



CYTOLOGICAL EVALUATION OF HEAD AND NECK LESIONS WITH ITS HISTOLOGICAL CORRELATION AND DIAGNOSTIC PITFALLS

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ABSTRACT **Aims And Objective-** The aim of this study was to evaluate the lesions of head and neck on cytology and correlate it with histopathology and study the pitfalls in diagnosis. **Introduction-** Head and neck swellings are seen frequently in routine clinical practice and can originate from lymph nodes, thyroid, salivary gland, oral cavity, skin, and soft tissue. They can present with perplexing diagnostic dilemma. Fine needle aspiration cytology is relevant in head and neck lesions because it is easily accessible, rapid, safe, minimally invasive and cost effective procedure. **Methods-** This is a retrospective study carried out for a period of three years from november 2020 to november 2023 in department of pathology at GMC badaun. It included 630 cases from head and neck lesions on which FNAC was performed and was correlated with the histopathological findings. **Results-** Most common site aspirated was lymph nodes followed by thyroid, salivary gland, oral cavity, soft tissue and skin. Most common diagnosis in lymph nodes was granulomatous lymphadenitis (44.5%), followed by reactive lymphadenitis (34.6%) cases. Most common lesions in thyroid were benign (71.4%) followed by malignant lesions (28.6%). Most common salivary gland swelling were benign neoplasm (66.6%), followed by sialadenitis (26.8%). In the oral cavity squamous cell carcinoma was the most frequent malignancy (62.5%) and in soft tissue and skin lipoma and epidermal inclusion cyst were most frequently encountered. OF the 630 cases histopathology was available in 203 cases. Cytohistological correlation was present in 185 (91.1%) cases. **Conclusion-** FNAC is a cheap, safe, outdoor diagnostic procedure which has high efficacy and can be employed for both therapeutic and prognostic reasons and thus it helps the surgeons to decide their treatment modality.

KEYWORDS : Fine needle aspiration cytology (FNAC), Head and neck swelling, histopathology.

INTRODUCTION

The aspirate from head and neck comprises lesions from salivary glands, thyroid, lymph node, soft tissue, blood vessels, and neural tissue and have a variable range from benign, inflammatory lesions to neoplasms. (1) FNAC is of great importance in Head and Neck region because the target sites are easily accessible, excellent patient compliance due to its minimally invasive nature, does not require anaesthesia, less time consuming and avoidance of surgery. (2) FNAC is also first line investigation in approach towards diagnosis of deep seated lesions of head and neck. (3) It is a simple, cost-effective, and rapid diagnostic procedure which is accepted by majority of the patients [4]. FNAC is useful as it helps to differentiate inflammatory lesions from neoplastic lesions. [5,6]. Patients are evaluated properly with a thorough history followed by complete head and neck examination, as the neck lesions are responsible for significant morbidity and mortality in India. (7). The purpose of the present study was to study the cytological findings of head and neck swellings and to classify the nature of the swellings and correlates with histopathological finding in a tertiary care center.

MATERIALS AND METHODS

This study was conducted in the department of pathology at GMC Badaun and it includes 630 cases of palpable head and neck lesions over a period of 3 years. It is a retrospective study in which non randomized sampling technique was applied to collect the necessary data. After taking written consent and explaining the procedure, clinical history and radiological details were obtained. Fine needle aspiration of the swelling was performed with 22 – 26 gauge needle using 10 ml syringe. The smears were made and the slides were then either wet-fixed in alcohol or dried and then fixed in methanol. Wet slides were then stained with hematoxylin and eosin stain and dry slides with MGG stain. Out of 630 cases, 203 were available for histopathological correlation. All biopsies for histopathology study were stained with H and E staining and special stain as and when required.

RESULTS-

In present study, 630 cases of head and neck lesion on which FNAC was performed during 3 year period from November 2020 to November 2023 were included.

