

**Clinicopathological Profile of Head & Neck Swellings Undergoing FNAC in a Tertiary Care Hospital**Deo Kumar Singh<sup>1</sup>, Sanjay Kumar Sahni<sup>2</sup>, Gluam Tabrez<sup>3</sup><sup>1</sup>Senior Resident, Department of Pathology, JNKTMC, Madhepura<sup>2</sup>Senior Resident, Department of Pathology, JNKTMC, Madhepura<sup>3</sup>Associate Professor & Head, Department of Pathology, JNKTMC, Madhepura**Received: 25-03-2024 / Revised: 23-04-2024 / Accepted: 25-05-2024****Corresponding Author: Dr. Sanjay Kumar Sahni****Conflict of interest: Nil****Abstract:**

**Background and Objectives:** Head and neck swellings are the commonly encountered disorders in our hospital, with a range of inflammatory, benign and neoplastic diseases involving different age groups. This study was undertaken to study the cytological types of inflammatory, benign and neoplastic swellings correlate with histologic result.

**Methods:** Written informed consent is taken from all patients included in the study. The study was carried out on 250 patients in the Department of Pathology at JNKTMC, over a period of 2 year prospective study, Patients was referred to the Cytology section from various departments. Predominantly from the departments of Otorhinolaryngology, General Surgery, Medicine and Paediatrics. The lesions included those from the thyroid, salivary glands, and lymph node, nose and paranasal sinuses.

**Conclusion:** Head and neck swellings are common condition encountered in clinical practice. The advantages of FNAC are, it is safe, gives a quick result, is sensitive and specific for the diagnosis of malignancy, requires minimal equipment, is an outpatient procedure, avoids the use of frozen section, reduces the rate of exploratory procedures, allows a definitive diagnosis of inoperable cases, and is repeatable and cost effective. To conclude, FNAC is a minimally invasive first line investigation with a high sensitivity and specificity for the diagnosis of various head and neck lesions.

**Keywords:** FNAC, Thyroid Gland, Lymph Nodes, Salivary Gland.

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**Introduction**

The diagnosis of a swelling in head and neck is a common clinical dilemma for surgeons. Head and neck mass lesions are frequently found presentations of patients seen in clinical practice. [1] Head and neck lesions are an accumulation of diverse disease & occur in different organs whose relationship to each other consists in the fact that they are located between the base of skull and thoracic aperture. [2] Most commonly seen swellings are branchial cysts, thyroglossal cysts, dermoid cysts, lymphangioma, haemangioma, lymphadenitis, sialadenitis, thyroiditis and neoplastic lesions. [3]

The etiology of head and neck swellings is varied, depends on site and organ involved. Infections, inflammation, immunological processes, gene mutations are the most common. Neoplastic processes can be primary or secondary. When physicians are faced with these patients, the critical tasks are to differentiate benign from malignant lesions, to identify serious medical conditions that because they are of great clinical significance and require specialist care and to reassure the patients who have benign swellings. Thus it is essential to estab-

lish a definitive diagnosis, as early as possible. The development of aspiration cytology is one of the biggest advances in anatomical pathology and is of particular relevance in the head and neck area because of easy accessibility of the target site, excellent patient compliance, minimally invasive nature of the procedure and helping to avoid surgery in non- neoplastic lesions, inflammatory conditions and also some tumors. It has contributed a great deal to transform cytology from a primarily screening tool to powerful diagnostic techniques. The FNAC has an accuracy rate exceeding 92%. Due to its simplicity, rapid diagnostic technique and high accuracy, this study of aspiration cytology plays a vital role to differentiate the infective process from neoplastic one and avoids unnecessary surgeries. [3] The other advantages are that it avoids the use of frozen section, reduces the rate of exploratory procedures, allows a definitive diagnosis of inoperable cases, is cost effective and can be carried out with ease in any age including children. [3,4] Modern imaging techniques, mainly ultrasonography (USG) and compound tomography

(CT), applied to organ and lesions in site not accessible to surgical biopsy offer vast opportunities for percutaneous, transthoracic fine needle biopsy of deeper structures.<sup>9</sup> Thus FNAC has become a first line of investigation in palpable masses anywhere in the body, sometimes replacing the need for surgical biopsy.

