

A Clinicopathological Analysis of 75 Salivary Gland Tumors at Mayo Hospital, Lahore

HAFIZ NASIR MAHMOOD¹, AHMAD ABDUL HASEEB², NABEELA RIAZ³, SAADIA FIRDOUS⁴, SABA HANIF⁵, SHAMMAS RAZA KHAN⁶

¹Senior Registrar, Department of Oral & Maxillofacial Surgery King Edward Medical university/ Mayo hospital, Lahore

²Demonstrator, Department of Oral & Maxillofacial Surgery King Edward Medical university/ Mayo hospital, Lahore

³Professor & Head of Department Oral & Maxillofacial Surgery King Edward Medical university/ Mayo hospital, Lahore

⁴Assistant Professor, Oral Maxillofacial Surgery, Avicenna dental College

⁵Demonstrator, Department of Oral & Maxillofacial Surgery King Edward Medical university/ Mayo hospital, Lahore

⁶Consultant Oral & Maxillofacial Surgeon, Ministry of health, Saudi Arabia

Correspondence to Dr. Ahmad Abdul Haseeb, Email: abdul.hsb@gmail.com, +923344362120

ABSTRACT

Aim: To describe the clinic-o-pathological pattern of patients presented with salivary gland tumors at Department of Maxillofacial surgery Mayo hospital Lahore during time period of one year from 1st January 2019 to 31st December 2019.

Methods: This was a retrospective cross-sectional study conducted at Department of Oral and Maxillofacial Surgery, Mayo Hospital Lahore. 75 cases of Salivary gland tumors in the head and neck region were identified. Patient's medical record and pathology reports were retrieved and carefully reviewed by a senior doctor to collect basic demographic data as well as tumor related information. Data entry and analysis was done with the help of SPSS version-26. Chi Square Test/Fisher exact test was applied to see the association between qualitative variables.

Results: In this study Mean age of patients in this study was 40.45±13.18. Male patients were predominant as compared to female patients; Male 53.3% & Female 46.7%. The most frequent tumor among patients was Pleomorphic Adenoma (61.3%) followed by Adenoid Cystic Carcinoma (17.3%), Mucoepidermoid Carcinoma (13.3%), Warthin's Tumor (4%), Squamous cell Carcinoma of Parotid (2.7%) and adenocarcinoma (1.3%) respectively. However no significant association was seen between salivary gland tumors with age and gender of patients (p-value=0.521).

Conclusion: Among the benign salivary gland tumors pleomorphic adenoma is the most common tumor whereas among malignant salivary gland tumors adenoid cystic carcinoma is the most frequent occurring tumor.

Keywords: Salivary gland Tumors, Maxillofacial Surgery, Pathological Pattern,

INTRODUCTION

World Health Organization has revealed that out of all the patients affected by salivary gland tumors, the ratio of females suffering from these tumors is slightly greater than males. This ratio may vary when considering a specific tumor type of salivary glands. These heterogeneous groups of tumors have inconsistent characteristics in different parts of the world; therefore, it is understandable that ethnicity and geography may have an effect on clinicopathologic characters of these tumors.

The exact etiological factors of these tumors have not been identified however smoking, sunlight, ionizing radiation, chemotherapy and deficiency of Vitamin A has been identified by some researchers. Occupations like working with asbestos or rubber, woodwork and plumbing have been reported to be associated occupational risk factor for developing salivary gland tumors¹.

These groups of tumors encompass approximately 3–5% of head and neck carcinomas, and only 0.5% of all malignant tumors are salivary gland tumors.¹⁹ The incidence of salivary gland tumors is varying and most of the salivary gland tumors are found in major salivary glands. Parotid gland is the most common site; approximately 80% of cases are located in this major salivary gland, while sublingual glands are rarely involved approximately less than 1%. Tumors occurring in the sublingual, submandibular and minor salivary glands are mostly malignant. Among the parotid gland tumors 15-32% tumors prove to be malignant.³

It is difficult to clinically delineate between malignant and benign salivary gland tumors at the initial stages of tumor development. However, pain, facial nerve palsy and paresthesia are a frequent finding in malignant salivary gland lesions². Magnetic resonance imaging is considered as the best modality of imaging choice in these patients. Both post contrast and pre contrast images are helpful for assessment of salivary gland tumors²⁰. Clinical data such as patient's age, gender, Salivary gland involved and the relative incidence are very crucial for accurate diagnosis and management.

Many studies have been conducted in the Western countries; there are only a handful of published data in Pakistan

regarding clinicopathologic character of salivary gland tumors. Therefore, this study has been conducted to describe the prevalence of salivary tumors, in patients presenting in Department of Oral & Maxillofacial surgery at King Edward Medical University/ Mayo hospital, Lahore. The objective of the study was to describe the clinic-o-pathological pattern of patients presented with salivary gland tumors at Department of Maxillofacial surgery King Edward Medical University/ Mayo hospital Lahore during time period of one year from 1st January 2019 to 31st December 2019.

