
SALIVARY GLAND TUMORS IN A BRAZILIAN POPULATION: A RETROSPECTIVE STUDY OF 124 CASES

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Salivary gland tumors constitute a highly heterogeneous histopathologic group. There are few epidemiological studies of large series of benign and malignant salivary gland tumors in Brazil.

MATERIAL AND METHODS: Hospital records of 124 patients with salivary gland tumors diagnosed from January 1993 to December 1999 were reviewed. The patients were analyzed according to gender, age, size, location, and histopathology of the tumor.

RESULTS AND CONCLUSIONS: Patients with benign and malignant tumors presented with a mean age of 47.7 and 48.8 years, respectively. The frequency of benign tumors was 80% (n = 99) and malignant tumors 20% (n = 25). Tumors were localized in the parotid gland 71% (n = 88), in the submandibular gland 24% (n = 30), and in the minor salivary glands 5% (n = 6). The most common benign tumors were pleomorphic adenoma in 84% (n = 84) and Warthin's tumor in 13% (n = 13). Among malignant tumors, mucoepidermoid carcinoma was the most common in 52% (n = 13), adenoid cystic carcinoma occurred in 20% (n = 5), and carcinoma ex pleomorphic adenoma was detected in 12% (n = 3).

DESCRIPTORS: Salivary gland tumors. Brazilian epidemiology.

INTRODUCTION

Salivary gland tumors are uncommon, corresponding to approximately 3% to 10% of neoplasms of the head and neck region^{1,2}. Incidence rates of malignant salivary gland tumors range from 0.5 to 1.2 cases per 100,000 inhabitants per year^{3,4}. These tumors occur mainly in the parotid gland, but the submandibular gland, minor salivary gland (15% of all salivary gland neoplasms), and sublingual gland can be affected too¹. There are few epidemiological studies of large series of benign and malignant salivary gland tumors in Brazil. The goal of this study was to retrospectively analyze 99 benign and 25 malignant primary

epithelial tumors of the major and minor salivary glands, regarding age, gender, tumor location, tumor size, and histological type of these lesions in Brazilian patients.

MATERIAL AND METHODS

The data were collected from 1993 to 1999 from the files of our division. We found during this period 124

tumors of the salivary glands, 99 being benign and 25 malignant. Information about age, gender, tumor location, and tumor size was obtained from each clinical record. The histopathological analysis of all cases was meticulously reviewed and classified according to the Armed Forces Institute of Pathology⁵ (AFIP) by 3 expert pathologists.

RESULTS

Patients with benign and malignant tumors presented with a mean age of 47.7 and 48.8 years, respectively. The distributions of age, gender, tumor location, size, and histopathological diagnosis are shown in tables 1, 2, 3, 4,

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and 5. No case of salivary gland tumor was noted in the sublingual gland.

BENIGN TUMORS

Pleomorphic Adenoma

Eighty-four tumors were diagnosed as pleomorphic adenoma (PA), which corresponded to 59% of all tumors of our sample. The parotid gland was affected in 58 cases, followed by 24 and 2 cases in submandibular and minor salivary glands, respectively. The fe-

male-to-male ratio was 2:1. The age range was 13-84 years. The mean age for both groups (female and male) was 39 years of age. The average size (maximum diameter) was 3.12 cm (range 0.5-10 cm). Seven out of 84 PA recurred.

Warthin's Tumor

Thirteen patients in our study (10.5%) had Warthin's tumor. Warthin's tumors affected only the parotid gland, and were bilateral in 1 case. This tumor occurred in 10 males and 3 fe-

males. The age range was 43-73 years. The mean age for both groups (female and male) was 59 years of age. The average size (maximum diameter) was 4.15 cm (range, 1.5-7.5 cm).

Basal Cell Adenoma

One basal cell adenoma case was diagnosed in the parotid gland of a man of 44 years of age. This tumor was 2.20 cm at the maximum diameter.

Myoepithelioma

One myoepithelioma was detected

Table 1 - Age and gender of patients with 99 benign and 25 malignant primary epithelial salivary gland tumors.

Tumors	Gender		Age (years)	Age range (years)
	Male	Female		
Benign				
Pleomorphic adenoma	29 (34.52%)	55 (65.48%)	39.00	13-84
Warthin's tumor	10 (76.92%)	3 (23.08%)	59.00	43-73
Basal cell adenoma	1 (100.00%)	0	44.00	-----
Myoepithelioma	0	1 (100.00%)	49.00	-----
Malignant				
Mucoepidermoid carcinoma	5 (38.46%)	8 (61.54%)	37.92	17-76
Adenoid cystic carcinoma	2 (40.00%)	3 (60.00%)	55.20	35-77
Carcinoma ex pleomorphic adenoma	0	3 (100.00%)	51.00	30-73
Acinic cell carcinoma	1 (100.00%)	0	36.00	-----
Adenocarcinoma NOS	0	1 (100.00%)	48.00	-----
Epithelial-myoepithelial carcinoma	1 (100.00%)	0	73.00	-----
Papillary cystadenocarcinoma	1 (100.00%)	0	41.00	-----

Table 2 - Location of 99 benign salivary gland tumors.