Distribution Of Lesions In Head And Neck (Table no. 1)

	Organ involved	Total cases
1	Lymph node	355
2	Thyroid	112
3	Salivary glands	93

4	Skin	28
5	Oral cavity	24
6	Soft tissue	18

In our study the highest incidence was of lymph node lesions in 355 (56.3%) cases followed by thyroid lesion in 112(17.7%)cases, salivary gland in 93(14.7%)cases, skin in 28(4.4%)cases, oral cavity lesions in 24 (3.8%)cases, soft tissue in 18 (2.8%) cases. (Table no. 1)

Distribution Of Lesions With Gender Distribution (Table 2)

		Male	Female	Total cases
1	Lymph node	193	162	355 (56.3%)
2	Thyroid	28	84	112 (17.7%)
3	Salivary gland	51	42	93 (14.7%)
4	Skin	21	7	28 (4.4%)
5	Oral cavity	20	4	24 (3.8%)
6	Soft tissue	12	6	18(2.8%)

The age of patients ranged from 1 year to 70 years with male to female ratio of 1.06:1. In our study male preponderance was seen in cases of lymph nodes, salivary glands, oral cavity soft tissue and skin. Only lesions from thyroid glands has higher female preponderance. (Table no 2)

The Distribution Of Various Lesions And Their Cytological Diagnosis (Table 3)

	Site	Total cases	Lesion	Number of cases	%
1	Lymph node	355	Granulomatous lymphadenitis	158	44.5
			Reactive lymphadenitis	123	34.6
			Metastasis	54	15.2
			Lymphoma	10	2.81
			Abscess	8	2.25
2	Thyroid	112	Benign lesions and thyroiditis	80	71.4
			Malignant neoplasm	32	28.6
3	Salivary gland	93	Sialadenitis	25	26.88
			Benign neoplasm	62	66.6
			Malignant neoplasm	6	6.4
4	Skin	28	Epidermal inclusion cyst	18	64.28
			Inflammatory lesion	6	21.42
			Malignant lesion	2	7.1
			Adenexal tumor	2	7.1
5	Oral cavity	24	Squamous cell carcinoma	15	62.5
			Round cell tumor	3	12.5

		Mucocoele	6	25
6	Soft tissue	Lipoma	12	66.6
		Benign spindle cell neoplasm	5	27.7

Cytological And Histological Correlation Of Head And Neck Lesions (Table No. 4)

			Histopath diagnosis available	Correlation present	Correlation Absent
1	Lymph node	355	64	62	2
2	Thyroid	112	56	50	6
3	Salivary glands	93	40	37	3
4	Skin	28	22	18	4
5	Oral cavity	24	16	14	2
6	Soft tissue	18	5	5	0

Among the benign Lymph node swellings, maximum number of cases were of granulomatous lymphadenitis 158 (44.5%), followed by reactive lymphoid hyperplasia 123 (34.6%) and abscess 8 (2.25%). Total number of Malignant lymph node cases were 64 out of which most common were cases of metastatic carcinomas 54 (15.2%), which were mostly squamous in origin followed by 10 cases (2.81%) hematolymphoid malignancies. Majority of which were non Hodgkin lymphoma followed by Hodgkin lymphoma (Table no.3). Histological diagnosis was available in 64 cases out of which histological correlation was present in 62 cases. (Table no.4)

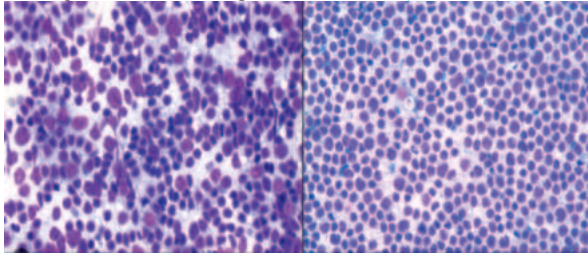


Fig.1- Cytology smear showing reactive lymphadenitis. (MGG stain 40x)

Fig.2- Cytology smear showing monotonous population in non-hodgkin lymphoma. (MGG stain 40x)

