

Original research article

## A Study of the Histopathological Pattern of Salivary Gland Neoplasms

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### Abstract

**Background:** Salivary gland neoplasms are very uncommon, and they vary widely based on the site, origin, and gender. It has been suggested that ethnic and regional variables affect the prevalence of salivary gland tumors. The diagnosis of these neoplasms is mostly based on histopathological findings, with very little input from cytogenetic analyses, immunohistochemistry, or special stains. The current study aimed to determine the distribution of salivary gland neoplasms in histopathological specimens received in our institute.

**Methods:** Consecutive samples of histopathology of salivary glands received at the department of pathology during the study period were included. The requisition forms contained clinical details that were documented. All tissue samples were fixed in 10% formalin, representative pieces were removed, and the tissue was processed histopathologically as usual. After that, paraffin wax was used to implant the treated tissue. Hematoxylin and eosin (H and E) stain were used to stain the sections.

**Results:** Out of the n=40 cases of salivary gland neoplasms n=30(75%) specimens were classified as benign tumors and n=10(25%) cases were classified as malignant neoplasms. Of the benign tumors, the most common was pleomorphic adenoma in 46.67% of cases followed by Warthin's tumor in 16.67% of cases details of the sex-wise distribution of the benign tumors. In the malignant category of salivary gland neoplasm, 50% of cases were diagnosed with mucoepidermoid carcinoma and 20% each were adenoid cystic carcinoma and acinic cell carcinoma.

**Conclusion:** The results of our study based on the age, sex, site distribution, and pathologic characteristics were consistent with those of research from India and other countries. Despite the modest number of salivary gland tumors examined in this study, the results should aid in improving our comprehension of the condition. Since there is so little data on head and neck tumors over the past two to three decades, only a small number of salivary gland tumors based on a significant number of cases are published from India.

**Keywords:** Salivary gland tumors, Pleomorphic Adenoma, Warthin's Tumor, Adenoid cystic carcinoma.

### Introduction

Neoplasms of the salivary glands are very uncommon, making up only around 1% of all neoplasms. They are involved in 3% to 10% of head and neck tumors. [1, 2] The salivary glands can develop a variety of neoplasms, and each tumor essentially has its unique clinicopathological characteristics. More than 35 different types of salivary gland neoplasms are accounted for in the new WHO classification of salivary gland malignancies from 2005. [3] Annually, 0.4 to 13 people per 100,000 have salivary gland tumors<sup>4</sup>. Seven to ten percent of cancers are found in the submandibular gland, 70 to 80 percent originate in the parotid gland, and the remainder is found in the sublingual and other small salivary glands. [4] Just

15–30% of the 70–80% of tumors that develop from the parotid are malignant; the remainder is benign. Pathologists are interested in salivary gland neoplasms because of their distinctive morphological and biological behavioral characteristics. [5]

The parotid glands, submandibular glands, and sublingual glands are where neoplasms are most frequently seen. In all age categories, women are afflicted more commonly than men, while there may be some gender differences depending on the kind of tumor. [6] Pleomorphic adenoma is the most frequent benign tumor of the parotid gland, whereas Mucoepidermoid carcinoma is the most frequent malignant tumor. Malignant tumors are present in around 50% of small salivary gland cancers. The most frequent malignant tumors of the small salivary glands include mucoepidermoid carcinoma, adenoid cystic carcinoma, and polymorphous low-grade adenocarcinoma. [7] While malignant tumors are more frequent in older people, benign tumors are more common in younger age groups. Clinically, benign, and malignant tumors are interchangeable; nevertheless, certain malignant tumors show fast growth in size, are unencapsulated and anchored to the underlying tissue, and display discomfort, soreness, facial nerve palsy, and ulcerated regions. [8] Risks associated with the job include exposure to asbestos, nickel compounds, or silica dust, as well as working in the rubber and woodworking sectors. [6] It is well established that radiation exposure raises the chance of developing a tumor, and that risk is dosage dependent. [9, 10] This study sought to identify the various histomorphology of salivary gland tumors, as well as their prevalence, age range, and location distribution.

### Material and Methods

This cross-sectional study was done in the Department of Pathology. Institutional ethical approval was obtained for the study. Consecutive samples of histopathology of salivary glands received at the department of pathology during the study period were included. The requisition forms contained clinical details that were documented. All tissue samples were fixed in 10% formalin, representative pieces were removed, and the tissue was processed histopathologically as usual. After that, paraffin wax was used to implant the treated tissue. Hematoxylin and eosin (H and E) stain were used to stain the sections, which were then cut at a thickness of five microns and inspected under a light microscope. On occasion, specialized stains were used (for mucin, for example). The authors evaluated each slide and categorized each one using the World Health Organization's histology tumor classification system.

