Cytological Diagnosis of Salivary Gland Lesions with Histopathological Correlation

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ABSTRACT

Background: The aim of this study was to demonstrate the diagnostic accuracy of FNAC in various salivary gland lesions and its correlation with histopathology, which helps in the appropriate management of the patient.

Methods: A total of 86 patients were included in this study that was to be investigated for the salivary gland lesions. FNACs were performed using 22 gauge needle. Surgical specimens were received from 68 cases only they were processed and slides were prepared. The cytological and histopathological stained slides were correlated clinically.

Result: Out of total 86 cases 54 were male and 32 were female patients with male to female ratio of 1.7:1. Most common age of presentation was between 21-40 years and maximum patients (42) were in this age group. In this study the most common site of involvement was parotid gland, out of total 86 cases 65 occurred in parotid gland. Mucoepidermoid carcinoma was diagnosed in 3 (3.48%) cases. 2 (2.32%) cases found to have acinic cell carcinoma and both the patients (100%) were male. 2 (2.32%) cases found to have Ca. Ex. Pleomorphic adenoma. Metastatic deposit was found in 1(1.16%) patient.

Conclusion: FNAC of the salivary gland is a safe and reliable technique in the primary diagnosis of salivary gland lesions and has a high diagnostic accuracy, though in case of some tumors due to variable cytomorphology, histological examination is must and proves to be accurate for diagnosis. This study concluded that FNAC of the salivary gland tumors is accurate, simple, rapid and cost-effective for the patient.

Keywords: FNAC, Salivary Gland, Salivary Gland Tumors, Diagnostic Accuracy

Introduction

The technique of Fine Needle Aspiration was initially used to investigate lesions in salivary glands in 1920¹ with improvement and development in 1950 and 1960 and popularization in the seventies¹. It is a minimally invasive diagnostic modality with minimum cost¹ used in diagnosis of neoplastic as well as non-neoplastic lesions and being able to differentiate between benign or malignant neoplasia with variable sensitivity and specificity. Salivary gland swellings can result from tumors, an inflammatory process, or cysts.

Salivary gland tumors comprise less than 3% of all tumors of head and neck. About 80% are located in the parotids, 10% in the sub mandibular glands and the remainder being distributed between the sublingual and countless minor salivary glands (Nagarkar N et al 2004)². Major salivary gland tumors tend to be benign whereas minor salivary gland tumors tend to be malignant (Epker B N et al 1969)³. Proper management of these tumors require an accurate diagnosis by the pathologist, correct interpretation by the surgeon, knowledge of surgical anatomy of salivary glands with a clear understanding of factors leading to recurrence and complications.

A review of the various recent studies shows that the diagnostic sensitivity of FNAC varied from 81-100%, that the specificity varied from 94-100% and that the diagnostic accuracy varied from 61- 80%⁴⁻⁸. Hence, FNAC proves to be simple and accurate method for diagnosis and thus appropriate therapeutic management could be planned earlier. The present study was carried out to find out the prevalence of salivary gland neoplasms, to classify them as per WHO classification, to see associated conditions like sialadenitis, sialolithiasis coexisting with salivary gland neoplasms and to do cyto-histopathological correlation.

Materials and Methods:

The present study was carried out in the department of Pathology of Government Medical College and Hospital, Saharanpur, Uttar Pradesh. This study included 86 cases of salivary gland lesions that underwent FNAC over a period of 1 year (July 2015-June 2016). The clinical history and relevant clinical examination of all the patients was done. FNACs were performed using 22 gauge needles and 10 ml disposable syringes using Franzen's syringe holder (Gun). The appearance, color, and texture of the aspirate was noted.

In each case, one -two wet fixed (Ether/Ethyl alcohol) smears for Papanicolaou stain, 3-4 dry fixed smears for Giemsa stain were prepared, and one-two smears were kept unstained for any further required stain. Only 68 cases were available for histopathology hence cytological and histopathological correlation was done in 68 cases only. We took histopathological diagnosis as gold standard. The diagnostic accuracy of FNAC was established. The detail clinical history and relevant clinical examination of all the patients has been done.

Result

Out of total 86 cases 54 (62.79%) were male and 32 (37.21%) were female patients with male to female ratio of 1.7:1. Most common age of presentation was between 21-40 years and maximum patients (42) (48.83%) were in this age group as shown in table no. 2. Out of total 42 cases in this age group 27 male and 15 were female patients. However lesions are present in any age group. The duration of lesions varied from few months to many years. Clinically the benign tumors presented as a painless swelling since many years while malignant tumors presented with persistent pain, fixity and rapid increase in size in a short duration.