### Objectives

To evaluate the utility of aspiration cytology as a first-line diagnostic tool in palpable head and neck masses and correlate with histologic results for evaluating diagnostic accuracy, sensitivity and specificity of the procedure.

### Material and Methods

The present study comprises of FNA cytology of 250 cases of palpable head and neck lesions encountered at JNKTMCH, Madhepura. for a period of 2 years, All aspirations were done by the pathologists. Before the procedure, the patient was informed about the procedure with its advantages and simplicity. His or her consent and co-operation was ensured. A thorough clinical examination of each case was done before the procedure. A chair with a headrest was used for aspiration of the head and neck lesion. Pre-aspiration sedation was not required in all the cases. Anxious and agitated patients were given vocal support and counselling before the procedure.

Local anaesthesia was not used in any of the cases examined. Occasionally, the procedure was repeated in cases where the aspiration was acellular

or inconclusive. A tissue biopsy was done wherever possible and the histopathology correlated with the findings of FNAC in instances where biopsy was not done.

### Inclusion Criteria

All patients with head and neck mass lesion presenting to Department of Pathology for FNAC selected for the study.

### Exclusion Criteria

#### Exclusion Criteria

Patients with Eye, CNS lesions and non-palpable swelling were excluded.

All the cases were subjected for surgery either incisional or excisional biopsy.

The biopsy material was sent to the department of pathology for HPE

The cytological features of all cases were reviewed with corresponding histopathology features.

### Results

A total of 250 patients presenting with head and neck swellings were taken during a study period of two years. No complications were observed in patients following the aspiration procedure; all patients tolerated the procedure well. Out of total 250 aspirates, 48 head and neck swellings biopsy specimens were received for histopathological correlation.

**Table 1: Case distribution of head & neck swellings**

Lesions	Number	Percentage
Thyroid	132	52.8%
Lymph node	77	30.8%
Salivary gland	20	8%
Soft tissue	18	7.2%
Inadequate for opinion	3	1.2%
Total	250	100%

Total number of head and neck swellings were 250. Out of which 132 (52.8%) cases were thyroid swellings, 77 (30.8%) were lymph node swellings, 20 (8%) cases were salivary glands swellings, 18 (7.2%) were soft tissue swellings and only 3 (1.2%) were inadequate for opinion.

**Table 2: Age distribution of head & neck swellings**

Age group	No. of lesions	Percentage
0-10 Yr	6	2.4%
11-20 Yr	29	11.6%
21-30 Yr	59	23.6%
31-40 Yr	53	21.2%
41-50 Yr	51	20.4%
51-60 Yr	23	9.2%
61-70 Yr	22	8.8%
>70 Yr	7	2.8%
Total	250	100%

The youngest patient in the study was 3 year old and oldest was 85 years old. The most common age group affected, was between 21-30 years of age, 59 (23.6%) and less common age group were between 0-10 years, 6 (2.4%).

