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HISTOPATHOLOGICAL STUDY OF SALIVARY GLAND LESIONS IN A TERTIARY CARE CENTRE

Dr. Sheela Lakshamanrao Gaikwad[1*], Dr. Sneha Sadashiv Sulkar[2], Dr. Nitin Gautam Kamble[3], Dr. Arvind Namdeorao Bagate[4],

[1*]MBBS, MD Pathology Associate Professor at Dept. Of Pathology, Swami Ramanand Teerth Rural Government Medical College, Ambejogai, Email id- sheela30gaikwad@gmail.com
[2]MBBS , MD Pathology Junior resident of Department of Pathology at Swami Ramanand Teerth Rural Government Medical College, Ambejogai. Email id- drsnehasulkar@gmail.com
[3]MBBS, MD Pathology Assistant Professor of Department of Pathology at Swami Ramanand Teerth Rural Government Medical College, Ambejogai. Email id – dr.nitin1100@gmail.com
[4]MBBS, MD Pathology Professor and Head at Department. Of Pathology, Swami Ramanand Teerth Rural Government Medical College, Ambejogai. Email id – drarvindbagate@gmail.com

***Corresponding Author:** Dr. Sheela Lakshamanrao Gaikwad
[*]MBBS, MD Pathology Associate Professor at Dept. Of Pathology, Swami Ramanand Teerth Rural Government Medical College, Ambejogai, Email id- sheela30gaikwad@gmail.com

ABSTRACT:
Introduction: Between 3–10% of tumors are salivary gland neoplasms, which are uncommon malignancies. Although immunohistochemistry (IHC) advancements have recently contributed significantly to improving the accuracy of the identification of these cancers, hematoxylin and eosin (H&E) are still widely regarded as the best diagnosis method for salivary gland malignancies. Examining the histology of salivary gland lesions in a tertiary care facility was the aim of the study.
Aims: To study the incidence, age at occurrence, and sex ratio of individuals with salivary gland lesions, to record the range of lesions that affect the salivary glands as well as their frequency.
Setting and Designs: This was the prospective study on salivary gland lesions that was carried out from January 1, 2021, to June 30, 2022, for a period of 18 months.
Result: From the 35 cases that were encountered for the current investigation, 18 (70.1%) were benign, 14 (41.1%) were inflammatory, and the final 3 (41.8%) were malignant. The most commonly affected salivary gland in the present study was the parotid. The more prevalent lesions were benign, followed by malignant lesions.
Conclusion: Because of the COVID-19 pandemic's restricted availability of cases, this study was unable to include some tumor types, such as acinic cell carcinomas, because of their exceedingly uncommon occurrence. Therefore, we suggest additional research.

Keywords:
Salivary glands, histopathology of salivary glands, Benign tumors, Haematoxylin and Eosine

INTRODUCTION:

There are two main exocrine groups in the human salivary gland system. The parotid, submandibular, and sublingual glands, which are found in pairs, as well as a large number of minor

salivary glands in the tonsils, tongue, oropharynx, floor of the mouth, and hard and soft palates, are considered to be the primary salivary glands.[1] Between 3–10% of head and neck tumors are salivary gland neoplasms, which are uncommon malignancies.[2] There are 0.4 to 13 salivary gland tumors per 100,000 patients per year.[3] The parotid gland accounts for roughly 70–80% of cancers, the submandibular gland for 7–10%, and the sublingual and other small salivary glands for the remaining malignancies.[4]

When compared to malignant tumors, benign tumors are more common in younger age groups than in older age groups. Clinically, benign and malignant tumors are identical; however, some malignant tumors develop rapidly, and are fixed to the underlying tissue; these tumors cause discomfort, soreness, facial nerve palsy, and ulcerated areas.[5]

Although immunohistochemistry (IHC) advancements have recently contributed significantly to improving the accuracy of the identification of these cancers, hematoxylin and eosin (H&E) are still widely regarded as the best method in the diagnosis of salivary gland malignancies. The type of cells, cell differentiation, cell proliferation, and tumor protein expression can all be determined via immunohistochemistry.[1]

In a tertiary care facility, this study was conducted to examine the histology of salivary gland lesions.

