ORIGINAL ARTICLE

THE HISTOPATHOLOGICAL PATTERN OF SALIVARY GLAND TUMORS

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ABSTRACT:

Background: Salivary glands are seromucinous exocrine glands concerned with production and secretion of saliva. The objectives of this study were to determine the distribution and histopathological pattern of salivary gland tumors.

Material & Methods: This descriptive cross-sectional study was conducted in Pathology Department of Bannu Medical College, Bannu, KPK, Pakistan from 1st January, 2011 to 31st December, 2015. Sample size was 78 patients with salivary gland tumors. Demographic variables were; gender, age in years and age groups. Research variables were; type of tumor, type of benign tumor, type of malignant tumor and anatomical site of tumors. Descriptive statistics were used to analyze the data.

Results: Out of a total of 78 patients with salivary gland tumors, the ratio of male to female was 1.2:1. The mean age of the sample was 31.22 ±11.23 years and range was from 13 to 58 years i.e 45 years. The common age group in benign tumors was 21-30 years in 46 (69.69%), followed by 31-40 years in 13 (19.69%) and 10-20 years in 4 (6.06%) cases, whereas in malignant tumors the most common age group was 41-50 years in 9 (75%) and 51-60 years in 3 (25%) cases. Amongst these salivary gland tumors, benign were 66 (84.61%) and malignant 12 (15.38%).

Conclusion: Pleomorphic adenoma was the commonest benign salivary gland tumor and mucoepidermoid carcinoma was the commonest malignant tumor. Most common site for major salivary gland tumors was parotid and for minor salivary gland tumors was palate, especially in males in their fourth decade of life.

KEY WORDS: Salivary gland; Pleomorphic adenoma; Mucoepidermoid carcinoma; Histopathology.

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INTRODUCTION

The salivary gland tumors have limited documented epidemiology as in many studies the data is restricted to parotid gland or tumors of major salivary glands. Salivary glands despite of having relatively simple morphology give rise to at least 40 histologically distinct tumors.[1,2] Salivary glands tumors are uncommon and consist about 2% of all the tumors of the body and about 5% of head and neck tumors.[3]

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The common location of salivary glands tumors is parotid 65% to 80% followed by submandibular10% and minor salivary glands. Salivary glands tumors can occur in any age, more common in adults with slight female predominance.[4-6] Overall benign tumors are more common as compared to malignant tumors. In parotid gland benign tumors are about 80% and the same drops to 60% in the submandibular glands, where as in minor salivary glands especially in oral cavity malignant tumors outnumbers the benign tumors.[7-12]

There is no confirm clinical criteria for differentiation of benign and malignant tumors. Histopathological examination is mandatory for proper and confirm diagnosis.[13,14]

According to World Health Organization (WHO) salivary glands tumors are broadly classified as epithelial tumors, soft tissues tumors, hematolymphoid tumors and metastatic tumors.[15]

Benign salivary gland tumors are usually curative on excision with healthy margins but recurrence is there if not completely excised, whereas malignant tumors prognosis depends on grade and stage of the tumors. These tumors are staged on the basis of tumor size, lymph node status and distant metastesis (TNM). The staging of minor salivary glands malignant tumors based on location like oral cavity, sinuses, larynx etc excluding all non-epithelial tumors.[16]

There is non-availability of tumor registry of salivary glands in the southern districts of KPK, so it is essential to have such a registry of tumor of this organ in this area of KPK, Pakistan.

Salivary glands inspite of having simple histology give rise to a variety of benign and malignant neoplasm. Major salivary glands neoplasm usually causes cosmetic problems whereas minor salivary glands neoplasm causes swallowing difficulties or oral discomfort. Therefore patients seeks medical advice when faces these problems.[17] Tumors of salivary gland are important for pathologists as well as head and neck surgeons for the reason of high morbidity and mortality because of anatomical location and facial nerve presence which traverses the parotid gland and is likely to be damaged during surgery.[18,19] The objectives of this study were to determine the distribution and histopathological pattern of salivary gland tumors.

