

Cytomorphological Spectrum of Non-thyroidal Palpable Head and Neck Lesion

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ABSTRACT

Background: Palpable Lesions in Head and Neck range from inflammatory lesions to neoplasms, both benign and malignant. A palpable neck lesion in an adult, present longer than a week is pathological until proven otherwise. Fine needle aspiration cytology (FNAC) is one of the most valuable tests available in the initial assessment of a patient with a mass in the head and neck region. We aim to study cytomorphological features of non-thyroidal palpable Head and Neck lesions.

Methods: The study was conducted on 500 patients with non-thyroidal palpable Head and Neck masses who visited various OPDs of GMERS Medical College and General Hospital Sola, Ahmedabad, from August 2017 to July 2019. All the palpable Head and Neck masses were aspirated in the Cytology laboratory and examined cytomorphologically under the microscope.

Results: The M:F ratio was 1.13:1. Maximum cases were 31-40 yrs. The head and neck lymph nodes were the most common site aspirated, followed by salivary glands. Unilateral lesions were more common. Among 500 cases, Inflammatory lesions were 56.0%, benign tumours 15.4%, Tuberculosis 14.6%, malignant tumours 12.8%, where secondary metastatic tumour were in 10.8% of cases and Primary malignant tumour were in 2% of cases. Inflammatory lesions were the most common lymph node lesions, benign lesions were common in salivary glands, and soft tissue lesions. The oral cavity had equal lesions.

Conclusion: Fine needle aspiration of head and neck swellings is an efficient tool to confirm the diagnosis of various neoplastic, non-neoplastic and inflammatory lesions before any surgical interventions.

Key-words: Cytomorphology, Fine needle aspiration cytology (FNAC), Inflammatory lesions, Lymph node, Salivary glands, Tuberculosis, Tumours

INTRODUCTION

Palpable lesions in the Head and Neck region have common clinical findings and affect all age groups. These lesions range from inflammatory to neoplasm, including both benign and malignant. A palpable neck lesion in an adult that is present for longer than a week is pathological until proven otherwise.

For ease of discussion, the lesions have been divided according to their anatomic sites ^[1], such as the Oral cavity, particularly oral soft tissues, including the tongue. Upper airways including the nose, pharynx, larynx, and nasal sinuses Ears Neck particularly thyroid, parathyroid, lymph nodes Salivary glands Orbital lesions Skin lesions involving the head and neck regions.

Fine needle aspiration cytology (FNAC) is one of the most valuable tests available in the initial assessment of a patient with a mass in the head and neck region or where a recurrence is suspected after previous treatment. This technique is an excellent first-line method for investigating the nature of palpable lesions in the head and neck region. ^[2]

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The value of FNAC is not only limited to neoplastic conditions. Still, it is also valuable in diagnosing inflammatory, infectious, and degenerative conditions in which samples can be used for microbiological and biochemical analysis in addition to cytological preparations.^[3]

The preferred method of obtaining biopsy material from a neck mass is FNA, which is generally well tolerated and can usually be performed without local anaesthesia. It is an invasive diagnostic procedure with a small but definable risk of potential problems, e.g., bleeding and sampling error.

MATERIALS AND METHODS

The present study was conducted on 500 patients with non-thyroidal palpable head and neck masses who visited various OPDs of GMERS Medical College and General Hospital, Sola, Ahmedabad, from 1st August 2017 to 31st July 2019. All the palpable head and neck masses were aspirated in the institute's Cytology laboratory and pathology department and examined cytomorphologically under a microscope. Fine Needle Aspiration diagnosis was correlated with details of relevant clinical findings and investigations.

Exclusion criteria- All head and neck swelling except thyroid swelling

Inclusion criteria- Thyroidal swelling

Methodology- The procedure and its indications were explained to the patient. Informed consent was taken. When positioning the patient for the fine needle aspiration, they were placed in a comfortable position, prone position on an examination couch with easy access from either side or sitting position on an examination chair by which mass must be palpable and easily grasped during fine needle aspiration. The nature of the lesion and its anatomical location, among other structures, were determined first. The skin over the lesion was decontaminated by applying rectified spirit, followed by betadine, and then again rectified spirit. After immobilizing the lump with one hand, a fine needle of 22 or 23 gauges with an attached 5ml syringe was introduced into the lump until the tip of the needle reached the centre of the nodule. The plunger of the 5ml disposable syringe was then withdrawn slowly, creating negative pressure in the syringe. The needle was moved

back and forth in different directions within the mass to collect samples from different areas around it. Negative pressure was maintained throughout the procedure in the syringe by keeping the plunger retracted. When the aspiration was felt to be complete, the plunger was released to equalize the pressure in the syringe before withdrawing the needle, thereby preventing the loss of cells from the lumen of the needle to the syringe. The needle with the syringe was then withdrawn. Pressure with a sterile gauze piece was applied at the site of aspiration for some time to stop any leakage of blood.

