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Original Research Article

Histomorphological study of salivary gland neoplasms: fifteen year study

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ABSTRACT

Background: The neoplasms of salivary glands are relatively uncommon and represent less than 2% of all human tumors. They are morphologically diverse, with marked heterogeneity among the different subtypes and even within the same tumor. The unpredictability in the long term outcome imposes a significant challenge in the clinical management.
Methods: This is a descriptive study done in a tertiary care teaching hospital over a period of 15 years. Patient details were collected from medical case records. All specimens were evaluated for site, laterality, size, nature of the cut surface and intactness of the capsule. Two to 5 representative bits were taken from each specimen and subjected to routine fixation, processing and section cutting followed by Haematoxylin and Eosin staining.
Results: A total of 138 salivary gland tumors were diagnosed from patients in the age group of 13 to 90 years with a mean age of 41.8 years. There were 53 (38.4%) males and 85 (61.6%) females with male to female ratio of 1:1.42. There were 115 (83.3%) benign tumors and 23 (16.7%) malignant tumors. Pleomorphic adenoma accounted for 70.3% of all salivary gland tumors followed by mucoepidermoid carcinoma (10.9%), Warthin tumor (8%), basal cell adenoma (2.9%), adenoid cystic carcinoma (2.2%), squamous cell carcinoma (2.2%), myoepithelioma (1.4%), oxyphillic adenoma (0.7%), acinic cell carcinoma (0.7%) and salivary duct carcinoma (0.7%).
Conclusions: The salivary gland neoplasms are relatively uncommon head and neck tumors. Parotid gland is the commonest site of occurrence. Pleomorphic adenoma is the commonest benign and mucoepidermoid carcinoma the commonest malignant salivary gland tumor.

Keywords: Mucoepidermoid tumor, Pleomorphic adenoma, Salivary gland tumors

INTRODUCTION

Salivary gland neoplasms are relatively rare and show a wide range of morphological diversity between different tumor types and within the individual tumor. The worldwide annual incidence of salivary gland tumors ranges from 0.4 to 13.5 cases per lakh population. They account for about 1 to 2% of all tumors and 2-3% of tumors of the head and neck.[1] Approximately 75-80% of all salivary gland neoplasms are benign; of these, pleomorphic adenoma is the most common tumor. Malignant salivary gland neoplasms are less common and account for less than 0.5% of all tumors. At least 24 different types of malignant salivary gland neoplasms have been recognised by World Health Organization (WHO).

The 4th edition of the classification of salivary gland tumors by WHO has many changes. Secretory carcinoma is a new entry, which morphologically recapitulates the breast secretory carcinoma and expresses ETV6-NTRK3 gene fusion. Sclerosing polycystic adenosis also a new

entity, resembles fibrocystic change and sclerosing adenosis of the breast. Other entries include intercalated duct hyperplasia, nodular oncocytic hyperplasia and lymphoepithelial lesion. Polymorphous low-grade adenocarcinoma is renamed as polymorphous adenocarcinoma. Though most of them are low grade, if a tumor deviates from norm a higher grade can be assigned. Sebaceous and non-sebaceous lymphadenoma are renamed as lymphadenoma, inverted and intraductal papilloma are renamed as ductal papilloma.[2]

Salivary gland neoplasms occur mainly in the parotid gland (70-80%), followed by submandibular gland, minor salivary glands (15%) and sublingual gland.[3] The malignant tumors usually occur in the 5th or 6th decade of life and benign tumors occur at a slightly earlier age.[2] The relative frequency of the tumors along with the morphological diversity, occurrence of hybrid tumors, dedifferentiation and propensity for some benign tumors to progress to malignancy are creating great problem in histological diagnosis.[4] Clinically it is very difficult to differentiate benign from malignant tumors. So it is important to understand the basic cytoarchitectural features of each tumor for correct diagnosis and management. Histological grading in addition, is particularly important from the prognostic point of view.[1]

The present study was undertaken to evaluate the relative frequency of benign and malignant tumors, to analyse the age and sex distribution, frequency of tumors in major and minor salivary glands and to study the histomorphology of salivary gland tumors.

