



## Cyto- Histopathological Correlation Of Salivary Gland Lesions In A Tertiary Care Centre

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Type of Publication: Original Research Paper

Conflicts of Interest: Nil

### Abstract

Background: Fine needle aspiration is a simple, rapid and minimally invasive technique which helps in diagnostic evaluation of salivary gland lesions due to their superficial location.

### Aim:

The aim of present study is cytomorphological and histopathological correlation of salivary gland lesions in a tertiary care centre in Kashmir region.

### Material and methods:

In the present study 60 cases were included. All aspirations were performed by cytopathologists using 22 gauge needle and smears were prepared on clean glass slide. The smears were stained with May Grunwalds Giemsa and Papanicolaou stains followed by cytopathological examination. Cytological and histopathological correlation was done in all cases.

### Results:

Pleomorphic adenoma was the commonest benign tumor found followed by warthins tumor and basal cell adenoma. Among the malignant tumors mucoepidermoid carcinoma was the commonest tumor found, followed by adenoid cystic carcinoma. Majority of malignant neoplasms are found in the age group of above 50 years.

### Conclusion:

The role of FNAC in the diagnosis of salivary gland lesions has evolved over the years. It helps in categorization of lesions into benign and malignant which helps further in the surgical management of cases.

**Keywords:** Fine needle aspiration cytology, salivary gland neoplasms, sensitivity

### Introduction

Salivary gland neoplasms (SGN) remain a diagnostic dilemma due to their heterogenic complex behavior. Their diverse histomorphological appearance is attributed to the underlying cellular mechanisms and differentiation into various histopathological subtypes with overlapping features. FNAC is one of the first line procedures used to diagnose SGN on account of its easy, inexpensive, highly accurate, quick, and minimally invasive nature [1]. FNAC is useful in benign and malignant tumor differentiation. However it has some limitations, which involve relatively high non-diagnostic results, possibly due to

bleeding, low cellularity, necrosis, or erroneous technique [1]. By cytological examination, lesions can be divided into inflammatory, reactive, benign, or malignant and, if possible, specific diagnosis is given which helps the clinicians in planning the management of the lesion [2].

### Materials and Methods

A hospital-based analytical study was conducted in government Medical College, Srinagar, in the department of pathology for a period of two years from January 2020. In total, 60 samples were

collected during the study period. All patients with salivary gland swelling after clinical examination were referred for FNAC. Relevant patient history about salivary gland swelling was obtained. For each patient in the study, the site, size, consistency, and tenderness were evaluated, and FNAC performed. The nature of the aspirated material was recorded in the patient record, fixed in slides, and stained with Giemsa and Papanicolaou stain and microscopically observed for cytological diagnosis. The observed FNAC diagnosis was correlated with clinical diagnosis provided in the patient record. The surgical specimens received were properly examined with gross details, appropriate sections from various parts of the excised tissues were taken and processed to prepare Hematoxylin and Eosin (H&E) stained slides. To evaluate the efficacy of FNAC in salivary gland lesions, slides were examined and the histopathological diagnosis was correlated with the diagnosis of FNAC. Salivary gland lesions were studied under two groups including benign and malignant tumors.

**Results:**

In the present study 60 patients with salivary gland tumors were included. FNAC yielded 52 benign cases and 8 malignant cases however on histopathological examination benign cases numbered 53 and malignant cases numbered 7. Out of 60 patients 36 cases were males (60%) and 24 cases were females

(40%) with overall M:F ratio of 1.5:1. Most of salivary gland tumors were seen in the age group of 40-49 years. All benign tumors were located in parotid gland (100% cases). Malignant tumors were located in minor salivary glands (4 cases) followed by parotid gland (3 cases). Pleomorphic adenoma was the commonest benign tumor found comprising of (50/53 cases, 94.33%) followed by Warthin's tumor comprising of (2/53 cases, 3.77%) and basal cell adenoma comprising of (1/53 cases, 1.88%). Among the malignant tumors mucoepidermoid carcinoma comprised of (4/7 cases, 57.14%) followed by adenoid cystic carcinoma comprising of (3/7 cases, 42.85%). Majority of malignant neoplasms are found in the age group of above 50 years. In the present study both cytology and histopathology was carried out in 60 cases and a correlation was done for sensitivity and specificity. The sensitivity and specificity of FNAC for malignant lesions was 87.5% and 98% respectively. Among benign tumors (total 53 cases), cytological diagnosis of 52 cases was consistent with histopathological diagnosis. Two cases one reported as pleomorphic adenoma and other as Warthin's tumor on FNAC turned out as adenoid cystic carcinoma and mucoepidermoid carcinoma respectively on histopathological examination. In malignant group histopathological diagnosis was consistent with cytological diagnosis in 7 cases.

