Original Research Article

A study on the morphological spectrum of salivary gland tumors

J Margaret Theresa¹*, A B Harke², Lavanya M¹

¹Dept. of Pathology, Sri Venkateshwara Medical College Hospital and Research Centre, Pondicherry, India
²Dept. of Pathology, Karpaga Vinayaga Institute of Medical Sciences and Research Centre, Kanchiparam, Tamil Nadu, India

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ABSTRACT

Introduction: Salivary gland neoplasms are relatively uncommon and constitute about 3% of all head and neck neoplasms. At least 80% of tumors are located in the parotid gland and the remaining tumors are located in submandibular, sublingual and in minor salivary glands.

Objective: The aim is to identify the occurrence of various salivary gland tumors and to categorize them as per WHO classification. Further to identify the histomorphological patterns of salivary gland tumors.

Materials and Methods: The biopsy and excised specimens of salivary gland tumors were received in the department of pathology. A gross examination of biopsy and excised specimen was carried out. All the biopsy specimens were well fixed in 10% buffered formalin, processed, embedded with paraffin. After the paraffin blocks were sectioned and stained with Haematoxylin-Eosin, special stains like PAS, Mucicarmin were applied to the sections where ever indicated. The stained slides were examined for histomorphological patterns of salivary gland neoplasms and categorized as per WHO classification.

Result and Conclusion: A total of 57 salivary gland tumors specimens were included in the present study. The study report revealed that 40 cases were belong to benign making it 70.2% and the remaining 17 were malignant making it to 29.8% of the total Salivary gland tumors. Pleomorphic Adenoma was the most commonly observed benign tumor. Out of 40 benign tumors 33 were Pleomorphic adenoma (82.5%). Mucoepidermoid carcinoma was the most commonly observed malignant tumor. Out of 17 malignant tumors 6 were Mucoepidermoid carcinomas (35.2%) of all the malignant tumors.

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1. Introduction

Three pairs of major salivary glands are there in the oral cavity, which consist of parotid, submandibular and sublingual glands. Apart from these, other minor salivary glands are also in the oral cavity located in the floor of mouth, hard and soft palate, tonsil, tongue and oropharynx.¹ Salivary gland neoplasms are rare, and are account for about 3-10% of head and neck neoplasms.² As per the WHO revised classification (2017) salivary gland tumors account for more than 35 distinct variants.³ Keeping this in mind the present study is planned to analyze the morphological pattern and the spectrum of salivary gland tumors in this local population to understand and to correlate the variants of salivary gland neoplasms in our area.

2. Materials and Methods

The present study is a retrospective and prospective study on salivary gland tumors, and was carried out in the department of Pathology for a period of five years between August 2012 and 2017. The study was conducted on biopsy and excised specimens of salivary gland tumors. A total number of 57 cases of Salivary gland tumors were included in this study. Institutional Ethics Committee approval was obtained. Required data like clinical history, duration of symptoms, location of tumors, and other relevant details such as age, gender, and social status use of tobacco were obtained from the patients. Other results such as radiological examination like X-ray, Ultrasound and CT
scan of the patients were also reviewed and documented.

2.1. Methods

Formalin fixed biopsy and excised specimens of salivary gland neoplasms received from hospital were studied macroscopically. The tissues were routinely processed in to paraffin embedded blocks. Microscopic sections were taken and stained with Haematoxylin & Eosin. Special stains PAS and Mucicarmin were also used to stain the sections as and when required.

3. Results

Among the 57 cases of Salivary gland tumors, histopathological reports revealed that 40 of them were benign neoplasm (70.2%) and the other 17 were malignant (29.8%) showed in Table 1.

Table 1: Incidence of benign and malignant salivary gland tumors

<table>
<thead>
<tr>
<th>Tumors</th>
<th>No. of cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benign</td>
<td>40</td>
<td>70.2</td>
</tr>
<tr>
<td>Malignant</td>
<td>17</td>
<td>29.8</td>
</tr>
<tr>
<td>Total</td>
<td>57</td>
<td>100.0</td>
</tr>
</tbody>
</table>

On the basis of histomorphological features, the benign salivary gland neoplasms were further classified in Pleomorphic adenoma, Warthin’s tumor, Basal cell adenoma and Myoepithelioma. We observed that the most common benign salivary gland tumor was pleomorphic adenoma, which is seen in 33 cases (82.5%) followed by warthin’s tumor which is seen in 3 cases (7.5%). The details of the number of cases in each type is shown Table 2.