METHODOLOGY:

This 18-month prospective study on salivary gland lesions was conducted between January 1, 2021, and June 30, 2022. The research involved receiving biopsies and excision samples of lesions on the salivary glands. The permission of the institutional ethics committee was attained.

Date of ethical issued – 21/12/2020

Name on whom issued – Dr. Sneha S Sulkar

Institute who issued - Swami Ramanand Teerth Rural Government Medical College, Ambejogai

Topic on which ethical issued - Histopathological study of salivary gland lesions in a tertiary care centre

All clinical information was gathered, including age, gender, tumor location, and length of symptom persistence. The results of routine investigations and radiological tests like X-rays, ultrasounds, and CT scans were evaluated and recorded.

After reviewing the patient's clinical profile, surgical specimens were taken and fixed in 10% formalin. After fixing, the specimen underwent a gross examination to check for size, shape, color, consistency, and cut surface. The most representative areas of each case were found, and sections of 1.5 x 1 were taken. A tissue cassette with a unique number given in the gross room for the tissue sample was carried throughout.

Statistical analysis:

The chi-square test and Student’s unpaired test were used to compare the mean and SD between the two groups, using SPSS 24.0 version IBM USA to analyze the data. A p-value of <0.05 represents statistical significance whereas a p-value <0.001 is considered highly significant.

RESULTS:

In the present study, we examined 35 cases of salivary gland lesions (**Figure 1A-D**) over a period of 18 months from January 2021 to June 2022. Out of these cases, 18 were benign (51.42%), 3 were malignant (8%), and the rest were inflammatory, as indicated in Table 1. Benign tumors exhibited diverse features, including chronic sialadenitis **(Figure 2G, H),** myoepithelioma **(Figure 3I-J),** basal cell adenoma **(Figure 3K-L),** and Warthin's tumor. Among the benign tumors, pleomorphic adenoma was the most frequently observed, accounting for 83.33% of the cases, followed by one case each of Warthin's tumor, basal cell adenoma, and myoepithelium.

Tumor	No. of cases	Percentage
Benign	18	51.43%
Pleomorphic adenoma	15	83.33%
Warthin's tumor	1	5.56%
Basal Cell adenoma	1	5.56%
Myoepithelioma	1	5.56%
Total	18	100.00%
Malignant	3	8.57%
Mucoepidermoid carcinoma	1	33.33%
Basal Cell Carcinoma	1	33.33%
Salivary duct Carcinoma	1	33.33%
Total	3	100.00%
Inflammatory	14	40.00%
Total	35	100.00%

Table 1- Incidence of salivary gland tumors

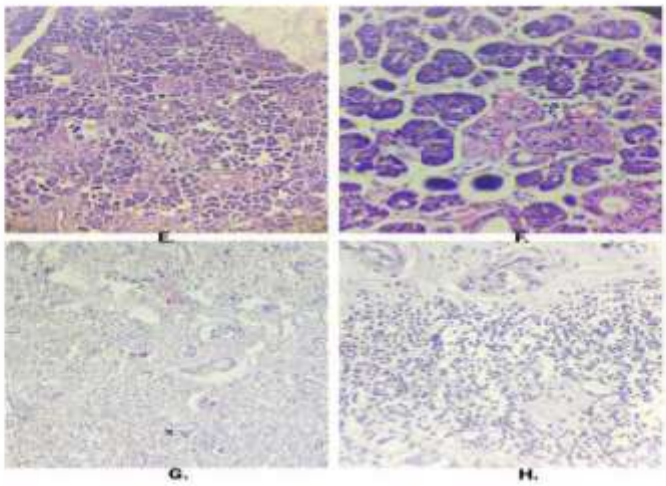

Figure 2. **(E) Normal histology of parotid gland with serous acini, intercalated ducts. (HE, X100). (F) Normal histology of parotid gland with serous acini, intercalated ducts. [HE, X400). (G) Chronic sialadenitis showing acinar destruction, fibrosis, and chronic inflammation. (HE, X100). (H) Chronic sialadenitis showing acinar destruction, fibrosis, and chronic inflammation. (HE, X400).**