MATERIALS AND METHODS

This descriptive cross-sectional study was conducted in Pathology Department of Bannu Medical College, Bannu, KPK, Pakistan from 1st January, 2011 to 31st December, 2015. Sample size was 78 patients with salivary gland tumors. Sampling technique was non-probability, consecutive. Inclusion criteria were all patients with salivary gland tumor biopsies done. Exclusion criteria was autolysed and insufficient biopsy specimens. The biopsies of salivary glands tumors were collected from public and private sector hospitals of districts of Bannu, Karak, Lakki Marwat and FR Bannu. Demographic variables were; gender, age in years and age groups. Research variables were; type of tumor, type of benign tumor, type of malignant tumor and anatomical site of tumors. Gender had attributes of male and female. Age groups had attributes of 10-20 years, 21-30 years, 31-40 years, 41-50 years and 51-60 years. Type of tumors were; major salivary glands and minor salivary glands. Type of benign tumor were; pleomorphic adenoma, monomorphic adenoma, warthin tumor, myoepithelioma and hemangioma. Type of malignant tumor were; mucoepidermoid carcinoma, adenoid cystic carcinoma, acinic cell carcinoma, malignant mixed tumor and large duct adenocarcinoma. Anatomical site of tumors were; parotid gland, submandibular gland, palate and buccal mucosa, lip and tongue. Morphological pattern had attributes; malignant tumor; mucoepidermoid carcinoma, adenoid cystic carcinoma, acinic cell carcinoma, malignant mixed tumor and large duct adenocarcinoma. All the biopsies were received in 10% buffered formalin. Biopsies were registered, numbers allotted and labeled. After fixation, tissues sections 5 mm thick were taken and processed in various grades of ethanol, xylene wax. Tissue block prepared, kept in refrigerator, freezed for hardening. Next sections 5 micron thick were prepared by cutting in microtome. Finallay slides prepared stained with hematoxylin and eosin. The slides were mounted with DPX and cover slip placed, labeled and diagnosis made by histopathologist. Gender and age group, type of tumor, type of benign tumor, type of malignant tumor and anatomical site of tumors were categorical variables whereas age in years was numeric variable. Frequency and percentages were calculated for categorical variables whereas mean and SD were calculated for the age in years.

RESULTS

Out of a total of 78 patients with salivary gland tumors, the ratio of male to female was 1.2:1. The mean age of the sample was 31.22 ±11.23 years

Table I: Distribution of types of salivary gland tumors (n=78).

S.No	Types of salivary glands	Anatomical site	frequency	Relative frequency (%)
1	Major	Parotid	48	61.53
		Submandibular	11	14.10
		Subtotal	59	75.64
2	Minor	Palate	13	16.66
		Buccal mucosa	03	3.84
		Lip	02	2.56
		Tongue	01	1.28
		Subtotal	19	24.35
	Total		78	100

Table II: Morphological pattern of salivary gland (n=78).

S. NO.	Histopathology of tumor	Frequency	Relative frequency (%)
1	Pleomorphic adenoma	57	73.87
2	Monomorphic adenoma	05	6.41
3	Warthin tumor	02	2.56
4	Myoepithelioma	01	1.28
5	Hemangioma	01	1.28
6	Mucoepidermoid carcinoma	05	6.4
7	Adenoid cystic carcinoma	03	3.84
8	Acinic cell carcinoma	02	2.565
9	Malignant mixed tumor	01	1.28
10	Large duct adenocarcinoma	01	1.28
Total		78	100

and range was from 13 to 58 years i.e, 45 years. The common age group in benign tumors was 21-30 years, in 46 (69.69%), followed by 31-40 years, 13 (19.69%) 10-20 years in 4 (6.06%) cases, whereas in malignant tumors the most common age group was 41-50 years in 9 (75%) and 51-60 years in 3 (25%) cases.

Major salivary gland tumors were 59 (75.64%) and minor salivary gland tumors were involved in 19 (24.35%) cases. Out of 59 major salivary glands, parotid was involved in 48 (82.35%) followed by submandibular gland in 11 (14.10%) cases, whereas out of 19 minor salivary glands, palate was commonest site involved by 13 (16.66%), followed by buccal mucosa 03 (3.84%) cases.

Amongst these salivary gland tumors, benign were 66(84.61%) and malignant 12(15.38%). Out of 66 benign tumors, pleomorphic adenoma were 57(73.87%) followed by monomorphic adenoma 5(6.41%), warthin tumor 2(2.56%), myoepithelioma and hemangioma 1(1.26%) in each case. Out of 12 malignant tumors mucoepidermoid carcinoma was in 5(6.41%), followed by adenoid cystic carcinoma in 3(3.84%), acinic cell carcinoma in 2(2.56%), malignant mixed tumor and large duct adenocarcinoma 1(1.28%) in each case. Table-2 shows the distribution of salivary gland tumors based on morphological pattern.

DISCUSSION

In this study the mean age was 31.22 ±11.23 years with age range of 13-58 (45 years). The ratio of male to female was 1.2:1. In study by Bahra et al[12] in 2012 in Kenya the mean age was 43.6 and age range was from 8-80 (72 years) and equal male to female ratio. Another study by Zaman et al[13] in Lahore showed the age range of 8-92 (84 years) with male to female ratio of 1:1.1. Still another study by Niazi et al[14] in Lahore in 2013 the mean age was 44 years and age range of 8-83 (75 years) with equal gender distribution. Another study by Musai et al[15] in 2008 in Karachi showed mean age of 34 years and age range of 18-70 (52 years). The ratio of male to female was 1:1.4. Other study conducted by Jude et al[18] show mean age of 39.34±17 years and age range of 2-75 (73 years). The male and female ratio was 1:1.3.

