

Original Research Article

Cytopathological study of salivary gland lesion in patients at a tertiary care centre, Indore: a one-year study

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ABSTRACT

Background: Fine needle aspiration cytology (FNAC) is being increasingly used in the diagnosis of salivary gland lesions. However, the diagnosis is still difficult sometimes. Salivary gland lesions account for 2-6.5% of all the neoplasms of the head and neck. The objective of this study was to evaluate the diagnostic accuracy and the sensitivity and specificity of FNAC in various salivary gland lesions and their histological correlation wherever possible.

Methods: A total of 123 FNACs were done on salivary gland swellings in the Department of Pathology, M.G.M. Medical College, Indore, Madhya Pradesh, India. The PAP stained cytological and H and E stained histopathological slides were studied and correlated.

Results: On FNAC, slides were studied and analyzed and the following lesions were observed: Inflammatory lesion (69), Inflammatory cystic lesion (1), Pleomorphic adenoma (29), monomorphic adenoma (1), Warthin's tumour (2), Benign Cystic lesion (4), Benign lesion (not specified) (4), Adenoid cystic carcinoma (3), Mucoepidermoid carcinoma (2), Metastatic carcinoma (3), and malignant tumour (unspecified) (5). Histopathological correlation was available in 41 cases and studied respectively.

Conclusions: The overall sensitivity, specificity and the diagnostic accuracy were 90.2%, 97.6%, and 90.2%, respectively. Hence, the appropriate therapeutic management could be planned earlier. This study documents that FNAC of the salivary gland tumours is accurate, simple, rapid, inexpensive, well tolerated and harmless procedure for the patient.

Keywords: Benign, FNAC, Malignant, Salivary gland tumours, Sensitivity, Specificity

INTRODUCTION

Fine needle aspiration cytology (FNAC) is being increasingly used in the diagnosis of salivary gland lesions. However, the diagnosis is still difficult sometimes. Salivary gland lesions account for 2-6.5% of all the neoplasms of the head and neck. Their easy accessibility due to superficial location and high diagnostic accuracy makes FNAC a popular method for evaluating them.¹⁻³ The objective of this study was to evaluate the diagnostic

accuracy and the sensitivity and specificity of FNAC in various salivary gland lesions and their histological correlation wherever possible.

The purpose of FNAC is not to give a specific definitive diagnosis but to provide necessary information so that management can be planned. It is used to provide the best possible initial assessment in conjunction with clinical and radiological findings on which management decisions can be based.⁴ The present study was designed to describe the

role of cytology in salivary gland lesions on FNAC and do histopathological correlation in possible cases.

METHODS

This prospective study was done on 123 cases of salivary gland lesions over a period of 1 years (February 2015-March 2016) in Department of Pathology, MGM Medical College and M.Y. Hospital, Indore. All patients with palpable swelling of both sexes and all age group are included in the study. Patients excluded from FNAC are Suspected masses of vascular origin, patient with bleeding diathesis, uncooperative patient, skin infection in the area of fine-needle aspiration (FNA).⁵

Detailed history and relevant clinical examination was done in all the cases. FNAC was performed using 22-gauge needle and 10 ml plastic syringe. The aspirate obtained was noted. Alcohol fixed smears were prepared, smear was stained with Papanicolaou stain. Cytological and histopathological correlation was done in 41 cases. Histopathological diagnosis was considered as a gold standard. Complete data analysis was done and sensitivity, specificity, and diagnostic accuracy of FNAC was calculated.

RESULTS

In this study out of 123 patients, we observe that, females (71 cases) (57.7%) were more affected than males (52) (42.3%) from the 3rd decade. The numbers of female

patients were more than male giving a male: female ratio of 0.73:1. Malignant lesions are more common in 7th decade followed by 5th and 4th decade. Over all it is observed that inflammatory lesions (56.1%) are more common followed by benign (32.5%) and malignant lesions (10.6%). Among neoplastic lesions, benign (32.5%) are more common than malignant lesions (10.6%). Among benign tumour pleomorphic adenoma (23.5%) is the most common, while among malignant tumour Adenoid cystic carcinoma (2.4%) is most common tumour followed by mucoepidermoid carcinoma (1.6%). In present study, it is observed that parotid gland (74%) is the most common gland involve in the salivary gland lesions followed by submandibular gland (23%), minor salivary gland (2%) and lingual gland (1%). Total histological and cytological correlation is available in 41 cases. The sensitivity, specificity and diagnostic accuracy is 90.2%, 97.6%, and 90.2%, respectively.