### Results

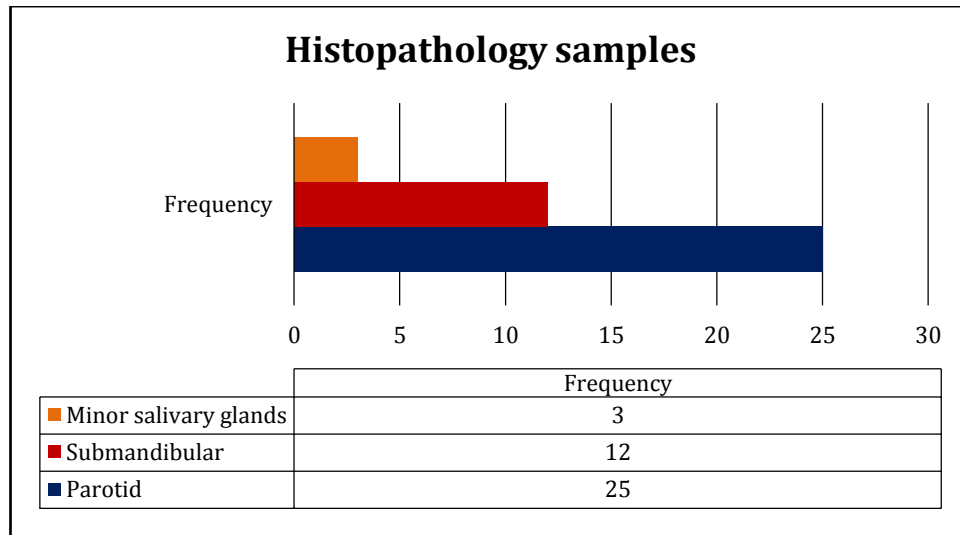
The overall specimens of salivary glands received during the study period were n=40 out of which n=14(35%) were males and n=26(65%) were females. The male-to-female ratio was 1: 1.8. The age distribution of samples in the stud was 19 years to 65 years. The mean age of the affected cases in the study was 44 years and most of the cases in the study were from the age group 31 – 40 years shown in table 1.

**Table 1: Age-wise and sex-wise distribution of cases included in the study.**

<i>Age in years</i>	<i>Male</i>	<i>Female</i>	<i>Total (%)</i>
<i>11 – 20</i>	00	01	01 (02.5)
<i>21 – 30</i>	01	03	04 (10.0)
<i>31 – 40</i>	05	06	11 (27.5)
<i>41 – 50</i>	02	08	10 (25.0)
<i>51 – 60</i>	05	04	09 (22.5)

> 60	01	02	03 (07.5)
<i>Total</i>	14	26	40 (100)

Most of the tumors were located in the major salivary glands (92.5%) among which parotid was the most common site (62.5%) with  $\chi^2 = 10.12$ ,  $df = 1$ , and  $P = 0.02$  which is statistically significant. Minor salivary glands were involved in 7.5% of cases depicted in figure 1.



**Figure 1: Showing the distribution of histopathology samples in the cases.**

Out of the n=40 cases of salivary gland neoplasms n=30(75%) specimens were classified as benign tumors and n=10(25%) cases were classified as malignant neoplasms. Of the benign tumors, the most common was pleomorphic adenoma in 46.67% of cases followed by Warthin's tumor in 16.67% of cases details of the sex-wise distribution of the benign tumors have been represented in table 2.

