International Journal of Otorhinolaryngology and Head and Neck Surgery
Yenkure P et al. Int J Otorhinolaryngol Head Neck Surg. 2023 Apr;9(4):283-287
http://www.ijorl.com
pISSN 2454-5929 | eISSN 2454-5937
DOI: https://dx.doi.org/10.18203/issn.2454-5929.ijohns20230758

Original Research Article

Fine needle aspiration cytology in head and neck masses, assessment of need for incision/excision biopsy

Priyanka Yenkure, Shubhajyoti Pore*, Anil Joshi, Damandeep Kaur

Department of Pathology, Government Medical College, Aurangabad, Maharashtra, India

Received: 15 January 2023
Revised: 17 March 2023
Accepted: 18 March 2023

***Correspondence:**
Dr. Shubhajyoti Pore,
E-mail: drsnpore@gmail.com

ABSTRACT

Background: FNAC is a rapid, simple, cost-effective, and minimally invasive technique used to diagnose different types of swelling occurring in head and neck masses, and assess its need for biopsy.
Methods: The study included 650 patients, who presented with palpable head and neck swelling over a period of 18 months, at our hospital. FNAC procedure has been performed and smears are stained with Papanicolaou stain, Gemisa stain, and H and E stain. Cyto-histopathological correlations were done to evaluate the need for a biopsy.
Results: Out of 650 cases, lymph node lesions constitute 370 cases (56.90%) most commonly involved. Thyroid gland lesions constitute 189 cases (29.10%) followed by salivary gland lesions 38 cases (5.80%), and other 53 cases (8.20%). Histo-pathological correlation of 116 cases were done out of 650.
Conclusions: FNAC serves as a guide to appropriate therapeutic management whether to locally excise a benign tumor or plan radical surgery and helps as an adjunct to histopathology.

Keywords: Cytology, Histopathological, Diagnostic, Biopsy, Aspiration, Head and neck

INTRODUCTION

FNAC is the primary investigation approaching the diagnosis of head and neck masses. Nowadays it is a powerful diagnostic tool.[1] Aspirates from the head and neck swelling include various lesions of salivary glands, thyroid, lymph node, soft tissue, blood vessels, and neural tissue and have a variable range from benign, inflammatory lesions to neoplasms.[2] FNAC is a rapid, inexpensive, relatively painless, simple OPD procedure. FNAC does not require anesthesia, causes minimal trauma to the patient and carries less risk of complications.[3,10] It also has an advantage, since this OPD procedure helps to avoid surgery in non-neoplastic or inflammatory conditions. It can be repeatable, reduces the rate of the exploratory procedure, and provides early differentiation of benign from malignant pathology.[4] FNAC does not give the same architectural detail as histology. The purpose of this study was to see the frequency and distribution of various pathologies detected on FNAC in patients presenting with head and neck swellings, to evaluate their role in their diagnosis and also assess the need for biopsy. This procedure will avoid incisional biopsy and the risks of fistula formation, or tumor implantation in case of neoplasms.[7] FNAC helps the surgeon's to guide, select, and modify the surgical planning in patients who need surgeries or general clinical management such as the need for antibiotic treatment and or neoadjuvant chemotherapy.[9]

METHODS

A study was done at the department of Pathology, GMC, Aurangabad. The study type is a retrospective

observational study. Inclusion criteria for the study were cases of head and neck was segregated from other lesions, FNAC was done over a period of 18 months from January 2008 to October 2009. Average calculated sample size is 381 by Cochran formula. Study was ethically approved. Those FNAC which were performed under Ultrasound guidance were not included in the study.

Fine-needle aspiration was performed by a pathologist, using a 23-G needle and a 10 ml syringe. The aspirated material was spread onto the slides. A few slides were immediately fixed by immersion in 95% ethyl alcohol and other slides were left at room temperature for a few minutes to air dry. Wet slides were stained with papanicolaou (PAP) stain and air-dried slides were stained with Giemsa stain.

Ziehl Neelsen (ZN) stain for acid-fast bacilli done wherever required. The stained smears were evaluated by a consultant pathologist with consideration of clinical and radiological findings. Biopsy samples were received at the Pathology department fixed with formalin and then processed and stained with H and E stain. Histopathological examination was done and the results were correlated with the cytological reports to evaluate the efficacy of the procedure.