**Table 3: sex distribution of head & neck swellings**

Sex	Number of cases	Percentage
Male	70	28%
Female	180	72%
Total	250	100%

**Table 4: distribution of various thyroid swellings**

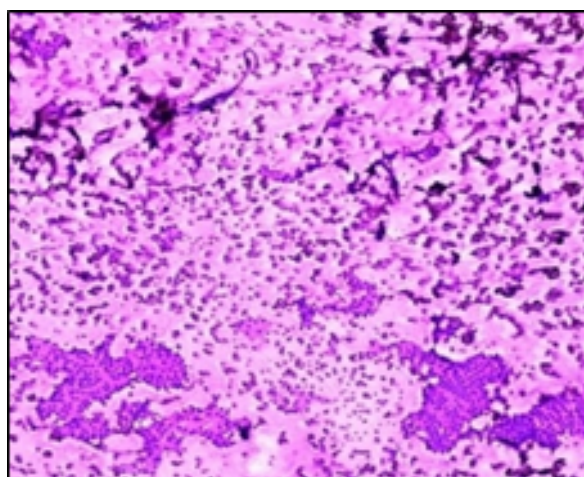
Lesions	Number	Percentage
Hashimoto thyroiditis	36	27.27%
Colloid goiter	34	25.75%
Nodular goiter	39	29.54%
Lymphocytic thyroiditis	10	7.57%
Follicular neoplasm	3	2.27%
Medullary carcinoma	2	1.51%
Papillary carcinoma	7	5.30%
Hurthle cell neoplasm	1	0.75%
Total	132	100%

Total number of thyroid swellings were 132, out of that most common swellings was diagnosed as nodular goiter, 39 (29.54%). 3 (2.27%) cases were follicular neoplasm, 7 (5.30%) cases were papillary carcinoma and only 1 (0.75%) case was Hurthle cell neoplasm. Females were more predominant.

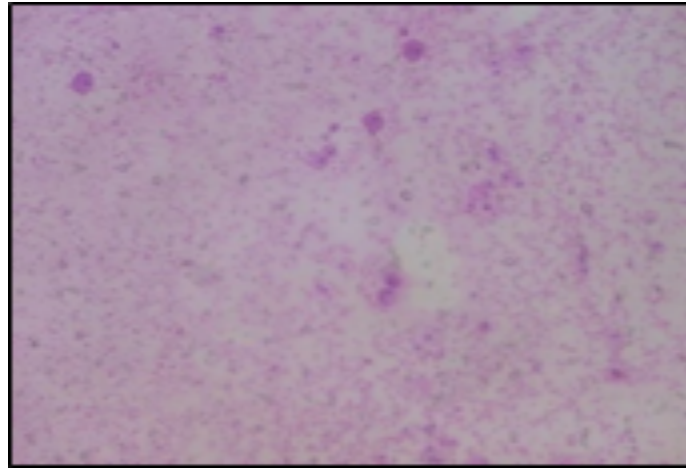
**Table 5: Diagnostic accuracy of FNAC in palpable swellings of head and neck region**

Statistical Parameter	Formula	Value in %
Sensitivity	$TP / (TP + FN) \times 100$	88.8%
Specificity	$TN / (TN + FP) \times 100$	90.6%
Positive predictive value	$TP / (TP + FP) \times 100$	93%
Negative predictive value	$TN / (TN + FN) \times 100$	85%
Diagnostic accuracy of FNAC	$(TP + TN) / (TP + TN + FP + FN) \times 100$	89.6%

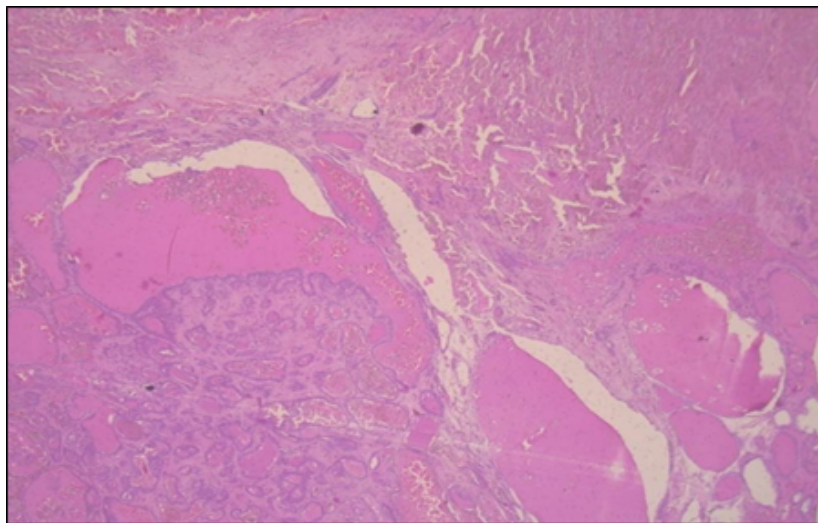
Sensitivity of the present study was 88.8%. Specificity of the present study was 90.6%. Positive predictive value of the present study was 93%. Negative predictive value of the present study was 85% and diagnostic accuracy of FNAC in present study was 89.6%.



