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Minor Salivary Gland Tumours. A Retrospective Study of 164 Cases in a Brazilian Population

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One hundred and sixty-four cases of intraoral salivary gland tumours retrieved from the files of the Surgical Oral Pathology laboratory of the University of São Paulo (Brazil), between 1970 and 1993, were studied. Of these, 164 tumours, 62% were classified as benign and 38% malignant. The palate was the main site of occurrence of the tumours followed by the buccal mucosa and upper lip. There was a slight predominance for female patients, with a female to male ratio of 1.3:1. The mean age for benign tumours was 39.9 years (40.8 for females, and 39.7 for males). For malignant tumours the mean age was 43.5 years (42.6 for females and 44.7 for males). Pleomorphic adenoma was the most common of the benign tumours, whereas mucoepidermoid carcinoma and adenoid cystic carcinoma were the most common malignant tumours. In general, benign tumours presented as an asymptomatic nodule. On the other hand, pain, ulceration and radiographic changes were more frequently associated with malignant lesions.

Keywords: minor salivary gland neoplasm, salivary gland neoplasm, epidemiology, classification

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INTRODUCTION

SALIVARY GLAND tumours comprise an important group of lesions in head and neck pathology. Regardless of variation in different series around the world, salivary gland tumours account for about 3% of all head and neck neoplasms, most of them being of epithelial origin [1]. Most of these neoplasms occur in major salivary glands. In minor salivary glands, neoplasms are still more rare, ranging from 9 to 23% of all salivary gland tumours [2–4]. Ethnicity and geographic location of a population apparently have an effect on the frequency of salivary tumours [4–6]. In South America, and especially in Brazil, few studies on the epidemiology of salivary gland neoplasms have been carried out [7] and none of them have been taken into account in the large series reviewed by Auclair *et al.* [4]. The purpose of the present study was to determine the prevalence of minor salivary epithelial neoplasms in a Brazilian sample, with respect to relative frequency and distribution of the various histologic types, as well as the clinical data, and compare the results with other epidemiological findings from different geographic locations around the world.

MATERIALS AND METHODS

One hundred and sixty-four minor salivary gland tumours histologically diagnosed in the Surgical Oral Pathology Laboratory at the University of São Paulo between 1970 and 1993 were studied. Recurrent lesions, consultation cases and those without sufficient material for reviewing the diagnoses were excluded.

The tumours included in this study occurred in the oral cavity, maxillary sinus and intra-osseous region. Representative slides stained with haematoxylin and eosin were reviewed and, when necessary, special stains such as periodic-acid–Schiff, mucicarmine and Alcian blue were also used. All doubtfull diagnoses were discussed by the authors. The tumours were classified according to the latest WHO classification [8]. Clinico-pathologic data including age, gender, site, duration, signs and symptoms, and size were recorded. A Mann–Whitney test was used to compare the mean age of female and male patients in the malignant and benign groups.

RESULTS

Of the 164 tumours studied, benign lesions accounted for 62.0% of the cases, whereas tumours classified as malignant accounted for 38.0%. From these tumours, the sex of the patient was known in 160 cases, 90 (56%) females and 70 (44%) males. The main data about mean age, sex and race of all tumours, as well as the benign and malignant tumours are expressed in Table 1.

Of the 99 cases of benign tumours in which the sex was recorded, 56 cases occurred in females (57%) and 43 cases in males (43%). For female patients, the age distribution of the tumours was bimodel, showing a first peak frequency occurring in the 3rd decade of life, and the second discreet peak in

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Table 1. Mean age, sex and racial predilection of benign and malignant minor salivary gland tumours

	F:M ratio	W:B ratio	Range of age	Mean age (±S.D.)		
				Total	Female	Male
All tumours*	1.3:1	3.7:1	8–81	41.5±17.5	41.7±17.1	42.2±17.2
Benign tumours†	1.3:1	4.4:1	8–81	39.9±18.7	40.8±18.3	39.7±19.4
Malignant tumours	1.3:1	3.1:1	17–72	43.5±15.4	42.6±15.9	44.7±14.9

*There was no statistical difference among female and male mean ages, Mann–Whitney ($z = -1.2253$, $\alpha > 0.05$).
†There was no statistical difference among female and male mean ages for benign tumours, Mann–Whitney ($z = 0.2659$, $\alpha > 0.05$) and malignant tumours, Mann–Whitney ($z = -0.5649$, $\alpha > 0.05$).