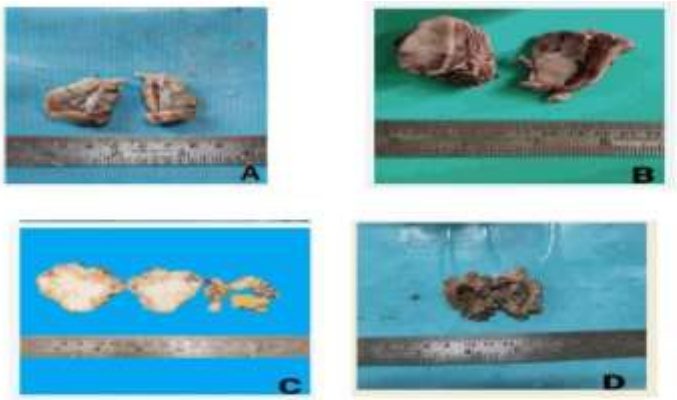

Figure 1. **(A)Chronic sialadenitis gross showing a grey white mass of size 3x2 cm. (B)Basal cell adenoma gross showing round to oval encapsulated nodule of size 4x3cm, grey-brown in color uniform and solid. (C)Pleomorphic adenoma gross showing demarcated, bosselated grey-white myxoid mass of size 5x4 cm. (D)Mucoepidermoid carcinoma gross showing tan yellow firm mass showing cystic space.**

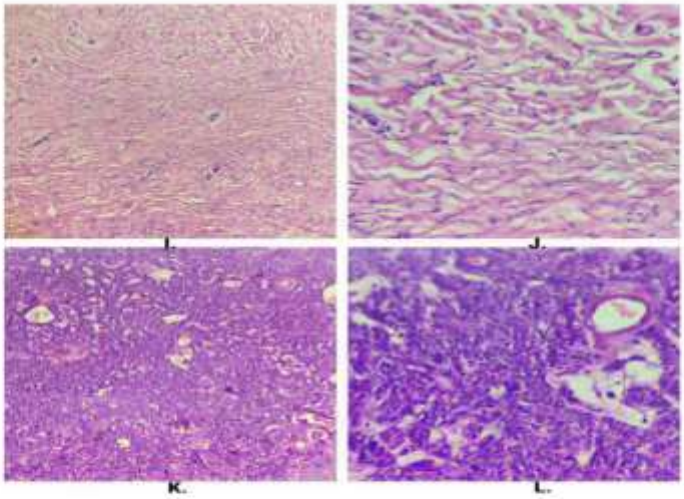

Figure 3. **(I) Myoepithelioma showing spindle-shaped bland-looking myoepithelial cells, stroma is hyalinised and fibrosed. (HE, X100). (J) Myoepithelioma shows spindle-shaped bland looking myoepithelial cells, stroma is hyalinised and fibrosed. (HE, X400) (K) Basal cell adenoma showing basaloid cells arranged in cords, sheets, and nests with cyst formation. (HE, X100 (L) Basal cell adenoma showing basaloid cells arranged in cords, sheets, nest with cyst formation. (HE, X400)**

Of the three types of malignant lesions observed in this study, mucoepidermoid carcinoma, basal cell adenocarcinoma, and salivary duct carcinoma were identified, as shown in table-1. It is noteworthy that pleomorphic adenoma was the most commonly encountered benign tumor in our study. It displayed characteristic chondromyxoid stroma and epithelial and myoepithelial cell proliferation **(Figure 4L-N). Figure 2E and F** showcase the normal histology of the parotid gland, depicting serous acini and intercalated ducts at different magnifications. These figures serve as a reference point for comparison with the abnormal features observed in the various benign and malignant lesions described in the study.

