

Clinicopathological Profile of Head & Neck Swellings Undergoing FNAC in a Tertiary Care Centre**Ritika Gupta¹, Pratibha Srivastava², Dilip Kumar³**¹Senior Resident, Department of Pathology, PMCH, Patna²Assistant Professor, Department of Pathology, PMCH, Patna³Associate Professor, Department of Pathology, PMCH, Patna

Received: 11-05-2023 / Revised: 14-06-2023 / Accepted: 15-07-2023

Corresponding author: Dr. Ritika Gupta

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 histological 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 PMCH Patna, 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.

This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

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 establish 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 ultra-sonography (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. [5]

Objectives

To study the relative frequency of head and neck swellings among patients referred for FNAC in the tertiary care hospital.

To evaluate the utility of aspiration cytology as a first-line diagnostic tool in palpable head and neck masses and correlate with histological 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 Patna Medical College and Hospital Patna, Bihar. 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,

After the needle was inserted into the representing area of the lesion, the barrel of the syringe was held by the free hand to ensure stability and about 15-20 rapid, firm, back and forth strokes were made

within the lesion. Repeated aspirations were made to create negative pressure. Many passes of the needle were necessary to obtain satisfactory sample. In some cases, this method was important particularly in fibrous tumors with low cell content. Aspiration of blood denoted unsatisfactory and haemorrhagic aspiration. It was important to release the negative pressure before the needle was withdrawn. The material in the syringe was expressed onto a clean glass slide and the aspirate was smeared with the aid of another clean slide. Smear was fixed in 95% ethanol or air dried as per the requirement. Air dried smears were stained with Haematoxylin and Eosin and May-Grunwald-Giemsa stain whereas 95% ethyl alcohol fixed smears were stained by Papanicolaou stain.

Inclusion Criteria

All patients with head and neck mass lesion presenting to Department of Pathology for FNAC duration of two years, were selected for the study.

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%

The head and neck swellings distribution of present study is shown in table 2. Total number of head and neck swellings were 250. Out of which 139 (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: Sex distribution of head & neck swellings

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

Table 3: 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%

The present study of distribution of various thyroid swellings. 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 4: age wise distribution of salivary glandswellings

Age group	Number	Percentage
0-10 Yr	-	0%
11-20 Yr	1	5 %
21-30 Yr	4	20%
31-40 Yr	1	5%
41-50 Yr	3	15%
51-60 Yr	5	25%
61-70 Yr	5	25%
>70 Yr	1	5%
Total	20	100%

Total numbers of salivary gland swellings were 20. Out of that most common age group affected were between 51 -60 years and 61 – 70 years, with 5 (25%) cases observed in both and in between 0 -10 years no cases observed. Out of the 20 cases, males were more prone to salivary gland swellings.

Table 5: distribution of various soft tissue swellings

Lesions	Number	Percentage
Lipoma	11	61.11%
Keratinous cyst	6	33.33%
Ranula	1	5.55%
Total	18	100%

Distribution of various soft tissue swellings, out of 18 cases, 11 (61.11%) were lipoma, 6 (33.33%) were keratinous cyst and only 1 (5.55%) cases was ranula. The females and males were commonly affected in present study.

Table 6: special stain for tuberculous lymphadenitis

	Number	Percentage
AFB Positive Cases	5	33.33%
AFB Negative Cases	10	66.66%
Total	15	100%

Special stain used in present study was Acid Fast Bacilli (AFB) stain to detect Tubercular bacilli. In 15 cases of lymphadenitis AFB stain was used, out of that 5 (33.33%) cases were positive, and 10 (66.66%) cases were negative.

Cytological diagnosis of inflammatory, benign and malignant nature of swellings

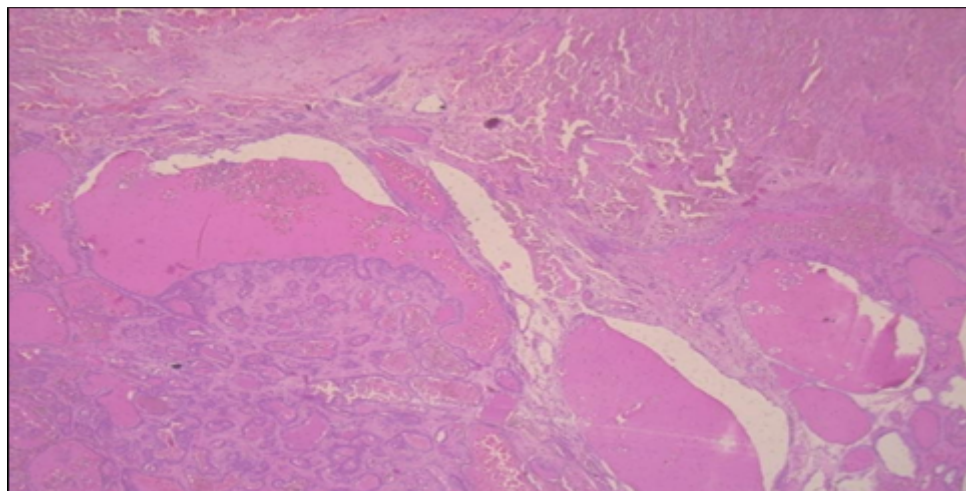
Out of 250 cases, 96 (38.4%) cases were benign

