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SALIVARY GLANDS TUMORS: DEMOGRAPHICS AND OCCURRENCE ACCORDING TO AGE AND GENDER

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ABSTRACT
Objective: This research aimed to study the salivary gland tumors' prevalence and correlation of benign and malignant tumors with demographic variables. **Materials and Methods:** This study was a retrospective study of the files of the patients who reviewed AlMouwasat University Hospital and were diagnosed with salivary gland tumors. The study included all cases from January 2015 to November 2019. Statistical analysis was done using SPSS 25.0. **Results:** The most common age group was 41-50 years old, while 81-90 years old was the least common age group. Most of the cases were benign tumors (89.6%). Parotid gland was the most affected. Pleomorphic adenoma (37.5%) and squamous cell carcinoma metastasis (8.3%) were the most common benign and malignant tumors, respectively. **Conclusion:** Salivary gland neoplasms were not common. Most common gland in which tumors rise was the parotid gland. Pleomorphic adenoma and squamous cell carcinoma metastasis were the most common benign and malignant tumors, respectively.

KEYWORDS: Salivary Gland Tumors, AlMouwasat University Hospital, Benign Tumors, Malignant Tumors.

INTRODUCTION
Salivary gland neoplasms (SGNs) or tumors are rare and most cases are referred to the head and neck clinic. The majority of these neoplasms are benign and only 20% are malignant. The annual incidence of salivary gland cancers ranges from 0.5 to 2 per 100,000 in different parts of the world, with the highest incidence occurring in Croatia.[1] In the United states, there is a rise in the incidence of salivary gland cancers; this group accounted for 6.3% of all head and neck cancers in 1974–1976, as compared to 8.1% in 1998-1999.[2] The sex distribution for salivary gland cancers is equal, and the majority of the cases arise in the sixth decade.[3] Tumors can occur in both the major and minor salivary glands. 80% of major salivary gland tumors occur in the parotid glands, while most minor salivary tumors are located in the palate.[4] As a general rule in clinical practice, the smaller the salivary gland is, the more likely the tumor is malignant. In the parotid glands, 20–25% of the tumors are malignant. This rises to 40% for the submandibular glands, and more than 90% of sublingual gland tumors are malignant.[5, 6]

The etiological agents of salivary gland cancers remain unclear. Whilst most other head and neck cancers are strongly related to smoking and drinking, these do not play a role in the salivary glands. Some studies have found that a diet rich in vitamin C and low in cholesterol may be effective in preventing salivary gland cancer.[7] On the other hand, possible risk factors include therapeutic radiation for other head and neck cancers, occupational exposures in rubber manufacturing and woodworking, and also employment at hairdressers or beauty shops.[8, 9] History of previous cancers, related to Epstein-Barr virus, immunosuppression, and radiation were also associated with an increased risk of salivary gland cancer. In a Swedish study, the risk of salivary gland cancer was increased 4 fold in Hodgkin's lymphoma patients.[10] HIV infection was also found to increase the risk of salivary gland cancers.[11]

Salivary gland tumors in the parotid or submandibular glands usually present as an enlarging mass. This may be associated with neurological symptoms such as facial nerve paralysis or pain if the tumor is malignant. Minor salivary gland tumors present as a submucosal intraoral mass which subsequently ulcerates. Clinical features suspicious for malignancy include ipsilateral facial nerve palsy, sudden tumor growth, pain, tumor fixation to the overlying skin or underlying muscle, and cervical lymphadenopathy.

MATERIALS AND METHODS
This study was a retrospective study of the records of the patients who reviewed AlMouwasat University Hospital and were diagnosed with salivary gland tumors. We

studied the demographic variables of these tumors, such as age and gender. We also studied the prevalence of different types of tumors and their correlation with age and gender. This study included all cases from January 2015 to November 2019. To ensure the privacy, only the authors collected all the data and all the names and personal information were blinded. Statistical analysis was done using SPSS 25.0.

RESULTS

The most common age group was 41-50 years old, while 81-90 years old was the least common. Regarding gender, 56 females (58.3%) were diagnosed with SGNs, while males were least common in 40 cases (41.7%). (Figure 1, Figure 2).