The needle detached from the syringe, and then air was drawn into the syringe and reattached to the needle. Keeping the needle tip on the surface of a clean, grease-free glass slide, the syringe plunger was advanced to force the aspirated material onto the slide. If the aspirate was fluid, a film was made with the help of another angled slide already dipped in absolute alcohol, like the peripheral blood smear preparation. The smears were fixed with 95% ethyl alcohol and stained with Haematoxylin–Eosin-stain.^[3]

Statistical Analysis- The data analysis used descriptive statistics for a percentage of non-thyroidal neck lesions and distributed them by age, sex, sites, and cytological diagnosis.

Ethical Approval- Ethical approval for this study was obtained from the Institutional Review Board of the tertiary care hospital in Gujarat, India. Informed consent was secured from all participants before their inclusion in the research, ensuring adherence to ethical standards in medical research.

RESULTS

In the present study, the maximum number of cases was in the fourth decade (31-40 yrs), followed by the third (21- 30 yrs) and the second decade (11-20 yrs). Of the 500 cases, 276(55.2%) were males and 224(44.8%) were females. The M: F ratio was 1.13:1. Thus, a slight male preponderance was observed. The head and neck lymph nodes were the most common site aspirated, followed by salivary glands. Among 500 cases, 397 cases were of lymph nodes (Table 1). Unilateral lesions were more common than bilateral lesions (Table 2).

Table 1: Site-specific incidence of lesion among study participants

Site of Lesion	Number (%)
Lymph node	397 (79.4)
Salivary gland	62(12.4)
Soft tissues and miscellaneous	39 (7.8)
Oral Cavity	02 (0.4)
Nasal cavity and paranasal sinuses	00 (0.0)

Table 2: Distribution of study participants according to bilateralism of lesions

Bilateralism of Lesion	Number (%)
Unilateral	458 (91.6)
Bilateral	42 (8.4)

Among 500 cases, Inflammatory lesions seen in FNAC were reported in 56.0% of cases, followed by Benign tumors in 15.4%, Tuberculosis in 14.6% and Malignant

tumors in 12.8 % of cases, secondary metastatic tumor reported in 10.8% of cases & Primary malignant tumor lesion was reported in 2.0% cases (Table 3).

Table 3: FNAC diagnosis of lesion among study participants

FNAC Diagnosis	Number (%)
Inflammatory Lesions	280 (56.0)
Benign Tumor	77 (15.4)
Tuberculosis	73 (14.6)
Secondary metastatic tumor	54 (10.8)
Primary Malignant Tumor	10 (2.0)
Insufficient material	06 (1.2)

Inflammatory lesions were the commonest in lymph node lesions, while benign lesions were the majority in salivary glands and soft tissue lesions. Oral cavity had

equal lesions of inflammation and malignancy. Cases that showed insufficient material for diagnosis were the most common in lymph node lesions (Table 4).

Table 4: Association between site specific lesion and cytological categorization (N=500)

Site	Cytological Diagnosis					Insufficient Material	p-value*
	Inflammatory	Benign	TB	Primary Malignant	Secondary Metastasis		
Lymphnode	253	4	73	8	54	5	<0.005
Salivary gland	20	40	0	1	0	1	
Soft tissues	4	35	0	0	0	0	
Oral cavity	1	0	0	1	0	0	
Total	280(56%)	77	73	10	54	6	

* = Chi-square Test

The lymph node was the commonest site aspirated. The city-diagnosis given in the 397 lymph node cases are as follows. Reactive lymphadenitis and acute lymphadenitis form most lymph node diagnoses (30.7% and 19.4) followed by Tuberculous lymphadenitis in 18.4% of cases. Also, metastatic malignancies (13.6%) were commoner than primary lymph node malignancies, including lymphomas (2.01%) (Table 5).

Table 5: Cyto-diagnosis in lymph node lesions among study participants

Lymph node Diagnosis	Number (%)
Reactive Lymphadenitis	122 (30.7)
Acute Lymphadenitis	77 (19.4)
Tuberculous Lymphadenitis	73 (18.4)
Secondary metastasis	54 (13.6)
Chronic Granulomatous Lymphadenitis (CGL) (excluding TB)	50 (12.59)
Infectious Mononucleosis	4 (1.0)
Hodgkins's lymphoma	4 (1.0)
Sinus Histiocytosis with massive lymphadenopathy	4 (1.0)
Non-Hodgkin's lymphoma	2 (0.5)
Langerhans cell histiocytosis	2 (0.5)
Insufficient Material	5 (1.3)

Salivary gland lesions were the next most common head and neck lesions. Sixty-two (62) cases of the thyroid were given the following diagnoses. Benign lesions were the commonest diagnoses. Pleomorphic adenoma (40.32%) followed by inflammatory conditions [Chronic sialadenitis (25.80%)] were the most frequent diagnosis (Table 6).

