

Fine-needle aspiration cytology (FNAC) of salivary gland lesions with histopathological correlation in a district hospital of Jammu region

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Abstract

Background: Fine needle aspiration cytology (FNAC) is a simple, rapid, cost effective and useful method for diagnostic evaluation of salivary gland lesions due to their superficial nature and easy accessibility.

Aim: To study the cytomorphological patterns of the salivary gland lesions and to perform histopathological correlation in suspicious cases in Government District Hospital, Gandhi Nagar, Jammu, India.

Material and Methods: In the present study 74 cases were included. FNAC was performed using 22 gauge needle and 10 ml plastic syringe with a detachable syringe holder (Franzen Handle). In each case, three alcohol fixed smears were prepared, first smear was stained with Papanicolaou stain, second with Giemsa stain and third one was kept unstained for any further required stain. Cytohistological correlation was made in 47 cases only.

Results: Parotid gland was the most commonly involved salivary gland. Maximum cases were seen among age group of 21 to 30 years. Most common non neoplastic lesion was chronic sialadenitis while pleomorphic adenoma was commonest benign lesion and adenoid cystic carcinoma was more frequent malignant lesion. Sensitivity, specificity and diagnostic accuracy of FNAC was 66.6%, 95.8% and 93% in case of neoplastic lesions and 100% in non neoplastic lesions.

Conclusion: The high accuracy, sensitivity, and specificity of FNAC makes it a useful and reliable screening and diagnostic procedure in case of salivary gland lesions especially in District Hospitals with limited infrastructure.

Key words: Diagnostic accuracy, FNAC, Salivary gland, Salivary gland neoplasms, Sensitivity.

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salivary gland lesions on FNAC and do histopathological correlation in some selected suspicious cases.

Material and Methods

This prospective study included 74 cases of salivary gland lesions that underwent FNAC over a period of 3 years (January 2013-December 2015) in Pathology section of Government Hospital Gandhi Nagar (District Hospital) Jammu. Detailed history and relevant clinical examination was done in all the cases. FNAC was performed using 22 gauge needle and 10 ml plastic syringe with a detachable syringe holder (Franzen Handle). The character of aspirate was noted. In each case, three alcohol fixed smears were prepared, first smear was stained with Papanicolaou stain, second with Giemsa stain and third one was kept unstained for any further required stain. Cytological and histopathological correlation was done in 47 cases. Keeping histopathological diagnosis as gold standard, sensitivity, specificity, and diagnostic accuracy of FNAC was calculated.

Data Analysis: Data was analysed using Epi info™ version 7.1.5 (CDC Atlanta). Statistical significance of associations was evaluated using Chi square test. A two tailed p value of <.05 was considered as statistically significant.

Introduction

Fine Needle Aspiration Cytology (FNAC) is a minimally invasive technique. It offers great help to physicians aiming at diagnosis of various palpable swellings of body like that of breast, salivary gland and lymph nodes and is particularly useful in case of salivary glands as core needle biopsy has possible risk of causing a fistula/tumour implantation through disrupted capsule. Since there are numerous entities like benign tumours, malignant tumours with subtypes, non epithelial tumours and secondary tumours etc, precise diagnosis by FNAC may seem very difficult. The purpose of FNAC is not to provide a definitive type specific diagnosis and it is not a substitute for histological diagnosis. It is used in conjunction with clinical and radiological findings to rapidly provide the best possible initial assessment on which management decisions can be based.¹ The present study was designed to describe the cytomorphological features of

Table 1: Age wise Distribution of Salivary Gland Lesions

Age groups	Chronic sialadenitis	Granulomatous sialadenitis	Sialadenosis	Retention cyst	Suppurative sialadenitis	Onco-cytoma	Warthins tumour	Pleomorphic adenoma	Mucoepi-dermoid CA	Adenoid cystic carcinoma
0-10	3			4	1					
11-20	4			1				2		
21-30	7			3	1			6		
31-40	5				2	1		7		1
41-50	2		2				1	3	1	
51-60	6		2		1			1		1
61-70		1					2	1		
71-80				1						
81-90										
91-100					1					
Total cases	27	1	4	9	6	1	3	20	1	2

Table 2: Gender Wise Distribution of Cases (on FNAC)

