## **Original Research Article**

DOI: http://dx.doi.org/10.18203/issn.2454-5929.ijohns20191726

# Diagnostic outcome of fine needle aspiration cytology in 400 cases of head and neck masses in tertiary care center

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Received: 17 December 2018 **Revised:** 05 February 2019 Accepted: 06 February 2019

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#### **ABSTRACT**

Background: The objective of the study was to identify various lesions of neck swellings and to study their distributions according to age, sex and site and to find out distribution of malignant, inflammatory and infective lesions in neck swellings.

Methods: The prospective study was conducted in the department of ENT, SCL General Hospital, NHL MMC, Saraspur, Ahmedabad from July 2014 to July 2016. All indoor and outdoor 400 patients of SCL hospital presenting with palpable head and neck swellings were referred to the cytology section at SCL hospital for FNAC and included in present study.

Results: In our study out of 400 cases, lymph nodes constituted 276 cases with female preponderance. Among the inflammatory lesions, commonest lesion was tuberculosis which comprised of 147 cases followed by 64 cases of reactive lymphadenitis. In thyroid lesions the male: female ratio was 1:18, with maximum incidence in age group of 20-50 years. Total 95 cases were observed, out of which benign thyroid lesions (Bethesda grade II) were most common (92.63%). Salivary gland comprised of 11 cases, Out of 10 benign neoplastic lesions, 9 cases of pleomorphic adenoma and 1 cases of Warthin's tumor were found.

Conclusions: FNAC is a very simple and expeditious procedure which can be carried out without much problem. It reduces the necessities to perform excisions biopsy in many cases. Thus, FNAC can be recommended as a first line of investigation in the diagnosis of neck swellings and can be adopted as an outpatient procedure, thus reducing the cost and time of hospitalization.

Keywords: Fine needle aspiration cytology, Head and neck masses, Thyroid swelling, Lymph node, Prospective study

#### INTRODUCTION

Certain diseases have either systemic or local manifestations. Diseases with local manifestations usually were seen in the form of swellings which were visible and palpable. Neoplasms were further classified as benign or malignant, which was either primary or metastatic. Lesions of the head and neck regions are routinely encountered by clinicians, in patients across all age groups and diagnoses range from reactive hyperplasia of lymph nodes to malignancies. To recognize and evaluate the type of swellings as infective, benign or malignant, in the head and neck region, fine needle aspiration cytology is very safe and reliable procedure as far as the surgeons and physicians were concerned in the management and treatment of the underlying disease.

FNAC as a diagnostic technique to evaluate head and neck lesions was first introduced by Martin in 1930 due to the easy accessibility of target sites and the minimally invasive method.<sup>1</sup>

Fine needle aspiration cytology is a part of diagnostic pathology that is the simplest, least expensive, least discomforting, rapidly diagnostic and easy-to-perform procedure, particularly for the palpable swelling of the head and neck region.

Certain lesions call for biopsy after an FNAC procedure. Such conditions are:

- When cytology does not rule out the possibility of malignancy.
- In lymph node where definite diagnosis is not obtained, as in mixed cell lymphomas.
- When typing of malignancy is necessary
- When aspirates are repeatedly unrepresentative or inconclusive in the presence of a definite mass lesion.

Cancer is among the ten leading causes of death in India, and head and neck neoplasia in India accounts for 23% of all cancers in male and 6% of all cancers in females.<sup>2</sup> The highest incidence of head and neck neoplasia, in the world, among women has been reported from India. A early diagnostic FNAC plays an important role for early diagnosis.<sup>3,4</sup> There is no evidence that the tumour spreads through the skin track created by the fine needle used in this technique.<sup>5</sup> This procedure can be both diagnostic and therapeutic in neck swellings.<sup>6</sup>

## Aims and objectives

- To identify various lesions of neck swellings and to study their distributions according to age, sex and site.
- To find out distribution of malignant, inflammatory and infective lesions in neck swellings.

## **METHODS**

A prospective study was conducted in all indoor and outdoor patients presenting with palpable head and neck swellings at the Department of ENT, SCL General Hospital, NHL MMC, Saraspur, Ahmedabad from July 2014 to July 2016 were referred to the cytology department for FNAC.

#### Exclusion criteria

Exclusion criteria were non palpable deep seated masses; neck swellings attached to vital structures; pulsatile swelling in neck.

The present study included total cases of palpable head and neck swellings predominately either as outdoor procedures or as pre-operative assessments.

#### Patient preparation

After a detailed explanation of the procedure to the patient and after obtaining consent and co-operation, the patient was made to sit on a chair with a headrest and the lesion to be investigated was palpated and fixed with a finger; the surface was cleaned with spirit and dried. The needle was then inserted into the lesion with the patient being made aware of it.

Pre-aspiration sedation or local anesthesia was not required in any of the cases, unless the patient was highly anxious and agitated.