	Parotid gland		Submandibular gland		Minor salivary gland		Total n
	n	%	n	%	n	%	
Pleomorphic adenoma	58	69.05	24	28.57	2	2.38	84
Warthin's tumor	13	100	0	0.00	0	0.00	13
Basal cell adenoma	1	100	0	0.00	0	0.00	1
Myoepithelioma	1	100	0	0.00	0	0.00	1
Total	73	73.73	24	24.24	2	2.02	99

Table 3 - Location of 25 malignant salivary gland tumors.

	Parotid gland		Submandibular gland		Minor salivary gland		Total n
	n	%	n	%	n	%	
Mucoepidermoid carcinoma	9	69.2	1	7.69	3	23.0	13
Adenoid cystic carcinoma	0	0.00	4	80.0	1	20.0	5
Carcinoma ex pleomorphic adenoma	3	100	0	0.00	0	0.00	3
Acinic cell carcinoma	1	100	0	0.00	0	0.00	1
Adenocarcinoma NOS	0	0.00	1	100	0	0.00	1
Epithelial-myoepithelial carcinoma	1	100	0	0.00	0	0.00	1
Papillary cystadenocarcinoma	1	100	0	0.00	0	0.00	1
Total	15	60.0	6	24.0	4	16.0	25

Table 4 - Size of benign and malignant tumors of salivary gland.

Tumors	Average size (cm)	Minimum and Maximum diameter (cm)
Benign		
Pleomorphic adenoma	3.12	0.5-10
Warthin's tumor	4.15	1.5-7.5
Basal cell adenoma	2.20	-----
Myoepithelioma	2.00	-----
Malignant		
Mucoepidermoid carcinoma	3.06	1.0-6.0
Adenoid cystic carcinoma	4.10	3.0-5.8
Carcinoma ex pleomorphic adenoma	3.50	1.5-4.5
Acinic cell carcinoma	2.00	-----
Adenocarcinoma NOS	1.20	-----
Epithelial-myoepithelial carcinoma	6.00	-----
Papillary cystadenocarcinoma	4.50	-----

Table 5 - Histopathological diagnosis of 99 benign and 25 malignant salivary gland tumors.

Histological type	n	% for group
Benign		
Pleomorphic adenoma	84	84.84
Warthin's tumor	13	13.13
Basal cell adenoma	1	1.01
Myoepithelioma	1	1.01
Malignant		
Mucoepidermoid carcinoma	13	52.00
Adenoid cystic carcinoma	5	20.00
Carcinoma ex pleomorphic adenoma	3	12.00
Acinic cell carcinoma	1	4.00
Adenocarcinoma NOS	1	4.00
Epithelial-myoepithelial carcinoma	1	4.00
Papillary cystadenocarcinoma	1	4.00

in the parotid gland of a woman of 49 years of age. This tumor was a 2.00 cm at the maximum diameter.

MALIGNANT TUMORS

Mucoepidermoid Carcinoma

Thirteen tumors were detected as mucoepidermoid carcinoma, and these accounted for 10.5% of all cases or 52% of the malignant tumors. We noted 9, 3, and 1 case in the parotid, minor salivary, and submandibular glands, respectively. Seven cases were histologically classified as low grade (5 cases located in the parotid gland and 2 cases in the minor salivary

gland), 2 cases as intermediate grade (2 cases located in the parotid gland), and 4 cases as high grade of malignancy (2 cases in the parotid gland and 1 case each in the submandibular and minor salivary glands). Mucoepidermoid carcinoma occurred in 8 females and 5 males, with an age range of 17-76 years. The mean age for both groups (female and male) was 37.92 years. The average size (maximum diameter) was 3.06 cm (range, 1.0-6.0 cm).

Adenoid Cystic Carcinoma

Five tumors were histopathologically diagnosed as adenoid cystic carcinoma (ACC), and these accounted for

4% of all cases or 20% of the malignant tumors. We observed 4 cases of ACC in the submandibular gland and 1 in the minor salivary gland. The predominant histological subtype of ACC was cribriform (3 cases located in the submandibular gland) followed by a solid variant (1 case located in the submandibular gland and another in the minor salivary gland). ACC affected 3 females and 2 males. The age range was 35-77 years. The mean age for both groups (female and male) was 55.2 years. The average size (maximum diameter) was 4.10 cm (range, 3.0-5.8 cm).