Diagnosis		Males	Females	Number of Cases
Non Neoplastic (n=47; 63.5%)				
	Suppurative sialadenitis	4	2	6
	Chronic sialadenitis	16	11	27
	Sialadenosis	4	0	4
	Retention cyst(Mucinous)	6	3	9
	Granulomatous sialadenitis	1	0	1
Neoplastic				
Benign (n=24; 32.4%)	Oncocytoma	0	1	1
	Pleomorphic adenoma	5	15	20
	Warthins tumour	2	1	3
Malignant (n=3;4.1%)	Mucoepidermoid carcinoma	1	0	1
	Adenoid cystic carcinoma	2	0	2
Total		40	34	74

Chi square=13.39 p value <0.01

Table 3: Distribution According to Site Involved

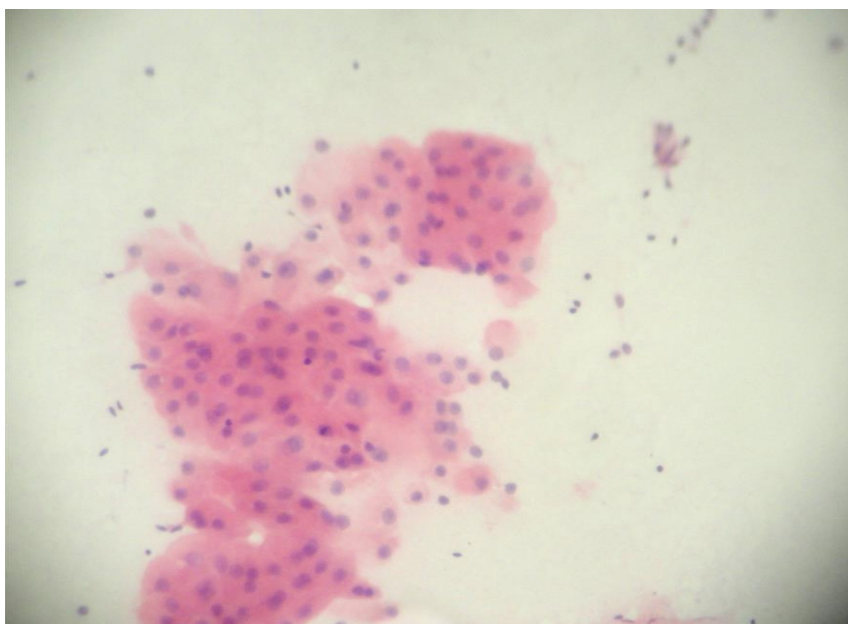
SITE(Type of salivary gland involved)	Number of Cases
Lingual	4
Minor salivary gland	11
Parotid	31
Sub mandibular	28
Total	74

Table 4: Histopathological Correlation of Salivary Gland Lesions

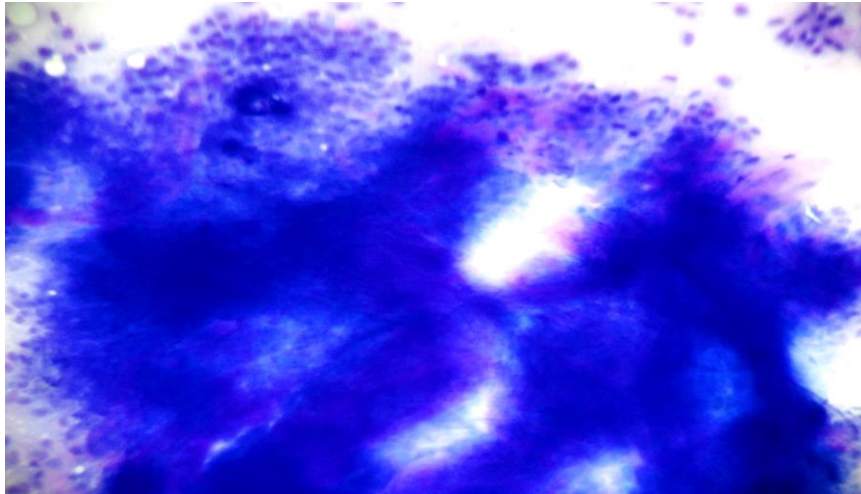
FNAC	Histopathology							
	Sialadenosis	Chronic Sialadenitis	Mucinous cyst	Oncocytoma	Pleomorphic adenoma	Warthins tumour	Mucoepidermoid carcinoma	Adenoid cystic carcinoma
Sialadenosis(3)	2	1	0	0	0	0	0	0
Chronic Sialadenitis(8)	2	6	0	0	0	0	0	0
Mucinous cyst(9)	0	1	8	0	0	0	0	0
Oncocytoma(1)	0	0	0	1	0	0	0	0
Pleomorphic adenoma(20)	0	0	0	0	19	0	0	1
Warthins tumour(3)	0	0	0	1	0	2	0	0
Mucoepidermoid carcinoma(1)	0	0	0	0	0	0	1	0
Adenoid cystic carcinoma(2)	0	0	0	0	1	0	0	1
Total cases(47)	4	8	8	2	20	2	1	2