Table 6: Cyto-diagnosis in salivary gland lesions among study participants

Salivary Gland Diagnosis	Number (%)
Pleomorphic Adenoma	25 (40.32)
Chronic sialadenitis	16 (25.80)
Benign cystic lesion	10 (16.12)
Acute sialadenitis	4 (6.45)
Mucocele	4 (6.45)

Warthin's tumor	1 (1.61)
Adenocarcinoma of salivary gland	1 (1.61)
Insufficient Material	1 (1.61)
Total	62(100)

Among various soft tissue and miscellaneous lesions, epidermal cysts are common and account for 46.15% of the present study (N=39). In the present study, two cases of the oral cavity were observed, which were inflammatory and round cell tumor (Table 7).

Table 7: Cyto-diagnosis in soft tissue & miscellaneous lesions among study participants

Soft Tissue & miscellaneous lesions Diagnosis	Number (%)
Epidermal Cyst	18 (46.15)
Lipoma	14 (35.89)
Dermoid Cyst	4 (10.25)
Neurofibroma	3(7.69)

DISCUSSION

Lesions of the Head and Neck is an easy-sounding title for a complex subject matter. This title stands for an accumulation of diverse diseases occurring in different organs whose relationship to each other consists in the fact that they are located between the base of the skull and the thoracic aperture. One reason for assembling all these different organs under the title "Lesions of the Head and Neck" is that the proximity of the organs of the head and neck region makes it difficult for the surgical pathologist to focus on one of these organs and neglect the pathology of others, which are only a centimeter apart. Thus, head and neck lesions are an arbitrary compilation of diseases and, at least to some extent, a group of disease entities with a common morphological and pathogenetic trunk.^[4]

The present study finding shows that most patients belonged to the fourth decade (31-40 years age group). The findings of the present study correlated with other Indian studies done by Nanik *et al.* ^[5], Amatya *et al.* ^[6], Kishor *et al.* ^[7], Soni *et al.* ^[8] and Wahid *et al.* ^[9]. In contrast, a study by Mohamed *et al.* ^[10] in Malaysia showed a mean age of 55.5 years.

The present study shows that 55.2% of patients were male and 44.8% were female. Male: female ratio was



1.13: 1, which was comparable to other Indian studies done by Soni *et al.* [8], Wahid *et al.* [9], Rathod *et al.* [11] and Meenai *et al.* [12], which showed male preponderance in their studies, while other Indian studies done by Kishor *et al.* [7], Muddegowda *et al.* [13] and Ahmed *et al.* [14] showed female preponderance in their studies.

The lymph node was the commonest site to be aspirated, followed by the salivary gland amongst all non-thyroidal head and neck lesions in the present study, which was by other studies [6-8,14]. In our study, 40.6% of cases are inflammatory lesions, 15.4% are benign tumors, 14.6% are tuberculosis and 12.8% are malignant tumours, which was concordant with other Indian studies done by muddegowda *et al.* [13] and Ahmed *et al.* [14] and foreign studies were done by El Hag *et al.* [15] in Saudi Arabia and Mohamed *et al.* [10] in Malaysia.

Lymph node FNAC, the commonest diagnosis was Inflammatory which was 63.73%, followed by Tuberculous lesions at 18.38%, benign tumors 1% and malignant tumours at 1.61%, which was similar to other Indian studies done by Muddegowda *et al.* [13] and a foreign study by Al-Qudehy *et al.* [16] in Saudi Arabia, while a survey by Kishor *et al.* [7] Maharashtra shows there was more incidence of tuberculous lesions than inflammatory lesions. This can be due to the high prevalence of tuberculosis.

Benign tumors (64.51%) were the most common lesion and malignant tumors (1.61%) were the least common. These findings were similar to those of other Indian studies by Meenai *et al.* [12], Khandekar *et al.* [17] and Nanik *et al.* [5], while a study by Kishor *et al.* [7] shows that inflammatory lesions were the most common lesions. Out of 500 cases, 39 cases were of soft tissue tumours. Epidermal cysts (46.15%) were the most common lesion followed by lipoma (35.89%), comparable with other studies done by Kishor *et al.* [7] and Nanik *et al.* [5]. In contrast, in the study by Meenai *et al.* [12], lipoma was the most common diagnosis, followed by epidermal cysts.

CONCLUSIONS

Fine needle aspiration cytology is a simple, quick, cost-effective, safe, repeatable, accurate, and rapid diagnostic procedure used to evaluate head and neck lesions. It can be performed in an outpatient setting without anaesthesia, saving the patient valuable time and money with fewer psychological implications. It offers the advantage of better patient compliance because it is a

minimally invasive procedure and helps to avoid surgery in Non-neoplastic, Inflammatory conditions.

In our study, the male-to-female ratio was 1.13: 1. Lymph node was the most common site involved among study cases. The most common cases were Inflammatory lesions followed by Benign tumors and tuberculous lesions. The association between cytological diagnosis and lesion site was statistically significant. Reactive Lymphadenitis was the most common diagnosis, followed by acute lymphadenitis and tuberculous lymphadenitis among all lymph node lesions. Pleomorphic adenoma was the most common diagnosis of salivary gland lesions.

CONTRIBUTION OF AUTHORS

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