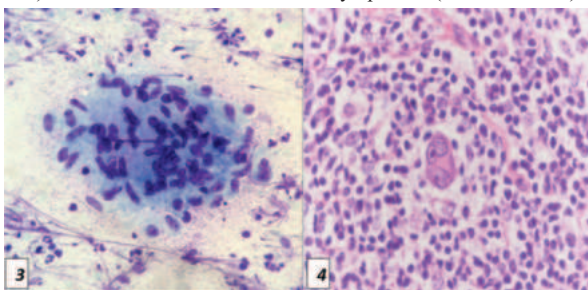


Fig.3- Cytology smear showing well-formed epithelioid cell granuloma. (MGG stain 100x)

Fig.4- Histology of showing RS cell on a background of lymphoid population in Hodgkin lymphoma (H&E stain 100x)

Out of total 112 cases of thyroid swelling 80 (71.4%) cases were non-neoplastic lesions of which most common was colloid goitre followed by thyroiditis, and Graves disease. Whereas 32 (28.6%) cases were of neoplastic lesions. The most common tumor was papillary thyroid carcinoma (PTC) followed by follicular neoplasm, medullary thyroid carcinoma (Table no. 3). Histological diagnosis was available in 56 cases out of which correlation was seen in 50 cases (Table no 4).

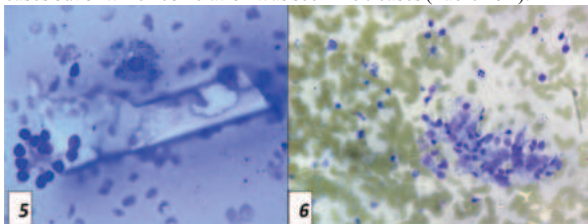


Fig.5- Cytology smear showing follicular epithelial cells on a background of colloid in colloid nodule. (MGG stain 40x)

Fig.6- Cytology smear showing lymphocytic impingement in the clusters of follicular epithelial cells (MGG stain 40x)

Of the total of 93 cases of salivary gland lesions most common were 62 (10.31%) cases and comprised of pleomorphic adenoma, sialadenitis and benign lymphoepithelial cyst and basal cell adenoma. Second most common were cases of sialadenitis 25(%) of which 20 cases were of chronic sialadenitis and 5 were of acute sialadenitis. Malignant neoplasm constituted of Adenoid cystic carcinoma, mucoepidermoid carcinoma and acinic cell carcinoma (Table no. 3). Out of 93 cases histological diagnosis was available for only 40 cases of which 37 cases correlated with the cytological diagnosis (Table no. 4).

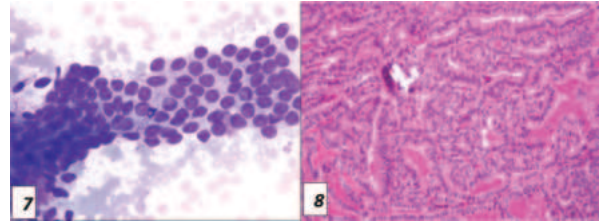


Fig.7- Cytology smears showing syncytial aggregate of follicular cells showing intra-nuclear grooving and ground nuclear grooving. (MGG stain 40x)

Fig.8- Histology of papillary carcinoma thyroid showing intra-nuclear grooving and ground glass nuclei. (H&E stain 40x)

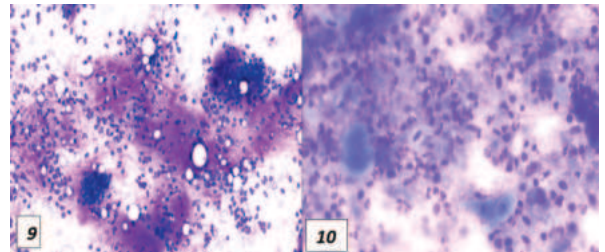


Fig.9- Cytology smear of pleomorphic adenoma. (MGG stain 40x)

Fig.10- Cytology smear of squamous cell carcinoma. (MGG stain 40x)