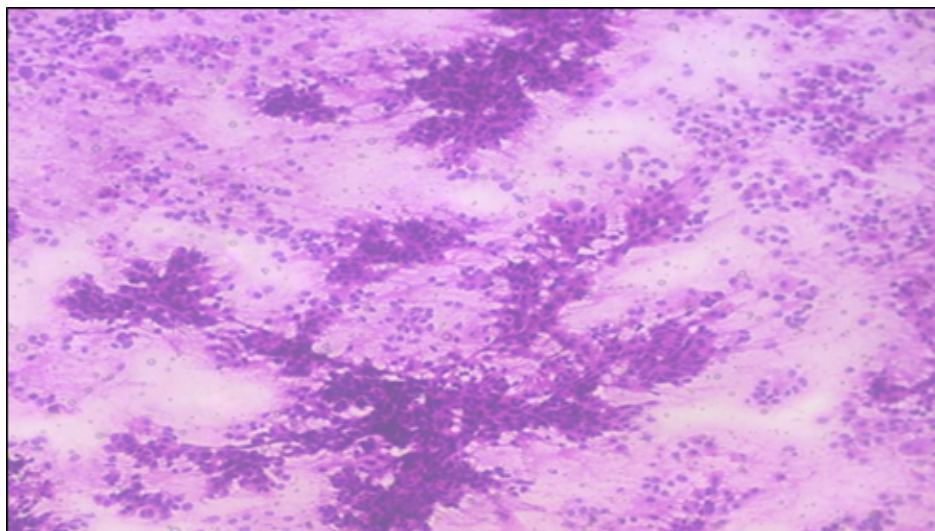
**Figure 1: Nodular goiter. Photomicrograph shows follicular cells in monolayered sheets & poorly cohesive clusters with scanty colloid, X10 Giemsa.**



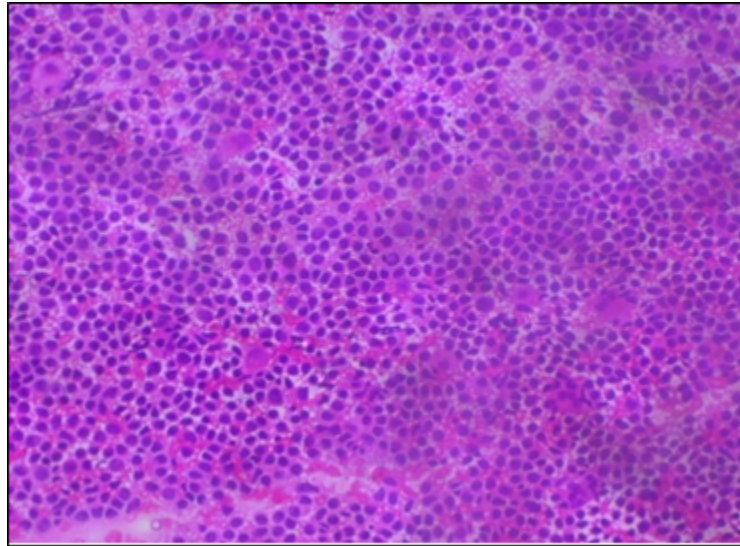
**Figure 2: Nodular goiter. Photomicrograph shows foamy macrophages with scanty colloid X20Giemsa.**