Statistical analysis

650 cases of FNAC were studied, Out of which 116 cases were histo-pathologically correlated. In the present study of all head and neck masses, FNAC had a sensitivity of 82.92%, specificity of 98.66%**,** diagnostic accuracy of 93%, positive predictive value of 97%, and negative predictive value of 91%. The overall cytological and histopathological correlation rate was 93%.

RESULTS

The present study was a comparative and observational study conducted on 650 cases in which histopathological correlation of 116 cases was done.

Age wise distribution of various cases

21-30 years was the most commonly affected age group in which 142 cases (21.9%) are seen followed by 31-40 years in which 130 cases (20%) were seen. 88 cases (13.5%) were seen in the age group of 11-20 years, 85 cases (13.1%) were seen in the age group of 51-60 years, 71 (10.9%) were seen in the age group of 41-50 years, 70 cases (10.7%) were seen in the age group of 61-70 years, 46 cases (7.1%) were seen in the age group of 0-10 years, 16 cases (2.5%) were seen in the age group of 71-80 years, 2 cases (0.3%) were seen in the age group of 81-90 years.

Sex wise distributation of cases

Out of 650 cases studied 341 are females and 309 are males.

Anatomical distribution of various cases

Of head and neck masses are as follows in which cervical lesions constituted the majority of cases 332 (51.2%), followed by thyroid cases 189 (28.6%) cases, submandibular 49 (7.5%) cases, parotid and face 29 (4.5%) cases each, submental 11 (1.7%) cases, scalp 8 (1.2%) cases, oral cavity 3 (0.5%) cases.

Distribution of cases according to the cytomorphological biological behavior of masses

Non-neoplastic lesions 431 (66.3%) cases were the most common findings followed by malignant 170 (26.2%), benign 37 (5.7%) then 12 (1.8%) cases were un-typable.

Organs specific distribution of cases

Most commonly 370 (56.9%) cases were seen of lymph nodes, followed by 189 cases (29.1%) of thyroid, 38 cases (5.8%) of the salivary gland, and another 53 cases (8.2%) seen.

Cytomorphologic distribution of the lymph nodes in both sexes

The lymph node was the most common organ involved, in which reactive lymph node was the most common finding, with 92 cases followed by 65 cases of granulomatous lymphadenitis, 21 cases of tubercular lymphadenitis which are AFB positive, 18 cases of acute suppurative lymphadenitis, 16 cases of tubercular lymphadenitis, and 2 cases of lymphoma. Also includes 134 cases that were positive for malignancy and 22 cases that were suspicious for malignancy.

Cytomorphologic distributions of the thyroid gland masses in both sexes

The thyroid gland showed colloid goiter 153 cases most commonly, followed by 19 cases of lymphocytic thyroiditis, 9 cases of follicular neoplasm, 3 cases of follicular lesions, 2 cases are not typable but positive for malignancy, 1 case each of toxic goiter and papillary carcinoma and 1 case is suspicious for malignancy.

Cytomorphologic distributions of the salivary gland masses in both sexes

Submandibular gland shows most commonly 26 cases of pleomorphic adenoma, 5 cases are positive for malignancy, 4 cases of parotid abscess, 1 case each of sialadenitis, acute sialadenitis, carcinoma ex. pleomorphic adenoma.

Cytomorphologic distributions of head and neck masses arising in other organs specific sites in both sexes

Table 1: Age-wise distribution of cases.

Age groups (years)	N	%
0-10	46	7.1
11-20	88	13.5
21-30	142	21.9
31-40	130	20
41-50	71	10.9
51-60	85	13.1
61-70	70	10.7
71-80	16	2.5
81-90	2	0.3
Total	650	100

Table 2: Anatomical distribution of cases.

Anatomical site	N	%
Cervical	332	51.2
Thyroid	189	28.6
Submandibular	49	7.5
Parotid	29	4.5
Face	29	4.5
Sub-mental	11	1.7
Scalp	8	1.2
Oral	3	0.5
Total	650	100

Table 3: Organ specific distribution of cases.

Specific organ site	N	%
Lymph node	370	56.9
Thyroid	189	29.1
Salivary gland	38	5.8
Others	53	8.2
Total	650	100

Table 4: Cytomorphologic distribution of lymph node in both sexes.

