ORIGINAL ARTICLE

FNAC of Head and Neck Lesions in a Tertiary Care Institute of Jammu- A 3 Year Retrospective Study

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Abstract

Background and aims: Head & neck region swellings are commonly encountered and rarely go unnoticed. FNAC provides early diagnosis and initial segregation into inflammatory versus neoplastic pathology.**Aims & objectives:** To study the role of FNAC in head and neck lesions, To study the cytomorphological patterns of various head and neck lesions and to study the distribution according to age, sex and site of various head & neck lesions.**Material & methods**::It is a retrospective observational study done over a period of 3 years from 1st March 2019 to 1st March 2022 in the Cytology section of the Post Graduate Department of Pathology in all age groups irrespective of their sex. **Results:**A total of 2024 cases of Head & neck region FNA (including guided FNA) aspirates were included in the study. Maximum number of cases were in the age group of 21-30 years (30%). Female to male ratio was 1.2:1 Maximum number of aspirates were from lymph nodes (41%) followed by thyroid (33%). In our study 68% cases were benign and 32 % cases were malignant.**Conclusion:** Our study shows patterns of head & neck lesions on FNAC. Despite its limitations FNAC still could be used as the initial investigating tool for assessing head & neck region swellings, although histopathology remains the gold standard.

Keywords

FNAC, Head & Neck Lesions, Diagnostic Tool.

Introduction

Fine-needle aspiration (FNA) biopsy is the study of cells obtained by puncturing organs of human body with the use of small-gauge needle either directly or with the help of various imaging techniques .

FNAC could be the initial diagnostic procedure for all palpable lessions. The Advantages of FNAC[1] include: Cost effective (simple and cheap) and routine OPD procedure, it has lower risk than surgical biopsy, it is easily repeatable and suitable for multifocal lesions, it causes less physical and psychological discomfort, avoids anaesthesia related complications, less time consuming and rapid results as compared to surgical biopsy.

It is therapeutic as well as diagnostic for cystic lesions., allows cases to be prioritized when there is a long waiting time for surgery. Diagnosis of some benign conditions alleviates the need for further surgery and it can confirm recurrence of previously treated malignancy without surgery.

It has some limitations as well like cytological smears cannot assess histological architecture, inflammatory, metaplastic or degenerative lesions can mimic malignancy on cytology, distinction between follicular

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adenoma vs. follicular carcinoma of the thyroid cannot be done solely on the basis of cytomorpholgy, the cellularity may be scant and samples may not always be representative of the lesion resulting into inconclusive diagnosis.

Lymphomas are difficult to diagnose on the basis of cytology alone.

Although modern ancillary techniques like flow cytometry, cytogenetics, electron microscopy, immunocytochemistry are useful for precise tissue specific diagnosis, they are expensive and not done routinely in all health care centers.

Aims and objectives:

1.To study the role of FNAC in head & neck lesions.

2.To study the cytomorphological pattern of various head and neck lesions.

3.To study the distribution according to age, sex and site of various head and neck lesions

Materials and Methods:

Ethical approval was taken from the Institutional Ethical committee of Government Medical College, Jammu and is registered vide no: C-315.

Inclusion criteria-

1.All the slides of patients with palpable swellings in the head and neck region belonging to all age groups irrespective of sex, presenting to the Cytology section of the Post Graduate Department of Pathology, GMC Jammu for FNA in the above mentioned period.

2.FNA of radiologically guided aspiration of palpable head and neck region swellings belonging to all age groups irrespective of sex in the above mentioned period were included in our study.

Exclusion Criteria-

1.Inadequate material and faded slides.

2.FNAC of swellings other than those in the head & neck region which were done in the Cytology section in the above mentioned period were excluded from our study.

The present study was an observational retrospective study conducted in the Cytology section of Post Graduate Department of Pathology Government Medical College, Jammu, from 1st March 2019 to 1st March 2022. All the slides of cases of FNA of head and neck region swellings were retrieved from the archives of the Cytology section of the Post Graduate Department of Pathology, GMC Jammu. The relevant clinical details mentioned in the Cytology requisition forms were noted. Usg guided FNA was done where ever a repeat aspiration was required in view of only necrosis and /or scant cellularity in the first attempt of aspiration, as well as in suspicious thyroid nodules. Usually about 20% of the specimens obtained by palpation guidance are cytologically inconclusive most often because of the aspiration of non diagnostic fluids from cystic lesions, where as sonography guides the needle into the solid portion of the mass.[2] Usg guided aspiration has high accuracy for both lymph node and salivary gland lesions.[3-5]

The cytological smears were stained with May Grunwald Giemsa (MGG) and Papanicolau stain(after fixing in 95% ethyl alcohol) and Ziehl Neelson Stain (ZN stain) smears for Acid Fast bacilli (where ever required) and were studied independently by two pathologists.

Results

This was a retrospective observational study of patients presenting with palpable swellings in the head and neck region, who underwent FNA in the Cytology Section of the Post Graduate Department of Pathology, Government Medical College Jammu from 1st March 2019 to 1st March 2022.