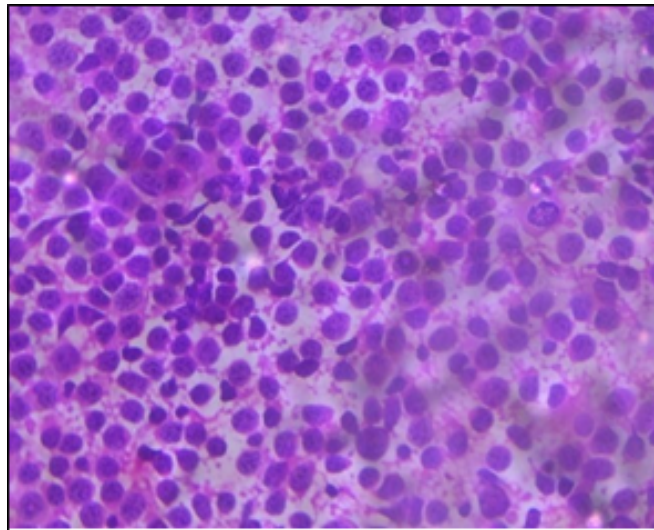
**Figure 3: Multinodular Goitre. Photomicrograph shows various sizes of follicles filled with colloid, lined by flattened epithelium, X4, H&E**



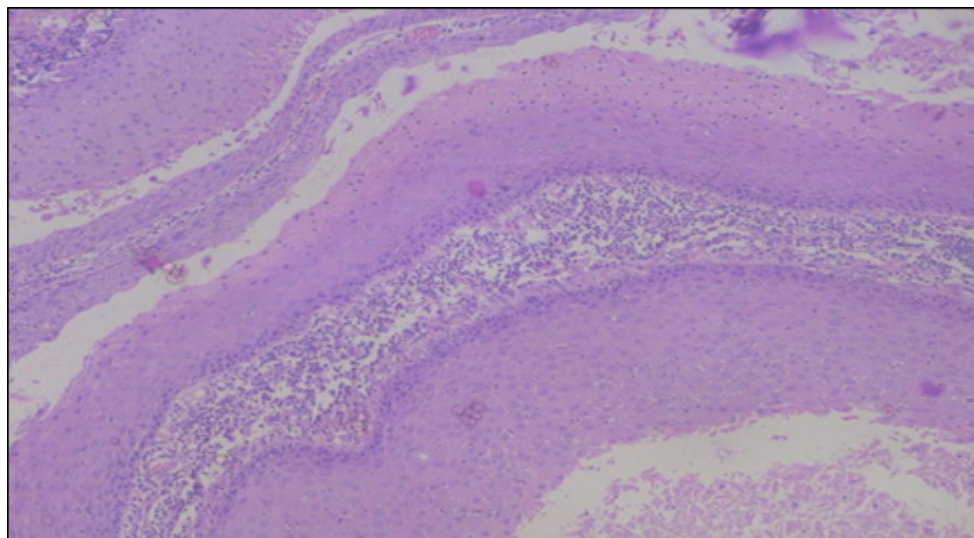
**Figure 4: Squamous cell carcinoma. Metastati deposit in lymph node. Photomicrograph shows papillae surrounded by lymphocyte. X 10 H&E.**



**Figure 5: Non Hodgkins Lymphoma. Photomicrograph showing monotonous population of small lymphocytes with coarsely granular chromatin X10 H&E.**



**Figure 6: Non Hodgkin Lymphoma. Photomicrograph showing monomorphous population of small lymphocytes along with few large lymphocytes X40, Giemsa.**



**Figure 7: Warthins tumor. Photomicrograph showing double layer of neoplastic epithelial cells resting on a dense lymphoid stroma and squamous cells, X10, H&E.**

## Discussion

In the present study, 250 patients were referred for fine needle aspiration cytology of head and neck swellings. Thyroid swelling was the most common organ on which fine needle aspiration cytology was done. Mild complications, following the aspirations of swellings have been reported in the literature. However, in the present study no complications were observed and all the patients tolerated the procedure well. In the present study, H&E stain,

Papanicolaou stain, Giemsa stain, Ziehl-Neelsen stains were routinely used to evaluate cytological smears from head and neck swellings aspiration. Hematoxylin & Eosin was preferred because of its advantage of giving crisper staining to the nuclei and other cell components. It also helped in correlating cell morphology seen in the smears and morphology on tissue sections. Papanicolaou stain was especially useful in delineating cytoplasmic differentiation and nuclear features.

