

# Spectrum Of Head And Neck Swellings In The Rural Population Of India Based On Fine Needle Aspiration Findings

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## Citation

U Jindal, K Singh, A Baghla, A Kochhar. *Spectrum Of Head And Neck Swellings In The Rural Population Of India Based On Fine Needle Aspiration Findings*. The Internet Journal of Head and Neck Surgery. 2012 Volume 5 Number 2.

## Abstract

**Introduction:**Head and Neck swellings are of great clinical significance as underlying disease may range from a treatable infectious etiology to malignant neoplasm. In fact it is also essential to establish the origin of swelling in question sometimes. Fine needle aspiration cytology plays a vital role in solving all this issues, and fine needle aspiration cytology is now being recognized as a rapid diagnostic technique because of its simplicity and high accuracy.**Aim:**This retrospective study was carried out at the Department of Pathology, Maharaja Agrasen Medical Collage, Agroha for a period of Dec 2010 to Dec 2011. The aim was to know the pattern and frequency of head and neck swelling in rural Indian population, and also to know the distribution of these lesions in relation to age and sex.**Result:**A total of 350 cases of head and neck swelling were observed during this period. Age of presentation varied from 1 year to 85 years with male to female ratio of 1.13 to 1. Lymph node enlargement was the commonest cause (50.85%), followed by thyroid lesions (22.85%). Salivary gland lesions comprised 8.5% of all lesions. Tuberculosis/Granulomatous lymphadenitis were the most common lesion observed constituting 19.14 % (n=67) followed by malignant Neoplasm comprising 17.15 % (n=60) among all lesions. Other common cause of swelling in region observed were due to Reactive lymphadenitis (16.85%, n =59), Thyroid Goiter (16%, n=56), Cystic lesion (7.42% n=26) and Abscess/inflammatory lesion (8.28% n=29).**Conclusion:**During the first three decades, most of the swelling of the head and neck region was either due to Tuberculosis/Granulomatous lymphadenitis or due to Reactive lymphadenitis. While in later decades i.e. 4<sup>th</sup> to 6<sup>th</sup> decades, most of the swelling is due to Metastatic carcinoma. Fine needle aspiration cytology is useful in diagnosis and differentiating Neoplastic and Non Neoplastic lesions.

## INTRODUCTION

The diagnosis of head and neck swelling is a common clinical dilemma for surgeons. A large number of diseases can manifest as visible or palpable swelling in the head and neck region. Commonly presenting head and neck masses are due to Lymph node, Thyroid and salivary gland enlargement<sup>(1)</sup>. Less common pathologic conditions which can give rise to swelling in this region are due to Thyroglossal cyst, Branchial cyst, Epidermal cyst and Soft tissue tumors. The proximity of tissue of various types and wide range of neoplasm are responsible for swelling at this site, making this region interesting and challenging in fine needle aspiration cytology diagnosis.

Fine needle aspiration cytology of head and neck masses proved useful in separating inflammatory lesions, which do not require surgical excision from cystic and neoplastic lesions with good certainty. It has contributed great deal to

transform cytology from a primarily screening tool to powerful diagnostic techniques.<sup>(2)</sup>

The sensitivity of Fine needle aspiration cytology for diagnosis of Lymphadenopathy averages 90% with a specificity of 95%. The high degree of diagnostic accuracy, low cost and minimally disruptive nature of procedure makes Fine needle aspiration cytology a highly desirable alternative to open biopsy for investigation of cervical Lymphadenopathy. Many reports have documented the utility of Fine needle aspiration cytology of thyroid for separating patient into operative and non-operative groups. Published results claim a sensitivity and specificity of over 90% in evaluation of thyroid nodule<sup>(3,4)</sup>. The accuracy of Fine needle aspiration cytology for diagnosis of salivary gland nodules is high with studies showing an accuracy of differentiation of benign from malignant lesion to be greater than 90%.<sup>(5)</sup>

## Spectrum Of Head And Neck Swellings In The Rural Population Of India Based On Fine Needle Aspiration Findings

In this study, spectrum of various lesions presented in the head and neck region were observed based on cytological findings.

### METHODS AND MATERIAL

This retrospective study was done in the Department of Pathology, Maharaja Agrasen Medical Collage, Agroha. A total of 350 cases who presented with head and neck swelling, during a period of Dec 2010 to Dec 2011 were selected. All the required data like clinical details, smoking, chewing tobacco, duration of swelling, change in size and associated systemic symptoms were noted.

Fine needle aspiration cytology was done under aseptic condition using a 23 gauge needle fitted to 10 ml disposable syringe attached to plunger. Smears were prepared and stained with May- Grunwald Giemsa stain (MGG), haematoxylin and eosin (HandE) and Papnicolaou stain. The Zeihl- Neelsen stain for AFB was done in those cases, where the clinical suspicion or diagnosis was tuberculosis and in those cases, where purulent or cheesy material was aspirated. Repeat Fine needle aspiration cytology was done in cases where the yield was inadequate in the first aspiration.

