of rapid diagnosis of the extrapulmonary tuberculosis cases for early start of treatment, to assess the incidence of different other etiological factors and the nature of head and neck swellings.

### AIMS AND OBJECTIVES:

The present study was undertaken to assess prevalence of different types of palpable head and neck swellings and the utility of FNAC in diagnosis of head and neck lesions.

### METHODS:

#### Data Management:

Cytopathological data of total 932 patients who attended the Department of Pathology, Jorhat Medical College, Jorhat from January 2016 to December 2017 were collected and analysed. Demographic details such as age and gender, cytological findings were retrieved and recorded. Patients with incomplete cytological results and demographic details were excluded from our study. The results were analyzed, according to anatomic location, into 3 groups: inflammatory, benign and malignant.

#### Procedure:

The present retrospective study was undertaken in the Department of Pathology, Jorhat Medical College and Hospital, Jorhat. Patients who presented with superficially palpable head and neck swellings in Otorhinolaryngology, General Surgical, Dermatology and Dental OPDs or admitted in hospital and underwent FNAC were considered as the study group. The study included 932 cases of FNACs done on head and neck swellings performed as outdoor procedure over a 24 months period. The patients were explained about the procedure to be performed. The palpable swelling was fixed with one hand and with all aseptic and antiseptic precautions, 22- 23G needle with 10ml syringe was inserted into the swelling and a negative pressure was applied. Aspiration was done from different directions and depth of the swelling and aspiration material was smeared on the glass slides and smears made were relevantly stained, including May Grunwald Giemsa, Papanicolaou and Haematoxylin and Eosin (H&E) stains. The lymph node swellings with purulent or cheesy material as aspirate or with clinical suspicion of tuberculosis were stained by ZN stain. Cytological findings were recorded and follow up or biopsy was advised to some cases depending upon the pathology.

### RESULTS:

A total of 932 patients had undergone FNAC of the head and neck region during the study period (January, 2016 to December, 2017). There were 403 (43.24 %) females and 529 (56.76%) males (F:M ratio of 1 : 1.3 ). The age and gender-wise distribution of the 932 patients in this study is shown at Table1. In the present study, age range of the patients was between 4 months to 88 years with mean age of 26.47 years. According to age, patients were divided into 0 – 10 years, 11 – 20 years, 21 – 30 years, 31 – 40 years, 41 – 50 years, 51 – 60 years and 61 years and above. It is noticed that highest number of cases were recorded in second and first decades of life with 233 (25.00%) cases and 197 (21.13%) cases respectively.

**Table: 1. Age and Gender distribution of patients**

Sl. No.	Age (Years)	Number of cases	Percentage
1	0 – 10	197	21.13 %
2	11 – 20	233	25.00 %
3	21 – 30	108	11.58 %
4	31 – 40	162	17.38 %
5	41 - 50	105	11.26 %
6	51 – 60	55	5.90 %
7	61 and above	72	7.72 %
	TOTAL	932	
Sl. No.	Gender	Number of cases	Percentage
1	Male	529	56.76 %
2	Female	403	43.24 %

Out of total 932 cases, largest number of aspirates were from lymph nodes 569 (61.05%), followed by thyroid lesions 152 (16.31%). Skin and soft tissue lesions including scalp accounted for 148 (15.88%), cases followed by salivary gland lesions 31 (3.32%) cases and least number of aspirates were from vascular lesions 15 (1.60 %) cases (Table 2 ). In 17 (1.82%) cases there were inadequate samples or inconclusive reports for any definitive opinion. Among the lymph node aspirates reactive hyperplasia was the most common cytological findings in 152 (26.71%) cases, however tuberculosis and granulomatous lymphadenitis together constitutes 163 (28.64%) cases (Table 3).

**Table: 2. Distribution of head and neck swellings according to site of pathology**

Sl. No.	Site of pathology	Number	Percentage
1	Lymph node	569	61.05 %
2	Thyroid gland	152	16.31 %
3	Salivary gland	31	3.32 %
4	Skin and soft tissue	148	15.88 %
5	Vascular	15	1.60 %
6	Inconclusive	17	1.82 %
	TOTAL	932	

**Table:3. Cytological distribution of various lymphadenopathies**

Sl. No.	Cytological Diagnosis	Number of cases	Percentage (out of 569 cases)
1	Reactive Hyperplasia	152	26.71 %
2	Granulomatous pathology	62	10.89 %
3	Necrotising	56	9.84 %
4	Tuberculosis	101	17.75 %
5	Acute Suppuration	104	18.27 %
6	Metastatic	91	15.99 %
7	Primary – NHL/HL	1	0.17 %
8	Inconclusive	2	0.35 %
	TOTAL	569	