METHODS

This is a descriptive cross-sectional study done in the department of pathology in a tertiary care teaching hospital after obtaining the ethical committee clearance. This study includes cases collected over a period of 15 years, retrospectively from June 2003-May 2011 and prospectively from June 2011-May 2018. For retrospective analysis, paraffin embedded tissue blocks and slides were retrieved from the archives of the histopathology section, the clinical details of the same were obtained from the medical records section. The prospective analysis included surgically resected specimens of salivary gland neoplasms. The specimens were grossed and fixed in 10% neutral buffered formalin. Clinical details included age, sex, duration of growth, history of smoking, clinical presentation, salivary gland involved, laterality, and various morphological features like size, consistency, external surface, cut surface and intactness of capsule were recorded. On an average 2-5 representative sections were studied for each specimen. After fixation and processing, 3-5 microns thick sections were cut and stained with Haematoxylin and Eosin. Special stains were done when necessary. Lesions with infective or inflammatory pathology were excluded from the study. Histological classification of these tumors was done as per the WHO classification.

RESULTS

A total of 138 cases of salivary gland tumors were studied, out of these 115 (83.3%) were benign and 23 (16.7%) were malignant. The frequency of different salivary gland tumors is shown in Table 1. The patients age ranged from 13 to 90 years with a mean age of 41.84 (SD=16.41) years. There were fifty seven (41.3%) males and 81(58.7%) females with a male to female ratio of 1:1.42. Benign tumors accounted for 115(83.3%) cases and malignant tumors 23 (16.7%) cases. The mean age of patients with malignant tumors was 43years (SD=19.9), 1.3 years older than those with benign tumors (41.7years, SD=15.87). The benign tumors were more common in females with 71 (61.7%) cases than in males with 44 (38.3%) cases, whereas malignant tumors were slightly more common in males with 13 (56.5%) cases than in females with only 10 (43.5%) cases. Clinically painless swelling was the commonest presentation; few cases in addition had tenderness (5.5%), fixity to the overlying skin (5.5%) and facial nerve involvement (1.1%). Sudden increase in size was the presenting feature in two cases. The salivary neoplasms most commonly involved the parotid gland with a total of 108 cases (78.3%). The minor salivary glands were least commonly involved with 12 (8.7%) cases (Figure 1).

Table 1: Frequency of salivary gland tumors.

Histopathological types	No. of cases (%)
Pleomorphic Adenoma	97 (70.3%)
Mucoepidermoid carcinoma	15 (10.9 %)
Warthin tumor	11 (8.0%)
Basal cell adenoma	4 (2.9 %)
Adenoid cystic carcinoma	3 (2 .2%)
Squamous cell carcinoma	3 (2.2%)
Myoepithelioma	2 (1.4%)
Oxyphilic adenoma	1 (0.7%)
Acinic cell carcinoma	1 (0.7%)
Salivary duct carcinoma	1 (0.7%)
Total	138 (100%)

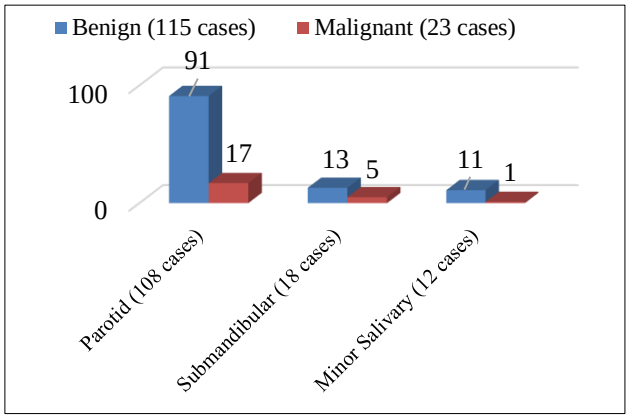

Figure 1: Frequency of benign and malignant tumors in different locations.

Pleomorphic adenoma: The present study had 97 cases of pleomorphic adenoma. They accounted for 70.3% of all salivary gland tumors and 84.3% of all benign tumors. It was most common in 15-30 years age group and least common after the age of 60. Females were affected more than the males. Most were solitary and presented as slow growing, painless, discrete mobile swelling. Parotid was the commonest site followed by submandibular and minor salivary glands (Figure 2). Grossly the tumor ranged in their greatest dimension from 0.8 cm to 7cm, were globular and well demarcated with firm consistency. The cut surface was grey white, homogenous with glistening areas and some of them showed cystic change. Microscopically, most were well circumscribed, comprising of epithelial and myoepithelial cells intimately admixed with fibromyxoid and chondromyxoid stroma. Epithelial component showed round to ovoid cells arranged in sheets, tubules, trabeculae, cords and ducts. The ducts were filled with eosinophilic material (Figure 3).