The present study included 2024 cases of head and neck lesions over a period of 3 years. The age range was 2 months to 85 years. Out of 2024 cases, 1112 (55%) were females and 912 (45%) were males. The female to male ratio is 1.2:1. Maximum number of cases were seen in the age group of 21-30 years (30%) with female preponderance. Maximum number of FNA were done in lymph nodes (41%) followed by thyroid (33%), salivary gland (16%) and skin, soft tissue & oral cavity(10%).

Out of the 2024 cases, n =364(18%) cases were Usg guided aspirates, maximum being in thyroid n =236(65%) followed by lymph nodes n=72(20%) and salivary glands n=56(15%).

Usg features of colloid thyroid nodules were iso to

Table 1- Age and Sex distribution

Age in years	No of cases(n)(%)	Female(n)(%)	Male(n)(%)
0-10	101 (5%)	50 (4.5%)	51 (5.6%)
11-20	263 (13%)	136 (12%)	127 (14%)
21-30	607 (30%)	355 (32%)	252 (28%)
31-40	404 (20%)	200 (18%)	204 (22.2%)
41-50	303 (15%)	180 (16%)	123 (13.5%)
51-60	225(11%)	131(12%)	94 (10%)
61 and above	121(6%)	60 (5.5%)	61 (6.7%)
Total	2024 (100%)	1112 (55%)	912 (45%)

Table 2. Showing distribution of various head & neck lesions according to site and cytomorphology.

Site	No. (%)		No. (%)		No. (%)		No. (%)
Lymph node	**830 (41%)**	**Thyroid**	**668 (33%)**	**Salivary gland**	**324 (16%)**	**Skin, soft tissue & Miscellanous**	**202 (10%)**
Non specific reative lymphadenitis	274(33%)	Colloid goitre	354(53%)	Sialadenitis	97(30%)	Lipomatous lesion	30(15%)
Granulomatous lymphadenitis	249(30%)	Hashimoto's thyroiditis	174(26%)	Pleomorphic Adenoma	90(28%)	Epidermal inclusion cyst	48(24%)
Acute supprative inflammation	33(4%)	Follicular neoplasm	26(4%)	Sialadenosis	38(12%)	Benign Adnexal tumour	16(8%)
Hodgkin's lymphoma	50(6%)	Papillary carcinoma	40(6%)	Warthin's tumour	33 (10%)	Benign cysts	41(20%)
Non Hodgkin's lymphoma	100(12%)	Medullary carcinoma	7(1%)	Mucuepideroid carcinoma	14(4%)	Benign spindle cell lesions	25 (12.2%)
Metastatic deposits to lymph node	124(15%)	Anaplastic carcinoma	14(2%)	Acinic cell carcinoma	19 (6%)	Retention cyst	21(10.4%)
-	-	Thyroglossal cyst	53(8%)	Adenoid cystic carcinoma	33(10%)	Acute supprative inflammation	21(10.4%)

hypoechoic, internal cystic change, with comet tail artifacts and specks of calcification. While Hashimoto's thyroiditis presented with diffuse thyromegaly with heterogenous echotexture and variable vascularity on colour doppler. Features favouring malignancy were ill defined hypoechoic nodule with presence of microcalcifications, absence of peripheral halo and presence of intranodular vascularity.

While in Usg guided Fna for neck nodes, it was seen that necrosis favoured granulomatous lymphadenitis, round homogenous hypoechoic nodes favoured malignancy while oval shape along with maintained central sinus echo favoured normal or reactive nodes.

In the lymph node aspirates (n= 830), the maximum number of cases were of non specific lymphadenitis(33%) followed by granulomatous lymphadenitis (30%), metastatic deposits to lymph nodes (15%), non Hodgkin lymphoma(12%), Hodgkin's lymphoma(6%) & acute supprative inflammation(4%). Among the metastatic deposits to lymph nodes, squamous cell carcinoma was the most common (50%) followed by poorly differentiated carcinoma (35%) and adenocarcinoma (15%). Among the FNA of thyroid gland(n= 668), Colloid goitre was the most commonly seen lesion(53%) followed by Hashimoto's thyroiditis(26%), thyroglossal cyst(8%), papillary carcinoma thyroid(6%), follicular neoplasm(4%), anaplastic carcinoma(2%) and medullary carcinoma(1%). Among the FNA of salivary glands(n= 324) sialadenitis

(30%) followed by, pleomorphic adenoma(28%), sialadenosis (12%) warthin's tumour(10%), adenoid cystic carcinoma(10%), acinic cell carcinoma (6%) & mucoepidermoid carcinoma (4%).

Among the FNA of skin, soft tissue & oral cavity (miscellaneous group) (n =202), the most common lesion was epidermal inclusion cyst(24%), benign cyst(20%), lipomatous lesions(15%), benign spindle cell lesion(12.2%), acute supprative inflammation (10.4%), retention cyst (10.4%) , benign adnexal tumour(8%). Benign spindle cell lesion comprised chiefly of schwannoma (66%) of cases. Amongst benign adnexal tumours, most common was pilomatricoma (55%) followed by chondroid syringoma (35%) & sebaous adenoma (15%).