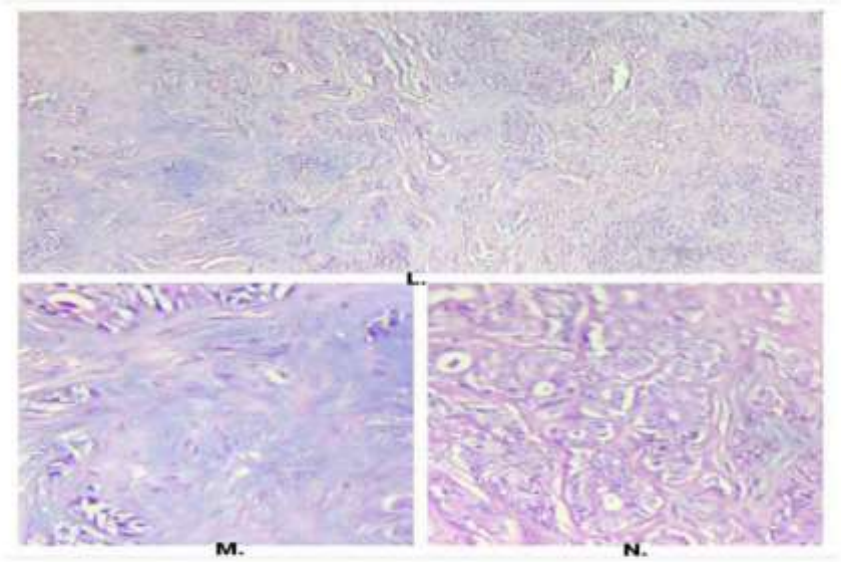

Figure 4. **(L) Pleomorphic adenoma showing chondromyxoid stroma and proliferation of epithelial and myoepithelial cells. (HE, X100). (M)Pleomorphic adenoma showing chondromyxoid stroma. (HE, X400) (N) Pleomorphic adenoma showing epithelial cells and clear myoepithelial cells. (HE, X400)**

The table 2 shows that out of a total of 18 cases, there were 15 cases of pleomorphic adenoma, 1 case of Warthin's tumor, 1 case of basal cell adenoma, and 1 case of myoepithelioma. Of these, 5 cases were in males and 10 cases were in females, indicating a higher incidence of these tumors in females.

Neoplasm	**Male**	**Female**	**Total**
Pleomorphic adenoma	5	10	15
Warthin's tumor	1		1
Basal cell adenoma		1	1
Myoepithelioma	1		1
Total	7	11	18
Mucoepidermoid carcinoma	0	1	1
Basal Cell Adenocarcinoma	0	1	1
Salivary duct carcinma	1	0	1
Total	1	2	3

Table-2: Gender-wise distribution of Benign Salivary gland tumors

In terms of malignancy, there were a total of 3 cases: 1 case of salivary duct carcinoma, 1 case of basal cell adenocarcinoma, and 1 case of mucoepidermoid carcinoma. Of these, 2 cases were in females and 1 case was in a male.

In the current investigation, the parotid salivary gland was the most frequently damaged. Twenty of the 20 neoplastic lesions were found in the parotid gland, and one was in the submandibular gland. (Table 3)

Neoplasm	Parotid	Submandibular	Sublingual	Minor SG	Total
Pleomorphic adenoma	14	1			15
Warthin's tumor	1				1
Basal cell adenoma	1				1
Myoepithelioma	1				1
Mucoepidermoid carcinoma	1				1

Basal Cell Adenocarcinoma	1				1
Salivary duct carcinma	1				1
Total	20	1			21

Table 3 – Site wise distribution of salivary gland tumors

The parotid gland was the salivary gland that benign tumors most frequently affected. 17 of the 18 benign tumors found were in the parotid gland. One benign tumor was found inside the salivary gland in the submandibular region. (Table 4)

Neoplasm	Parotid	Submandibular	Sublingual	Minor SG	Total
Pleomorphic adenoma	14	1			15
Warthin's tumor	1				1
Basal cell adenoma	1				1
Myoepithelioma	1				1
Total	17	1			18

Table 4 – Site wise distribution of Benign salivary gland tumors

The parotid gland was the salivary gland that was most frequently affected by malignant tumors. All three of the malignant tumors that were found were in the parotid gland.(Table 5)

Neoplasm	Parotid	Submandibular	Sublingual	Minor SG	Total
Mucoepidermoid carcinoma	1				1
Basal Cell Adenocarcinoma	1				1
Salivary duct carcinma	1				1
Total	3				3

Table 5 – Site wise distribution of malignant salivary gland tumors

DISCUSSION:

Salivary gland cancers include a wide range of tumors (benign and malignant) with complex clinical presentations, variable morphological architecture, and unpredictably poor prognoses.