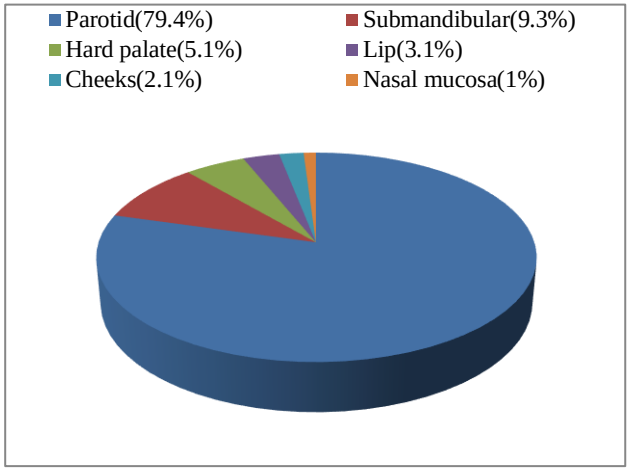

Figure 2: Site distribution of pleomorphic adenoma.

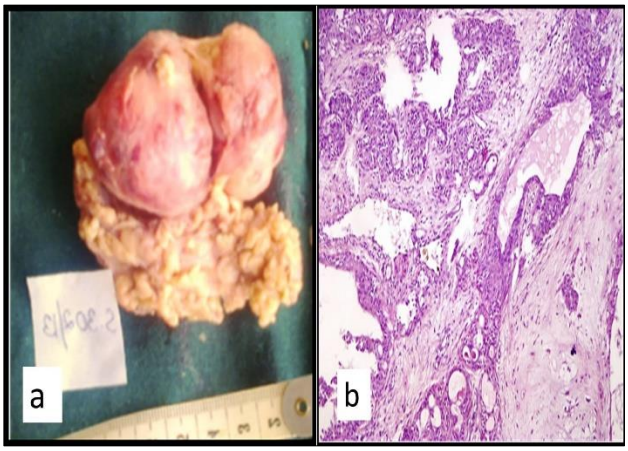

Figure 3: Pleomorphic adenoma (a) well circumscribed, lobulated tumor with adjacent normal salivary gland tissue; (b) Photomicrograph showing epithelial and myoepithelial cells with chondromyxoid stroma (H&E, x100).

Warthin tumor

In our study 11 cases of Warthin tumor were reported. They accounted for 10.9% of all tumors and 9.6% of all benign tumors. Parotid gland was the commonest site with 10 out of 11 cases and one occurred in the submandibular gland. All were male patients and 60 to 75 years (45.4%) was the commonest age group. Clinically all cases presented with a slow growing painless mass.

Grossly these tumors were well encapsulated and firm in consistency. The size ranged from 3-10cm, cut surface was grey white to grey brown with cystic spaces containing brownish fluid. Microscopically these tumors were well encapsulated comprising of both solid and cystic areas. The epithelial cells were bilayered projecting into the cysts in a papillary pattern resting on a dense lymphoid stroma. The outer layer was composed of tall columnar cells with abundant granular eosinophilic cytoplasm and inner layer of cuboidal basal cells. The cysts were of variable sizes and contained secretions within (Figure 4).

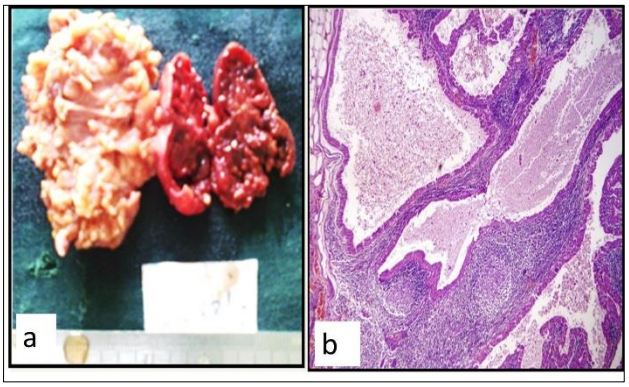

Figure 4: Warthin tumor. (a) Cut surface showing grey brown, solid, cystic areas with adjacent normal salivary gland tissue; (b) Cystic spaces lined by bilayered epithelium with lymphoid stroma. (H&E, x100).