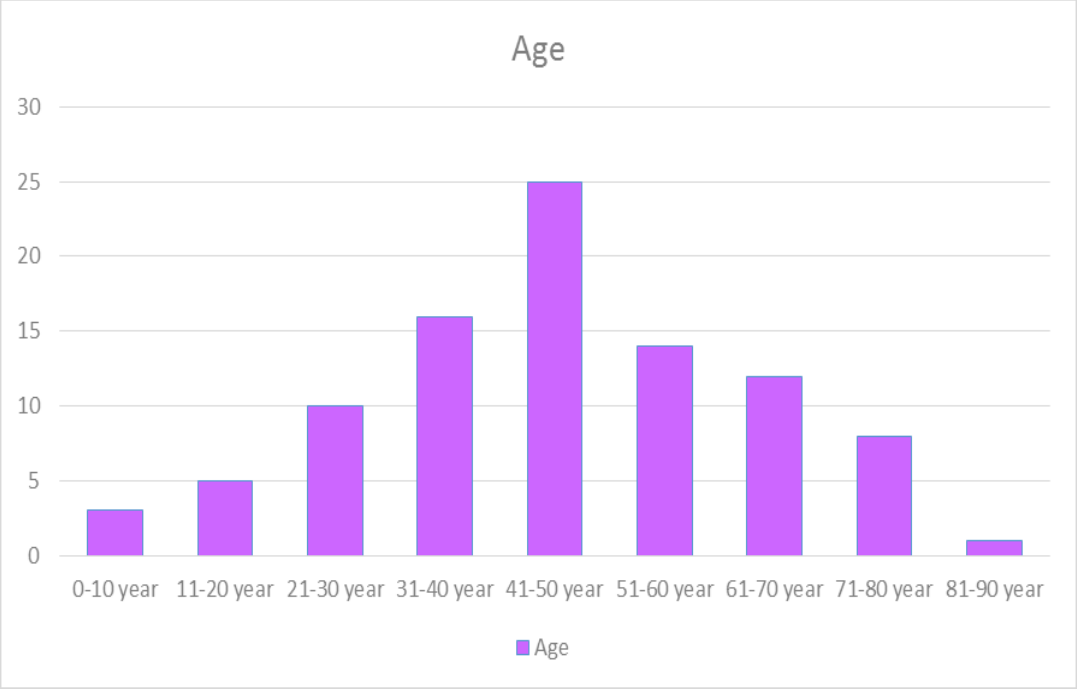

Figure 1: Age of participants in our study.