**Table 2: sex wise distribution of the benign salivary gland neoplasms**

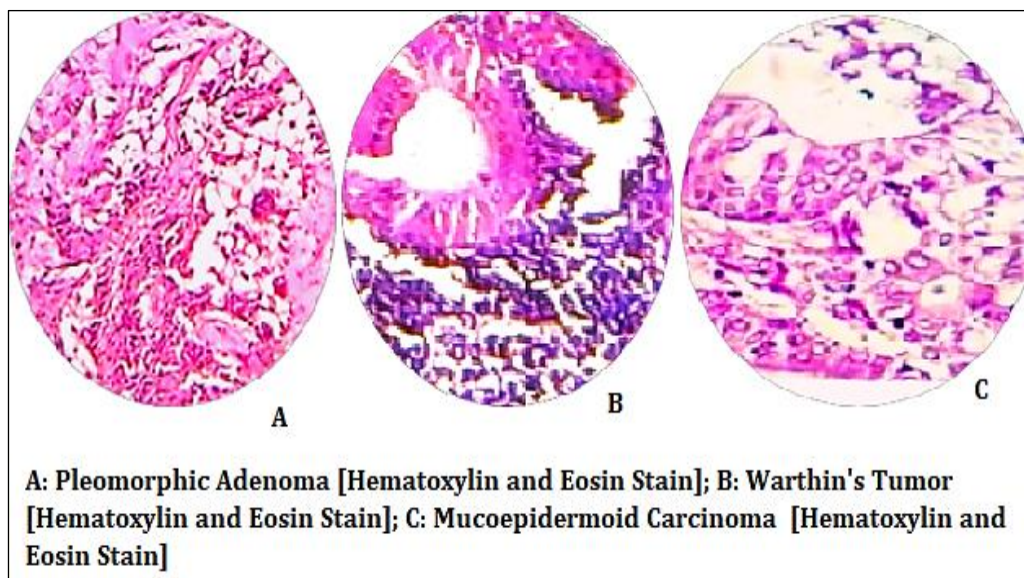
<i>Benign Tumors</i>	<i>Male</i>	<i>Female</i>	<i>Total (%)</i>
<i>Pleomorphic adenoma</i>	04	10	14 (46.67)
<i>Warthin's tumor</i>	02	03	05 (16.67)
<i>Monomorphic adenoma</i>	02	02	04 (13.33)
<i>Basal cell adenoma</i>	01	02	03 (10.00)
<i>Myoepithelioma</i>	01	03	04 (16.66)
<i>Total</i>	10	20	30 (100.0)

In the malignant category of salivary gland neoplasms, 50% of cases were diagnosed with mucoepidermoid carcinoma and 20% each were adenoid cystic carcinoma and acinic cell carcinoma depicted in table 3.

**Table 3: sex wise distribution of the Malignant salivary gland neoplasms**

<i>Malignant Tumors</i>	<i>Male</i>	<i>Female</i>	<i>Total (%)</i>
<i>Mucoepidermoid carcinoma</i>	02	03	05 (50.00)

<i>Adenoid cystic carcinoma</i>	01	01	02 (20.00)
<i>Acinic cell carcinoma</i>	01	01	02 (20.00)
<i>Carcinoma ex pleomorphic adenoma</i>	00	01	01 (10.00)
<i>Poorly differentiated carcinoma</i>	00	00	00 (00.00)
<i>Total</i>	04	06	10 (100.0)



## Discussion

The present study was conducted on n=40 samples of salivary gland histopathology received. The age range of the cases in the study was 19 – 65 years and the mean age of the affected cases in the study was 44 years and most of the cases in the study were from the age group 31 – 40 years. Shrestha et al., [11] in their study reported the mean age as 44.76 years with an age range of 12 to 75 years. Khattak et al., [12] observed the mean age for salivary gland tumors as 31.2 years and Venugopal et al., [13] reported a higher incidence in the fourth and fifth decades. In the current study, we found a slight female predominance ratio being 1.8: 1. Similar findings have also been reported by Laishram et al., [14] Sando et al., [15] and Ochicha et al., [16] found slight female predominance in their studies as 1:1.08, 0.7:1 and 1:1.1 respectively. In the current study based on the involvement of the site it was found that the parotid gland was most commonly involved in 62.5% of cases followed by the submandibular gland in 30% of cases, and least commonly affected were the minor salivary glands. In a similar study, Khattak et al., [12] found parotid gland involvement in 82.35% of instances followed by submandibular glands in 14.10%, and least commonly involved were the minor salivary glands of the palatal region in 3.8% of cases. Another study by Venugopal et al., [13] found the parotid gland to be involved in 83.63% of cases of salivary gland neoplasms. In the current we found out of n=40 cases 75% were benign neoplasms and 25% were found to be malignant neoplasms of the salivary gland. Laishram et al., [14] in a similar study found 71.79% benign neoplasms and 28.21% malignant cases. However, Shrestha et al., [11] reported 62.5% malignant cases as compared to 37.5% benign salivary neoplasms. In this study among the benign neoplasms the most commonly diagnosed was pleomorphic adenoma in n=14 (46.67%) of cases and Warthin's tumor in n=5(16.67%) cases. Teeda et al., [17] found 77.4% of benign neoplasms as pleomorphic adenoma and 9.67% as Warthin's tumor. Khattak et al., [12] found 73.8% as pleomorphic adenoma and 2.5% as Warthin's tumor in their study. Among the malignant cases, we found out of n=10 cases 50% were

mucoepidermoid carcinoma and 20% each were adenoid cystic carcinoma and acinic cell carcinoma. There were 10% cases of Carcinoma ex pleomorphic adenoma, and no cases of poorly differentiated carcinoma were found. Venugopal et al., have found 46.4% cases of mucoepidermoid carcinoma and 32.1% cases of adenoid cystic carcinoma, and 7.1% cases of acinic cell carcinoma. Although our study found most of the cases and frequency as found in the other similar studies however there are slight variations in the results obtained due to the number of histopathology samples used in the study. Long-term follow-up and more samples will give a clear picture of the incidence of salivary gland neoplasms in the population of the study.

