



# Salivary Gland Tumors: A 15- year Report from Iran

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## ABSTRACT

**Objective:** The aim of this study was to document the clinicopathologic characteristic of salivary gland tumors in Tehran, Iran, over a 15-year period.

**Material and Method:** A retrospective study was conducted on salivary gland tumors diagnosed at two pathology centers of Shahid Beheshti University of Medical Sciences from March 2000 to March 2015. Patient age, sex, tumor site and frequency, as well as clinical and radiographic features and histopathologic diagnosis constituted the main analysis outcome measures.

**Results:** Of the 45429 biopsies conducted over 15 years, 6065 (13.3%) cases were oral and maxillofacial lesions and 937 (15.4%) of these had tumoral diagnoses. Of the 937 tumoral cases, 184 (19.6%) were salivary gland tumors and among 184 cases, 65 (35.3%) were benign and 119 (64.7%) were malignant. Pleomorphic adenoma was the most frequently occurring tumor, comprising 32.6% of all tumors, followed by mucoepidermoid carcinoma (27.1%) and adenoid cystic carcinoma (22.2%). Tumors were frequently reported in minor salivary glands (75%), particularly in the palate with 89 (48.4%) cases. The peak ages of incidence were the fourth and sixth decades of life. Malignant salivary gland tumors showed a predilection for females (72.9%), which was statistically significant ( $P < 0.01$ ).

**Conclusion:** The data presented herein are similar to previously published reports in other countries and other areas of Iran. However, some differences were observed in our study, such as higher overall frequency, a lower mean age of patients with malignant tumors, and the particular sites of involvement. These differences can be attributed to racial factors, the pathology centers of sample collection, and the duration of the studies.

**Key Words:** Salivary gland, Tumor, Iran

## INTRODUCTION

The salivary gland system is composed of three pairs of major glands and many lobules of minor salivary glands that are scattered in the upper aero digestive tract, especially in the oral cavity (1). Salivary gland neoplasms, though uncommon, are remarkable for their diverse and complex histologic features and various behaviors and prognoses. These tumors account for 3-6% of all head and neck tumors (2). Less than 5% of salivary gland neoplasms occur in patients under 16 years of age (3).

Epidemiologic studies have shown that the incidence and subgroup distributions of salivary gland neoplasms vary across the world, with diverse demographic results in different regions.

The aim of the present study was to evaluate the epidemiologic characteristics of salivary gland tumors (SGTs) during a 15-year period in Tehran, Iran based on the 2005 WHO classification. Select data that are available

from other provinces in Iran and other countries are also compared and discussed.

## MATERIAL and METHODS

The data in this retrospective and descriptive study included records of the following 2 referral pathology centers of Shahid Beheshti University of Medical Sciences in Tehran, Iran: (a) the Oral and Maxillofacial Pathology Department and (b) the Taleghani hospital. Patient records from March 2000 to March 2015, in which SGTs were diagnosed, were reviewed.

Patient age, sex, tumor site and frequency, as well as clinical, radiographic feature and histopathologic diagnosis constituted the main analysis outcome measures. All data was anonymous prior to analysis. This research was approved by the ethics committee of Shahid Beheshti University of Medical Sciences. Data were analyzed using SPSS software (version 11.5).

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**RESULTS**

Of the 45429 biopsies conducted over 15 years, 6065 (13.3%) cases were oral and maxillofacial lesions, and 937 (15.4%) of these had tumoral diagnoses. Of the 937 tumoral cases, 184 (19.6%) cases were SGTs. The overall frequencies of benign and malignant tumors were 35.3% and 64.7%, respectively. Pleomorphic adenoma (PA) was the most frequently occurring tumor, comprising 60 cases, 32.6% of all tumors and 92.3% of benign neoplasms. Mucoepidermoid carcinoma (MEC) was the most frequently occurring malignancy and the second most common tumor, representing 27.1% of all tumors and 42.01% of malignant tumors. There were 41 cases of adenoid cystic carcinoma (ADCC) (22.2% of all tumors), which made it the third most frequent tumor and the second most common malignant tumor (34.4% of malignant tumors). Tumors were more frequently reported in minor salivary glands (73.9%), particularly the palate with 89 (48.4 %) cases, followed by the parotid (14.6%).

Table I shows the distribution and location of the individual neoplasms. Eight cases of intraosseous MEC (16% of all MECs and 4.3% of all cases considered) were identified in our series, and these cases mainly affected women (62.5%) and particularly the posterior of the mandible (5 cases) for patients with a mean age of 40.5 years. Interestingly, all

cases of acinic cell carcinoma were diagnosed during the second decade of life.