Colloid goitre was the common cytological diagnosis reported in our study. Out of total 152 thyroid lesions colloid goitre was reported in 95 (62.50%) cases, followed by thyroiditis in 23 cases (hashimoto's thyroiditis in 17 cases and lymphocytic/granulomatous thyroiditis in 6 cases) (Table 4). Skin and soft tissue lesions were recorded in 148 (15.88%) cases. Epidermoid/Inclusion cyst was the most common lesion in 102 (68.92%) cases followed by benign cystic lesions and lipoma. Among the salivary gland lesions, pleomorphic adenoma was the commonest lesion with 17 (54.83%) cases, followed by sialadenitis in 5 cases, mucoepidermoid carcinoma 2 cases, acinic cell carcinoma one case, one case of adenoid cystic carcinoma and 5

cases of benign cystic/lipomatous lesion. It is observed that out of total 932 cases, 520 (55.79%) cases were inflammatory in nature, 313 (33.58%) cases benign and 99 (10.62%) cases were malignant (Table 5). Metastatic carcinoma to lymph nodes (91 cases) was the most common type of malignancy followed by primary salivary malignancy. Metastatic carcinoma to the lymph nodes was seen in 91 (91.91%) cases, and all cases were deposits of squamous cell carcinoma. Primary salivary carcinoma and papillary carcinoma of thyroid constituted 4 and 3 cases respectively.

**Table: 4. Cytological Distribution of various thyroid swellings**

Sl. No.	Cytological Diagnosis	Number of cases	Percentage (out of total 152 cases)
1	Colloid Goitre	95	62.50 %
2	Hashimoto's thyroiditis	17	11.18 %
3	Follicular Neoplasm	16	10.52 %
4	Papillary carcinoma	3	1.97 %
5	Lymphocytic/Granulomatous thyroiditis	6	3.94 %
6	Adenomatous Goitre	15	9.86 %
	TOTAL	152	

**Table:5. Distribution of nature of head and neck swellings**

Sl No.	Nature of Swelling	Number	Percentage
1	Inflammatory	520	55.79 %
2	Benign	313	33.58%
3	Malignant	99	10.62%
	TOTAL	932	

#### Discussion:

The present study was undertaken to assess the incidence and nature of various head and neck swellings by FNAC. FNAC results from 932 patients with head and neck masses were reviewed and analysed. The results were analyzed according to age, gender, site of origin, anatomic location and nature of swelling. In the present study the peak age group was 2nd decade constituting 25.00% followed by first decade (21.13%) of all patients with head and neck lesions. Study conducted by Ajay S.T. et al and Singhal P et al observed that head and neck lesions were relatively common in second to fourth decade, age ranging from 1 to 70 years<sup>9,10</sup>. Similar observation was also seen by Md. Mohmudul Haq et al and Uddin MS et al<sup>11,12</sup>.

Cytological findings of different lymph node and thyroid swellings were analysed and divided accordingly. In the present study out of total 932 cases lymph node swelling constituted highest in 569 (61.05%) cases followed by thyroid swellings 152 (16.31%) in second place and swellings originating from skin and soft tissue 148 (15.88%) in third place. It is observed that our results are in correlation with study conducted by Shaan K et al who observed lymph nodes in 185(64.1%) cases, followed by thyroid lesions 49(16.9%)<sup>13</sup>. Ajay ST et al also observed maximum number of aspirates were from lymph nodes (50.8%) followed by thyroid gland (32.6%), salivary glands (10.4%)<sup>9</sup>. Similar findings were also reported by Singhal P et al with 48.09% (26 cases) from lymph node lesions, 28.39% (30 cases) benign from thyroid gland lesions, 16.95% (35 cases) from salivary gland lesions and 6.57% (16 cases) from miscellaneous lesions of head and neck<sup>10</sup>. Richa Sharma et al in their study reported maximum number of aspirates were from lymph nodes 60.8%<sup>14</sup>.