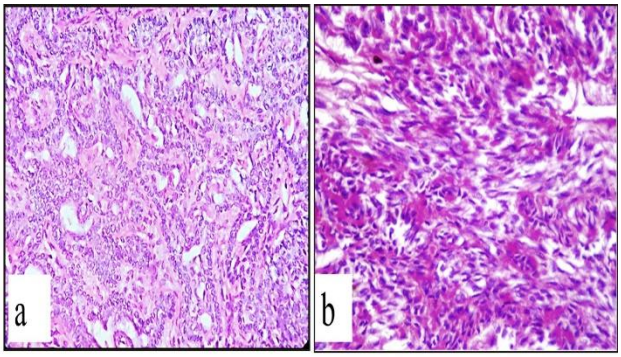

Figure 5: (a) Basal Cell Adenoma. Basaloid cells in strands, tubules and trabecular pattern with peripheral palisading (H&E, x100); (b) Myoepithelioma. Spindle cells arranged in solid sheets (H&E, x400).

Basal cell adenoma

There were 4 cases of basal cell adenoma, accounting for 2.9% of all tumors and 3.5% of benign tumors. Two each occurred in the parotid gland and submandibular gland, with equal sex distribution. The commonest age group was between 5th to 6th decades. Clinically they presented as slow growing painless mass. Grossly the tumors were well encapsulated, globular and measured approximately 0.5-3.0 cm in size. They were firm in consistency with grey brown cut surface. Histopathology revealed well encapsulated tumor, comprising of round to oval cells arranged in trabeculae, nests, islands, acini separated by fibrous stroma. Some of the tumor cell nests showed peripheral palisading (Figure 5a).

Myoepithelioma

Our study had two cases of myoepithelioma, accounting for 1.4% of all salivary gland tumors and 1.7% of benign tumors. One case was seen in 50 years old male and the other occurred in 60 years old female. Clinically, both presented as slow growing painless masses involving the parotid gland. Grossly, both the tumors were well circumscribed, globular, firm in consistency with grey white cut surface and each measured 3×2×1.5cm and 2x2x1cm in size. Histologically, the tumors were well encapsulated, comprised of spindle shaped cells with scant eosinophilic cytoplasm and elongated vesicular nuclei. The tumor cells were arranged in sheets and fascicles. The stroma showed focal hyalinization (Figure 5b).

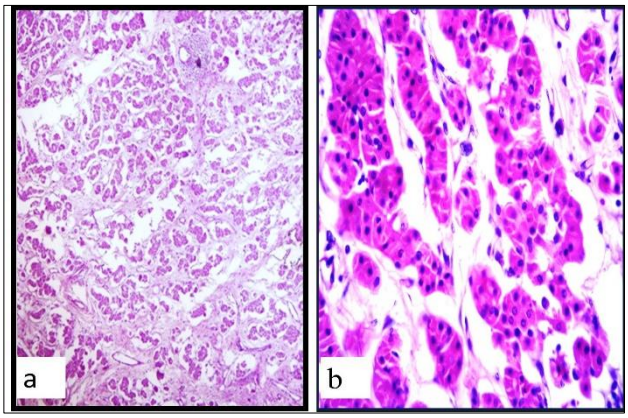

Figure 6: Oncocytoma. (a) Tumor cells arranged in trabeculae with intervening stroma (H&E,x100): (b) Oncocytes with abundant granular eosinophilic cytoplasm, arranged in trabecular pattern (H&E, x400).

Oxyphilic adenoma

Single case which accounted for 0.7% of all salivary gland tumors and 0.9% of benign salivary gland tumors was reported in the parotid gland of a 50year old female. Clinically it presented as a slow growing painless mass. Grossly, the tumor was well circumscribed, firm to hard in consistency with grey-brown cut surface and measured 4.5×4×2cms in size. Microscopically, the tumor was well encapsulated, comprising of large, round to oval cells with abundant granular eosinophilic cytoplasm and round to oval eccentrically placed nuclei with fine chromatin. The cells were arranged predominantly in trabecular pattern and also in sheets and acini, separated by fibrous stroma (Figure 6).