In this study the common age group in benign tumors was 3rd decade in 46 (69.69%), followed by 4th decade 13 (19.69%) and 2nd decade in 4 (6.06%) cases, whereas in malignant tumors the common age group was 5th decade in 9 (75%), followed by 6th decade in 3 (25%) cases. In a study conducted by Jude et al,[18] the common age group in benign tumors 17.88% was 21-30 years followed by 41-50 years in 13.00%, 8.94% in 31-40 years and 8.13% in 51-60 years, whereas in malignant tumors 8.13% the common age group involved was 51-60 years, followed by 5.09% in 41-50 years and 4.87% in 31-40 years.

In this study the common anatomical site of salivary gland tumors was major salivary glands 59 (75.64%) of which parotid was involved in 48 (82.35%) followed by submandibular gland 11 (14.10%) cases, whereas minor salivary glands in 19 (24.35%) cases of which palate was commonest site involved by 13 (16.66%), followed by buccal mucosa 03 (3.84%) cases. In a study conducted by Jude et al, parotid gland was involved in 57% cases, submandibular 16% cases and minor glands in 27% cases. Another study conducted by Gupta et al major salivary glands were involved in 24.32% cases and minor glands in 75.67% of cases. Still another study conducted by Bahra et al,[12] minor glands were involved in 67% cases and major glands in 33% of cases. Another study conducted by Zaman et al,[13] major salivary glands were involved in 67.03% and

minor glands in 32.97% of cases.

In this study the commonest benign tumor was pleomorphic adenoma 57 (73.87%) followed by monomorphic adenoma 5 (6.41%), warthin tumor 2 (2.56%), myoepithelioma and hemangioma one (1.26%) case each. The commonest malignant tumor was mucoepidermoid carcinoma 5 (6.41%), followed by adenoid cystic carcinoma 3 (3.84%), acinic cell carcinoma 2 (2.56%), malignant mixed tumor and large duct adenocarcinoma one (1.28%) case each. In a study conducted by Soni et al the commonest benign tumor was pleomorphic adenoma 57.33% followed by warthin tumor 6.66%, myoepithelioma 2.66%, whereas the commonest malignant tumor was mucoepidermoid carcinoma 10.66% followed by adenoid cystic carcinoma 6.66%, carcinoma ex pleomorphic adenoma 2.66% and acinic cell carcinoma 1.37% cases. Another study conducted by Gill et al[17] show pleomorphic adenoma as the commonest tumor 61.74% followed by warthin tumor 4.49%, hemangioma 2.11%, monomorphic adenoma 0.53% and myoepithelioma 0.26%, whereas the commonest malignant tumor was mucoepidermoid carcinoma 15.30% followed by adenoid cystic carcinoma 5.28%, carcinoma exploemorphic adenoma 1.32%, acinic cell carcinoma 1.00% and salivary duct carcinoma as 0.53%. Another study conducted by Jude et al,[18] show pleomorphic adenoma 53.2% as the commonest tumor followed by monomorphic adenoma 4.58%, hemangioma 3.66% and warthin tumor and myoepithelioma 0.91% each, here adenoid cystic carcinoma 10.09% was the commonest tumor and mucoepidermoid carcinoma 8.25% was the second commonest malignant tumor. Other malignant tumors were acinic cell carcinoma and salivary duct carcinoma 6.42% and 0.91% respectively. In a study conducted by Zaman et al[13] the commonest tumor was pleomorphic adenoma 47.2% and monomorphic adenoma 7.5% was the second common tumor and myoepithelioma 5.6% was third in number. In malignant tumors adenoid cystic carcinoma 42% was first commonest tumor and mucoepidermoid carcinoma 39.5% was second than acinic cell carcinoma 7.8% and carcinoma ex pleomorphic adenoma was in 2.6% cases.

CONCLUSION:

Pleomorphic adenoma was the commonest benign salivary gland tumor and mucoepidermoid carcinoma was the commonest malignant tumor. Most common site for major salivary gland tumors was parotid and for minor salivary gland tumors was palate, especially in males in their fourth decade of life.

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CONFLICT OF INTEREST
Authors declare no conflict of interest.
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AUTHORS' CONTRIBUTION

Conception and Design:	MSK, SA, NN
Data collection, analysis & interpretation:	MSK, SA, NN
Manuscript writing:	MSK