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Research Paper

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Diagnosis of Salivary Gland Tumors by FNAC

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ABSTRACT

An analysis of the salivary gland lesions presenting for FNAC diagnosis at VSGH was done & the results compared histologically. The reason for the study was to test the diagnostic efficacy of FNAC while keeping the histological diagnosis as the gold standard. The salivary glands are suitable for FNAC due to their superficial location & easy accessibility. The cytology & histopathology of the operated lesions was correlated. The frequency of the commonly encountered lesions & the diagnostic pitfalls were recorded.

INTRODUCTION

A variety of non-neoplastic & neoplastic lesions can involve the salivary glands during routine clinical practice.[1, 2] A large varieties of such lesions are benign & non-neoplastic which can be cured on routine OPD basis. Also a careful cytological assessment of the lesions can serve as an effective tool for pre-operative evaluation of the patient. The study aimed to find out the prevalence of different types of salivary gland lesions on FNAC, a histocytologic correlation of the resected lesions & to assess the sensitivity, specificity & diagnostic accuracy of FNAC for the diagnosis of salivary gland lesions.

MATERIALS & METHODS

The study was conducted at the department of cytology at Smt. V.S General Hospital. 50 cases of FNAC done on salivary gland lesions over a period of one year attending the OPD at Smt. VSGH were studied. FNAC was performed with disposable 22 gauge needle & 10 ml syringe. Multiple smears prepared, fixed with methanol & stained with H & E stain.

RESULTS & DISCUSSION

A higher incidence of the lesions was found in males with an average sex ratio of 4:1. The M/F sex ratio varied from 3:1 in the non-neoplastic lesions to 5:1 in neoplastic lesions showing a male preponderance for neoplastic lesions.

However, although 62.5% of males (n=25) & 50% of females (n=5) had a neoplastic lesion, the difference was statistically not significant after applying chi-square test with Yates correction (at dof. =1, p=0.14).

(Table 1)

Table 1Distribution of neoplastic & non-neoplastic lesions among males & females.

	Male	Female	Total	M/F
Non Neoplastic	15 (37.5%)	05 (50%)	20 (40%)	3:1
Neoplastic	25 (62.5%)	05 (50%)	30 (60%)	5:1
Total no. of cases	40	10	50	
M/F Ratio	4:1			

The non- neoplastic lesions were 40% & the neoplastic lesions (comprising of both Benign & Malignant lesions) comprised of 60% of all the cases.

In more than half (52%) of the patients the average age of involvement of the salivary gland lesions was more than 40 years.

48% of the lesions were in 20-40 yr age group , of which there were 18 males (75%) . The neoplastic lesions in the same age group were seen in 71.4% males increasing to 84.6% in the above 40 year age group showing an increase in the male predisposition to neoplastic thyroid lesions with increasing age.

The non neoplastic lesions which comprised of inflammatory lesions were seen in 76.5% males in 20-40yr age group & 66.7% in those above 40 year age group.

The total neoplastic lesions in 20-40 year age group were 7 (29.2%) rising to 23 (88.5 %) in above 40 year age group. The neoplastic lesions in females in the 20-40 year age group was 28.6% which decreased to 13% in the above 40 year age group. The trend shows a significant male predisposition to thyroid lesions & more so towards an increase in the incidence of neoplastic lesions with an increasing age.

An age related statistical analysis showed non neoplastic involvement in < 40 yrs age group was 70.8 %(n=17), & 11.5% (n=3) in > 40 yrs age group. Neoplastic involvement in < 40 years age group in 29.2 %(n=7) of patients & 88.5 %(n=23) in > 40 yrs age group which was extremely significant after applying Chi square test with Yat's correction (Chi value=15.895 at dof =1, p < 0.0001). (Table 2)

Table 2 Distribution of Neoplastic & Non-neoplastic lesions as per the average age & sex of the study group

		Age					Total No.	%	Total %
Lesion	20-40 (yrs)			>40 (yrs)					
	Male	Female	Total	Male	Female	Total			
Non Neoplastic	13 (76.5%)	04 (23.5%)	17 (70.8%)	02 (66.7%)	01 (33.3%)	03(11.5%)	20	40	100
Neoplastic	05 (71.4%)	02 (28.6%)	07 (29.2%)	20 (87%)	03 (13%)	23(88.5%)	30	60	
Total no. of cases	18 (75%)	06 (25%)	24	22 (84.6%)	04 (15.4%)	26	50	100	
	24			26					
Total %	48			52					

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Another significant correlation was the rise in the incidence of malignant lesions with an increase in the age group; which rose from 0% incidence in 20-40yr age group to 15.4% in more than 40 years age group. The incidence of malignant lesions was 11.5% in males as compared to 3.8% in the females. (Table 3)

Table 3 Distribution of the Benign & Malignant lesions as per the average age & sex of the study group

Age							Total No.	%	Total %
Lesion	20-40 (yrs)		Total	>40 (yrs)		Total			
	Male	Female		Male	Female				
Benign	14(58.3%)	10(41.7%)	24(100%)	19(73.1%)	03(11.5%)	22(84.6%)	46	92	100
Malignant	00 (0.0%)	00 (0.0%)	00(0%)	03(11.5%)	01(3.8%)	04(15.4%)	04	08	
	14	10		22	04				
Total No.	24			26			50		
%	48			52			100		

The salivary gland most frequently involved was the Parotid (56%), followed by the submandibular (32%) & the minor salivary glands (12%) respectively.