### Conclusion

The results of our study based on the age, sex, site distribution, and pathologic characteristics were consistent with those of research from India and other countries. Despite the modest number of salivary gland tumors examined in this study, the results should aid in improving our comprehension of the condition. Since there is so little data on head and neck tumors over the past two to three decades, only a small number of salivary gland tumors based on a significant number of cases are published from India. As a result, prospective studies involving larger samples are necessary to identify the influencing factors more accurately.

### References

1. Pons-Vicente O, Almendros-Marqués N, BeriniAytés L, Gay Escoda C. Minor salivary gland tumors: A clinicopathological study of 18 cases. *Med Oral Pathol Oral Cir Bucal*. 2008; 13:582-8.
2. Ethunandan M, Davies B, Pratt CA, Puxeddu R, Brennan PA. Primary epithelial submandibular salivary gland tumors-Review of management in a district general hospital setting. *Oral Oncol*. 2009; 45:173-6.
3. Barnes L, Eveson JW, Reichart P, Sidransky D. World Health Organization classification of tumors: pathology and genetics of head and neck tumors. World Health Organization Classification of Tumours: Pathology and genetics of head and neck tumors. 2005. Available at <https://publications.iarc.fr/Book-And-Report-Series/Who-Classification-Of-Tumours/Pathology-And-Genetics-Of-Head-And-Neck-Tumours-2005> [Accessed on 21/03/2022]
4. Sun, G W, Yang, X., Tang, E., Wen, J., Lu, M., & Hu, Q. The treatment of sublingual gland tumors. *International journal of oral and maxillofacial surgery* 2010;39(9): 863-68.
5. Vuhahula EA. Salivary gland tumors in Uganda: Clinical pathological study. *Afr Health Sci*. 2004; 4:15–23.
6. Ellis GL. What's new in the AFIP fascicle on salivary gland tumors: a few highlights from the 4th Series Atlas. *Head Neck Pathol*. 2009 Sep;3(3):225-30.
7. Neville BW, Damm DD, Allen CM, Bouquout JE. *Salivary Gland Pathology in Oral and Maxillofacial Pathology*. 3rd ed. Elsevier, St. Louis. 2009; Chapter 11: p. 453-506.
8. Seifert G, Miehlike A, Haubrich J, Chilla R. *Diseases of the salivary glands*. Georg. Thieme Inc. New York 1986; 1986.
9. Takeichi N, Hirose F, Yamamoto H, Ezaki H, Fujikura T. Salivary gland tumors in atomic bomb survivors, Hiroshima, Japan. II. Pathologic study and supplementary epidemiologic observations. *Cancer* 52:377-385,1983.
10. Beal KP, Singh B, Kraus D, Yahalom J, Portlock C, Wolden SL. Radiation-induced salivary gland tumors: a report of 18 cases and a review of the literature. *Cancer J*. 2003; 9:467–71.

11. Shrestha S, Pandey GK, Pun CB, Bhatta R, Shahi R. Histopathological Pattern of Salivary Gland Tumors. *Journal of Pathology of Nepal*. 2010;520-4.
12. Khattak MS, Ahmad S, Noman N. The histopathological pattern of salivary gland tumors. *Gomal Journal of Medical Sciences* 2016;14:(4): 203-07.
13. Venugopal M, Devi CP, Deepthi K, Mutte K. The dynamics of diagnosis of salivary gland tumors. *Histopathology matters. Int J Res Med Sci* 2016; 4:1855-61.
14. Laishram RS, Kumar KA, Pukhrambam GD, Laishram S, Debnath K. Pattern of salivary gland tumors in Manipur, India: A 10-year study. *South Asian J Cancer*. 2013 Oct;2(4):250-3.
15. Sando Z, Fokouo JV, Mebada AO, Djomou F, NDjolo A, Oyono JL. Epidemiological and histopathological patterns of salivary gland tumors in Cameroon. *Pan Afr Med J*. 2016 Mar 3; 23:66.
16. Ochicha O, Malami S, Mohammed A, Atanda A. A histopathologic study of salivary gland tumors in Kano, Northern Nigeria. *Indian J Pathol Microbiol*. 2009; 52:473–6.
17. Teeda DR, Akarsh MP, Sindhura. A Histopathological Study of Salivary Gland Lesions. *Journal of Dental and Medical Sciences* 2016;15:(6):80-6.