Mucoepidermoid carcinoma

The present study had 15 cases of mucoepidermoid carcinoma of which 9(60%) occurred in males and 6(40%) in females. They accounted for 10.9% of all salivary gland tumors and 65% of malignant tumors. The commonest age group involved was 15-30 years (47% of cases). Fourteen (93%) of them occurred in the parotid gland, except for one which was reported in the submandibular gland. Thirteen cases were of intermediate grade and the rest two were low grade. Clinically most of the cases presented as slow growing painless masses. Majority of the tumors were irregular in shape, firm to hard in consistency and measured 2-8cm in their greatest dimension. The cut surface was grey white with tiny cysts and necrotic areas. Microscopically, the tumors showed mucous cells, intermediate cells and squamous cells in varying proportions. The intermediate grade tumor showed more solid areas comprising of intermediate and squamous cells along with few cystic areas lined by mucous cells. Two of the tumors were of low grade with more cystic component (Figure 7).

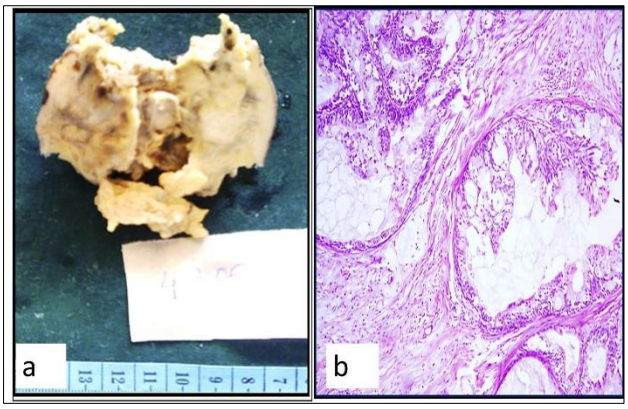

Figure 7: Mucoepidermoid carcinoma. (a) Gross specimen showing solid, grey white tumor with cystic areas; (b) Photomicrograph showing cysts lined by mucous, intermediate and clear cells (H&E, x100).

Adenoid cystic carcinoma (ACC)

Three cases of adenoid cystic carcinoma were reported in the present study accounting for 2.2% of all salivary gland tumors and 13% of the malignant tumors. Two cases occurred in submandibular gland and one in minor salivary gland. Two patients were males of 21 and 54 years of age and one patient was a 65 year old female. Clinically, they presented as slow growing painful

masses. Grossly, the tumors were poorly circumscribed, irregular, firm to hard in consistency and measured 2-3.5cms in size. Cut surface was grey brown with both solid and cystic areas. Microscopically, they were unencapsulated with cells arranged in cribriform, glandular, nested and trabecular pattern. The neoplastic cells were small, cuboidal with scanty cytoplasm and centrally placed hyperchromatic nuclei. Also seen were cystic spaces filled with amphophilic material. Perineural and perivascular invasion was noted in all (Figure 8a).

Squamous cell carcinoma (SCC)

There were three cases of squamous cell carcinoma in our study, accounting for 2.2% of all salivary gland tumors and 13% of all malignant tumors. Two cases occurred in the parotid glands of a 65year old male and 24 year old female patient. The third case involved the submandibular gland of a 58 years old male patient. Clinically they all presented as painful, rapidly growing hard masses. The tumors were unencapsulated, grey-brown, globular, hard in consistency and measured 4-5cms in size. Cut surface was nodular and grey-white to grey-brown with focal areas of hemorrhage. The microscopic examination revealed pleomorphic tumor cells with moderate to abundant cytoplasm and hyperchromatic nuclei, cells were arranged in sheets and nests with keratin pearl formation Also noted were mitoses (Figure 8b). One case in addition showed heavy lymphocytic infiltrate in the stroma. One case had regional lymph node metastasis.

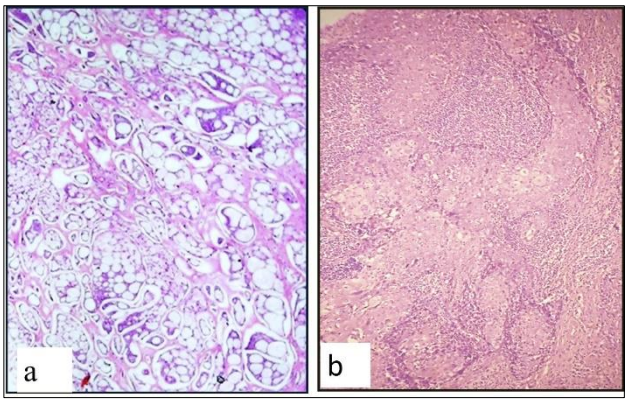

Figure 8: (a) Adenoid cystic carcinoma. Tumor cells arranged in cribriform and trabecular pattern (H&E, x100). (b) Squamous cell carcinoma, nests of squamous cells surrounded by fibrous stroma and lymphocytic infiltration (H&E, x100).