Carcinoma ex Pleomorphic Adenoma

Three cases were diagnosed as carcinoma ex pleomorphic adenoma (CPA) and these accounted for 2.4% of all tumors or 12% of the malignant salivary gland tumors. We detected 3 cases of CPA only in the parotid gland. The malignant component noted in all cases was adenocarcinoma. CPA affected only women in our study population. The age range was 30-73 years. The peak incidence was in the 5th decade. The average size (maximum diameter) was 3.50 cm (range, 1.5-4.5 cm).

Acinic Cell Carcinoma

One acinic cell carcinoma case was diagnosed in the parotid gland of a man of 36 years of age. This tumor had a maximum diameter of 2.00 cm.

Adenocarcinoma not otherwise specified (NOS) low grade

One adenocarcinoma NOS case was observed in the submandibular gland of a woman of 48 years of age. This tumor had a maximum diameter of 1.20 cm.

Epithelial-Myoepithelial Carcinoma

One epithelial-myoepithelial carcinoma was identified in the parotid

gland of a man of 73 years of age. This tumor had a maximum diameter of 6.00 cm.

Papillary Cystadenocarcinoma

One papillary cystadenocarcinoma was noted in the parotid gland of a man of 41 years of age. This tumor had a maximum diameter of 4.50 cm.

DISCUSSION

In this present study, we reviewed 124 major and minor salivary gland tumors, revealing a predominance of benign (80%) compared to malignant tumors (20%). The vast majority of our salivary gland tumors occurred in a major salivary gland (95%), especially in the parotid gland. We found a higher prevalence of salivary gland tumors in females (60%) than in males (40%). The peak incidence was in the 4th decade. In contrast, Frade Gonzalez et al.⁴ observed a predominance of salivary gland tumors in the male group (58.75%) and in the 7th decade of age.

We found in the English literature a predominance of benign salivary gland tumors (60% to 80%) compared with malignant tumors (20% to 40%), which is similar to our findings. Satko et al.⁶, analyzing a group of 1021 Slovakian patients with salivary gland tumors, observed that the frequency of benign tumors (74%) was higher than that of malignant tumors (26%). Ma'aita et al.⁷ analyzing 221 salivary gland tumors in a Jordanian population, found 151 benign and 70 malignant tumors. Osuch-Wojcikiewicz et al.⁸, studying 332 Polish patients with salivary gland tumors, reported 275 benign and 57 malignant tumors. In contrast, Bardwill et al.⁹ and Lopes et al.¹⁰ reported a higher prevalence of malignant tumors in minor salivary glands. However, as these data were collected from cancer centers^{9,10}, a certain degree of bias must be considered.

In our opinion, it is more appropriated to consider the prevalence of benign and malignant tumors of minor salivary glands as similar. We detected in our sample 16.9% major and 3.22% minor salivary gland tumors that were malignant; however, when we considered only tumors occurring in the minor salivary glands, malignant tumors were more prevalent, representing 4 out of 6 or 66.6% of tumors.

No case of salivary gland tumor was noted in the sublingual gland in our study. This result demonstrates the low prevalence of sublingual tumors, as has been reported by Eveson et al.¹, who observed 1 sublingual tumor to 100 parotid tumors. Similarly, Ma'aita et al.⁷ reported 1 sublingual tumor (0.4%) among 221 cases. In contrast, Satko et al.⁶ reported sublingual tumors in 33 out of 1021 salivary gland tumors, which presented a higher incidence (3.2%) than that of minor salivary gland tumors (3%).

Pleomorphic adenoma was the most common tumor (67.7%) of all salivary glands in the present study and corresponded to 84.8% of all benign tumors. Eighty-two cases occurred in major glands (58 cases in the parotid and 24 in the submandibular gland) compared with 2 cases in minor salivary glands. All epidemiological papers analyzing the prevalence of salivary gland tumors in the head and neck region showed a singular predominance of pleomorphic adenoma (50% to 80%) among benign and malignant tumors^{4,6,8}. The parotid gland is the main site affected by pleomorphic adenomas followed by the submandibular and minor salivary glands.

Warthin's tumor (WT) comprised 13% of the benign salivary gland tumors, but none were found in the submandibular, sublingual, or minor salivary glands. The frequency observed in the literature of WT ranged from 9% to 28%^{5,11-13}. Most bilateral parotid gland tumors are WT, but

bilateralism occurred in only 1 out of 13 cases in our study population.