The non neoplastic inflammatory lesions accounted for 40% of all the lesions, & 43.4% of all the benign lesions. Neoplastic lesions accounted for 60% of all lesions included in our study of which 86.6% were benign & 13.4% were malignant.

Pleomorphic adenoma was the commonest encountered benign neoplastic lesion accounting for (76.9 %) among benign neoplastic lesions, 66.6% of the total neoplastic lesions & 40% of the total number of lesions.

The other benign neoplastic lesions accounted for 12% of the total number of lesions studied, 20% of all the neoplastic lesions & 23.07% of the benign neoplastic lesions. Malignant lesions were reported in 8% of all the lesions accounting for 13.3% of the neoplastic lesions.

60% of all the lesions were neoplastic, of which 86.6% were benign & 13.4% were malignant. Of the total number of lesions, 92% were benign & 8% were malignant. (Table 4 &5)

Table 4
Distribution of lesions

Lesion	No. of cases	Benign	Malignant	Neoplastic				%(Total)
Inflammatory/ Non-neoplastic	20	20 (43.5%)		Benign	Malignant	% of Neoplastic	Total neo %	40
Pleomorphic adenoma	20	20 (43.5%)		20 (76.9%)		66.6	86.6	40
Warthin's tumor	4	4 (8.7%)		4 (15.4%)		13.3		8
Benign fibrous tumor	1	1 (2.8%)		1 (3.8%)		3.3		2
Benign Cystic tumor	1	1 (2.8%)		1 (3.8%)		3.3		2
Mucoepidermoid carcinoma	1		1 (25%)		1 (25%)	3.3	13.4	2
Adenoid Cystic Carcinoma	1		1 (25%)		1 (25%)	3.3		2
Acinic Cell Carcinoma	1		1 (25%)		1 (25%)	3.3		2
Carcinoma in Pleomorphic adenoma	1		1 (25%)		1 (25%)	3.3		2
Total neo. no.				26	4			
Total no.	50	46	4	30				
% of total	100	92	8	60		100	100	100

Table 5
Benign vs malignant lesions

	Total No.	%	Benign	%	Malignant	%	Total %
Neoplastic	30	60	22	73.33	8 (26.66%)	26.66	100
Non-Neoplastic	20	40	20	100	0	0.00	100
Total	50	100	46	92%	4	8%	100

16 of the cases included in the study were resected & studied histologically. The histopathological results were correlated with the cytological findings. Of the total specimen, 12 were labeled as benign and 4 as malignant. No false positive cases were recorded. 2 (12.5%) of the cases were found to be false negative, probably due to a sampling error. Diagnostic accuracy of the cytological examination was - 92%, with a sensitivity of 87.5% & 100% Specificity. (Table 6)

Table 6
Correlation of FNAC vs HPE diagnosis

Lesion	No. of cases	FNAC Diagnosis	HPE Correlation		Final diagnosis
			Yes	No	
Pleomorphic Adenoma	9	9	9	0	-
Mucoepidermoid Ca	1	1	1	0	-
Benign Neoplastic Lesion ?? Monomorphic adenoma	1	1	0	1	Adenoid cystic Ca
Malignant Tumor (Not Specified)	2	2	2	0	1.Acinic Cell Ca 2.Ca in Pleomorphic adenoma
Benign Salivary Gland Lesion (Neoplastic)	1	1	0	1	Myoepithelioma
Warthin's Tumor	2	2	2	0	
Total	16	16	14	2	

Our results on histocytologic correlation compares well with studies. The diagnostic accuracy in studies by Shintani, Jayaram & Young was 93.0%, 87.7% & 96% respectively. The sensitivity ranged from 56.5% (MAVEC) to 97.6% (Crystalline) and speci-

ficity from 94 %(O' Dwer) to 100 %(Young & Bono) [2, 3, 4.]

Table 7
Comparison with other similar series

Authors	No. of cases with histologic confirmation	Diagnostic Accuracy %	Sensitivity %	Specificity %
Shintani	43	93.00	88.90	94.10
Jayaram	57	87.70	80.90	94.30
Qizibash	146	98.00	87.50	-
Cristallini	63	97.90	97.60	98.45
MAVEC	475	87.80	56.50	98.90
Young	59	96.60	87.50	100.00
Bono	79	80.40	86.70	100.00
O'Dwyer	341	90.00	73.00	94.00
Our series	16	92	87.5	100

A few pitfalls in the diagnosis were recorded.
Two of the cases reported as Pleomorphic adenoma were reported to have associated epithelial hyperplasia on histology. The case reported as benign fibrous tumor was reported as myoepithelioma on histology.

One case was labeled on cytology as a benign neoplastic salivary gland lesion with a possibility of monomorphic adenoma was reported as adenoid cystic carcinoma. The errors in diagnosis could be explained to have occurred due to a limited sampling on FNAC, which might have resulted in missing out the specific focus.[5.6, 7]

CONCLUSION
Hence we can conclude that in view of the ever increasing health costs, FNAC of salivary glands provide financial advantages by providing rapid & accurate diagnosis on an OPD basis & is also a useful diagnostic tool in the pre-operative assessment of patients with salivary gland lesions.

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