In this study the most common site of involvement was parotid gland, out of total 86 cases 65 (75.38%) occurred in parotid gland and 12 (13.95%) occurred in submandibular gland. Nine lesions were found in minor salivary glands of which 5 were in the palate, 3 in the floor of mouth and 1 in the lip as shown in the table 1. The most common gland involved is parotid gland.

On FNA out of total 86 cases, 62 (72.09%) were pleomorphic adenomas, and out of this 38 (61.29%) patients were male while 24 (38.71%) patients were females, 07 (8.14%) were of chronic sialadenitis, out of this 05 (71.42%) were male and 02 (28.58%) were female patients. Total 03 (3.48%) were of sialadenosis out of which 01 (33.33%) was male, 02 (66.67%) were female patients. Benign parotid tumor was found in 1 (100%) female patient that is (1.16%) of total 86 patients. Warthin's tumor (Fig.1) was given in 2 (100%) male patients i.e. (2.32%) of total 86 patients, 3 cases were found to have cystic lesions out of which 2 (66.67%) were male and 1 (33.33%) was a female patient shown in table no. 2. Mucoepidermoid carcinoma (Fig. 2, 3) was diagnosed in 3 (3.48%) cases out of which 2 (66.67%) were male and 1 (33.33%) was a female patient. 2 (2.32%) cases found to have Acinic cell carcinoma (Fig. 4) and both the patients (100%) were male. 2 (2.32%) cases found to have Ca. Ex. Pleomorphic adenoma, out of which 1 (50.00%) was male and 1 (50%) was female patient. Metastatic deposit was found in 1 (1.16%) patient and that was a (100%) male patient.

On histological examination, out of total 86 cases histology was available in 68 cases. Out of 62 cases of Pleomorphic adenoma histology was available in 52 cases; in 10 cases we did not get histology. On histology the observations were as seen in table no. 3.

Cytohistological correlation done. Out of total 86 cases diagnosed on cytology 55 (63.95%) were well correlated histologically while 13 (15.11%) cases not correlated and no histology available in 18 (20.93 %) cases as seen in table no. 4.

Table No.1: Shows site wise distribution of salivary gland lesions.

Sr. No.	Glands Involved	No. of Cases	Case Percentage
1.	Parotid gland	65	75.38%
2.	Submandibular gland	12	13.95 %
3.	Palate	05	5.81%
4.	Lip	01	1.16%
5.	Floor of Mouth	03	3.48%
	Total Cases	86	100 %

Table No.2: Cytological Diagnosis.

Sr.No.	FNA Diagnosis	Males	Females	Total Cases	Percentage
1.	Pleomorphic adenoma	38 (61.29%)	24 (38.71%)	62	72.09 %
2.	Chronic Sialadenitis	05 (71.42%)	02 (28.58)	07	8.14 %
3.	Sialadenosis	01 (33.33%)	02 (66.67%)	03	3.48 %
4.	Benign Parotid tumor	00 (00.00%)	01 (100%)	01	1.16 %
5.	Warthin's tumor	02 (100%)	00 (00.00%)	02	2.32 %
6.	Cystic Lesions	02 (66.67%)	01 (33.33%)	03	3.48 %

Sr.No.	FNA Diagnosis	Males	Females	Total Cases	Percentage
7.	Mucoepidermoid Carcinoma	02 (66.67%)	01 (33.33%)	03	3.48 %
8.	Acinic Cell Carcinoma	02 (100%)	00 (00.00%)	02	2.32 %
9.	Ca Ex Pleomorphic adenoma	01 (50.00%)	01 (50.00%)	02	2.32 %
10.	Metastatic Deposits	01 (100%)	00 (00.00%)	01	1.16%
	Total	54 (62.79%)	32 (37.21%)		100%

Table No. 3: Shows FNA diagnosis and their variations on histopathology

Sr.No	FNA Diagnosis		Histopathology		
	Diagnosis	No.of cases	Diagnosis	Cases	Histopathology not available
1.	Pleomorphic Adenoma	62	Pleomorphic Adenoma	41	10
			Basal cell adenoma	02	
			Warthin's tumor	02	
			Myoepithelioma,	01	
			Benign lymphoepithelial cyst,	01	
			Mucocele	02	
			Sialadenosis	02	
			Mucoepidermoid carcinoma.	01	
2.	Benign parotid tumor	01	Pleomorphic adenoma	01	-
3.	Warthin's tumor	02	Warthin's tumor	01	01
4.	Cystic lesions	03	Mucocele	02	01
5.	Ca. Ex. Pleomorphic adenoma	02	Ca. Ex. Pleomorphic adenoma	01	-
			Mucoepidermoid carcinoma	01	-
6.	Mucoepidermoid carcinoma	03	Mucoepidermoid carcinoma	02	01
7.	Acinic cell carcinoma	02	Acinic cell carcinoma	02	-
8.	Metastatic deposit	01	Metastatic deposit	01	-
9.	Chronic sialadinitis	07	Chronic sialadinitis	03	04
10.	Sialoadenosis	03	Sialoadenosis	02	01
	Total	86		68	18

Table no. 4: shows Cytohistological correlation of salivary gland lesions.