Basal cell adenomas and myoepitheliomas occurred only in the parotid gland. Basal cell adenomas are reported as clinical cases affecting principally the parotid gland, and the peak incidence has ranged from the 4th to the 7th decade¹⁴. Myoepithelioma represents about 1% to 1.5% of all salivary gland tumors and is most frequently located in the parotid gland, as we found in our study.

Mucoepidermoid carcinomas (MEC) were more common in major salivary glands (8% of salivary gland tumors) than in minor salivary glands (2.4%). When we evaluated only malignant tumors, MEC was the most common tumor (52%). We detected 7 low-grade cases, 2 intermediate-grade cases, and 4 high-grade cases of malignancy. Of the 234 cases of MEC reported by Goode et al.¹⁵, 178 cases were low grade, 18 cases intermediate grade, and 31 cases high grade of malignancy.

Adenoid cystic carcinoma (ACC) occurred in 5 cases of the total sample, 4 cases (16% of malignant salivary gland tumors) in the submandibular gland, and 1 case in a minor salivary gland (4%). Szymeja et al.¹⁶, studying 111 cases of ACC, observed that the main site affected was the parotid gland (47 cases), and the most common location of ACC in a minor salivary gland was the palate (14 cases).

Carcinoma ex pleomorphic adenoma formed 12% of malignant salivary gland tumors and affected only the parotid gland in our study population. Olsen et al.¹⁷ reported 73 cases of carcinoma ex pleomorphic adenoma, of which 64% occurred in males and 36% in females. The mean age was 61 years. Adenocarcinoma (31 cases) and salivary duct carcinoma (24 cases) were the most common malignant subtypes. Our 3 cases affected females only, the peak incidence was the 5th

decade, and the only malignant histological subtype observed was adenocarcinoma.

Acinic cell carcinoma, adenocarcinoma NOS, epithelial-myoepithelial carcinoma, and papillary cystadenocarcinoma occurred in 1 case each and affected the major salivary glands.

CONCLUSIONS

The epidemiological analysis of 124 salivary gland tumors has permitted the following conclusions:

- 1) Patients with benign and malignant tumors presented with a mean age of 47.7 and 48.8 years, respectively.
- 2) The frequency of benign tumors was 80% (n = 99) and of malignant tumors was 20% (n = 25).
- 3) 71% (n = 88) of the tumors were localized in the parotid gland, 24% (n = 30) in the submandibular gland, and 5% (n = 6) in the minor salivary glands.
- 4) The most common benign tumors were pleomorphic adenoma (84%, n = 84) and Warthin's tumor (13%, n

= 13). Among malignant tumors, mucoepidermoid carcinoma was the most common (52%, n = 13) followed by adenoid cystic carcinoma (20%, n = 5), and carcinoma ex pleomorphic adenoma (12%, n = 3).

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RESUMO

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VARGAS PA e col. - Estudo retrospectivo de 124 casos de tumores de glândulas salivares em uma população brasileira. **Rev. Hosp. Clín. Fac. Med. S. Paulo** 57(6):271-276, 2002.

Tumores de glândulas salivares apresentam características histopatológicas altamente heterogêneas. Existem poucos estudos epidemiológicos analisando um número elevado de tumores de glândulas salivares benignos e malignos no Brasil.

MATERIAL E MÉTODOS: Revisamos os prontuários hospitalares de

124 pacientes com tumores de glândulas salivares durante o período de Janeiro de 1993 até Dezembro de 1999. Os pacientes foram analisados de acordo com o sexo, idade, tamanho do tumor, localização e tipo histopatológico.

RESULTADOS E CONCLUSÕES: Pacientes com tumores benignos e malignos apresentaram uma média de idade de 47,7 e 48,8 anos, respectivamente. A frequência de ocorrência dos tumores benignos foi de 80% (n=99) e dos tumores malignos de 20% (n=25). Tumores foram localizados na parótida em 71% (n=88) dos casos, na glândula

submandibular em 24% (n=30), e glândulas salivares menores em 5% (n=6). Os principais tumores benignos foram o Adenoma Pleomórfico que representou 84% (n=84) dos casos e o Tumor de Warthin com 13% (n=13) dos casos. Entre os tumores malignos, o Carcinoma Mucoepidermóide foi o mais comum correspondendo a 52% dos casos (n=13), seguido pelo Carcinoma Adenóide Cístico em 20% (n=5) e Carcinoma ex Adenoma Pleomórfico que foi detectado em 12% dos casos (n=3).

DESCRITORES: Tumores de glândulas salivares. Epidemiologia.

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