Table 5: Diagnostic Accuracy of FNAC in Neoplastic Lesions

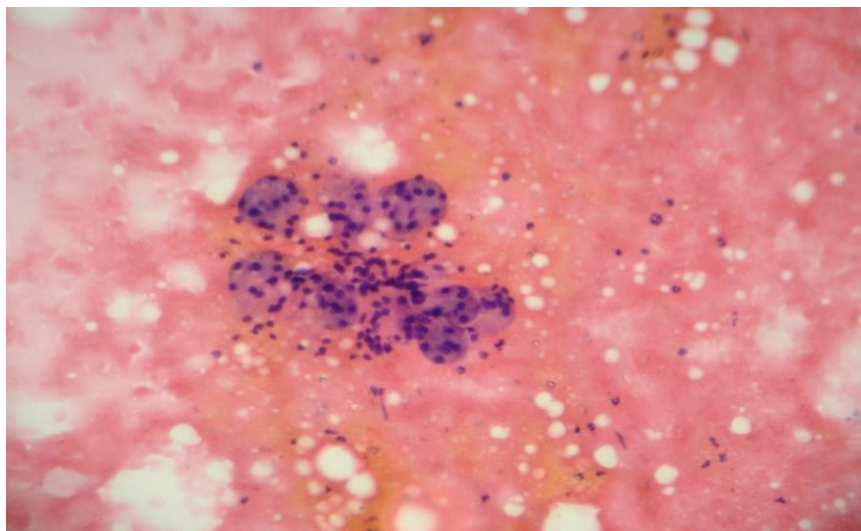
FNAC	Histopathology		
	Malignant neoplastic	Benign neoplastic	Total
Malignant neoplastic	2	1	3
Benign neoplastic	1	23	24
Total	3	24	27



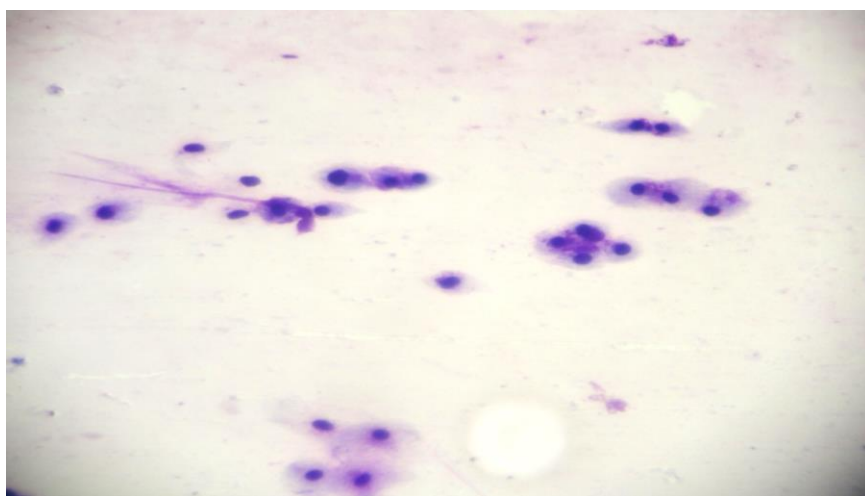
Microphotograph of Warthins tumor(Cystadenoma Lymphomatosum) showing sheet of oncocytic cells in a background containing lymphocytes(20x, PAP)