Table 2: Frequency and distribution of benign salivary gland tumors

<table>
<thead>
<tr>
<th>Benign Tumors</th>
<th>No of cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pleomorphic Adenoma</td>
<td>33</td>
<td>82.5</td>
</tr>
<tr>
<td>Warthin’s tumor</td>
<td>3</td>
<td>7.5</td>
</tr>
<tr>
<td>Basal cell adenoma</td>
<td>2</td>
<td>5.0</td>
</tr>
<tr>
<td>Myoepithelioma</td>
<td>2</td>
<td>5.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>40</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Similarly, on morphological examination we could able to identify the histological variants of malignant salivary gland tumors as Mucoepidermoid carcinoma, Adenoid cystic carcinoma, Polymorphous low grade adenocarcinoma, Carcinoma ex pleomorphic adenoma, Basal cell adenocarcinoma and Salivary duct carcinoma. Among these, the most common malignant salivary gland tumor identified is mucoepidermoid carcinoma, which is seen in 6 cases (35.3%) followed by adenoid cystic carcinoma seen in 5 cases (29.4%). The details of the number of cases in each type is shown Table 3.

Table 3: Frequency and distribution of malignant salivary gland tumors

<table>
<thead>
<tr>
<th>Malignant Tumors</th>
<th>No. of cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mucoepidermoid carcinoma</td>
<td>6</td>
<td>35.3</td>
</tr>
<tr>
<td>Adenoid cystic carcinoma</td>
<td>5</td>
<td>29.4</td>
</tr>
<tr>
<td>Polymorphous low grade adenocarcinoma</td>
<td>1</td>
<td>5.9</td>
</tr>
<tr>
<td>Carcinoma ex pleomorphic adenoma</td>
<td>1</td>
<td>5.9</td>
</tr>
<tr>
<td>Basal cell adenocarcinoma</td>
<td>1</td>
<td>5.9</td>
</tr>
<tr>
<td>Salivary duct carcinoma</td>
<td>3</td>
<td>17.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>17</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

29 were observed in parotid gland. Similarly submandibular salivary gland involved by 7 benign tumors. It is observed that the least commonly involved salivary gland is minor salivary glands. The details of the number of cases in each type is shown Table 4.

The most commonly involved salivary gland by the malignant tumors is parotid gland. Out of 17 malignant tumors 13 were observed in parotid gland. However minor salivary gland was involved by 3 cases of malignant tumor. The least commonly involved salivary gland is the sublingual gland. Details of the number of cases in each type is shown Table 5. The most common benign and malignant salivary gland neoplasms were pleomorphic adenoma and mucoepidermoid carcinoma which is shown below.

The following Haematoxylin and Eosin stain show the microscopic features of Pleomorphic Adenoma shown Figure 1.

Fig. 1: Haematoxylin and eosin stain of pleomorphic adenoma (Salivary gland Tumor Magnification: 100X)

The following Haematoxylin and Eosin stain show the microscopic features of Low grade Mucoepidermoid carcinoma shown Figure 2.

4. Discussion

Salivary gland tumors exhibit a diverse group of benign and malignant tumors which showed multifaceted clinical pictures, different morphological architecture with unpre-
Tables 4 and 5 present the site-wise distribution of benign and malignant salivary gland tumors, respectively. The data shows that the parotid gland is the most common site for both benign and malignant tumors. Pleomorphic adenoma is the most common benign tumor, and Mucoepidermoid carcinoma is the most common malignant tumor. The study also highlights the importance of accurate pathological diagnosis, as it is a significant factor in determining the clinical behavior of salivary gland tumors.