the 7th decade. For male patients the curve of age distribution was flatter, with a discreet peak frequency in the 7th decade (Fig. 1). Seventy-seven percent of all benign tumours occurred in the palate. The other most common sites of involvement were the buccal mucosa (17%) and lip (10%). These locations represented the preferential locations for 95% of the all benign tumours. All the benign tumours presented as a nodule. Of these, 82% were asymptomatic and 18% presented some type of symptom such as pain, paresthesia or pain to palpation; only 9% showed ulceration. The mean duration was 91.7 months and the mean size (mean diameter) was 2.4 cm.

In the malignant group of neoplasms, there were 34 female (56%) and 27 male patients (44%). A distinct prevalence for the 5th decade was observed in male patients, whereas the peak frequency for females was bimodal: 3rd and 5th decade of life. More than 60% of the patients in both gender groups were below the 5th decade (Fig. 2). The palate was by far the most common site of origin of the malignant group (73%), followed by retromolar area (13%) and buccal mucosa (8%). No malignant tumours occurred in the tongue and maxillary sinus in this series. The mean duration of symptoms prior to examination was 28.6 months and the tumour means size was 4.2 cm. Of the 54 cases (86%) in which symptomatology was recorded, 52% were symptomatic. The main complaints were pain and paresthesia. Ulceration, osseous resorption and lymphadenopathy, corresponded to 20, 14 and 8% of clinical signs, respectively.

The distribution of the 164 tumours, according to the histologic type, is shown in Table 2. Table 3 shows the principal aspects related to the individual histologic types of minor salivary gland tumours. Relative to clinical aspects, the benign group reflects the picture of the pleomorphic adenoma, since it represents the bulk of the group. The most common lesions of the malignant group were mucoepidermoid carcinoma, adenoid cystic carcinoma and acinic cell carcinoma. The major signs and symptoms related to the individual histologic types of malignant minor salivary gland tumours are expressed in Table 4.

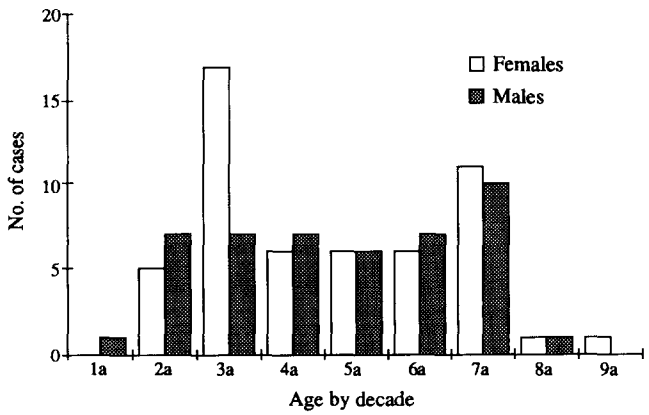

Fig. 1. Age distribution by sex of total benign minor salivary gland tumours.

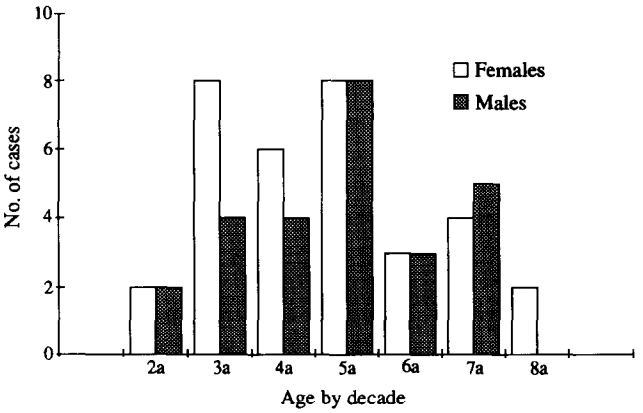

Fig. 2. Age distribution by sex of total malignant salivary gland tumours.