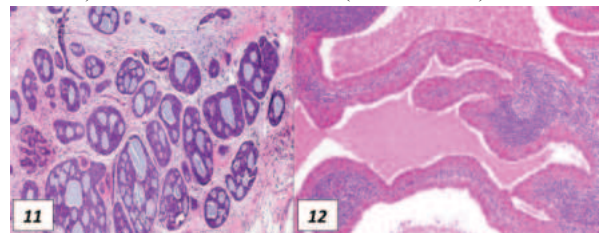


Fig.11- Histology of adenoid cystic carcinoma. (H&E stain 40x)

Fig.12- Histology of Warthin's tumor (H&E stain 100x)

Out of 28 cases of skin lesions, most common lesion were epidermal inclusion cyst 18 (64.28 %) cases followed by other inflammatory lesions 6 (21.42%) cases. 2 cases of 1 each of squamous carcinoma and basal cell carcinoma and 2 cases of benign adenexal neoplasm (Table no. 3). Out of 28 cases of skin lesion histology was available for 22 cases of which correlation was seen in 18 cases (Table no.4).

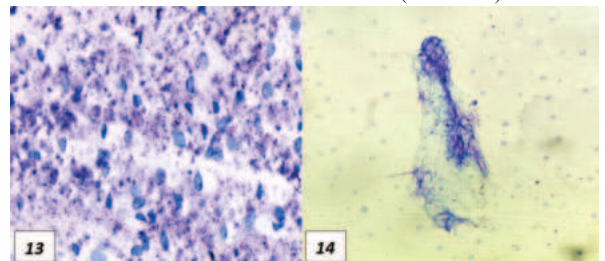


Fig.13- Cytology smear showing epidermal inclusion cyst. (MGG stain 40x)

Fig.14- Cytology smear showing lipoma. (MGG stain 40x)

Of the total 24 cases of oral cavity. Most common were squamous cell carcinoma 15 (62.5%) cases followed by mucocoele and round cell tumor. (Table no.3). Histological diagnosis was available for 16 cases of which correlation was present in 14 cases. (Table no. 4)

Out of 18 cases of soft tissue lesions, most common were lipoma 12 cases (66.6%) followed by 5 (27.7%) cases of benign spindle cell neoplasm and one case of lymphangioma. (Table no. 3). Histological diagnosis was available for only 5 cases all of which correlated with

the cytological findings (Table no. 4)

DISCUSSION

Lesions of head and neck are the most diversified and challenging amongst the swellings that are available for fine needle aspiration cytology. Most of these swellings, although superficially located, are related closely to the important anatomical structures of this region. Because of its minimally invasive nature, fine needle aspiration cytology has always been supported by clinicians as a replacement to the incisional biopsy. Although FNAC is fairly accurate, a relevant clinical history and a help from radiology regarding the nature and location of swelling can further improve the likelihood of correct diagnosis. (8-10) Fine needle aspiration cytology (FNAC) has well patient compliance and accessible to the representative focus of the lesion. Once stated by Koss that 'FNAC is a technique whose time has come' is really true. (11) This study comprises of 630 cases of fnac of head and neck lesion. Most common site aspirated was lymph node followed by thyroid, salivary glands, skin, oral cavity, soft tissue. This is in accordance with the study Meenai F.J.et.al (4) except for cases of oral cavity and soft tissue. This could be possibly because it is tertiary care centre serving rural population which has higher rate of tobacco consumption.

In this study out of total 630 patients 330 were males and 300 were females. Overall male to female ratio was 1.061:1. However in thyroid swelling male to female ratio was 1:3. This is in concordance with study of Meenai F.J.et.al (4) and Bhardwaj aparna.et.al (12).

Among the lymph nodes most common diagnosis was granulomatous lymphadenitis which is in accordance with the study of Valiya L.G.et.al (13) . and in discordance with Nanik.J.et.al (1), Kishore SH.et.al (14) and Sreedevi P.et.al (15) who reported reactive lymphadenitis as the most common diagnosis and Mennai F.J.et.al (4) who reported metastatic lymphadenopathy most common. Tuberculosis is widely prevalent in developing countries with prevalence as high as 1.5% and tubercular cervical lymphadenopathy being the most common form of extrapulmonary tuberculosis. FNAC has been reported to have 90-100 % diagnostic accuracy in detection of tuberculous affliction of nodes. (16-19).