The present study was carried out on 57 consecutive cases of various types of salivary gland neoplasms. Out of these, 40 were benign (70.2%) and 17 were malignant (29.8%). The results are in line with previous studies by Janudevi et al., Juan Araya et al., Rajesh Sing et al., M.S. Gill et al., Alpana Banerjee et al., and Nepal et al., irrespective of the total number of cases. The details of the number of cases in each type are shown in Table 6.

The benign lesions were more common than the malignant lesions. Pleomorphic Adenoma was the most commonly observed benign tumor. Of the 40 benign tumors, 33 were Pleomorphic adenomas, making up 82.5% of all benign tumors. Similar observations were reported by Shahidanizai et al., Shilpa H Gandhi et al., Shafkat Ahnads et al., and Khandekar et al. Mucoepidermoid carcinoma is the common malignant tumor observed in the present study. Out of 17 malignant tumors, 6 were Mucoepidermoid carcinomas, making up 35.2%. Similar observations were reported by Khandekar et al. and Shashikala et al. The neoplastic lesions affected salivary gland was parotid gland followed by submandibular salivary gland and other minor salivary glands. Among the 57 salivary gland tumors encountered in this study, it is observed that 42 cases involve the parotid gland (73.6%) and 8 cases involve submandibular gland (14.3%). The results also showed that the sublingual and minor salivary gland are the least affected. These findings are comparable with the results of other studies quoted by Krishnaraj Subhashraj et al., Lakshmi B Mallappa et al., Maj T Chatterjee et al., Kirti N Jaiswal et al., and Subhashini Bandar et al.

The study concludes that accurate pathological diagnosis is crucial in determining the clinical behavior of salivary gland tumors. Further research is needed to understand the factors influencing the behavior of these tumors and to develop effective treatment strategies.
Table 6: Incidence of salivary gland tumor in various studies

<table>
<thead>
<tr>
<th>S.No</th>
<th>Study</th>
<th>Place</th>
<th>Year</th>
<th>Cases</th>
<th>Benign</th>
<th>Malignant</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Janu Devi et al</td>
<td>Assam</td>
<td>2</td>
<td>84</td>
<td>57(67.8%)</td>
<td>27(32.2%)</td>
</tr>
<tr>
<td>2</td>
<td>Juan Araya et al</td>
<td>Valparai sochile</td>
<td>11</td>
<td>279</td>
<td>196(70.2%)</td>
<td>83(29.8%)</td>
</tr>
<tr>
<td>3</td>
<td>Rajeshsingh et al</td>
<td>Manipur</td>
<td>10</td>
<td>104</td>
<td>56(53.8%)</td>
<td>22(21.1%)</td>
</tr>
<tr>
<td>4</td>
<td>M.S.Gill et al</td>
<td>Karachi</td>
<td>8</td>
<td>379</td>
<td>277(73.1%)</td>
<td>102(26.9%)</td>
</tr>
<tr>
<td>5</td>
<td>Alpana Banerjee et al</td>
<td>Tripura</td>
<td>7</td>
<td>46</td>
<td>37(80.4%)</td>
<td>9(19.6%)</td>
</tr>
<tr>
<td>6</td>
<td>Nepal et al</td>
<td>Nepal</td>
<td>5</td>
<td>51</td>
<td>41(80.4%)</td>
<td>10(19.6%)</td>
</tr>
<tr>
<td>7</td>
<td>Present study</td>
<td>Kanchipurm</td>
<td>5</td>
<td>57</td>
<td>40(70.2%)</td>
<td>17(29.8%)</td>
</tr>
</tbody>
</table>

5. Conclusion
The present study results conclude that salivary gland neoplasms exhibit a varied histomorphological patterns. The most commonly observed benign and malignant salivary gland neoplasms are pleomorphic adenoma and mucoepidermoid carcinoma. Limitations of this study include a limited number of available cases of each tumor type and therefore missing of some tumor types may be due to its relatively infrequent occurrence.

6. Source of funding
None.

7. Conflict of interest
None.

References

Author biography
J Margaret Theresa Assistant Professor
A B Harke Professor
Lavanya M Associate Professor