Sr.No.	Cytology	No. of cases	Histology		
			Histology correlated	Histology not correlated	Histology not available
1.	Pleomorphic Adenoma	62	41 (66.12%)	11 (17.74%)	10
2.	Chronic sialadinitis	07	03 (42.85%)	-	04
3.	Sialadenosis	03	02 (66.67%)	-	01
4.	Benign parotid tumor	01	-	01 (100%)	-
5.	Warthin'tumor	02	01 (50%)	-	01
6.	Cystic lesion (Mucocele)	03	02 (66.67%)	00	01
7.	Mucoepidermoid carcinoma.	03	02 (66.67%)	-	01
8.	Ca. Ex. Pleomorphic adenoma	02	01 (50%)	01 (50%)	-
9.	Acinic cell carcinoma	02	02 (100%)	-	-
10.	Metastatic deposit	01	01 (100%)	-	-
Total		86	55 (63.95%)	13 (15.11%)	18 (20.93%)

Fig. 1: FNAC, Cytomorphology of Warthin's tumor showing cluster of oxyphilic cells and scattered lymphocytes (Giemsa stain 40 X).

Fig. 2: Cyтомorphology of mucoepidermoid Carcinoma showing intermediate cells with abundant vacuolated cytoplasm (Giesma stain 40 X).

Fig. 3: Histology of Mucoepidermoid Carcinoma showing mucin filled spaces and mucinous cells. (H&E Stain 40 X).

Discussion

In our study most common age of presentation was between 21-40 years and maximum patients 42 (48.83%) were in this age group. Out of total 42 cases in this age group 27 male and 15 were female patients. The duration of lesions varied from few months to many years. Clinically the benign tumors presented as a painless swelling since many years while malignant tumors presented with persistent pain, fixity and rapid increase in size in a short duration.

In this study the most common site of involvement was parotid gland, out of total 86 cases 65 (75.38%) occurred in parotid gland and 12 (13.95%) occurred in submandibular gland. 9 lesions were found in minor salivary glands of which 5 were in the palate, 3 in the floor of mouth and 1 in the lip. We observed that tumors both benign as well as malignant are more in male than in females this may

Fig. 4: Histology of Acinic cell Carcinoma showing papillary structures With Acinic cells (H&E Stain 40 X).

be due to variation in the habits as tobacco, smoking, alcohol consumption as well as exposure to occupational hazards is more in males than females, in this study we found that most of the male patients were smoker and tobacco user. The commonest benign lesion in this study is pleomorphic adenoma and 41 (66.12%) cases of pleomorphic adenomas are correlated cytologically and histologically. The mucoepidermoid carcinoma is the most common malignant lesion reported in this study that is correlated with Nguansangiam et al⁹. The common non-neoplastic lesion was chronic sialadenitis, common in submandibular gland this is in concordance with study done by Atula T et al¹⁰. Cytomorphologically the diagnosis of mucoepidermoid carcinoma may have resemblance with pleomorphic adenoma, Ca. Ex. Pleomorphic adenoma and

Warthin's tumor so histological confirmation is required the same is also observed by Layfield L.J. et al¹¹.

Conclusion

Pleomorphic adenoma was the commonest benign tumor while mucoepidermoid carcinoma was the commonest malignant tumor in the present study and the incidence of neoplastic lesions were high in major gland while non-neoplastic lesions were high in minor salivary glands. The overall accuracy in cytohistopathological correlation varied from 63.95% to more than 80% depending on the availability of histopathology. FNAC of salivary gland lesions can be more accurate but it has certain limitation in the form of limited availability of histology and limited histological architectural features. However multiple sampling and increasing experience help to minimize the errors¹². Thus FNAC is safe and cost effective outpatient procedure. FNAC continues to be a reliable diagnostic technique. It is advantageous both for the patients and the clinicians because of its quick results, accuracy, cost-effectiveness, and lack of complications to the patient.

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