Table 1. Distribution according to salivary gland involved.

SITE (Type of salivary gland involved)	Number of cases	Percentage of cases (%)
Parotid	91	73.98
Submandibular	29	23.57
Minor salivary gland	02	1.64
Lingual	01	0.81
Total	123	100

Table 2: Age wise distribution of salivary gland lesions.

Age groups	Inflammatory lesions	Inflammatory cystic lesion	Pleomorphic adenoma	Monomorphic Adenoma	Warthins tumour	Benign cystic lesion	Benign lesion (not specified)	Adenoid cystc CA	Mucoepidermoid CA	Metastatic carcinoma	Malignant lesion (NOS)	Total
0-10	1	0	0	0	0	0	0	0	0	0	0	1
10-20	8	0	2	00	0	2	1	0	0	0	0	13
20-30	13	0	8	0	0	2	3	0	0	0	0	26
30-40	10	1	6	0	1	0	0	0	0	1	0	19
40-50	18	0	4	1	0	0	0	0	1	2	0	26
50-60	8	0	5	0	1	0	0	0	0	0	4	18
60-70	5	0	3	0	0	0	0	3	0	0	1	12
70-80	5	0	1	0	0	0	0	0	1	0	0	7
80 -90	1	0	0	0	0	0	0	0	0	0	0	1
Total	69	1	29	1	2	4	4	3	2	3	5	123
Percentage (%)	56.1	0.8	23.6	0.8	1.6	3.3	3.3	2.4	1.6	2.4	4.1	100

Table 3: Distribution of cases of salivary gland lesions in males and females.

Diagnosis		Males		Females		Total	
		Number of cases	Percentage (%)	Number of cases	Percentage (%)	Number of cases	Percentage (%)
Non-neoplastic (n=70; 56.9%)	(Inflammatory lesions)	28	53.7	41	57.8	69	56.1
	Inflammatory cystic lesion	0	00	1	1.4	1	0.8
Neoplastic							
Benign (n = 40;32.5%)	Benign cystic lesion	0	00	4	5.6	4	3.2
	Benign lesion(NOS)	2	3.9	2	2.9	4	3.2
	Pleomorphic adenoma	13	25.0	16	22.5	29	23.5
	Monomorphic adenoma	0	00	1	1.4	1	0.8
	Warthins tumour	2	3.9	0	00	2	1.6
Malignant (n = 13;10.6%)	Malignant lesion (NOS)	1	1.9	4	5.6	5	4.1
	Mucoepidermoid carcinoma	1	1.9	1	1.4	2	1.6
	Adenoid cystic Ca.	2	3.9	1	1.4	3	2.4
	Metastatic Ca.	3	5.8	0	0	3	2.4
Total		52	100	71	100	123	100

Table 4. Histopathological correlation of salivary gland lesions.

FNAC	Histopathology												Total
	Inflammatory lesions	Cystic lesion	Benign cystic lesion	Benign lesion(NOS)	Pleomorphic adenoma	Monomorphic Adenoma	Warthin's	Malignant lesion (NOS)	Mucoepidermoid CA	Adenoid cystic CA	Malignant mix tumour of parotid	Metastatic ca.	
Inflam- matory lesions (69)	0	0	0	0	1	0	0	0	0	0	0	0	1
Cystic lesion (1)	0	0	0	0	0	0	0	0	0	0	0	0	0
Benign cystic lesion (4)	0	0	0	0	1	0	0	0	0	0	0	0	1
Benign lesion (NOS) (4)	0	0	0	0	2	0	0	0	0	0	0	0	2
Pleomorphic adenoma (29)	0	0	0	0	25	0	0	0	0	0	0	0	25
Monomorphic adenoma (1)	0	0	0	0	0	0	0	0	0	0	0	0	0
Warthins tumour (2)	0	0	0	0	0	0	2	0	0	0	0	0	2
Malignant lesion (NOS) (5)	0	0	0	0	0	0	0	0	0	0	2	0	2
Mucoepidermoid Ca. (2)	0	0	0	0	0	0	0	0	2	0	0	0	2
Adenoid cystic Ca. (3)	0	0	0	0	0	0	0	0	0	3	0	0	3
Metastatic Ca. (3)	0	0	0	0	0	0	0	0	0	0	0	3	3
Total	0	0	0	0	29	0	2	0	2	3	2	3	41