Acinic cell carcinoma

One case of acinic cell carcinoma was reported which accounted for 0.7% of all salivary gland tumors and 4.3% of all malignant tumors. It was seen in the parotid gland of a 35 year old female, who presented with a slow growing painful mass. Grossly tumor measured 9X4X2.5cm, was firm in consistency with grey-brown cut surface showing focal areas of calcification and haemorrhage. Microscopic examination revealed the tumor to be partially encapsulated and cells were round to oval with abundant granular basophilic cytoplasm, eccentrically placed nuclei having bland chromatin. Some of the cells showed granular eosinophilic cytoplasm. They were arranged in solid sheets, nests, micro cysts and lobules. The stroma was fibrous with focal areas of calcification, sclerosis and hemorrhage (Figure 9). Perineural and perivascular invasion was also documented.

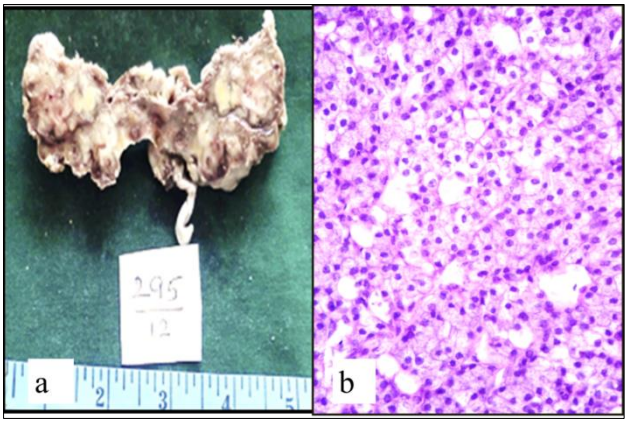

Figure 9: Acinic cell carcinoma. (a) Gross image showing solid, grey white to yellowish cut surface with focal cystic spaces; (b) Cells with abundant basophilic cytoplasm and cystic spaces (H&E, x400).

Salivary duct carcinoma

Single case was reported in a 60 year old male who presented with left sided submandibular swelling. Grossly it measured 4.5X3X2.5 cm, cut surface showed partly solid and partly cystic areas with numerous papillary excrescences projecting into the cyst cavity. On microscopy the tumor showed both intra ductal and invasive components. The intra ductal component showed pleomorphic cells arranged in solid nests with central comedo necrosis, cribriform and papillary arrangement. The invasive component showed sheets, cords and nests of tumor cells with desmoplastic stroma. The tumor cells were large polygonal with moderate amount of cytoplasm and pleomorphic nucleus having coarsely clumped chromatin. The tumor also showed metastasis to regional lymphnodes.

DISCUSSION

Salivary gland neoplasms account for 2% of all tumors in humans. Parotid gland is most commonly involved with 65-80% of all the tumors, followed by submandibular gland, minor salivary glands and sublingual gland.[5] We studied a total of 138 salivary gland tumors, of which 108 (78%) occurred in the parotid gland, 84% of them were benign and 16% were malignant. The submandibular gland was the second commonest site with 18 tumors, of which 72% were benign and 28% were malignant and

least incidence was noted in minor salivary glands with 12 cases, of which 92% were benign and 8% were malignant. So the overall distribution between the sites was 108:18:12. This is in accordance with traditional distribution rule of 100:10:10:1 for parotid, submandibular, minor and sublingual gland.[3] However, in our study no sublingual gland tumors were reported. In contrast, some studies involving African population have reported nearly 1:1:1 ratio of tumors between parotid: submandibular gland: minor salivary glands.[6] There is a consistent difference in the pattern of distribution between African population and those of Western world. Although the explanation for this is not clear, some workers have attributed it to endemic parotitis. As there is higher prevalence of malnutrition in these countries, studies done on malnutrition induced changes in salivary glands have shown serous cells to be more susceptible for destruction than mucous cells. As parotid gland contains predominantly serous acini there is lower frequency of neoplasms in the parotid.[7]