DISCUSSION

In our material, 62% of the lesions were benign, and 38% were malignant tumours [5, 9]. In the literature, the proportion of benign lesions has varied between 48 and 72% [6, 10]. Isacsson and Shear [6] postulated that the high frequency of benign tumours in their series was related to the higher prevalence of black patients over white ones. However, analysing a similar sample constituted of black patients, van Heerden and Raubenheimer [10] observed a frequency of benign tumours comparable to that which predominated in Caucasian or Asian individuals [1–3, 11–13]. In Brazil, the expressive miscigenation of the population brings some difficulties in analysing this subject.

Other studies have shown a smaller difference in the relative frequency of benign and malignant tumours, sometimes with malignant tumours being more common than the benign [1, 13–15]. Spiro *et al.* [14, 15] found about 80% of malignant tumours in their series. However, this high percentage of malignant tumours has been associated with the fact that their institution is a major cancer referring centre [10].

In our series, the female to male ratio was 1.3:1 for both the benign and malignant groups. Sex predilection for salivary

Table 2. Classification and frequency of 164 minor salivary gland tumours

Histologic type	No. of cases	% for group	% of all tumours
Benign			
Pleomorphic adenoma	87	86.0	53.0
Cystadenoma	6	6.0	4.0
Myoepithelioma	3	3.0	2.0
Inverted ductal papilloma	2	2.0	1.0
Basal cell adenoma	2	2.0	1.0
Intraductal papilloma	1	1.0	1.0
Malignant			
Mucoepidermoid carcinoma	28	44.0	17.0
Adenoid cystic carcinoma	22	35.0	13.0
Acinic cell carcinoma	6	10.0	4.0
Polymorphous low grade ac.	4	6.0	2.0
Epithelial–myoepithelial ca.	2	3.0	1.0
Adenocarcinoma	1	2.0	1.0

Table 3. Main clinical data of the individual histologic types of benign and malignant minor salivary gland tumours

	Clinical data			
Histologic type	Major location	Peak of decade	Race No. of cases (W/B)	Sex No. of cases (F/M)
Pleomorphic adenoma	Palate	3rd	61/17	48/38
Cystadenoma	Palate/lip	7th	3/2	4/1
Myoepithelioma	Palate	3rd	3/0	3/0
Inverted ductal papilloma	Palate/ B. mucosa	3rd	2/0	1/1
Intraductal papilloma	Palate	7th	1/0	0/1
Basal cell adenoma	B. mucosa	7th	1/0	1/0
Mucoepidermoid carcinoma	Palate	4th	21/5	14/14
Adenoid cystic carcinoma	Palate	5th	13/6	11/10
Acinic cell carcinoma	Palate	3rd	3/2	4/1
Polymorphous low grade ac.	Palate	6th	3/1	2/2
Epithelial–myoepithelial ca.	Palate	7th	2/0	2/0
Adenocarcinoma	Palate	5th	1/0	1/0

Table 4. Major signs and symptoms related to individual histologic malignant minor salivary gland tumours

	Signs and symptoms			
Histologic types	Pain	Ulceration	Bone resorption	Lymph nodes
Mucoepidermoid carcinoma	10/25	5/26	5/26	3/26
Adenoid cystic carcinoma	13/18	2/13	—	—
Acinic cell carcinoma	2/5	1/5	—	—
Polymorphous low grade ac.	—	—	1/2	1/2
Epithelial–myoepithelial ca.	2/2	1/2	—	—
Adenocarcinoma	1/1	—	1/1	1/1

gland neoplasm has been related to ethnic variations. In this way, a major prevalence of salivary gland tumours in female over male black patients has been reported by several authors [6, 10, 16]. In contrast, in non-black populations, no significant sex predilection was mostly found [4, 5, 13, 17, 18]. Only Waldron *et al.* [3], reviewing 426 cases, indicated a clear tendency for female predominance. As we can see, data are still controversial and larger series must be analysed, in order to define an ethnic influence on salivary gland tumour prevalence.

The mean age of Brazilian patients was 39.9 years for benign tumours, and 43.5 years for malignant tumours, which were lower than the mean age of patients from some other series studied [2–4, 14, 17], but similar to others described [5, 6, 10].

The literature shows some variation concerning the mean age for individual histologic types of salivary gland tumours. In our series, pleomorphic adenoma showed a peak frequency in the 3rd decade of life, which in general, is below that of benign non-pleomorphic [2, 5, 6, 12] and malignant tumours [3]. We also observed that mucoepidermoid carcinoma presented a lower peak frequency than other malignant lesions [2, 5, 6, 10] as indicated by Fonseca *et al.* [19]. This fact is probably related to major prevalence of mucoepidermoid carcinoma in young patients [19].