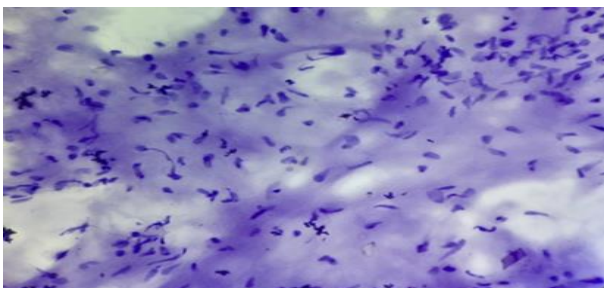


Figure 1: FNAC image of pleomorphic adenoma (Pap stain, 40x view).

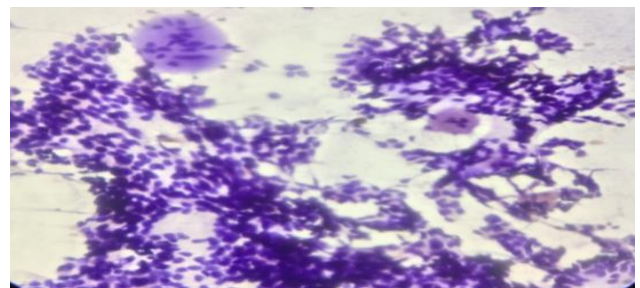


Figure 2: FNAC image of adenoid cystic carcinoma (Pap stain, 40 x view).

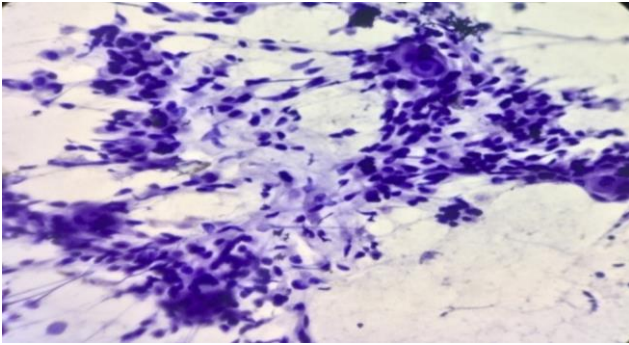


Figure 3: FNAC image of mucoepidermoid carcinoma (H and E stained 10x view).

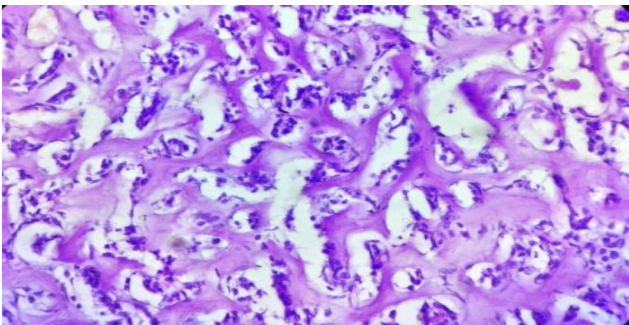


Figure 4: Histological image of adenoid cystic carcinoma (H and E stained 40x view).

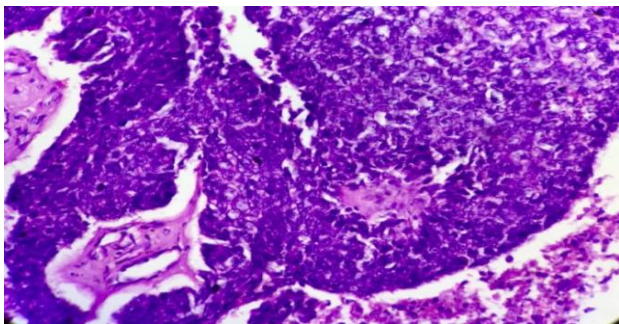


Figure 5: Histological image of mucoepidermoid carcinoma (H and E stained 40x view).