## Procedure of fine needle aspiration cytology

The skin was cleaned with the use of spirit, betadine and spirit in that order. The needle was attached to a 10 cc plastic syringe. Syringe was manipulated with the dominant hand while the swelling was fixed with the other hand. The needle was inserted centrally into small nodule and peripherally into the larger ones perpendicular to the surface of the skin. There was sensation of resistance as the needle pierced the swelling because of the fibrous capsule, or pseudo capsule, around the tumour mass. Once the needle was within mass, continuous negative pressure was applied by withdrawing the plunger to obtain an adequate specimen. The needle was moved within the circumscribed area with to and fro movements with short stabs and a corkscrew method. Admixture with blood tends to be less if the needle is moved along the same track rather than in multiple directions. The junction of the needle and hub of the syringe was observed while performing actual aspiration. On the appearance of any sample aspirate, the aspiration was stopped before the needle withdrawal. Needle was then gradually drawn from the mass. After withdrawal the needle was detached from the syringe, the plunger completely reattached and finally aspirated specimen was ejected on to the slides. In case of cystic swellings, fluid was aspirated completely and then the residual nodule was aspirated to obtain cellular material. The ideal aspirate has a creamy consistency due to high cell content in a small amount of fluid and remains inside the needle.

## **RESULTS**

Most common anatomical site of for lesions was in the cervical region followed by thyroid region. Cervical region includes all the triangles of neck (Table 1).

The male to female ratio was 1:1.72 which showed female predominance.

The age of the patients with palpable lesions of Head and Neck region, ranged from 2 year to 84 years, with a median age of 44 years. The maximum number of lesions was seen in patients of the age group of 21-30 years (31%) and majority of the lesions were infective lesions and benign neoplasms. The least number of lesions were

seen in patients of the age group of 81-90 years (0.25%) and they were all malignant lesions of either primary or secondary type (Table 2).

Out of 400 cases of palpable head and neck lesions aspirated, majority of the lesions were of the lymph node (276 cases; 69.00%), followed by thyroid lesions (95 cases; 23.75%), miscellaneous lesions such as cystic lesions, benign neoplasm, soft tissue etc. (18 cases; 4.50%) and lesions from the salivary glands which comprised of 11 cases (2.75%) (Table 3).

Table 1: Region wise distribution of palpable head and neck lesions.

Head and neck region	No. of cases	Percentage (%)
Cervical region		
Submandibular region	50	12.50
Submental region	7	1.75
Supraclavicular region	28	7.00
Posterior triangle	182	45.50
Thyroid region	97	24.25
Nape of neck	2	0.50
Scalp region	1	0.25
Pre auricular	11	2.75
Post auricular	13	3.25
Parotid region	9	2.25
Total	400	100

Table 2: Age distribution of palpable head and neck lesions.

Age (years)	No. of cases	Percentage (%)
0-10	33	8.25
11-20	93	23.25
21-30	124	31.00
31-40	48	12.00
41-50	50	12.50
51-60	29	7.25
61-70	18	4.50
71-80	4	1.00
81-90	1	0.25
Total	400	100

Table 3: Organ wise distribution of palpable head and neck lesions.

Organs involved	No. of cases	Percentage (%)
Lymph nodes	276	69
Thyroid gland	95	23.75
Salivary gland	11	2.75
Soft tissue and miscellaneous	18	4.50

Table 4: Etiological distribution of cases.

Organ	Inflammatory	Non Inflammatory		
		Benign	Malignant	Total
Lymph node	255	-	21	276
Thyroid	28	60	7	95
Salivary gland	1	10	-	11
Soft tissue/ Miscellaneous	15	3	-	18
Total	299	73	28	400

Table 5: Incidence of various cytological diagnosis of lymph node.

	Diagnosis	No. of cases	Percentage (%)	Total (%)
Inflammatory	Tuberculous lymphadenitis	62	22.46	90.94
	Reactive lymphadenitis	64	23.18	
	Caseating tuberculous lymphadenitis	39	14.13	
	Cold abscecss	46	16.66	
	Abscess	33	11.95	
	Granulomatous lymphadenitis	2	0.72	
	Hemorrhagic and necrotic material	5	1.81	
Metastatic	Metastatic squamous cell carcinoma	17	6.15	7.59
	Metastatic adenocarcinoma	1	0.36	
	Metastatic carcinoma	1	0.36	
	Neoplastic lesion	2	0.72	
Lymphoma	Lymphoproliferative disorder	4	1.44	1.44
	Total	276	100	100

Table 6: Distributions of various thyroid lesions according to Betl	thesda system.
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	According to Bethesda grading	No. of cases	Percentage (%)
Grade I	Non diagnostic	0	-
Grade II	Benign	88	92.63
Grade III	Atypia or follicular lesion of undetermined significance	0	-
Grade IV	Follicular neoplasm/ suspicious for a follicular neoplasm	3	3.16
Grade V	Suspicious for a malignancy	1	1.05
Grade VI	Malignancy	3	3.16
	Total	95	100

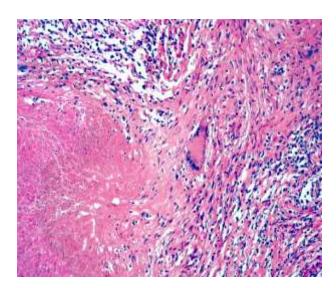


Figure 1: Histologic features of tuberculous lymphadenitis.