### OBSERVATIONS AND RESULTS

The present study includes 350 patients who had undergone FNAC for head and neck swellings during a period of Dec 2010 to Dec 2011 at the Department of Pathology, Maharaja Agrasen Medical College, Agroha. Swellings were divided into different categories depending upon underlying pathology and their relative distribution is shown in Table-1. The most common lesions were an enlarged lymph nodes due to inflammation either because of Tubercular/Granulomatous inflammation (19.14%) or Reactive lymphadenitis (16.85%).

Others were, malignant neoplasm (17.15%), benign neoplasm (4.85%), Non neoplastic thyroidgoiter (16%), Sialadenitis (4.57%), abscess (8.28%), cysticlesions (7.42%), Thyroiditis (4.28%) and indeterminate (1.43%) where on Fine needle aspiration cytology it was not possible to categorize lesion as malignant, benign or non-neoplastic.

**Figure 1**

Results of FNAC showing the relative frequencies of various Pathological conditions

S. No.	Diagnosis	Number of cases	Percentage
1	Tubercular/Granulomatous lymphadenitis	67	19.14%
2	Malignant neoplasm	60	17.15%
3	Reactive lymphadenitis	59	16.85%
4	Thyroid goiter	56	16%
5	Abscess/Inflammatory	29	8.28%
6	Cystic lesions	26	7.42%
7	Benign neoplasm	17	4.85%
8	Sialadenitis	16	4.57%
9	Thyroiditis	15	4.28%
10	Indeterminate	5	1.43%
11	Total	350	

There were 186 male patients (53.15%) and 164 (46.85%) female patients with male to female ratio of 1.13:1. Malignant neoplasm and Reactive lymphadenitis were common in male patients while thyroid lesions and Tubercular/Granulomatous lymphadenitis were seen more frequently in female patients as shown by Table -2

**Figure 2**

Sex wise distribution of cytological diagnosis

S. No.	Diagnosis	Male	Female
1	Tubercular/Granulomatous lymphadenitis	25	42
2	Malignant neoplasm	45	15
3	Reactive lymphadenitis	37	22
4	Thyroid goiter	12	44
5	Abscess/Inflammatory	19	10
6	Cystic lesions	21	5
7	Benign neoplasm	11	6
8	Sialadenitis	12	4
9	Thyroiditis		15
10	Indeterminate	4	1
11	Total	186	164

Lymph node enlargement was the most frequent cause (50.85%) of head and neck swellings, followed by thyroid pathology (22.85%). Salivary gland comprised 8.51% of all lesions and others which includes Abscess, Cysts, Soft tissue neoplasm constitute 17.71 %.( Table-3)

**Figure 3**

Site wise distribution of head and neck swellings observed

S. No	Site of lesions	Number	Percentage
1	Lymph node	178	50.85%
2	Thyroid	80	22.85%
3	Salivary gland	30	8.51%
4	Others(Abscess ,Cysts, Soft tissue neoplasm)	62	17.71%
5	Total	350	

Age group wise distribution is shown in Table-4.

Tubercular/Granulomatous lymphadenitis (80.6%) and Reactive lymphadenitis (79.6%) were seen more frequently during first three decade of life while malignant neoplasms were common after third decade (90%).

**Figure 4**

Age group wise distribution of cytological diagnosis

S. No	Categories	0-10 years	11-20 years	21-30 years	31-40 years	41-50 years	51-60 years	>60 years	Total
1	Tubercular/Granulomatous lymphadenitis	10	12	32	7	4	2	-	67
2	Malignant neoplasm	1	1	4	11	21	6	16	60
3	Reactive lymphadenitis	16	16	15	6	2	2	2	59
4	Thyroid goiter	1	7	16	8	17	6	1	56
5	Abscess/Inflammatory	9	3	6	3	4	1	3	29
6	Cystic lesions	2	6	8	5	3	1	1	26
7	Benign neoplasm	1	-	-	8	3	2	3	17
8	Saladenitis	-	4	4	3	1	2	2	16
9	Thyroiditis	-	2	4	6	2	1	-	15
10	Indeterminate	-	-	1	1	1	1	1	5
11	Total								350

Among the benign neoplasm, pleomorphic adenoma was the most common followed by Lipoma which is found as soft tissue swelling around nape of neck. (Table-5) The indeterminate group includes cases of Follicular or Hurthle cell neoplasm which on a cytology basis could not be classified as benign or malignant. It also includes two cases where the cytologically possibility of both Mucus retention cyst and mucoepidermoid carcinoma was given.

**Figure 5**

Distribution of Benign swellings of head and neck

S. No.	Diagnosis	Numbers	Percentage
1	Pleomorphic adenoma	7	2%
2	Warthin tumor	2	0.58%
3	Oncocytoma	1	0.28%
4	Lipoma	5	1.42%
5	Spindle cell lesion	2	0.58%
6	Indeterminate	5	1.42%

Metastatic carcinoma was the most common cause of malignant neoplasm accounting for nearly 76% of all malignant tumors seen. (Table-6). The next common malignant tumor observed was lymphoma (10%) and papillary carcinoma (8.33%).