METHODS

This retrospective cross-sectional study was conducted at Department of maxillofacial Surgery; Mayo Hospital Lahore. 75 Cases of salivary gland tumors presented from 1st January 2019 to 31st December 2019 were included in this study. After taking ethical approval, patient's medical record and pathology reports were retrieved and carefully reviewed by a senior doctor to collect basic demographic data like age and gender as well as tumor related information. Data entry and analysis was done with the help of SPSS version-26. Quantitative variables like age were presented with mean and standard deviation. Qualitative variables like gender, type of salivary gland tumors and site of occurrence were presented with the frequency and percentage. Chi Square Test/Fisher exact test was applied to see the association between type of tumor and location of tumor in these patients. P-value ≤0.05 was considered significant.

RESULTS

Mean age of patients in this study was 40.45±13.18 years. Minimum and maximum age of patients was 11 and 85 years. Mean age of male and female patients was 42.93±14.76 years and 37.63±10.62 years respectively. Among patients 40(53.3%) were male and 35(46.7%) were female. Among patients 46(61.3%) presented with Pleomorphic Adenoma, 10(13.3%) patients presented with Mucoepidermoid Carcinoma, 13(17.3%) patients with Adenoid Cystic Carcinoma, 2(2.7%) patients presented with Squamous cell carcinoma of Parotid, 1(1.3%) patient presented

with adenocarcinoma and 3(4%) patients presented with Warthin's Tumor.

In table-1 detailed description is given for each type of tumor in relation to site of occurrence (Table-1). The most frequent tumor in all groups was Pleomorphic Adenoma. However, in the elderly age group (>50 years) the second most common tumor was Adenoid cystic CA (41.7%). Variation was seen in the frequency of different types of tumors in different age groups. However no statistically significant association was seen between age groups and type of salivary gland tumors (p-value=0.368) (Table-2).

Among male patients the most common tumor type was Pleomorphic Adenoma (60%) followed by Mucoepidermoid carcinoma (17.5%), Adenoid Cystic carcinoma (17.5%) and Warthin's Tumor (5%) while among female patients the same trend was seen as in male patients with two tumor types exceptions which were not seen among male patients which were Squamous cell carcinoma of parotid (5.7%) and Adenocarcinoma(2.9%). Gender of patients had no significant impact on frequency of type of tumor. i.e. (p-value=0.521 (Table-2).

Table-1: Type of tumor in relation to site of occurrence

	Pleomorphic Adenoma	Mucoepidermoid CA	Adenoid Cystic CA	SCC Parotid	Adeno-Carcinoma	Warthin's Tumor	Total
Alveolar Mucosa	1(2.2%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	1
Buccal Mucosa	1(2.2%)	1(10%)	2(15.4%)	0(0%)	0(0%)	0(0%)	4
Mandible	0(0%)	3(30%)	0(0%)	0(0%)	0(0%)	0(0%)	3
Maxilla	0(0%)	0(0%)	1(7.7%)	0(0%)	0(0%)	0(0%)	1
Palate	9(19.6%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	14
Parotid	25(54.3%)	1(10%)	1(7.7%)	2(100%)	1(100%)	3(100%)	33
Sublingual	0(0%)	0(0%)	1(7.7%)	0(0%)	0(0%)	0(0%)	1
Submandibular	9(19.6%)	5(50%)	2(15.4%)	0(0%)	0(0%)	0(0%)	16
Tongue	0(0%)	0(0%)	1(7.7%)	0(0%)	0(0%)	0(0%)	1
Upper Lip	1(2.2%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	1
Total	46	10	13	2	1	3	75

Table-2: Salivary Gland Tumors in relation Age of patients

	Age (n=75)					Gender (n=75)	
	11-20	21-30	31-40	41-50	>50	Male	Female
Pleomorphic Adenoma	2(66.7%)	10(76.9%)	18(64.3%)	10(53.6%)	6(50%)	24(60%)	22(62.9%)
Mucoepidermoid CA	0(0%)	2(15.4%)	6(21.4%)	1(5.3%)	1(8.3%)	7(17.5%)	3(8.6%)
Adenoid Cystic CA	1(33.3%)	1(7.7%)	3(10.7%)	3(15.8%)	5(41.7%)	7(17.5%)	6(17.1%)
SCC Parotid	0(0%)	0(0%)	0(0%)	2(10.5%)	0(0%)	0(0%)	2(5.7%)
Adenocarcinoma	0(0%)	0(0%)	0(0%)	1(5.3%)	0(0%)	0(0%)	1(2.9%)
Warthin's Tumor	0(0%)	0(0%)	1(3.6%)	2(10.5%)	0(0%)	2(5%)	1(2.9%)
Total	3	13	28	19	12	40	35
p-value*	0.368					0.521	