and 34 (13.6%) cases were malignant. Inflammatory swelling were 77 (30%), Autoimmune lesions were 36 (14.4%), inadequate

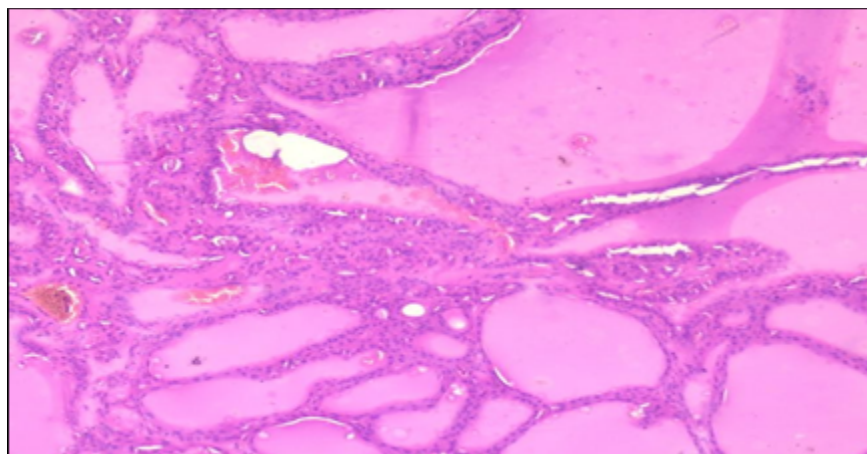
for opinion were 3 (1.2%) and 4 swellings of salivary gland werediagnosed normal.

Table 7: sex wise distribution of various head and neckneoplastic swellings

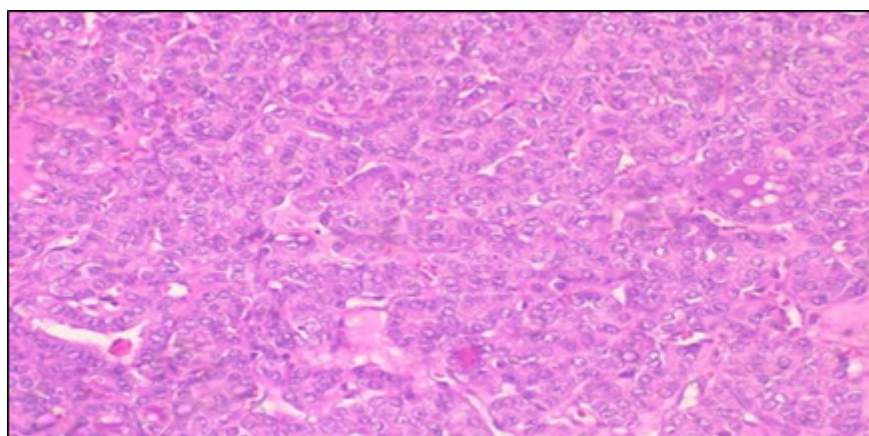
Sex	No of neoplastic cases	Percentage
Male	18	52.94%
Female	16	47.05%
Total	34	100%



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

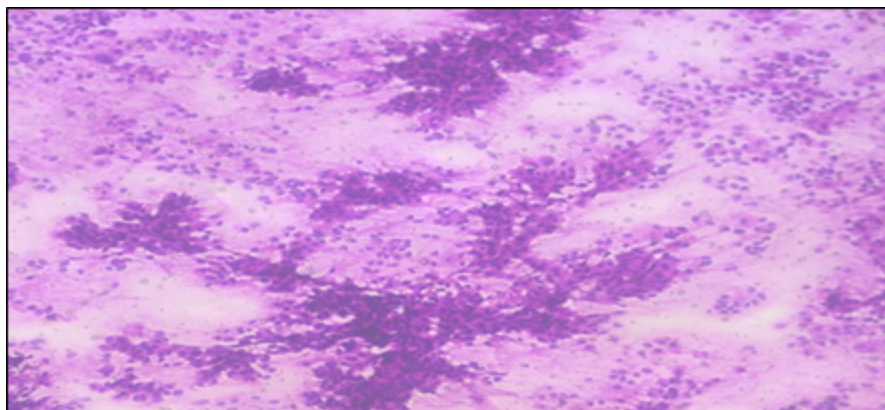


Colloid goiter. Photomicrograph shows follicles filled with colloid, X10,H&E.