Regarding location, Fischer’s exact test showed no significant difference between benign and malignant tumors ( $p = 0.301$ ).

In terms of gender, 111 (60.4%) cases were female and 73 (39.6%) cases were male. Benign tumors showed a slight predilection for males (53.8%), whereas malignant tumors showed a predilection for females (72.9%). This difference was statistically significant ( $p < 0.01$ ) and represented the higher malignancy predilection in females.

The peak ages of incidence were the fourth and sixth decades of life with mean ages of 41.2 and 45.5 years for benign and malignant tumors, respectively (Table II). T-test on individual samples revealed no significant difference between the mean ages of benign and malignant tumors ( $p = 0.148$ ).

The most significant sign of benign tumors was a painless swelling, while rapid growth and ulcerative surface were noted in malignant cases and especially high-grade tumors. In 24 ADCC cases, the first significant sign was pain, which has been associated with perineural invasion on pathological evaluation.

**Table I:** Distribution and locations of benign and malignant salivary gland tumors

Tumors	PG n (%)	SMG n (%)	SLG n (%)	MSG n (%)	Intraosseous n (%)	Total n
<b>Benign (n=65)</b>						
Pleomorphic adenoma	10 (5.4%)	3 (1.63%)	-	47 (25.5%)	-	60 (32.6%)
Basal cell adenoma	1 (0.54%)	-	-	-	-	1 (0.54%)
Warthin’s tumor	1 (0.54%)	-	-	-	-	1 (0.54%)
Myoepithelioma	1 (0.54%)	-	-	2 (1.08%)	-	3 (1.63%)
<b>Malignant (n=119)</b>						
Mucoepidermoid carcinoma	5 (2.7%)	3 (1.63%)	1 (0.54%)	33 (17.9%)	8 (4.3%)	50 (27.1%)
Adenoid cystic carcinoma	2 (1.08%)	0 (0%)	1 (0.54%)	38 (20.6%)	0 (0%)	41 (22.2%)
Adenocarcinoma not otherwise specified	4 (2.1%)	1 (0.54%)	1 (0.54%)	5 (2.7%)	0 (0%)	11 (5.9%)
Carcinoma ex- pleomorphic adenoma	1 (0.54%)	1 (0.54%)	0 (0%)	3 (1.63%)	0 (0%)	5 (2.7%)
Hyalinizing clear cell carcinoma	0 (0%)	0 (0%)	0 (0%)	1 (0.54%)	0 (0%)	1 (0.54%)
Polymorphous low-grade adenocarcinoma	0 (0%)	0 (0%)	0 (0%)	3 (1.63%)	0 (0%)	3 (1.63%)
Acinic cell carcinoma	1 (0.54%)	0 (0%)	0 (0%)	2 (1.08%)	0 (0%)	3 (1.63%)
Undifferentiated carcinoma	0 (0%)	0 (0%)	0 (0%)	1 (0.54%)	0 (0%)	1 (0.54%)
Salivary duct carcinoma	1 (0.54%)	0 (0%)	0 (0%)	3 (1.63%)	0 (0%)	4 (2.1%)
<b>Total</b>	<b>27 (14.7%)</b>	<b>8 (4.3%)</b>	<b>3 (1.7%)</b>	<b>138 (75%)</b>	<b>8 (4.3%)</b>	<b>184 (100%)</b>

PG: Parotid gland, SMG: Submandibular gland, SLG: Sublingual gland, MSG: Minor salivary gland.