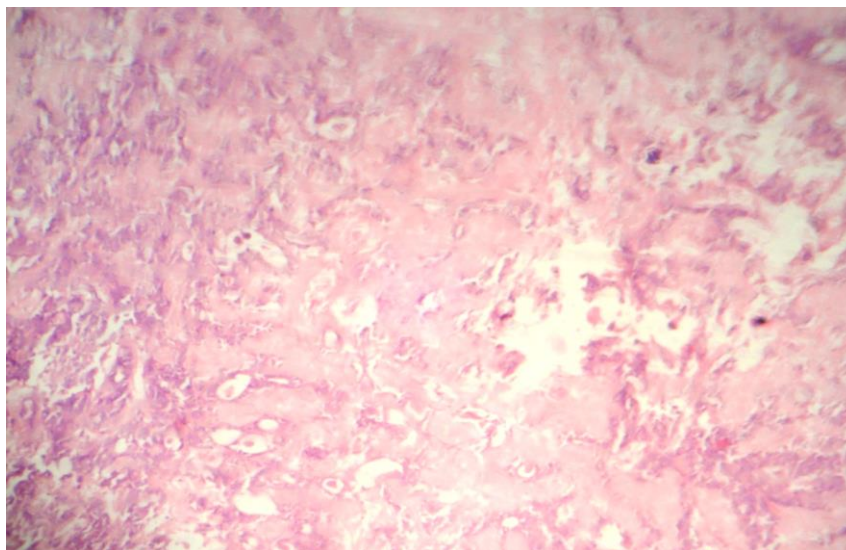
Microphotograph of a case of Pleomorphic Adenoma showing epithelial cells admixed with myxofibrillary material(20x,Giemsa)



Microphotograph of a case of Chronic Sialadenitis showing salivary acini cluster admixed with lymphocytes(20x,PAP)



Microphotograph of a case of Mucinous(Retention) cyst showing numerous mucinophages in a mucinous background(40x,Giemsa)



Microphotograph of a case of Pleomorphic Adenoma (20x, H&E)

Discussion

FNAC is safe, simple, rapid and cost effective procedure. Besides helping in defining the nature of lesion, in some cases FNAC also helped in making specific diagnosis. Although, management of almost all neoplastic salivary gland lesions is surgical excision, a pre-operative diagnosis of benign or malignant assists the clinician in planning the extent of surgery.²

In the Present study the mean age of patients was 35.7 years (± 19.3 years) for all lesions considered together with age range of 3 to 93 years. Males were more in number as compared to females. However studies conducted by various authors reported age range of 8 to 68 years with mean age of 40 years and male predominance.^{3,4} Regarding site, Parotid gland was observed as the most common site involved. This is in agreement with findings of other authors.^{5,6,7} Among lesions observed on FNAC, the rate of non neoplastic lesions in our study was 63.5%. This finding finds consonance with these studies reporting between 20% to 72.9%.^{8,9} Most common non neoplastic lesion was chronic sialadenitis followed by retention cyst. Overall benign neoplasms accounted for 32.4% of all cases with pleomorphic adenoma as the most common type. These findings corroborated with study.³ In the current study we have reported lower incidence of malignant neoplasms (4.1%) lesions. However various authors have reported little higher incidence.^{3,7,10} Nguansangiam et al.⁸ have also reported the lower rate of malignant neoplasms. In the present study adenoid cystic carcinoma was most common malignant neoplastic lesion. This finding is in contrast with findings of various studies^{3,8,11}. We reported sensitivity, specificity and diagnostic accuracy of FNAC as 66.6%, 95.8% and 93% respectively in case of neoplastic lesions and 100% in non neoplastic lesions. Various studies have reported sensitivity from 62% to 97.6% and specificity from 94.3% to 100%.^{3,12,13,14} High

diagnostic accuracy also finds consonance with other studies^{3,15,16}.

Results

Out of 74 patients, 40 cases were males (54 %) and 34 cases were females (46 %) with overall M: F ratio of 1.2:1 and among them it was 0.4:1 for benign neoplasms and 3:0 for malignant neoplasms. The mean age was 35.7 years (± 19.3 years) for all lesions considered together. Mean age of benign neoplastic lesions was 36.4 ± 13.4 years and malignant lesions was $45 \text{ years} \pm 10.4$ years. Out of the 74 cases, 31 (41.9%) occurred in parotid gland, 28 (37.8 %) in submandibular gland, 11 (14.9 %) in minor salivary gland tumours and 4 (5.4%) were lingual. Majority of lesions were non neoplastic (63.5%) followed by benign neoplastic (32.4%) and three cases (4%) were malignant. Among non neoplastic lesions maximum cases were chronic sialadenitis (57.4%). Pleomorphic adenoma was the most common lesion among benign neoplastic lesions. Adenoid cystic carcinoma was seen in two cases and mucoepidermoid carcinoma was present in one case. Sensitivity, specificity and diagnostic accuracy of FNAC was 66.6%, 95.8% and 93% in case of neoplastic lesions and 100% in non neoplastic lesions.

Conclusion

The high accuracy, sensitivity and specificity of FNAC makes it a useful and reliable screening and diagnostic procedure in case of salivary gland lesions especially in District Hospitals.

Acknowledgement: Nil

Conflicts of Interest: Nil

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