In our study, out of total 569 lymphadenopathies the most common diagnoses were reactive/nonspecific lymphadenitis with 152 (26.71%) cases, acute inflammatory/suppuration in 104 (18.27 %) cases and tuberculous lymphadenitis in 101 cases (17.75 %). Study conducted by Apoorva KP et al observed reactive lymph node highest in 38.7% cases followed by tuberculosis in 25.7% cases, granulomatous lesions in 13.5% cases and metastatic nodes in 10.2 % cases<sup>15</sup>. In the present study, we observed that inflammatory lesions (55.79 %) were the most commonly encountered head and neck swellings followed by benign (33.58%) and malignant lesions (10.62%). Our results were in correlation with the results of Gupta et al who observed similar findings in relation to nature of head and neck swellings<sup>16</sup>. However, granulomatous/tubercular lymphadenitis was the most common cytological diagnosis in studies conducted by Shaan K et al & Setal C et al.<sup>13,17</sup>.

In India, an important cause of superficial lymphadenopathy is

tuberculosis. Ahmad et al in his study observed tuberculous lymphadenitis was the commonest diagnosis (36%) followed by reactive/non-specific lymphadenitis (18%)<sup>18</sup>. Various types of cytological appearances have been described in tubercular lymphadenitis which includes the following four categories: epithelioid granulomas with caseous necrosis, epithelioid granulomas without necrosis, necrosis only without epithelioid granulomas and polymorphs with necrosis with or without epithelioid granulomas<sup>18</sup>. The combination of FNAC with ZN staining for AFB is of utmost significance as a diagnostic modality in these lesions. A study conducted at a referral centre for tuberculosis in New Delhi showed a higher incidence of tubercular lymphadenitis at 55% and overall AFB positivity at 71%<sup>19</sup>.

In the present study, thyroid swelling constituted 16.31 % (152 cases) of total palpable head and neck swellings and which is similar to the finding observed by Shaan K et al<sup>13</sup>. A study conducted by Apoorva KP et al in 1272 cases with head and neck swellings observed thyroid lesions in 25.47% (324) cases<sup>15</sup>. In our study among the thyroid lesions colloid goitre was the most common cytological diagnosis in 95 (62.50%) cases followed by thyroiditis of different varieties in 23 (15.13%) cases, follicular neoplasm in 16 (10.52%), adenomatous goitre 15 (9.86%) and papillary carcinoma in 3 (1.98%) cases. Rout et al (2011)<sup>24</sup> in his study recorded colloid goitre in 42.2% cases, whereas Apoorva KP et al observed colloid goitre in 64.5% cases and thyroiditis in 18.2% cases<sup>15,20</sup>. In the malignant category, it was observed that commonest site of malignancy in head and neck region was cervical lymph nodes. Squamous cell carcinoma is one of the commonest tumours in the head and neck region. It usually presents late and with nodal metastasis. Metastatic squamous cell carcinoma is the earliest diagnosis on FNAC. In present study, out of 932 cases malignancy was reported in 10.62% of cases. Metastatic carcinoma to the lymph nodes was seen in 91 (91.91%) cases, and all cases were deposits of squamous cell carcinoma. Primary salivary carcinoma and papillary carcinoma of thyroid were recorded in 4 and 3 cases respectively. Similar findings were also observed by Shaan K et al, metastatic lymph nodes was the most common type of cancer and all cases were deposits of squamous cell carcinoma<sup>13</sup>. Malignancy was reported in 25% of cases by Setal C. et al and 7.6% cases by Shaan K et al<sup>13,17</sup>.

In our study, among the salivary gland lesions, pleomorphic adenoma was the commonest lesion with 17 (54.83%) cases, followed by acute sialadenitis in 5 cases, mucoepidermoid carcinoma 2 cases, one case each for acinic cell carcinoma and adenoid cystic carcinoma and 5 cases of benign lipomatous lesion. Similar types of studies conducted by Setal C. et al, Fernandes H. et al and Shaan K. et al have also reported pleomorphic adenoma to be the most common benign tumor and mucoepidermoid carcinoma as the commonest malignant tumor in their series<sup>3,13,17</sup>.

## CONCLUSION:

In conclusion, the present study confirmed that FNAC is an excellent first line investigative method, for diagnosis of nature of palpable head and neck swellings. It has been observed that most of the swellings occurring in the head and neck region are inflammatory and benign in nature. Our study also indicates that apart from reactive lymphadenopathy, tuberculosis and metastatic carcinoma are important and common causes of cervical lymphadenopathy. FNAC is an alternative to open biopsy of lymph nodes and helps as a guide to the appropriate therapeutic management of the lesion. Lastly, there must be a close cooperation between cytopathologists and clinicians for rapid and maximum diagnostic accuracy of palpable head and neck lesions.

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