**Table 1 Distribution of salivary gland lesions according to sex.**

Tumor type	Total number of cases	Males	Females
Pleomorphic adenoma	48	28	20
Warthin's tumor	3	2	1
Basal cell adenoma	1	1	0
Mucoepidermoid carcinoma	5	3	2
Adenoid cystic carcinoma	3	2	1

**Table 2. Distribution of salivary gland lesions according to age.**

Age range	Pleomorphic adenoma	Warthin's tumor	Basal cell adenoma	Mucoepidermoid carcinoma	Adenoid cystic carcinoma	Total number of cases
10-19	8					8

20-29	9					9
30-39	9	1				10
40-49	12	2		3	2	19
≥ 50	10		1	2	1	14
Total number of cases	48	3	1	5	3	60

**Table 3. Distribution of salivary gland lesions according to site**

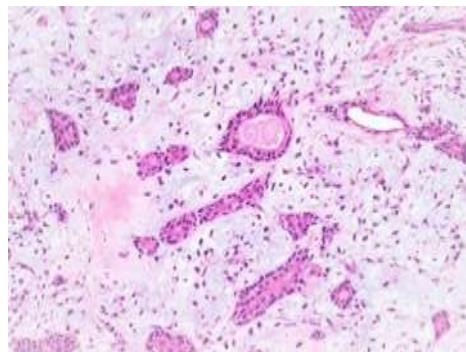
Tumor type	Parotid gland	Submandibular gland	Minor salivary gland	Total number of cases.
Pleomorphic adenoma	24	20	4	48
Warthins tumor	3	0	0	3
Basal cell adenoma	1			1
Mucoepidermoid carcinoma	3		2	5
Adenoid cystic carcinoma	0	0	3	3
Total number of cases	31	20	9	60

**Table 4. Cyto- histopathological correlation of salivary gland tumors**

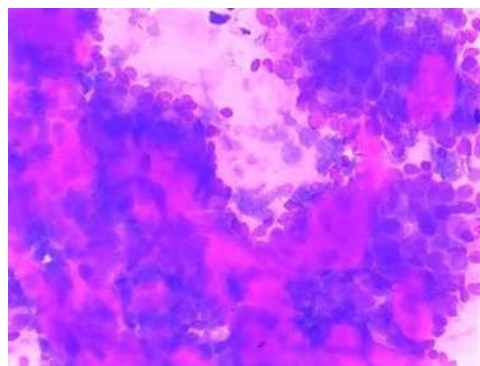
Cytology	Histopathology (number of cases)				
	Pleomorphic adenoma	Warthins tumor	Basal cell adenoma	Mucoepidermoid carcinoma	Adenoid cystic carcinoma
Pleomorphic adenoma (48 cases)	50				1
Warthins tumor (3 cases)		2		1	

Basal cell adenoma (1 case)			1		
Mucoepidermoid carcinoma (5 cases)	0			3	
Adenoid cystic carcinoma (3 cases)					2
Total	50	2	1	4	3

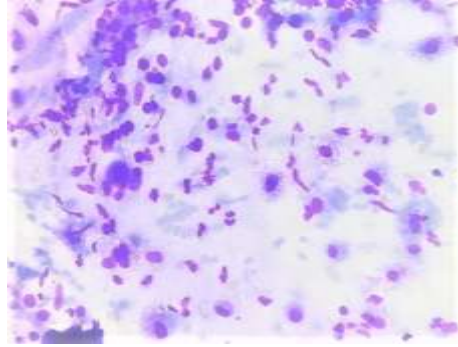
**Photomicrograph showing HPE of Adenoid Cystic Carcinoma**



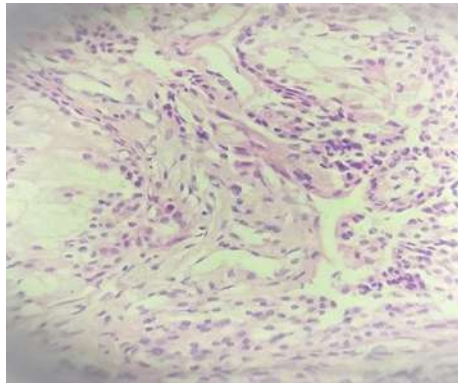
**Photomicrograph showing Cytology of Adenoid Cystic Carcinoma**