In the present study of 138 salivary gland tumors, 83% were benign and 17% were malignant. Many studies have shown wide variation in the proportion of benign tumors ranging from 37.5% to 84%.[8,9] However, some studies have reported higher prevalence of malignant tumors to the account of 86 to 88%.[10,11] In the present study 12 tumors occurred in minor salivary glands, of which 11 (92%) were benign and only one (8%) was malignant. Study by kumaran et al, have shown overall increased incidence of malignant tumors with minor salivary glands being the common site.[12] The salivary gland neoplasms were seen between the age groups of 13 to 90 years with mean age of 41.84 years (SD=16.41). The highest incidence was noted in 2nd and 3rd decades with 47% of all the cases, followed by 5th and 6th decades together accounting for 39%. This is in accordance with the study done by Edda AM and Vuhahula.[6] Most benign tumors occurred at a younger age (mean= 41.7 years), as compared to malignant tumors (mean= 43 years) which is in agreement with other studies.[8,12] In the present study female to male ratio was 1.4:1 with female preponderance for both benign and malignant neoplasms. This is similar to most other studies, however male preponderance has been observed by few other studies like Shrestha S et al.[13,14,8]

Benign salivary gland tumors

Pleomorphic adenoma was the most frequent salivary gland neoplasm in the present study accounting for 70.3% of all the neoplasms and 84.3% of all benign tumors. The peak incidence was seen between 15-45 years of age with female preponderance of 1.8:1 and predilection for parotid gland. Our findings were similar to the other studies by Vargas and Solange et al.[15,16] Histomorphologically, the tumors showed an admixture of epithelial and mesenchymal components in varying proportions. Focal squamous metaplasia was seen in seven of our cases with similar findings in other studies.[17,18]

Warthin tumor was the 2nd commonest benign tumor accounting for 8% of all neoplasms and 9.6% of benign tumors. The frequency observed in various studies ranged from 8% to 29%.[14,19] The peak incidence was noted between 46-75 years, with male preponderance and parotid was the commonest site. Though most Warthin tumors are bilateral, bilateralism was not seen in our study. Histomorphologically the tumors were partly solid and partly cystic. Microscopically the epithelial cells were arranged in papillae projecting into the cystic spaces and resting on lymphoid stroma. The epithelium was bilayered with outer oncocytic and inner cuboidal cell layer. Squamous metaplasia was noted in 3/11 cases. The metaplasia can be squamous or mucous type and is attributed to inflammation or infarction. Similar features are reported in other studies.[20,21] A study comprising of 24 cases of Warthin tumor showed metaplasia and necrosis in 4 cases. However, unlike squamous cell carcinoma the squamous metaplasia here will not show keratinisation. Extensive mucinous metaplasia when associated with necrosis can be misdiagnosed as low grade mucoepidermoid carcinoma. Hence extensive sampling is needed to confirm the diagnosis.[22]

Basal cell adenoma accounted for 2.9% of all salivary gland neoplasms and 3.5% of benign tumors. The peak incidence was seen in 5th decade with equal sex distribution. Two cases each occurred in parotid and submandibular gland in the present study. Basal cell adenomas are reported mainly in the parotid gland, and the peak incidence is between 4th to 7th decades.[23] Histomorphological features were typical with uniform, monotonous, basaloid cells arranged in solid, trabecular, tubular and membranous patterns. The absence of chondromyxoid and mucoid stroma helps in differentiating it from pleomorphic adenoma.

The other less common benign tumors encountered in the present study were myoepithelioma and oncocytoma. Both cases of myoepithelioma showed spindle cell type histologically. It is important to distinguish spindle cell myoepithelioma from fibrohistiocytic tumors, nerve sheath tumors, nodular fasciitis and synovial sarcoma. The most consistent immunostains are positivity for cytokeratins S-100 and SMA.[24] Single case of oncocytoma was encountered, which was well encapsulated with homogenous, grey brown cut surface. Microscopically presence of fibrous capsule helps to differentiate it from nodular oncocytic hyperplasia which occurs exclusively in parotid gland, has peak incidence in 5th to 6th decades and presents as multiple unencapsulated nodules of oncocytes.[25,26]