Note (*): Fisher Exact test

DISCUSSION

In this study mean age of patients in this study was 40.45±13.18. Age of patients ranges between 11-85 years. Male patients were predominant as compared to female patients; Male 53.3% & Female 46.7%. According to a Brazilian study the age of patients presenting with salivary gland tumors was 46.47 years which was higher as compared to this study as well as the study reported higher female ratio as that of male patients. (51.4% & 48.3%).⁴ An Iranian study also reported higher frequency of male patients presenting with salivary gland tumors. (56.25% & 43.75%)⁵ However studies have reported higher female ratio for these tumors.¹⁵ Studies have reported 7th and 8th decades as the most prevalent range and few studies have reported peak incidence of these tumors in sixth decade of life.⁷ In this study the peak incidence was seen in the age group 31-40 years (37.33%) of age followed by patients in the age group 41-50 years (25.33%) and >50 years (16%). In accordance with these study findings previous local studies in other parts of the country report an age range of fourth and fifth decade^{8,9,10}.

The most frequent tumor among patients was Pleomorphic Adenoma (61.3%) followed by Adenoid Cystic carcinoma (17.3%), Mucoepidermoid carcinoma (13.3%), Warthin's Tumor (4%), Squamous cell carcinoma Parotid (2.7%) and adenocarcinoma (1.3%) respectively.

Most studies report, Mucoepidermoid as the commonest malignant pathology followed by adenoid cystic.^{8,9,11} According to Shinomiya et al., Adenoid cystic Carcinoma was the third commonest tumor.¹² In a study by Dzaman K et al., acinic cell carcinoma was the commonest followed by adenocarcinoma and non-Hodgkin lymphoma in decreasing order of frequency.¹³ According to the results of local study Mucoepidermoid carcinoma was the most common histological variant (50%) followed by

adenoid cystic carcinoma (13%), and adenocarcinoma (10%). Histology has further categorized these malignant tumors into low (34%), intermediate (28%), and high (21%) grades.¹⁴ Various studies have reported Pleomorphic Adenoma as the most common tumor. In line with the results of this Tessa PJ et al and Bharti Devi Thaker reported pleomorphic adenoma as the most frequent comprise of 86.6% and 82.3% cases of salivary gland tumor respectively.^{6,15}

Jawwad Ahmed discovered adenoid cystic carcinoma (78%), followed by mucoepidermoid carcinoma (20%) and acinic cell tumour (14%) in his research (5%). (5%) (2%) Among the nonneoplastic, benign and malignant lesions identified by Bharti Devi Thaker in her research were chronic sialadenitis, Pleomorphic adenoma and Mucoepidermoid carcinomas, which she classified as the most common.

Pleomorphic adenoma as the most common benign salivary gland tumour, followed by mucoepidermoid carcinoma as the second most common. The parotid gland was the source of all of the lesions. It ranks third on the list of most frequent salivary gland tumours.

The lowest conductivity was seen in adenoid cystic carcinoma, which was the most common SGT. This tumour grows slowly and causes harm to nerves and lymph nodes in its early stages. Advanced tumours necessitate surgical intervention. Studies in the Congo, Tanzania, Croatia, and Nigeria revealed that adenoid cystic carcinoma was the most common kind of cancer. Mucoepidermoid carcinoma, on the other hand, is more common than adenoid cystic carcinoma in Iran, Brazil, Jordan, the United States, the United Kingdom, and Italy, with a distribution that is equivalent in China, Finland and Mexico.

Some benign salivary gland tumours have a propensity to recur, whilst others have no such proclivity. Malignant transformation is known to occur in some tumours, but it is unusual

or unknown to occur in other tumours. According to epidemiological data, salivary gland tumours are common around the world. Salivary gland neoplasms are histologically diverse, presenting with varying incidence, course and prognosis depending on the kind and location of the tumour.

The number of new cases has been stable, with a slight upward trend in recent months. The mortality rate remained stable on an overall basis. This was a one-year retrospective study, according to the authors. It will need further research to fully understand salivary gland cancers in Pakistan.

CONCLUSION

Among the benign salivary gland tumors pleomorphic adenoma is the most common tumor whereas among malignant salivary gland tumors adenoid cystic carcinoma is the most frequent occurring tumor.

