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RESEARCH ARTICLE

Diagnostic Accuracy Of Fine Needle Aspiration Cytology In Salivary Gland masses

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Abstract

Background: Fine Needle Aspiration Cytology (FNAC) is simple, safe, costeffective, and minimally invasive & out patient procedure to establish preliminarydiagnosis of salivary gland masses.
Aim of the Study: To study the diagnostic accuracy of FNAC in salivary glandmasses by correlating with histopathology.
Materials & Methods: It was a two year study conducted on 43 cases ofsalivary gland masses. The diagnostic accuracy of FNAC was calculated byconsidering histopathological diagnosis as gold standard.
Results: Pleomorphic adenoma was the most common salivary gland lesion. In our study, sensitivity, specificity, Positive Predictive Value (PPV), NegativePredictive Value (NPV) & diagnostic accuracy of FNAC were 90.9%, 100%, 100%, 96.97% & 97.67%. One case in our study was diagnosed as pleomorphicadenoma on cytology which turned out to be adenoid cystic carcinoma onhistopathology.
Conclusion: FNAC is a reliable diagnostic technique in establishing preliminary diagnosis of salivary gland masses.

Introduction:-

Fine Needle Aspiration (FNA) is cost effective & minimally invasive procedure carried out in out patient settings. In any unexplained salivary gland mass, FNA is the preferred biopsy method because incisional biopsy is associated with an increased risk of infection & potential contamination of surgical planes. Precise classification of salivary gland neoplasms by FNA is possible for many of the commonly encountered lesions, but remains problematic for a number of less common entities[1]. Although a specific diagnosis may not be feasible, non neoplastic lesions usually can be distinguished from neoplastic lesions which further can be categorised into benign or malignant with an appropriate differential diagnosis sufficient for clinical management.

The present study was conducted to analyse the role of FNAC in diagnosing salivary gland masses.

Materials & Methods:-

It was an observational study done over a period of 2 years (Mar 2016- Feb 2018). It included the cases where FNAC was followed subsequently by histopathology. FNA was done using 23-25 gauge, 30-50mm fine needle.

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Giemsa & pap staining was applied. FNAC results were correlated with histopathological diagnosis established thereof. Data was entered in microsoft excel spreadsheet. The diagnostic accuracy of FNAC was calculating on www.openepi.com. Tabulation for study was done using SPSS 20.0.

Results:-

Of the 43 cases, 27 were male (62.79%) & 16 were female (37.2%). Age range varied from 11-75 years. Maximum number of cases were found in the age group of 20-29 years & 40-49 years. [Table 1]

Table 1:- Age and Gender Distribution Of Salivary Gland Lesions.

Age Group	Female (n_1=16)	Male (n_2=27)	Total (n_1+n_2=43)
<10	0	1 (3.7%)	1 (2.32%)
10-19	1 (6.25%)	3 (11.11%)	4 (9.3%)
20-29	4 (25%)	5 (18.51%)	9 (20.93%)
30-39	1 (6.25%)	4 (14.81%)	5 (11.62%)
40-49	5 (31.25%)	4 (14.81%)	9 (20.93%)
50-59	3 (18.75%)	2 (7.4%)	5 (11.62%)
60-69	1 (6.25%)	1 (3.7%)	2 (4.65%)
70-79	1 (6.25%)	5 (18.51%)	6 (13.95%)
80-89	0	1 (3.7%)	1 (2.32%)
90-99	0	1 (3.7%)	1 (2.32%)

Parotid was the most common site (24 cases) followed by minor salivary glands (12 cases) & submandibular gland (7 cases). Amongst all salivary gland lesions, pleomorphic adenoma (21 cases) was the most commonly encountered & Mucoepidermoid carcinoma was the most common malignant diagnosis. [Table 2]

Table 2:- Histopathological spectrum of salivary gland lesions.