35 consecutive cases of various forms of salivary gland lesions were included in the current investigation. The incidence rate of salivary gland tumors in various age groups and the micromorphological findings obtained from the light microscopic analysis are the key factors taken into account in the current study. In the current investigation, 35 cases were observed, of which 18 (70.1%) were benign, 14 (inflammatory), and 3 (malignant, 29.8%).

Regardless of the overall number of patients, the outcome of the current study is consistent with those of **Janu Devi et al.[6], Juan Araya et al.[7], Rajesh Sing et al.[8], M.S. Gill et al.[9], Alpana Banerjee et al.[10],** and **Nepal al.[11]**.

The more prevalent lesions were benign, followed by malignant lesions. There were more benign neoplasms than malignant ones. There were 21 salivary gland neoplasms in total, of which 21 were benign (85.71%) and 3 malignant (14.29%). Additionally, this finding corresponds with those made by **Janu Devi et al.[6], Juan Araya et al.[7], Rajesh Sing et al.[8], M.S. Gill et al.[9], Alpana Banerjee et al.[10],** and **Nepal et al.[11].**

When **M.S. Gill et al.[9]** examined 379 salivary gland neoplasms, they discovered 277 (73.0%) benign and 102 (26.9%) malignant neoplasms. Similar findings were made by **Juan Araya et al.,** who examined 279 cases of salivary gland tumors. They discovered 196 benign tumors, accounting for 70.2% of cases, and 83 malignant tumors, accounting for 29.7%.

Pleomorphic adenomas made up 15 of the 18 benign neoplasms examined in this study, accounting for 83.33% of all benign tumors. Pleomorphic adenomas were the benign tumors that were found most frequently in the current study. **Shilpa Gandhi et al.[13]**, **Shafkat Ahrnad et al.[14]**, **Shahida**

Niazi et al.[12], and others all cited similar observations. Pleomorphic adenomas made up 146 of the 162 benign tumors reported by Shahida Niazi et al., 33 of the 42 benign tumors reported by **Shilpa H. Gandhi et al**., and 73 of the 85 benign tumors reported by **Shafkat Ahrnad et al**., or 90.1%, 85.8%, and 78.5%, respectively, of the total number of benign tumors reported. All three of the research metioned above can be compared to our findings from the current investigation.

One of the three malignant neoplasms in the current study, mucoepidermoid carcinoma, accounted for 33.33% of the total number of malignant tumors, along with salivary duct carcinoma and basal cell carcinoma, which each accounted for 33.33% of the total number of malignant tumors. Mucoepidermoid carcinoma comprised 11 of the 22 malignant tumors described by **Khandekar et al.**[15] and 5.0% of the 7 malignant tumors reported by **Shashikala et al.**[16], respectively. Our findings in the current study cannot be compared to those of the studies mentioned above.

With a female: male ratio of 1.6:1, the majority of benign and malignant salivary gland tumors were seen in the present study primarily in females, which is consistent with the data cited by **Samina Zaman et al.**[17]. A 2:1 ratio of the 15 pleomorphic adenomas detected in the current investigation, 10 of which were found in females and 5 in males.

CONCLUSION:

In the current study, we analyzed the incidence, distribution, and histopathological patterns of salivary gland lesions over a period of 18 months, from January 1, 2021, to June 30, 2022. We have an incidence of benign tumors in 83.33% of all salivary gland lesions. There was a 6:1 ratio between benign and malignant tumors. The majority of benign tumors were discovered in patients between the ages of 30 and 55, with a mean age of 50. Salivary gland tumors, both benign and malignant, most frequently impact women. Pleomorphic adenomas, which comprised 83.33% of all benign tumors, were the most prevalent benign tumor type. Regardless of the type of tumor, the parotid was the salivary gland most frequently affected.

More research is advised due to the small number of accessible cases because of the COVID-19 pandemic and the absence of particular tumor types, such as acinic cell carcinomas, because of their very uncommon frequency.

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