**Table 6: Comparison of age group incidence in head and neck swellings**

S. No.	Studies	Most common age group (years)
1	Patel DN, Patel PB, Gandhi TJ, et al (2015) (n=250) <sup>10</sup>	31-40
2	Singal P, Bal MS, Kharbanda J, et al (2014) (n=289) <sup>11</sup>	21-30
3	Rathod GB, Parmar P (2012) (n=200) <sup>9</sup>	21-30
4	Sharma R, Mathur DR (2012) (n=125) <sup>9</sup>	21-30
5	Present study (n=250)	21-30

The most common age group presenting with head and neck swellings in our study was 21-30 years, in contrast to study by Patel et al, where the most common age group involved was 31-40 years. Similar observation as present study was made by Richa Sharma et al, Singhal P. Bal MS et al and Rathod GB et al.

**Table 7: Comparison of distribution of benign and malignant lesions aspirates**

Sr. No.	Studies	Benign	Malignant
1	Patel DN, Patel PB, Patel HV, et al (2015) (n=250) <sup>10</sup>	202	48
2	Rathod GB, Parmar P (2012) (n=200) <sup>12</sup>	170	30
3	Present study (n=250)	216	34

benign lesion of head and neck swellings were more common than malignant swellings in present study and was similar to study done by Patel DN et al, Rathod GB et al.

distribution of various thyroid swellings in present study of medullary carcinoma, papillary carcinoma is similar and other thyroid swelling distribution in present study is nearer to study done by Rathod

GB, Khabra NC and Singal P, and Khabra NC et al. distribution of various lymph nodes swelling of reactive lymphadenitis, metastatic deposit squamous cell carcinoma is similar in present study is similar to the study done by Singal P et al, and is in contrast to study done by Rathod GB, Khabra NC et al. Other distribution of lymph node swelling is nearer to study done by Rathore GB, Khabra NC, Singal P et al.

**Table 8: comparison of soft tissue and miscellaneous swellings distribution among all aspirated cases:**

S. No.	Soft tissue lesions	Singal P, Bal MS, Kharbanda J, et al. (2014) (n=289)	Patel DN, Patel PB, Gandhi TJ, et al (2015) (n=250)	Present study (n=250)
1	Lipoma	6(31.5%)	5(21.7%)	11(61.11%)
2	Epidermal cyst	2(10.5%)	-	6(33.33%)
3	Total number of cases	19(6.57%)	23 (9.2)	18(7.2%)

comparison of various soft tissue and miscellaneous swelling, total number of swelling in present study is similar than study done by Singal P and Patel DN et al whereas number of cases of lipoma and epidermal cyst was not similar.

Sensitivity and specificity of present study was 88.8% and 90.6% respectively. The results were comparable with other studies by Richa Sharma, Fernandes H, et al, Singhal P et al and Tilak V et al. Positive and negative predictive value of present study was also similar.

## Conclusion

With increasing cost of medical facilities any technique which speeds up the process of diagnosis, limits physical and psychological trauma to the patient and saves the expenditure of hospitalization, avoids unnecessary surgeries, and is of tremendous value. FNAC is one such procedure. FNAC used in conjunction with clinical findings, radiological and laboratory investigations can be a cost-effective method and first line investigation in palpable head and neck swellings. Fine needle aspiration cytology has been found to be a useful diagnostic and supportive investigation in our study. Although fine needle aspiration cytology is not a substitute for

histopathology diagnosis, as it cannot classify and grade the tumors.

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