S.No.	Category	No. of Cases (n=43)	Percentage (%)
1	Pleomorphic adenoma	20	46.5
2	WarthinTumor	2	4.7
3	Myoepithelioma	1	2.3
4	Adenoid Cytic Carcinoma	2	4.7
5	Mucoepidermoid Carcinoma	5	11.6
6	Carcinoma ex pleomorphic adenoma	1	2.3
7	Epithelial Myoepithelial carcinoma	1	2.3
8	Non-Hodgkin Lymphoma	2	4.7
9	Chronic Sialadenitis	3	7.0
10	Mucocele	5	11.6
11	Necrotising Sialometaplasia	1	2.3

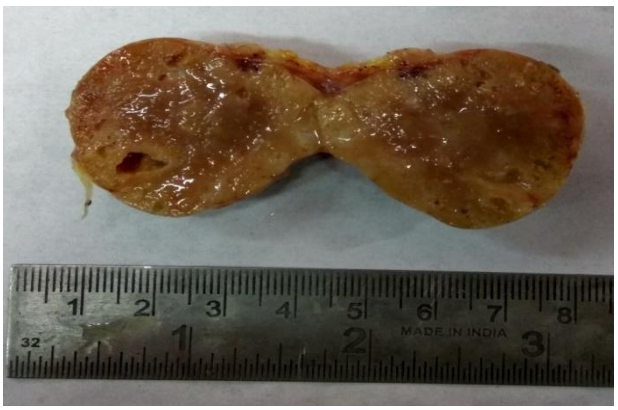

Fig 1:- Warthin Tumor of Parotid Gland.

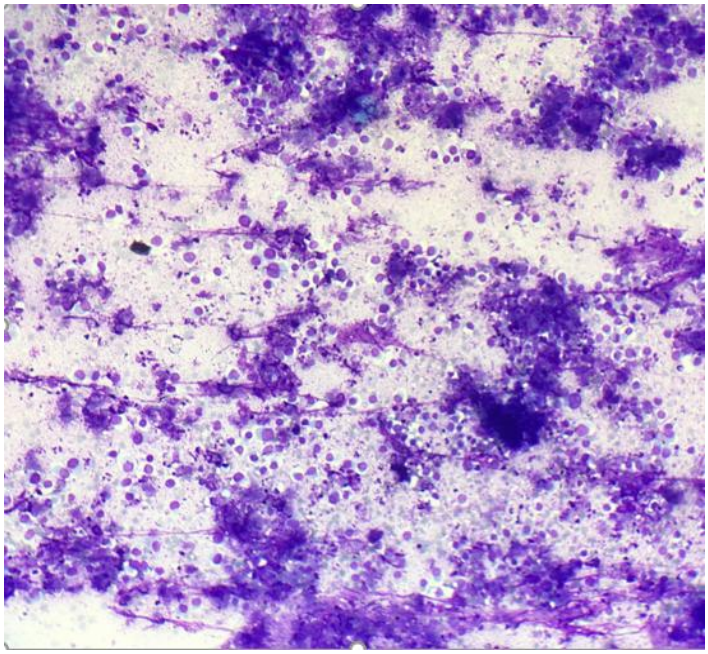

Fig 2:-Warthin Tumor, Cytology (Giemsa).