Our results, as well as the ones in the literature, showed that the palate is the most common site of involvement for minor benign and malignant tumours, followed by the buccal mucosa, lip and retromolar region [1–5]. In our study, besides the palate, benign tumours were also found in the buccal mucosa and lip. This finding, with a few variations, is shared with other studies [1, 5, 6, 10, 13]. For the malignant lesions, we found the retromolar area as the most common affected region after the palate, especially for mucoepidermoid carcinoma. A significant number of malignant lesions in the retromolar area has been observed in the literature [20]. We did not find tumours located in the tongue and floor of the mouth as described by Chaudhry *et al.* [11, 12] and Auclair *et al.* [4].

It has been reported that malignant and benign neoplasms of salivary glands do not differ significantly in clinical aspects. In general, they appear as a slow growing, asymptomatic swelling. In this study, most of the tumours presented as an asymptomatic swelling. The number of symptomatic and ulcerated lesions was higher in the malignant tumours. Bone resorption and lymphadenopathy were only found in malignant lesions as described by Chau and Radden [5]. We think that recent increase in size, ulceration, pain and radiographic changes are indicative of malignancy; particularly pain is a significant clinical finding related to the adenoid cystic carcinoma.

Our results also showed that mean time of duration of symptoms of benign tumours was higher than that of the malignant group. On the other hand, the mean size of malignant lesions was higher than that of the benign tumours. These differences seem to correlate with the growth potential of neoplasms.

In general, the distribution and relative frequency of the most common tumours of the salivary glands found in our study are similar to those reported in the literature [3, 5, 9, 10]. Pleomorphic adenoma was the most common histological type among the benign group and the entire group of salivary gland tumours [1–13, 16–19, 21]. For the malignant group, mucoepidermoid carcinoma and adenoid cystic carcinoma were the most prevalent [3, 5, 7, 9, 12, 13]. Variations in these findings have been observed in the literature. Some studies have pointed out adenoid cystic carcinoma, polymorphous low grade adenocarcinoma and adenocarcinomas as the most frequent tumours in the malignant group [1, 2, 6, 10, 17, 21]. However, it must be regarded that some of these papers were published at a time when different classifications were used, and many lesions had not yet been described [3]. For example, many of the polymorphous low grade adenocarcinomas and epithelial–myoepithelial carcinomas were included among the adenoid cystic carcinomas and adenocarcinomas [22, 23]. Moreover, the overlapping of histologic features in some malignant tumours may lead to a misdiagnosis.

Our results showed that the non-pleomorphic epithelial benign tumours were rare, being 14% of all benign lesions. In the series of van der Wal [1] myoepithelioma, canalicular adenoma, basal cell adenoma and intraductal papilloma followed the pleomorphic adenoma in the benign group. In the study of Waldron *et al.* [3], monomorphic adenomas constituted approximately 19% of the benign lesions followed by cystadenoma (9%) and sialoadenoma papilliferum (2%). These authors include among the monomorphic adenomas, benign glandular tumours commonly designated as basal cell adenoma, trabecular adenoma, canalicular adenoma or tubular adenoma. Rippin and Potts [17] found monomorphic adenomas to be the second most common benign neoplasms, followed by oncocytoma and papillary cystadenoma. They classified the benign epithelial tumours as pleomorphic, monomorphic adenomas, oncocytoma and papillary cystadenoma. Prior to the WHO's 1990 classification, the basal cell adenoma and the canalicular adenoma were designated as monomorphic adenomas [24]. This fact has to be kept in mind when different studies are analysed.

Concerning the aetiology of salivary gland tumours, the prevalence of pleomorphic adenoma and acinic cell carcinoma in women with a distinct peak in the 3rd decade of life, signalises a hormone influence. Some studies have been performed in this subject [25, 26], but without conclusive results. Among others, ethnicity and geographic locations have been proposed as having an effect on the frequency of occurrence of salivary gland tumours [4, 27, 28]. However, the data presently expressed, except for discreet differences, show similarities among those encountered all over the world [1–6, 10, 13], especially in relation to the sex, mean age, and location. These findings may imply that common aetiologic agents might be acting regardless of ethnical and geographic location.

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