Lymph node lesions accounted for 276 cases of the total 400 cases of fine needle aspiration cytology in the present study. Majority of the benign lesion were inflammatory nature i.e. tuberculosis (Figure 1).

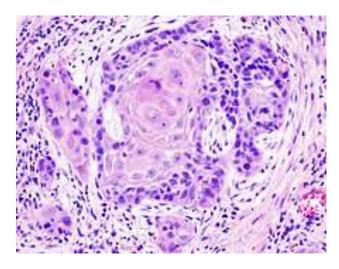


Figure 2: Showing histopathology of metastatic squamous cell carcinoma.

Predominant malignant lesion prone for metastatic deposits was squamous cell carcinoma (Figure 2).

## Thyroid gland

Out of 95 cases of thyroid lesions 88 (92.63%) was from Bethesda cat-II (Figure 3).

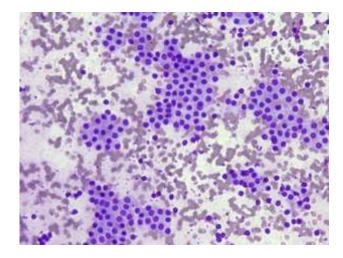


Figure 3: Benign follicular cells in thyroid gland.

#### **DISCUSSION**

Fine needle aspiration cytology has become an accepted method for the work-up of many palpable and radiological demonstrable lesions in neck regions, because of the repeated occurrence of many infective, reactive, cystic and neoplastic lesions in this area.

In present study of 400 cases of various palpable neck swelling were examined by FNAC and its distribution according to age, sex, type of lesions, organ involvement and nature of lesion were evaluated.

In our study out of 400 cases, Lymph nodes constituted 276 cases with female preponderance similar to Tariq Ahmed et al, Kishor et al, Khokle et al study. The Male: Female ratio found 1:1.71.

Age of the patients with lymph node swellings in the present study is between 2 years to 84 years with maximum number of patients belonging to 21-30 years of age similar to Shaan et al, Wahid et al and Gunvanti et al study. 10-12

Out of 400 FNAC of neck swelling lymph node swelling were the most common and accounted for 69% in present study. Similar result were found in Suryawanshi et al, Patel et al and Pawde et al. 8,13,14

Among the inflammatory lesions, commonest lesion was tuberculosis (53.25%) which followed by reactive lymphadenitis (23.18%) similar to Shaan et al and Gunvanti et al study. Studies done in developing countries have consistently shows tuberculoses and reactive/ non specific lymphadenitis to be the commonest causes of neck swellings.

Neoplastic lesions include 21 cases of metastatic deposits in the lymph node, out of which commonest one was squamous cell carcinoma which is more common in males.

Thyroid lesions were categorized according to Bethesda grading. The Male: female ratio was 1:18, with maximum incidence in age group of 20-50 years. Total 95 cases were observed, out of which benign thyroid lesions (Bethesda grade II) (92.63%) were most common.

Salivary gland comprised of 11 cases, Out of which non neoplastic lesions were found in 1 (9.09%) cases. Out of 10 benign neoplastic lesions, 9 (81.82%) cases of pleomorphic adenoma commonest of all salivary gland lesions and 1 (9.09%) cases of warthin's tumor was found. Similar result found in Yogesh and Patel et al study. 13,14

#### **CONCLUSION**

It can thus be concluded from the present study that FNAC can be confidently enlisted as a primary diagnostic tool by clinician. FNAC is a very simple and expeditious procedure which can be carried out without much problem. It reduces the necessities to perform excisions biopsy in many cases. FNAC can be recommended as a first line of investigation in the diagnosis of neck swellings and can be adopted as an outpatient procedure, thus reducing the cost and time of hospitalization. FNAC is very useful for preoperative diagnosis of various lesions of neck region and thus helps the surgeons in selecting the patient for palliative or surgical management. Fine needle aspiration cytology is a valuable supplement to conventional treatment and histopathological diagnosis.

Funding: No funding sources Conflict of interest: None declared

Ethical approval: The study was approved by the

Institutional Ethics Committee

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Cite this article as: Patel AV, Patel NR, Vadher PR, Kakadia MB. Diagnostic outcome of fine needle aspiration cytology in 400 cases of head and neck masses in tertiary care center. Int J Otorhinolaryngol Head Neck Surg 2019;5:665-9.