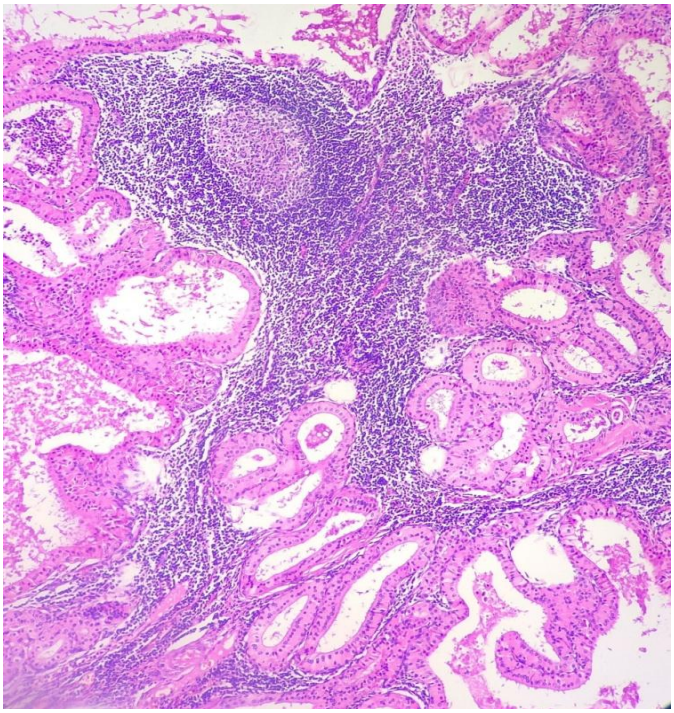

Fig 3:- 40X warthin tumor (H&E stain).

The cytopathology correlated well with histopathology in all cases except one where adenoid cystic carcinoma was the final diagnosis which however was preliminarily labelled as pleomorphic adenoma on FNAC. [Table 3]

Table 3:- Cyto-histological correlation of salivary gland lesions.

Cytological Diagnosis	**No. of Patients**	**Histopathological Diagnosis**	**No. of Patients**
Pleomorphic Adenoma	21	Pleomorphic Adenoma	20
		Adenoid Cystic Carcinoma	1

Warthin's Tumor	2	Warthin's Tumor	2
Myoepithelioma	1	Myoepithelioma	2
Adenoid Cystic Carcinoma	2	Adenoid Cystic Carcinoma	1
		Epithelial Myoepithelial Carcinoma	1
Mucoepidermoid Carcinoma	5	Mucoepidermoid Carcinoma	5
Non-Hodgkin Lymphoma	2	Non-Hodgkin Lymphoma	2
Chronic Sialadnitis	4	Chronic Sialadenitis	3
		Necrotising Sialometaplasia	1
Mucocele	5	Mucocele	5

The sensitivity, specificity, Positive Predictive Value (PPV), Negative Predictive Value (NPV) & diagnostic accuracy of FNAC were 90.9%, 100%, 100%, 96.97% & 97.67% respectively. [Table 4]

Table 4:- Cytohistological correlation to diagnose benign and malignant lesions of salivary gland.

Cytological Diagnosis	**No. of Patients**	**Histopathological Diagnosis**	**No. of Patients**
Benign	33	Benign	32
		Malignant	1
Malignant	10	Benign	0
		Malignant	10

Discussion:-

In this study, age range varied from 11-94 years with male preponderance similar to studies by other authors[2,3]. Parotid gland was the most common site involved which corresponds with earlier studies[4,5]. Chronic sialadenitis, pleomorphic adenoma & mucoepidermoid carcinoma were respectively the commonest non neoplastic, benign & malignant lesions, the findings in harmony with previous studies[6,7].

In our study, there were no false positives and one false negative. Out of 21 cases reported as pleomorphic adenoma on fine needle aspiration cytology, 20 were consistent with diagnosis and 1 turned out to be adenoid cystic carcinoma on histopathology. This could be due to shared cytological features like uniform epithelial like cells, fibrillar myxoid stromal component and hyaline stromal globules in both pleomorphic adenoma and adenoid cystic carcinoma. Similar misdiagnosis has been reported in prior studies[7,8,9,10].

The sensitivity, specificity, Positive predictive value, negative predictive value and diagnostic accuracy were 90.9%, 100%, 100%, 96.97% and 97.67% whichwas comparable to other studies.

Conclusion:-

Analyzing the diagnostic accuracy of FNAC in relation to histopathology, it can be concluded that Fine Needle Aspiration Cytology is the critical part of initial work up of patients presenting with salivary gland masses with its prime ability to reliably distinguish benign and malignant lesions. Subsequent surgical biopsy affirms the FNAC diagnosis and categorizes the lesions into definitive diagnosis.

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