Malignant salivary gland neoplasms

There were 23 malignant salivary gland tumors, out of which fifteen were mucoepidermoid carcinoma and

accounted for 65% of all malignant tumors. The peak incidence was noted between 15-30 years with male preponderance. Parotid gland was the commonest site. Similar observations were reported by other researchers.[15,27] However, studies by Rewsuwan S and Lima SS have reported adenoid cystic carcinoma as the commonest malignancy.[14,16]

Histomorphologically, mucoepidermoid carcinoma showed 3 types of cells, namely mucin producing, intermediate and epidermoid cells in varying proportions. Majority of these were intermediate grade (87%) and the rest low grade (13%). Histopathological features associated with worse biological behavior were mitoses ≥4/10 high power field, anaplasia, necrosis, neural involvement and cystic component less than 20% of entire tumor.[28] The 4th edition of WHO classification does not endorse grading in mucoepidermoid carcinoma due to lack of consensus on optimal grading criteria.[2]

Three cases of adenoid cystic carcinoma were reported, accounting for 13% of all malignant tumors. Two occurred in submandibular gland and one in minor salivary gland. Two of them were males and one was female. Three different growth patterns have been identified, cribriform type is the commonest followed by tubular pattern and solid pattern is the least common.[12] Cytologically the tumor cells are relatively uniform, basaloid in appearance with angulated, hyperchromatic nuclei and scant, clear to eosinophilic cytoplasm.[12] High-grade or ''dedifferentiated'' ACC contains an area of conventional ACC of any grade and an area of high-grade undifferentiated or poorly differentiated carcinoma with loss of ductal-myoepithelial differentiation, increased (>5/high power field) mitotic activity, comedo necrosis, micropapillary and squamoid growth patterns, and fibrocellular desmoplasia. Prognosis depends on tumor grade, stage, lymph node metastasis, invasion of major nerves and margin status.[29]

Squamous cell carcinoma accounted for 2.2% of all salivary gland tumors and 13% of all malignant tumors. It is a rare aggressive neoplasm with reported frequency varying from 0.9 to 4.7% of all tumors. The average age is between 61-68 years with strong male predilection. Exposure to radiation in the past is associated with increased risk. Before making the diagnosis, metastasis of SCC from other sites has to be ruled out. Our cases did not have primary SCC elsewhere. The differential diagnosis includes high grade mucoepidermoid carcinoma and undifferentiated carcinoma.[30] Histomorphologically the diagnosis of SCC is based on presence of keratin and / or intercellular bridges.

One case each of acinic cell carcinoma and salivary duct carcinoma were encountered in our study. Acinic cell carcinoma was seen in the parotid gland of a 35 year old female. It is a low grade malignant salivary neoplasm constituting 0.7% of all salivary gland neoplasms. Median age at diagnosis is 52 years with female preponderance. Histomorphologically tumor shows serous acinar cell differentiation. However other growth patterns recognised include acinar, intercalated ductal, vacuolated, clear cell type, microcystic, papillary cystic and follicular growth pattern.[31,32] Salivary duct carcinoma was reported in a 60 year old male patient in submandibular salivary gland with metastasis to regional lymph nodes. This is a rare, highly aggressive tumor accounting for 1% to 3% of malignant salivary gland tumors. The mean age ranges between 55 to 61 years and parotid is the commonest site. They are known for early distant metastases, local recurrence and high mortality. Histomorphologically the tumor resembles ductal carcinoma of the breast showing both intraductal and invasive components. The intraductal component is cribriform, papillary, solid with comedo necrosis. The infiltrative component shows glands and cords of cells in a desmoplastic stroma.[33]

CONCLUSION

Salivary gland tumors are relatively uncommon head and neck tumors, most commonly occurring between third and sixth decades of life. Parotid gland is the most frequently involved gland. Benign tumors are more common than the malignant tumors. Female preponderance is seen in both benign and malignant tumors. Pleomorphic adenoma is the commonest salivary gland tumor occurring mostly in the parotid gland. Warthin tumor is the second most common benign salivary gland neoplasm. Mucoepidermoid carcinoma is the most common malignant salivary gland neoplasm and parotid gland is the common site of occurrence. Adenoid cystic carcinoma and squamous cell carcinoma are the next most common malignant salivary gland tumors. Histopathological examination is the most important method for diagnosis, typing, grading and staging of malignant tumors.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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