



Clinicopathologic evaluation of salivary gland neoplasms: a 38-year retrospective study in Iran

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ABSTRACT

We present a 38-year retrospective study of 165 patients with salivary gland tumors that were diagnosed from 1971 to 2009 in the Department of Oral and Maxillofacial Pathology, Faculty of Dentistry, Mashhad, Iran. The histologic diagnoses were reevaluated according to the 2005 World Health Organization classification. A total of 165 tumors were identified in 79 male and 86 female patients. The mean age was 43.41 ± 18.59 for male patients and 40.06 ± 15.91 for female patients. Although benign salivary gland tumors are usually more common than the malignant counterpart in previous studies, neoplasms showed an almost equal frequency of benign and malignant tumors in the present study. The frequency of major salivary gland tumors was 15.8%, and that of minor salivary gland tumors was 83%. The mean age of patients with major salivary gland tumors (44.30 years) was slightly higher than patients with minor ones (41.15 years). Pleomorphic adenoma was the most common histologic type of benign tumor identified, whereas mucoepidermoid was the most common malignant tumor. In contrast to some previous studies that have been reported parotid gland as the most common site for salivary tumors, in the current study, the palate was the most frequent location for salivary gland tumors and tumors have a propensity to occur at the palate than any other sites. Therefore, any lesion arising from the palate should be considered as a possible salivary gland tumor.

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1. Introduction

Neoplasms of salivary gland origin are very rare, accounting for less than 1% of all tumors and 3% to 5% of head and neck neoplasms. Salivary gland tumors represent a heterogeneous group of neoplasms with variable histologic features. In limited biopsies, the evaluation can be quite challenging. Hence, they are remarkable for their histologic diversity [1,2].

Moreover, their varied occurrences in the population have been the focus of several studies. The distribution pattern of salivary tumors observed in one country may not be evident in other countries [1,3]. The clinicopathologic features of these tumors including patient age and sex, tumor location, and distribution vary with race and geographic location. A study of different ethnic groups in Malaysia showed a higher frequency of salivary gland tumors in Malays than in Chinese and Indians [4].

There is little information in the English-language literature about the clinicopathologic features of salivary gland neoplasms in Iranian population.

In the present study, we reviewed 165 tumors of the major and minor salivary glands over a 38-year period. The purposes of this study were to evaluate the clinicopathologic features of salivary gland neoplasms in Iranian population and to provide data for comparison with other studies in different geographic locations and/or racial populations.

2. Materials and methods

The files of the department of Oral and Maxillofacial Pathology, Faculty of Dentistry, Mashhad, Iran, from 1971 to 2009 were searched for salivary gland neoplasms. The histologic diagnosis records were reevaluated for 165 patients who were treated for salivary gland tumors.

Information gathered about each patient included age, sex, tumor location, histologic type based on the 2005 World Health Organization classification, type of salivary gland (minor/major), and pattern of growth (benign/malignant).

The Student *t* test was applied to compare average ages between malignant and benign tumors as well as between sexes separately. χ^2 Test was used to compare distribution of malignant and benign tumors in male and female patients. Data were considered significant at $P < .05$.

3. Results

In the present study, we reviewed the files of all patients referred to our department, between 1971 and 2009. Of the 9807

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Table 1
Mean age and sex predilection of benign and malignant salivary gland tumors

Salivary gland tumor	Mean age \pm SD (y)		P
	Male (n = 75)	Female (n = 86)	
Benign tumors	39.94 \pm 16.46	36.27 \pm 15.30	.12
Malignant tumors	46.62 \pm 20.05	45.08 \pm 15.40	.01

patients, 165 (1.7%) cases were benign and malignant salivary gland neoplasms.

3.1. Age

Tumors were in the age range of 8 to 80 years. Average age was 44 and 41 years in patients with major and minor salivary gland tumors, respectively. The peak decade of incidence for these patients was the third decade of life.

A total of 165 salivary gland tumors were identified in 79 male patients and 86 female patients. The mean was 43.41 \pm 18.59 years age for men and 40.06 \pm 15.91 years for women, with statistically no significant difference ($P = .22$).

The mean ages of patients with benign and malignant salivary gland tumors were 37.85 \pm 15.81 and 45.87 \pm 17.88 years, respectively. The malignant tumors showed a predilection for older patients, and there were no statistically significant differences ($P = .003$).

The mean ages of the patients for benign and malignant tumors by sex are demonstrated in Table 1. According to the Student *t* test, there were no statistically significant differences in age of male patients between benign and malignant tumors ($P = .12$), whereas in female patients, a significant difference was observed ($P = .01$) with predilection for malignant tumors.