DISCUSSION

The precise histological diagnosis is made by examination of the post-operative specimen. Diagnosis of the salivary glands lesions is aided by the fine needle aspiration cytology, although this has its limitations. Studies have demonstrated that repeated fine needle aspiration is associated with increased chance of diagnosing the lesion.⁶ In the diagnosis of salivary gland lesions, FNAC has gained the popularity as diagnostic tool due to its low cost and safe procedure with minimal risk to the patient and aid to the clinicians in the management planning. In present study, it is found that out of 123 patients, females (71 cases) (57.7%) were more affected than males (52 cases) (42.3%) from the 3rd decade. The numbers of female patients were more than male giving a male: female ratio

of 0.73:1. A study in Iran reported a mean age of 40 years for the occurrence of salivary gland tumors. Generally, this study showed that there were more females who reported to hospital with salivary gland conditions than males at a ratio of 1.8:1. Al-Khateeb et al in Jordan and Zhao et al in India reported similar trends.⁷ However, the studies by Chidzong in Zimbabwe and Nitin in India had higher numbers of males compared to females.^{8,9} The higher number of females may be due to the fact that generally Indian women tend to be more immunogenicity due to poor hygienic and economic conditions. There was no clear-cut sex predilection for either benign or malignant lesions. Salivary gland lesions in general are however more common in females. The present study also consistent with the above cited study. The sites of FNA included in the earlier salivary gland studies were parotid, submandibular, sublingual, and oral.¹⁰⁻¹² In the present study, the major sites were also parotid including, submandibular region, minor salivary gland and lingual glands which are consistent with the above cited studies.

In the present study, most common non-neoplastic lesion was sialadenitis followed by cystic lesion and most of the non-neoplastic lesions involved the parotid. Dilip K et al studied the similar observation in his study.

The frequency of benign neoplasms in the above-cited studies 11-19 ranged from 21.2% to 51.4% with an average of 38.4%, in present study it is 32.5% which is consistent with the above cited studies. In present study among benign lesions pleomorphic adenoma (23.6%) is the most common lesion which is consistent with above studies. Pleomorphic adenoma was the most common benign tumour, with slight female dominance occurring mainly in the third decade of life.^{19,20} It most commonly affects the parotid gland, cytology of the tumour shows a bland epithelial cell in aggregates and sheets and fragments of the chondromyxoid fibrillary stroma.^{19,20,22} This tumor posed no cytological difficulties in our study. In present study Warthin's tumour, the second most common 1.6% benign tumour occurs mainly in the fourth to sixth decade, with a male preponderance.^{22,23}

Faur A et al and Lima SS et al also find the similar findings in their studies. Various authors have reported that the incidence of malignant tumours ranged from 15% to 32%.^{26,27} In present study it is 10.6%, which is slightly low due to low sample size and short duration of study. Classifying the salivary gland lesions into non-neoplastic, benign and malignant neoplasm may guide the clinician to make correct therapeutic decisions as to which patient requires further investigation, medical treatment or excision.²⁸ ADCC was the most common malignant tumor 2.4% in our study similar to other studies of Schoeman BJ et al and Eglis K et al.^{29,30}

However, few more studies also document it to be the most common salivary gland tumor. Cytological features of salivary gland tumors can often overlap; hence the final diagnosis must always take into account cellular, stromal

and clinical features into account. In present study, among malignant tumour mucoepidermoid carcinoma (1.6%) is the 2nd most common lesion which is consistent with the above lesions.

Comparative analysis of sensitivity and specificity of fine needle aspiration cytology with other studies was as Paik et al has studied sensitivity and specificity of 89.7% and 96.3% respectively.¹⁹ Laurie et al has studied sensitivity and specificity of 66% and 100% respectively.¹⁹ Canan et al has studied sensitivity and specificity of 66% and 100% respectively.¹⁹ Das et al has studied sensitivity and specificity of 94.3% and 75% respectively.¹⁹ In present study sensitivity and specificity of 90.2% and 97.6% was observed respectively.

The statistical analysis, based on histopathological correlation, revealed that outcomes for the diagnostic categories non-neoplastic, benign, and malignant (combined suspicious and malignant) were statistically significant. FNAC is a reliable examination procedure that provides valuable information for the preoperative diagnostic work-up and alerts the surgeon to the possible presence of malignancy. As the complication rate logically increases with the degree of invasiveness of the surgical procedure, it is important to be able to characterize the tumor preoperatively to correctly inform the patient about the type of surgery that will be performed, the need for lymph node dissection and the possibility of nerve sacrifice.^{31,32}

CONCLUSION

Awareness of the therapeutic implications and limitations of the cytological interpretation amongst both the clinicians and the cytopathologists should enable FNAC to its best advantage. Although FNAC of the salivary gland tumours has a high diagnostic accuracy (92% in the present study), it can further be improved by a wider sampling and ultrasound guided aspirations.

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