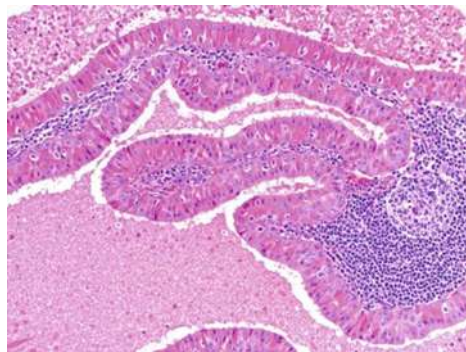
**Photomicrograph showing Cytology of Mucoepidermoid Carcinoma**



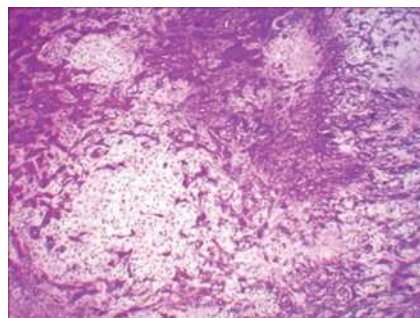
**Photomicrograph showing HPE of Mucoepidermoid Carcinoma**



**Photomicrograph showing HPE of warthins tumor**



**Photomicrograph showing HPE of Pleomorphic Adenoma**





## Discussion

60 patients diagnosed with salivary gland neoplasms on FNAC were included in the present study. Most of the tumors in salivary glands were categorized as benign (86%) followed by malignant (13.33%) which is in accordance with Gupta S et al [3] who reported the benign tumors as 54.94% (50/91) and malignant tumors as 15.38% (14/91) in their study, based on salivary gland aspirates from 91 cases. In a study by Omhare et al benign neoplasms accounted for 39 cases (31.45%) and that of malignant tumors by 15.32% (4). This is in concordance with study by sandhu et al and Nguansangiam et al who reported benign cases as 82.5%, 89.47% and malignant cases as 15% and 8.27% respectively. (5,6). Rate of occurrence of benign tumors in various studies ranged from 29% to 80% and that of malignant tumors from 4.44% to 26.66%. [3-6,9-15].

Most common benign tumor in the present study was pleomorphic adenoma (94.33%). This correlates well with Naz S et al

[7] and Pai RR et al [8] who observed the rate of pleomorphic adenoma as 89.06% and 87.5% respectively. Similar study results were obtained by sandhu et al who found pleomorphic adenoma comprising of 77.5% cases of all neoplasms. This is in concordance with a study conducted by vargas et al and Ito et al who reported incidence of pleomorphic adenoma as 67.7% and 67.8% respectively (9,10). In the present study parotid gland was the most common site for pleomorphic adenoma. Omhare et al have found parotid gland as the commonest site of salivary gland neoplasms. Usually, the diagnosis of pleomorphic adenoma is made after apparent identification of 3 main components such as extracellular matrix, myoepithelial cells and ductal cells. These components are present in varying proportions making the diagnosis at times challenging because of long list of differential diagnosis [11].

Warthin's tumor (3.77%) was the second most common benign tumor in this study, predominantly occurring in parotid gland. Pai RR [8] and Sandhu VK et al [5] observed similar incidence rates for Warthin's tumor. Microscopically, Warthin's tumor showed dense lymphocytic population of cells, oncocytes and dirty fluid background. It needs to be differentiated from lymphoepithelial cysts of

salivary gland, chronic inflammatory and obstructive duct lesions and oncocytic neoplasms [11-13].

In the present study salivary gland tumors predominantly affected the male patients with male to female ratio of 1.5:1 which was in concordance with study by omhare et al in which M:F ratio was 3.7:1. Mucoepidermoid carcinoma was the most common malignant tumor (42.85%) in the present study with three cases involving the parotid gland and two cases involving minor salivary glands. Omhare et al also noted mucoepidermoid carcinoma as the commonest type of malignant tumor studied and accounted for 42.1% cases [4]. Pai RR et al [8] and Arul P et al [14] reported an incidence rate of mucoepidermoid carcinoma of 37.5% and 30% respectively in their studies. Gupta S et al [3] reported the maximum no of cases of mucoepidermoid carcinoma occurring in parotid gland in their study. On cytology mucoepidermoid carcinoma show mucin producing cells, squamous cells and intermediate cells in the dirty mucoid background with varying degree of atypia depending on the grade of tumor [15]. The differential diagnoses of Mucoepidermoid carcinoma include squamous cell carcinoma, both primary as well as metastatic or contiguous involvement from cutaneous or intra-oral location. The distinction from metastatic carcinoma requires clinical and

radiological findings suggesting the involvement of intraparotid or submandibular lymph node [11]. Adenoid cystic carcinoma was the next common malignant tumor found comprising of two cases on histopathology. All cases of adenoid cystic carcinoma were found in minor salivary glands and were seen in elderly age group. sandhu et al in his study found that majority of patients with adenoid cystic carcinoma were aged more than 40 years and frequently involved minor salivary glands.