**Table II:** Age and sex distributions of salivary gland tumors

Tumor	Age (y) and sex (M/F)							
	0-9 0 (0%)	10-19 10 (5.4%)	20-29 12 (6.5%)	30-39 46 (25%)	40-49 25 (13.6%)	50-59 60 (32.6%)	60-69 20 (10.9%)	70-79 11 (6%)
Pleomorphic adenoma	-	1/2	3/2	13/4	7/1	5/11	2/4	2/3
Mucoepidermoid carcinoma	-	1/3	3/1	4/10	4/5	1/7	1/5	1/4
Adenoid cystic carcinoma	-	-	1/1	6/2	1/5	4/18	0/2	0/1
Adenocarcinoma	-	-	-	1/2	-	1/2	1/4	-
Salivary duct carcinoma	-	-	-	-	2/0	2/0	-	-
Carcinoma ex-pleomorphic adenoma	-	-	-	0/1	-	2/2	-	-
Acinic cell carcinoma	-	1/2	-	-	-	-	-	-
Hyalinizing clear cell carcinoma	-	-	-	-	-	0/1	-	-
Polymorphous low- grade adenocarcinoma	-	-	-	-	-	1/1	0/1	-
Basal cell adenoma	-	-	-	-	0/1	-	-	-
Myoepithelioma	-	-	0/1	1/1	-	-	-	-
Undifferentiated carcinoma	-	-	-	-	-	0/1	-	-
Warthin's tumor	-	-	-	-	-	1/0	-	-
<b>Total</b>	-	<b>3/7</b>	<b>7/5</b>	<b>25/21</b>	<b>14/11</b>	<b>17/43</b>	<b>4/16</b>	<b>3/8</b>

The predominant radiographic feature of intraosseous MECs was ill-defined multilocular radiolucency.

### DISCUSSION

The present study profiles SGTs in Tehran, Iran, according to the 2005 WHO classification using cases taken from two large university pathology centers over a 15-year period. Of the 45429 biopsies reported, 184 cases (0.4%) were SGTs. In previous reports from other Iranian, Nigerian and Mexican groups, the percentages of SGT cases were 2.7%, 0.4% and 0.2%, respectively. (4-6).

Moreover, the cases of SGTs evaluated in this study constituted 19.6% of the oral and maxillofacial tumors encountered, in contrast to the much lower ratios (4.5%,2%) reported by other researchers (2,7,8). However, it is noteworthy that Pour et al. (9) reported a ratio of 26.1% for malignant SGTs in head and neck tumors.

The present study's evaluation of 184S GT cases indicates that the majority of tumors were malignant, in contrast to the results of most studies in west and south Iran and other countries (1, 4, 6, 10-13) and in agreement with a few studies (14,15).

In agreement with the results of Masanja et al. (11), Ansari et al. (16) and Laishram et al. (2), we found an overall higher frequency in females versus males which was statistically significant. It should be considered that the male-to-female ratio of benign tumors was 1.06: 1, whereas malignant tumors had a male-to-female ratio of 0.45: 1, indicating that benign tumors were slightly more common in males and malignancies were more common in females. These results are in agreement with previous studies of Tunisian and Nigerian populations (5,17), but are in contrast to previously reported results in Brazilian, Turkish, Mexican and Chinese populations (6, 10,18,19).

The patients' ages in current study varied from 11 to 79 years old, with a mean age of 41.2 years, in agreement with other studies (1, 6, 10, 16,19). The mean age of patients with malignant tumors did not differ significantly from the mean age of patients with benign tumors, indicating that the mean age of patients with malignant tumors had been lowered in our series and the tumors can be seen in younger patients, as found by Jansisyanont et al. (20).

Most SGT cases (73.9%) originated in the minor salivary glands, demonstrating a high frequency in the palate (48.4%). The parotid (14.6%) was the second most common SGT site, which is consistent with some previous

reports (8,14,15) but not with others (1,4,5,13,19,21-23). In addition, 8 cases (4.3%) of central MEC were observed in the present study and these mainly affected women (62.5%) having a mean age of 40.5 years, similar to the Li et al. report (24). Moreover, the present study confirmed previous reports that PA (32.6%) was the most frequently occurring type of SGT (1,2,4-6,10-13,16,19,21,25). The next most frequently occurring tumor types were MEC (27.1%) and ADCC (22.2%) (13,14,16,19,26). In contrast, in the Velazquez et al. and Wang et al. studies, Warthin's tumor was the second most common tumor, followed by malignant tumors (6,21). In studies of populations in the Congo, Jordan and Croatia, ADCC and MEC comprised the second and third most common tumors, respectively (22,27,28). However, Kamulegeya et al. studied an Ugandan population and found that adenocarcinoma was the most common malignant tumor (29). In the present series, adenocarcinoma constituted 5.9% of the SGTs encountered.

The most predominant clinical sign of benign tumors in the present study was painless expansion, while pain, rapid growth and ulcerative surface were observed in malignant tumors, in accordance with previous studies (2,3,9,30).

In conclusion, the data and results presented herein were similar to previously published reports in other countries and other areas of Iran. However, some differences were observed, such a higher overall frequency, a lower mean age of patients with malignant tumors and the particular sites of involvement in our study. These differences can be attributed to racial factors, the pathology centers of sample collection and the duration of the studies.

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