3.2. Sex

Of all cases of salivary gland tumor studied, 86 (52.1%) were recorded in women and 79 (47.9%) in men. Most neoplasms in both women (83.3%) and men (84.8%) were identified in minor salivary glands.

Statistically, a significant difference between type of salivary gland (major/minor) and patient sex was not observed ($P = .797$).

3.3. Location

Of 165 tumors, 27 (15.8%) were in major salivary glands, whereas 138 (83%) were found in minor salivary glands.

The palate (55.2%) was the most common site for tumors, followed by lip mucosa (9.7%), submandibular gland (9.1%), cheek mucosa (7.9%), and parotid gland (6.1%) (Table 2). The palate was the most frequent location for minor salivary gland tumors, and most major salivary gland cases were diagnosed in submandibular gland.

Table 2
Site distribution of salivary gland tumors

Tumor location	n (%)	Mean age (y)	SD
Palate	91 (55.2%)	38.75	16.27
Lips	16 (9.7)	37.56	16.89
Submandibular gland	15 (9.1)	41.33	20.81
Cheek mucosa	13 (7.9)	45.23	16.70
Parotid gland	10 (6.1)	46.20	13.34
Retromolar area	6 (3.6)	46.66	13.35
Maxillary sinus	5 (3.0)	54.75	11.26
Floor of the mouth	3 (1.8)	73.33	11.54
Lingual	3 (1.8)	52.00	21.65
Sublingual gland	1 (0.6)	70.00	0
Mandible (central type)	2 (1.1)	37.50	19.09

Table 3
Distribution of histologic type of 165 salivary gland tumors

Histologic type	n	%
Pleomorphic adenoma (mixed tumor)	77	46.7
Myoepithelioma	4	2.4
Warthin tumor	1	0.6
Basal cell adenoma	1	0.6
Monomorphic adenoma	1	0.6
Sebaceous adenoma	1	0.6
MEC	33	20
ADCC	23	13.9
Adenocarcinoma NOS	12	7.3
Malignant pleomorphic adenoma	2	1.2
Intraductal papilloma	1	0.6
Salivary duct papilloma	1	0.6
Malignant papilliferous sialadenoma	1	0.6
Basal cell adenocarcinoma	1	0.6
Polymorphous low-grade adenocarcinoma	6	3.6
Total	77	100

NOS; not otherwise specified.

Sites such as sublingual gland and floor of the mouth showed a predilection for older patients, whereas tumors of the lips, palate, and mandible occurred in younger patients (Table 2).

The mean age of patients with major salivary gland tumors (44.30 years) was slightly higher than patients with minor ones (41.15 years), without any significant difference ($P = .397$).

3.4. Histologic type

Eighty-five (51.5%) tumors were recorded as benign and 80 (48.5%) as malignant. Of the 80 cases of malignant tumors, 67 corresponded to major and 13 to minor salivary glands. The number of benign tumors in major and minor salivary glands was 15 and 70, respectively.

Statistically, a significant difference was not detected between histologic type of tumor (malignant/benign) and type of salivary gland ($P = .537$).

Pleomorphic adenoma was the most common tumor (46.7%) of all salivary tumors and also accounted for 89.4% of all benign tumors. Of the 80 malignancies, mucoepidermoid carcinoma (MEC; 41.25%) was the most common histologic type, followed by adenoid cystic carcinoma (ADCC; 13.9%).

The histopathologic diagnoses of all our salivary gland including benign and malignant tumors are summarized in Table 3.

4. Discussion

The present study details the profile of patients diagnosed as having minor and major salivary gland tumors between 1971 and 2009. A total of 165 salivary gland tumors were evaluated, and epidemiologic findings were compared with previous studies.

In our study, salivary gland neoplasms showed an almost equal frequency of benign and malignant tumors. In contrast, previously studies on salivary tumors demonstrated in Table 4 revealed a predominance of benign over malignant tumors, except when only minor salivary tumors are considered, which show that malignant tumors are more common [5–17].

Although benign salivary gland tumors are usually more common than the malignant counterpart in most oral pathology laboratories, in studies of Dhanuthai et al [16], Wang et al [18], and van Heerden and Raubenheimer [19], malignant salivary gland tumors accounted for 52.73%, 53.9%, and 51.40%, respectively.

In the present study, women were more often affected than men, which is consistent with the studies of Ansari [20], Vuhahula [21], and Pires et al [22]. However, malignant tumors were more common in men in the study of Wang et al [18].

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