There was no conflict of interest

No funding was done for this article

REFERENCES

1. Jaafari-Ashkavandi Z, Ashraf MJ, Moshaverinia M. Salivary gland tumors: a clinicopathologic study of 366 cases in southern Iran. *Asian Pac J Cancer Prev*. 2013 Jan 1;14(1):27-30.
2. Liao WC, Chih-Chao C, Ma H, Hsu CY. Salivary Gland Tumors: A Clinicopathologic Analysis From Taipei Veterans General Hospital. *Ann. Plast. Surg*. 2020 Jan 1;84(1S):S26-33.
3. Shen SY, Wang WH, Liang R, Pan GQ, Qian YM. Clinicopathologic analysis of 2736 salivary gland cases over a 11-year period in Southwest China. *Acta. Otolaryngol*. 2018 Aug 3;138(8):746-9.
4. Vasconcelos AC, Nör F, Meurer L, Salvadori G, Souza LB, Vargas PA, Martins MD. Clinicopathological analysis of salivary gland tumors over a 15-year period. *Braz. Oral. Res*. 2016;30(1).
5. Akbari ME, Atarbashi-Moghadam F, Atarbashi-Moghadam S, Bastani Z, Zalani SS. Primary malignant neoplasms of parotid gland in Iranian population. *Int. J. Cancer. Manag*. 2017 Nov;10(11).
6. Thaker BD, Devi A, Bhardwaj S. FNAC of Salivary Gland Lesions-A Hospital Based Study. *JK Sci*. 2018 Oct 1;20(4):177-80.
7. Maahs GS, Oppermann PD, Maahs LG, Machado Filho G, Ronchi AD. Parotid gland tumors: a retrospective study of 154 patients. *Braz. J. Otorhinolaryngol*. 2015 Jun;81(3):301-6.
8. Gill MS, Muzaffar S, Soomro IN, Kayani N, Hussainy AS, Pervez S, Hasan SH. Morphological pattern of salivary gland tumours. *J. Pak. Med. Assoc*. 2001;51(10):343.
9. Mirza SM, Hanif F, Chughtai A. Management of Salivary Gland Tumours Our Experience. *Ann. King. Edw. Med. Univ*. 2001;7(4).
10. Ahmed J, Saqlain G. Morphologic Pattern of Salivary Gland Malignancy—Five Years' Experience at Capital Hospital, Islamabad. *IMJ*. 2017;9(6):415.
11. Shinomiya H, Otsuki N, Yamashita D, Nibu KI. Patterns of lymph node metastasis of parotid cancer. *Auris. Nasus. Larynx*. 2016 Aug 1;43(4):446-50.
12. Zaman S, Majid S, Chughtai O, Hussain M, Nasir M. Salivary gland tumours: a review of 91 cases. *J. Ayub. Med. Coll. Abbottabad*. 2014 Sep 1;26(3):361-3.
13. Dżaman K, Pietniczka-Załęska M, Piskadlo-Zborowska K, Siek M, Żebrowska J. Parotid gland tumours in the ENT Department in Międzyzleski Hospital in Warsaw between 2007 and 2014. *Otolaryngol. Pol*. 2016 Feb 29;70(1):34-40.
14. Faisal M, Abbas T, Adeel M, Khaleeq U, Anwer AW, Malik K, Hussain R, Jamshed A. Clinicopathological Behavior and Oncological Outcomes of Malignant Parotid Tumors in a Pakistani Population. *Cureus*. 2018 Feb;10(2).
15. Tessy PJ, Jayalekshmy PS, Cicy PJ, Poothiade U. Fine needle aspiration cytology of salivary gland lesions with histopathological correlation-A two year study. *Int. J. Biomed. Res.*. 2015 Jul;3(4):91-.
16. Triantafyllidou K, Iordanidis F, Psomaderis K, Kalimeras EJJoo, surgery m. Acinic cell carcinoma of minor salivary glands: a clinical and immunohistochemical study. *J. Oral. Maxillofac. Surg*. 2010;68(10):2489-96.
17. Hellquist H, Paiva-Correia A, Vander Poorten V, Quer M, Hernandez-Prera JC, Andreasen S, Zbären P, Skalova A, Rinaldo A, Ferlito A. Analysis of the clinical relevance of histological classification of benign epithelial salivary gland tumours. *Adv. Ther*. 2019 Aug 1;36(8):1950-74.
18. Kordzińska-Cisek I, Grzybowska-Szatowska L. Salivary gland cancer—epidemiology. *Nowotwory. J. Oncol*. 2018;68(1):22-7.
19. Galdirs TM, Kappler M, Reich W, Eckert AW. Current aspects of salivary gland tumors—a systematic review of the literature. *GMS Interdiscip Plast Reconstr Surg DGPW*. 2019;8.
20. Razek AA, Mukherji SK. State-of-the-art imaging of salivary gland tumors. *Neuroimaging Clin. N. Am*. 2018 May 1;28(2):303-17.