**Figure 6**

Distribution of Malignant swellings of head and neck

S. No.	Diagnosis	Numbers	Percentage
1	Metastatic carcinoma	46	13.14%
2	Mucoepidermoid carcinoma	2	0.58%
3	Lymphoma	6	1.71%
4	Papillary carcinoma	5	1.42%
5	Anaplastic carcinoma	1	0.28%
6	Total	60	

**DISCUSSION**

Most of the patients coming to our hospital belong to rural areas. They have low socioeconomic status and low education level. Many of them regularly chew tobacco and smoke and are generally ignorant about their health. So, infectious diseases and malignant conditions constitute a significant proportion of health problems among them.

Diagnostic cytology when performed by well trained experienced individual offers a high degree of reliability and feasibility. In our study the spectrum of lesion observed from the various regions in head and neck confirms its utility as an effective tool in the diagnostic workup of this area.

Tubercular/granulomatous lymphadenitis was the most common condition in our study, accounting for 19.14% which is comparable to similar study carried out by Manjula

K et al.<sup>(6)</sup> Frequency of incidence varies from 20% to 60% in different studies.<sup>(7,8,9,10)</sup> The diagnosis of tuberculosis was made in the presence of necrotizing epithelioid granulomas and offered immediately when AFB were demonstrated. The presence of granulomas alone in the absence of necrosis was not considered diagnostic of tuberculosis and was placed under granulomatous lymphadenitis. Most of our patients in this category were young females and were in their first three decades of life. Lack of outdoor activity, poor nutrition and ignorance of female health in our country could be contributing factors. Malignant neoplasms were the second most common group (17.15%) and the commonest cause of neck swelling in patients older than 40 years. Frequency of incidence in different studies vary from 7.5% to 38.6%<sup>(8,11,12)</sup>. Metastatic carcinoma was the most common cause of malignancy (13.14%) and usually presents as hard, solid mass in old age male. Next common group in this category was lymphoma (1.71%) which includes four cases of Hodgkin's and two of Non Hodgkin lymphoma. There were five cases of papillary carcinoma and one case of Anaplastic carcinoma of thyroid together comprising 1.70% of all lesions. Among salivary gland malignant lesions, two cases of mucoepidermoid carcinoma were seen.

There were five cases which were placed under the category of Indeterminate because cytologically it was not possible to group them in either of benign or malignant types. For example cytologically it is not possible to differentiate between benign and malignant follicular lesion as it requires histological evidence about status of capsule.

Reactive lymphadenitis was the next commonest condition in our study (16.85%) and was seen in young children frequently. Reactive lymphadenitis may occur as part of specific disease or purely as non specific response. Results are comparable to study done by Ahmad et al.<sup>(7)</sup>

Non neoplastic thyroid lesions i.e. goiter accounted for 16% of head and neck swellings. Most of the patients were female and were seen commonly during third to fifth decades of life. We had good number of Thyroiditis patients which presents as diffuse firm thyroid lesion clinically. Cytologically smears show two types of population comprising of lymphoid series cells and variable number of follicular cells with minimal colloid in the background. Hurthle cell metaplasia, giant cells and epithelioid cells were also seen.

Benign neoplasm's of neck swelling accounted for 5.7%

which is comparable to study done by Manjula et al.<sup>(6)</sup>. The most common benign lesion was pleomorphic adenoma of salivary gland, followed by Warthin tumor. Pleomorphic adenoma was seen commonly during the fourth decade of life while Warthin tumor was common in old age males. Among soft tissue tumors, Lipoma was seen more frequently than others and common site was nape of neck.

Cystic lesions were found in 7.46% of cases comparable to other studies.<sup>(6,8,11)</sup> The common cyst was epidermal cyst (40%). others were Thyroglossal cyst, Branchial cyst and mucus retention cyst of salivary gland. Sialadenitis comprised 4.57% of all lesions and patients usually presents as firm swelling around submandibular area. Cytologically smears were hypocellular and show few ductal or acinar cells with inflammatory infiltrate along with fibrotic stromal fragments.

Acute inflammatory process i.e. abscess comprised significant number in our study (8.28%) and cytologically shows neutrophils and nuclear debris with fibrinoid background.

## CONCLUSION

It is concluded from the present study that there is wide range of diseases that can present as head and neck swelling and can be diagnosed by Fine Needle Aspiration. Tubercular and reactive lymphadenitis is the most common cause of head and neck swelling in children and adolescence. Metastatic carcinoma is the most common malignant neoplasm in this region and seen in old aged male patients. Fine needle aspiration cytology of head and neck region is useful in diagnosis, can differentiate neoplastic and non-neoplastic lesions.

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