Histopathological diagnosis was available in 64 cases and histological correlation with the cytological diagnosis was discordant in 2 cases. One case was cytologically diagnosed as granulomatous lymphadenitis. On histopathology it turned out to be Hodgkin's lymphoma. On reviewing the FNAC smears, the smears were hemorrhagic with few granulomas. On careful screening the smears also showed few eosinophils and occasional mononuclear cells and was considered as interpretation and screening error. Careful examination for presence of Reed Sternberg cells should be done. Another case was cytologically diagnosed as reactive lymphadenitis but on histopathology it was diagnosed as a case of non Hodgkin lymphomas because of the presence of monomorphic cell population. Thus, with proper technique and careful study, FNA of lymph nodes is simple tool in the diagnosis of reactive, granulomatous well as metastatic lesions and help detect occult primary malignancies inpatients.

Of the total 112 cases of thyroid lesions most common diagnosis was benign lesions of thyroid of which colloid goitre was the most common diagnosis followed by thyroiditis and primary hyperplasia of thyroid. This is in accordance with Meenai F.J et al (4). Amongst the malignant lesions papillary thyroid carcinomas were the most common finding. Out of 112 cases histopathological diagnosis was available in 56 cases of which 50 cases correlated with cytological diagnosis. Three cases of papillary thyroid carcinomas on histology was diagnosed as colloid goitre on cytology. This could be due to poor sampling, small focus of neoplasm and absence of papillary fragments in the smears. Two cases of follicular carcinomas were diagnosed as follicular adenoma on cytology. This is because of low cellularity and also because vascular and capsular invasion are seen on histopathological examination.

Of the total 93 cases of salivary gland swellings most common were cases of pleomorphic adenoma. This is in concordance with studies conducted by Jindal U et al (20) , muddegowda et al (21) and Bhagat VM et al (22). Among the malignant cases adenoid cystic carcinomas were the common findings. Out of 93 cases of salivary gland lesions histopathological diagnosis was available in 40 cases of which 37 correlated with cytological diagnosis. One case of warthin's tumor on

histology was diagnosed as lymphoepithelial cyst on cytology. This was due to poor cellularity and sampling error. Two cases of pleomorphic adenoma were found to be adenoid cystic carcinoma on histology. On reviewing the smears, clusters of uniform cells in myxoid stromal background were notable absence of hyaline globules. Among the 28 cases of skin lesions our most common diagnosis was of epidermal inclusion cyst followed by inflammatory lesion. This is in accordance with the studies conducted by bhagat VM et al (22) and Sreedevi P et al (15). Out of 28 cases histological diagnosis was available in 22 cases and 18 cases correlated histologically. Two cases of epidermal inclusion cyst were found to be pilomatrixoma on histology. This was because of poor cellularity and only ghost cells were seen on fnac smears. One case of acute inflammatory lesion was found to be squamous cell carcinoma, because of presence of acute inflammatory cells atypia in squamous cells was thought to be reactive change. One case of blue round cell tumor was later diagnosed as metastasis from small cell carcinoma.

Of the 24 cases of oral cavity lesions our most common diagnosis was squamous cell carcinoma. This is in accordance with Meenai FJ et al (4). Out of 24 cases histological diagnosis was available in 16 cases. Of the 16 cases correlation was present in 14 cases. Two cases of inflammatory lesion were diagnosed as cases of dysplasia on histological examination. This was because atypical changes present in squamous cells were considered as reactive change on cytology.

CONCLUSION

From our study we came to know about the spectrum of head neck lesions and the implication of FNAC as first line investigation in diagnosis of the broad spectrum of lesion which can help the clinician to decide the suitable treatment and plan for surgical intervention wherever necessary thus avoiding unnecessary trauma to the patient.

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