Follicular carcinoma. Photomicrograph shows microfollicular pattern of growth, X20, H&E.

Squamous cell carcinoma. Metastatic deposit in lymph node. Photomicrograph shows papillae surrounded by lymphocyte. X 10 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 8: 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) [6]	31-40
2	Singal P, Bal MS, Kharbanda J, et al (2014) (n=289) [7]	21-30
3	Rathod GB, Parmar P (2012) (n=200) [5]	21-30
4	Sharma R, Mathur DR (2012) (n=125) [5]	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 9: comparison of sex wise distribution of cases:

S.No.	Studies	Males	Females	M:F
1	Patel DN, Patel PB, Gandhi TJ, et al (2015) (n=250) [6]	130(52%)	120(48%)	1:0.9
2	Sharma R, Mathur DR (2012) (n=125) [5]	49(39.2%)	76 (6%)	1:1.5
3	Tilak V, Dhaded AV, Jain R Tilak 1995) (n=55) [8]	16(29%)	39(70.9%)	1:2.4
4	Present study (n=250)	70 (28%)	180 (72%)	1:2.5

Head and neck swellings were more predominant in females in present study (1:2.5) and the observation was similar as study done by Richa Sharma et al (1:1.5), Tilak V. Jain et al (1:2.4). It was in contrast to study by Patel DN et al, where male were predominantly affected.

Table 10: Comparison of distribution of lesions involved

Location	U Jindal, K Singh, A. Baghla, et al, (2011) (n=350) [9]	Fernandes H, D, Souza C R S, Thejaswini BN, et al, (2009) (620) [10]	Rathod GB, Parmar P (2012) (n=200) [11]	Present study (n=250)
Thyroid	80	350	104	132
Lymph Node	178	230	57	77
Salivary Gland	30	23	22	20
Soft Tissue	62	12	8	18
Others	-	5	9	3

Table 11: 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)[6]	202	48
2	Rathod GB, Parmar P (2012) (n=200) [11]	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 DNet al, Rathod GB et al.

Table 12: 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)[7]	Patel DN, Patel PB, Gandhi TJ, et al (2015) (n=250)[6]	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 swellings 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.

Conclusion

Head and neck swellings are common conditions encountered in clinical practice and always pose a diagnostic dilemma for the treating surgeons. Most of the cases are thyroid swellings and treated with medicine but some require surgery. 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.

References

1. Khabra NC, Garg S, Garg LN, et al. Clinicopathological spectrum of head and neck mass lesions A study of 200 cases in a tertiary care centre. Research and Reviews Journal of Medical and Health Sciences 2014, July- Sep;3 (3):106-116.
2. Dr. Ranapurwala MF, Dr. Tripathi S. Cytology of head and neck lesions I a tertiary healthcare centre in saurashtra with corroboration by histopathology. International journal of innovative research & development. 2013, June 2 (2), 566-573.
3. Maniyar AU, Patel HL, Parmar BH. Study of

Cytodiagnosis of Head and Neck Neoplastic Lesion and Comparison with Histopathology. Research and Reviews Journal of Medical and Health Sciences 2013, April –June; 2 (2):54-59.

4. Ahmad S, Akhtar N, Singla S, Srivastva G. FNAC as a diagnostic tool in pediatric patients with lymphadenopathy. Annals of Biological Research 2013;4 (4):92-95.
5. Sharma R, Mathur DR. Fine needle aspiration cytology of palpable lesions of head and neck region. International Journal of current research and review 2012, Nov; 04(22):74-84.
6. Patel DN, Patel PB, Patel HV, Gandhi TJ. Fine needle aspiration cytology role in head and neck lesions. International Archives of Integrated Medicine 2015;2(8):99-104
7. Singal P, Bal MS, Kharbanda J, Sethi PS. Efficacy of fine needle aspiration cytology in Head and Neck lesions. International Journal of Medical and Dental Sciences 2014, July;3(2):421-430.
8. Tilak V, Dhaded AV, Jain R. Fine needle aspiration cytology of head and neck masses. Indian Journal Pathology Microbiology 2002; 45(1):23- 30.
9. 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 2012;2 (5).
10. Fernandes H, D'Souza C R S, Thejaswini B N. The role of fine needle Aspiration cytology in palpable head and neck masses. Journal of Clinical and Diagnostic Research 2009 Oct;3(5):1719-1725.
11. Rathore GB, Parmar P. Fine Needle Aspiration Cytology of Swelling of Head and Neck region. Indian Journal of Medical Sciences. 2012, March & April; 66 (3,4).