Benign tumors usually presented in the age group of 10 to 50 years while as malignant tumors were frequently seen in the age group of above 50 years. This was in agreement with studies conducted by Omhare et al and Sandhu et al [4,5].

## Conclusion

The present study highlighted the importance of FNAC as initial minimally invasive technique which give tissue based diagnosis of salivary gland lesions. It helps in making the primary diagnosis thereby

avoiding the major surgical procedure in inflammatory and benign tumors. Adequate sampling techniques, good quality smear preparation and expertise in field of cytopathology can diagnose the majority of salivary lesions with more specificity. Pleomorphic adenoma was the most common benign tumor found involving mostly the parotid gland and predominantly affecting males whereas mucoepidermoid carcinoma was the most common malignant tumor found in the present study.

#### References:

1. Edizer, D.T.; Server, E.A.; Yigit, O.; Yıldız, M. Role of Fine-Needle Aspiration Biopsy in the Management of Salivary Gland Masses. *Turk. Arch. Otorhinolaryngol.* 2016, 54, 105–111.
2. M. W. Stanley, R. H. Bardales, C. E. Farmer et al., “Primary and metastatic high-grade carcinomas of the salivary glands: a cytologic-histologic correlation study of twenty cases,” *Diagnostic Cytopathology*, vol. 13, no. 1, pp. 37–43, 1995.
3. Gupta S, Balani S, Malik R. Cytopathological spectrum of salivary gland lesions in a tertiary care centre. *Ind J Res.* 2019; 8:70-73.
4. Omhare A, Kumar S, Singh J, Nigam AS, Sharma. Cytohistopathological Study of Salivary Gland Lesions in Bundelkhand Region. *Pathol Res Int*; 2014:1–5.
5. Sandhu VK, Sharma U et al. Cytological Spectrum of Salivary Gland Lesions and Their Correlation With Epidemiological Parameters. *J Oral Maxillofac Pathol.* 2017; 21 (2):203-210.
6. S. Nguansangiam, S. Jesdapatarakul, N. Dhanarak, and K. Sosrisakorn, “Accuracy of fine needle aspiration cytology of salivary gland lesions: routine diagnostic experience in Bangkok, Thailand,” *Asian Pacific Journal of Cancer Prevention*, vol. 13, no. 4, pp. 6.S. Nguansangiam, S. Jesdapatarakul, N. Dhanarak, and K. Sosrisakorn, “Accuracy of fine needle aspiration cytology of salivary gland lesions: routine diagnostic experience in Bangkok, Thailand,” *Asian Pacific Journal of Cancer Prevention*, vol. 13, no. 4, pp.
7. Pai RR, Sahu K, Raghuveer CV, Shenoy S. Fine needle aspiration cytology of salivary gland lesions – are appraisal. *J Cytol.* 1998; 15:17-21.
8. Vargas PA, Gerhard R, Araújo Filho VJ, de Castro IV. Salivary gland tumors in a Brazilian population: A retrospective study of 124 cases. *Rev Hosp Clin Fac Med Sao Paulo* 2002;57:271-6.
9. Ito FA, Ito K, Vargas PA, de Almeida OP, Lopes MA. Salivary gland tumors in a Brazilian population: A retrospective study of 496 cases. *Int J Oral Maxillofac Surg* 2005;34:533-6.
10. Mukunyadzi P. Review of fine-needle aspiration cytology of salivary gland neoplasms, with emphasis on differential diagnosis. *Am J Clin Pathol.* 2002;118:S100-S115. doi:10.1309/WVVR-30E4-13TW-494D.
11. Ballo MS, Shin HJ, Sneige N. Sources of diagnostic error in the fine-needle aspiration diagnosis of Warthin's tumor and clues to a correct diagnosis. *Diagn Cytopathol.* 1997;17(3):230-234.
12. Elliott JN, Oertel YC. Lymphoepithelial cysts of the salivary glands. Histologic and cytologic features. *Am J Clin Pathol.* 1990;93(1):39-43. doi: <https://doi.org/10.1093/ajcp/93.1.39>.
13. Arul P, Akshatha C, Masilamani S, Jonathan S. Diagnosis of salivary gland lesions by fine needle aspiration cytology and its histopathological correlation in a tertiary care center of southern India. *J Clin Diagn Res* 2015;9(6):EC07-EC10. doi: 10.7860/JCDR/2015/14229.6076.
14. Klijanienko J, Vielh P. Fine-needle sampling of salivary gland lesions. IV. Review of 50 cases of Mucoepidermoid carcinoma with histologic correlation. *Diagn Cytopathol.* 1997;17(2):92-98.