Cytomorphologic patterns of lymph node masses	Female	Male	Total
Tubercular lymphadenitis AFB+ve	10	11	21
Granulomatous lymphadenitis S/o TB	44	21	65
Tubercular lymphadenitis	10	6	16
Reactive lymph nodes	41	51	92
Acute suppurative lymphadenitis	9	9	18
Lymphoma	1	1	2
Suspicious smears for malignancy	1	21	22
Positive for malignant cells	23	111	134
Total	139 (37.20)	231 (62.80)	370 (100)

Table 5: cytomorphologic distribution of the thyroid gland in both sexes.

Cytomorphologic patterns of thyroid gland masses	Female	Male	Total
Colloid goiter	138	15	153
Lymphocytic thyroiditis	19	0	19
Toxic goiter	1	0	1
Follicular lesions	2	1	3
Follicular neoplasm	7	2	9
Papillary carcinoma	1	0	1
Suspicious smear for malignancy	1	0	1
Positive for malignant cells	1	1	2
Total	170 (89.94)	19 (10.06)	189 (100)

Table 6: Cytomorphologic distribution of the salivary gland in both sexes.

Cytomorphologic patterns of salivary gland masses	Female	Male	Total
Sialadenitis	0	1	1
Acute sialadenitis	0	1	1
Parotid abscess	2	2	4
Pleomorphic adenoma	14	12	26
Carcinoma ex-pleomorphic adenoma	1	0	1
Positive for malignant cells	3	2	5
Total	20 (52)	18 (48)	38 (100)

Table 7: Cytomorphologic distribution of head and neck masses arising in other organ specific site in both sexes.

Cytomorphologic patterns of head neck masses	Female	Male	Total
Epidermal cyst	9	29	38
Lipoma	1	6	7
Benign spindle cell lesion	0	2	2
Paraganglioma	1	0	1
Benign adnexal tumor	0	1	1
Suspicious smear for malignancy	0	1	1
Positive for malignant cells	1	2	3
Total	12 (22.64)	41 (77.35)	53 (100)

Table 8: Cytological and histopathological correlation.

Lesion	No. of cases diagnosed on FNAC	Histo-patholo-gical consistent cases	Diagnostic accuracy
Thyroid	39	36	92.30
Lymph node	51	47	92.15
Salivary gland	14	13	92.85

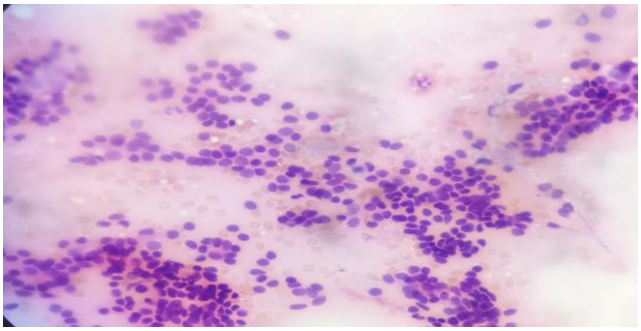

Figure 1: Shows groups micro follicles with hemorrhagic backgrounds and scattered macrophages (Bethesda category III).

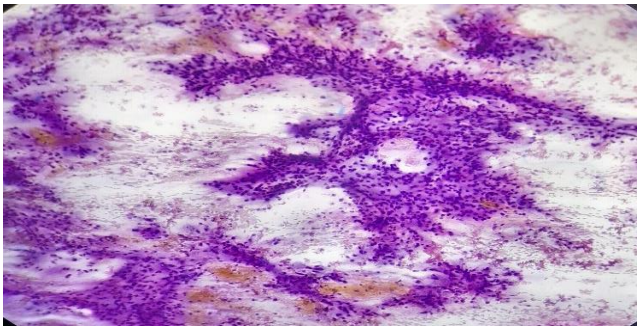

Figure 2: Parotid gland showing clusters and groups of round to oval cells with myoepithelial cells and chondromyxoid stroma (pleomorphic adenoma).

Other organs show 38 cases of epidermal cyst, 7 cases of lipoma, 2 cases of benign spindle cell lesion, 1 case each of paraganglioma, benign adnexal tumor, and 1 case each of positive for malignancy and suspicious for malignancy.

DISCUSSION

36 out of 39 cases of the thyroid gland are correlated giving its diagnostic accuracy of 92.30%, 47 out of 51 cases of the lymph node are correlated giving its diagnostic accuracy of 92.15%, and 13 out of 14 cases of the submandibular gland are correlated giving its diagnostic accuracy of 92.85%. Overall diagnostic accuracy was 93%.