The age and sex distribution in these 2024 cases is shown in *Table No. 1*. *Table No. 2* shows distribution of various head and neck lesions according to site and cytomorphology.

Discussion

Most of the medical professionals world wide have affirmed, FNA as the first line investigation in assessment of various head and neck lesions although with varying results. Lymph node, thyroid, major salivary glands are most frequently sampled by FNA followed by skin & subcutaneous swellings and oral cavity lesions. [6]

In our study various parameters like age, sex, site and cytological diagnosis were studied and compared with other similar studies. In the present study most of the cases were in the age group of 21-30 years followed by 31-40 years. This is in concordance with Chauhan S *et al* [6] , Sood S *et al* [7] , Khetrapal S *et al* [8] , Singal P *et al* [9] . In our study the females out numbered males with female to male ratio of 1.2:1 This is in concordance with studies of Sood S *et al* [7] which showed the female to male ration of 1.6:1, Singal P *et al* [9] which showed F:M ratio of 1.5: 1 and Sanghavi AK *et al* [10] which showed F:M ratio as 1.7: 1.

In our study the maximum number of aspirates in the head & neck region were from lymph nodes (41%), followed by thyroid (33%), salivary glands (16%), skin, soft tissue and oral cavity (miscellaneous) (10%) . This is in concordance with studies of Sood *et al*,[7] , Khetrapal S *et al*,[8] Thakur AS *et al*, [11] Verma N *et al*.[12]

In our study of lymph node cytology, maximum cases were of non specific reactive lymphadenitis(33%) followed by granulomatous lymphadenitis(30%) and metastatic deposits to lymph nodes(15%). Both non specific reactive lymphadenitis & granulomatous lymphadenitis are important cause of superficial lymphadenopathy especially in the Indian subcontinent. Epithelioid cell granulomas, amorphous granular necrosis and langhans giant cells are some of important cytological features of tuberculosis. Ziehl Neelson stain for acid fast bacilli is the gold standard for the diagnosis of Tuberculosis. In our study out of the 249 cases of granulomatous lymphadenopathy, ZN stain for AFB was positive in 140 (56%) cases. This was followed by cases of metastatic deposits to lymph node (15%). This is in concordance with studies of Sood *et al* [7], Goswami *et al*[13], Padia *et al*,[14] Bargotra.[15] Jandial *et al* [16] reported, most common metastatic deposits in lymph nodes as squamous cell carcinoma followed by poorly differentiated carcinoma and deposits of adenocarcinoma in FNA of lymph nodes, which is similar to our study. The study of Modi *et al* [17] differed from the above mentioned studies as they observed metastatic cancer as the most common finding in lymph nodes on FNA.

In the present study Thyroid was the next common site for aspiration in the head and neck region. Radiologically guided FNA of thyroid was done where repeat aspiration was advised due to scant cellularity in the first attempt of FNA or when suspicious nodule was suspected. In our study Colloid goitre constituted 53% of the total thyroid FNA. This was followed by Hashimoto's thyroiditis and thyroglossal cyst. Among the neoplasms, papillary carcinoma of thyroid was the commonest followed by follicular neoplasm, anaplastic carcinoma & medullary carcinoma. Other studies also showed colloid goitre as the most commonly encountered lesion in thyroid FNA.[9,12-14,17-18]

In our study amongst FNA of salivary glands, the most common lesion was Sialadenitis (30%) followed by Pleomrphic adenoma (28%) and Sialadenosis (12%). Sialadenitis was the most common salivary gland lesion

in the studies done by Sood S *et al* [7] , Modi *et al* [17], Banstola l *et al* [19] & Kapoor S *et al* [20]. Studies by Goswami *et al* [13] , Padia *et al* [14] and Patel *et al* [21] showed Pleomorphic adenoma as the most commonly encountered lesion on FNA of salivary glands.

In our study Skin, soft tissue & oral cavity lesions (miscellaneous group) comprised of the least number of cases (10%). Epidermal inclusion cyst was the most common lesion (24%) followed by benign cyst (20%) and lipomatous lesions(15%). This is in concordance with studies of Goswami *et al* [13] & Modi MH *et al* [17]. While studies by Sood S *et al* [7] , Padia B *et al* [14] & Shekhar H *et al* [22] showed lipomatous lesion as the most common cytological lesion in this category.

Conclusion

Our study shows a spectrum of head and neck lesions on FNAC over a period of 3 years. Despite various limitations of FNAC mentioned earlier, it could still be used as the initial investigative tool for evaluating head & neck lesions particularly in our set up , although histopathology still remains the gold standard. FNAC helps to differentiate inflammatory lesions from neoplasms, thus reducing surgical intervention where ever they are unnecessary and at the same time bringing to light the missed diagnosis of malignancies, which could otherwise lead to dire consequences.

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Conflicts of Interest

There are no conflicts of interest.

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