Evaluation of the neck masses must be approached in a thorough and disciplined manner, the technique is performed in the outpatient department and causes minimal trauma to the patient.[5] It is a simple, reliable, and inexpensive diagnostic tool in the evaluation of head and neck swellings. FNAC does not give the same architectural detail as histology.[8] but it can provide cells from entire lesions as many pass through the lesion and can be made while aspirating.[6] Meta-analysis and comparative systematic review establish that FNAC is highly effective in the diagnosis of head and neck masses, with some limitations.[8]

The present study was carried out with the objective of clinicopathological assessment of the palpable head and neck masses with the help of various patterns like the anatomical site, age, sex, and cytomorphology. The availability of histopathologic diagnosis in 18% of all cases provided a gold standard to assess the performance of fine needle aspiration cytology as a reliable and accurate tissue diagnostic procedure in palpable head and neck masses.

650 cases of palpable head and neck masses were studied over a period of 18 months, by a detailed clinical evaluation followed by the performance of fine needle aspiration of the mass. The histopathologic diagnosis was available in 116 cases, those cases were studied regarding the correlation of FNAC and histopathologic diagnosis.

CONCLUSION

It is concluded from the present study, that the most common site of involvement in head and neck region was the cervical region. The lymph node was the commonest tissue involved in which tubercular lymphadenitis is the common problem. Colloid goiter was the most common non-neoplastic mass encountered in the present study mostly affecting females. Pleomorphic adenoma was the most common benign salivary gland neoplasm present in both sexes. metastatic lymph nodes, lipomas, and epidermal cysts had a 100% diagnostic accuracy with FNAC. FNAC had got significant diagnostic value in diagnosing secondaries in lymph nodes from primary growth. FNAC is a rapid, cost-effective, highly accurate, and feasible first-line diagnostic tool in the management of palpable head and neck swellings. It makes its use as an initial diagnostic tool an intelligent approach to the diagnosis of head and neck masses. It is very beneficial in the early differentiation of benign from malignant pathology and thus greatly influences the planning of treatment. It reduces the cost of hospitalization for patients. It is a technique that has a high degree of accuracy. However doubtful lesions should always be correlated with histopathology.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Shiladaria PB, Khant VS. Role of FNAC in evaluation and diagnosis of head and neck lesions: A retrospective study at a tertiary care center. nt J Clin Diagn Pathol. 2019;2(1):239-42.
2. Bhardwaj A, Pandey A, Kishore S, Kaushik S, Maithani T. Cytohistological study of head and neck lesions and their diagnostic pitfalls. Annals Pathol Lab Med. 2016;3(5):A397-407.
3. Mohan A, Jain RK, Thakral RK. Cytomorphological spectrum of pediatric head and neck lesions–a comparative study in a tertiary teaching hospital in Western Uttar Pradesh, India. Indian J Pathol Oncol. 2016;3(3):450-5.
4. Khetrapal S, Jetley S, Jairajpuri Z, Rana S, Kohli S. FNAC of head & neck lesions and its utility in clinical diagnosis: a study of 290 cases. Thyroid. 2015;49(16.9):44.
5. Ishar T, Gupta RK, Khajuria A. Role of FNAC in diagnosis of non-thyroidal head and neck lesions. JK Sci. 2012;14(1):9.
6. Gupta G, Joshi DS, Shah A, Gandhi M, Shah NR. FNAC of head and neck swellings. GCSMC J Med Sci. 2014;3(1):38-41.
7. Kambale T, Iqbal B, Patil A, Kumar H. Diagnostic role of FNAC in salivary gland lesions and its histopathological correlation. Indian J Pathol Oncol. 2016;3(3):372-5.
8. Itagi IR. Evaluation of FNAC of head and neck swellings: a retrospective study. International J Otorhinolaryngol Head Neck Surg. 2018;4(1):189.
9. Shobha SN, Rajashekar YR. Role of Fine needle aspiration cytology in Head and neck lesions. Indian J Pathol Oncol. 2017;4(3):408-12.
10. Kapoor S, Bagga PK, Rupesh S, Singh A, Kumar A, Singh H. Diagnostic accuracy of fine needle aspiration cytology in palpable lesions of head and neck in comparison to histopathology. IJCMR. 2017;4(2):449-53.

Cite this article as: Yenkure P, Pore S, Joshi A, Kaur D. Fine needle aspiration cytology in head and neck masses, assessment of need for incision/excision biopsy. Int J Otorhinolaryngol Head Neck Surg 2023;9:283-7.