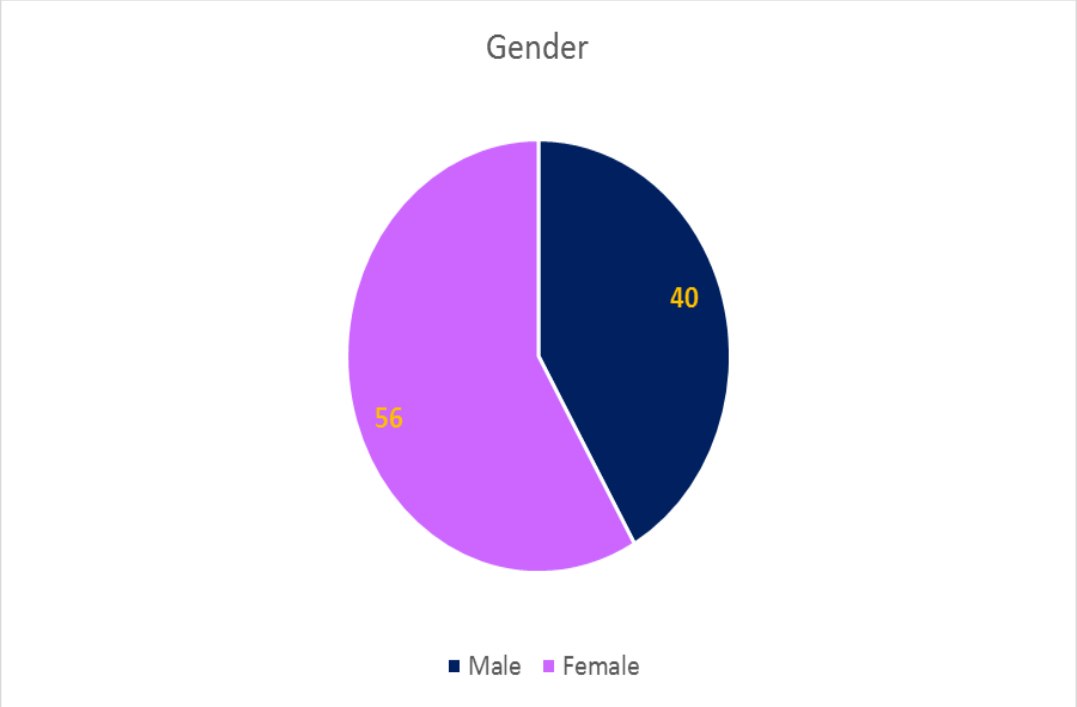

Figure 2: Gender Distribution of participants in our study.

Tumors were divided to 75% benign and 25% malignant. (Figure 3). The neoplasms (benign or malignant) were found either in the parotid gland (most common, 89.6%), and in the submandibular gland (10.6%). (Figure 4)

Figure 3: Gland affected in participants in our study.

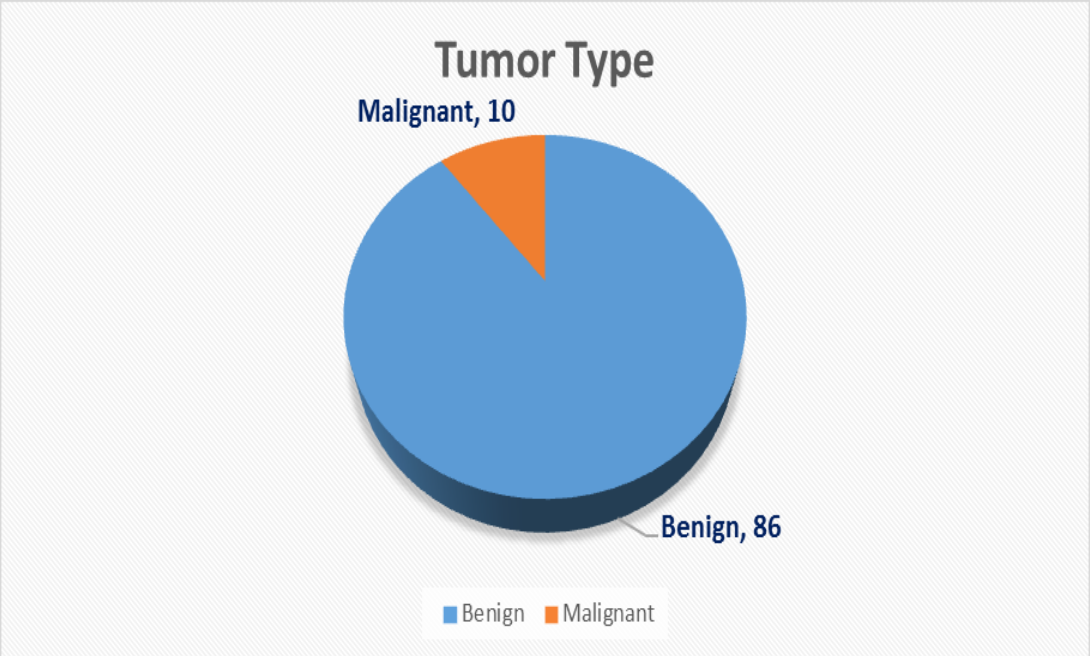

Figure 4: Tumor type in participants in our study.

Regarding benign tumors, we found that Pleomorphic adenoma (PA) with 36 cases, was the most common tumor, followed by Warthin tumor with 26 cases. Furthermore, the least common benign tumor was Myoepithelioma with 3 cases. Regarding malignant tumors, 8 cases were squamous cell carcinoma metastasis (the most common), while clear cell adenocarcinoma and myoepithelial carcinoma with two cases for each. (Figure 5).

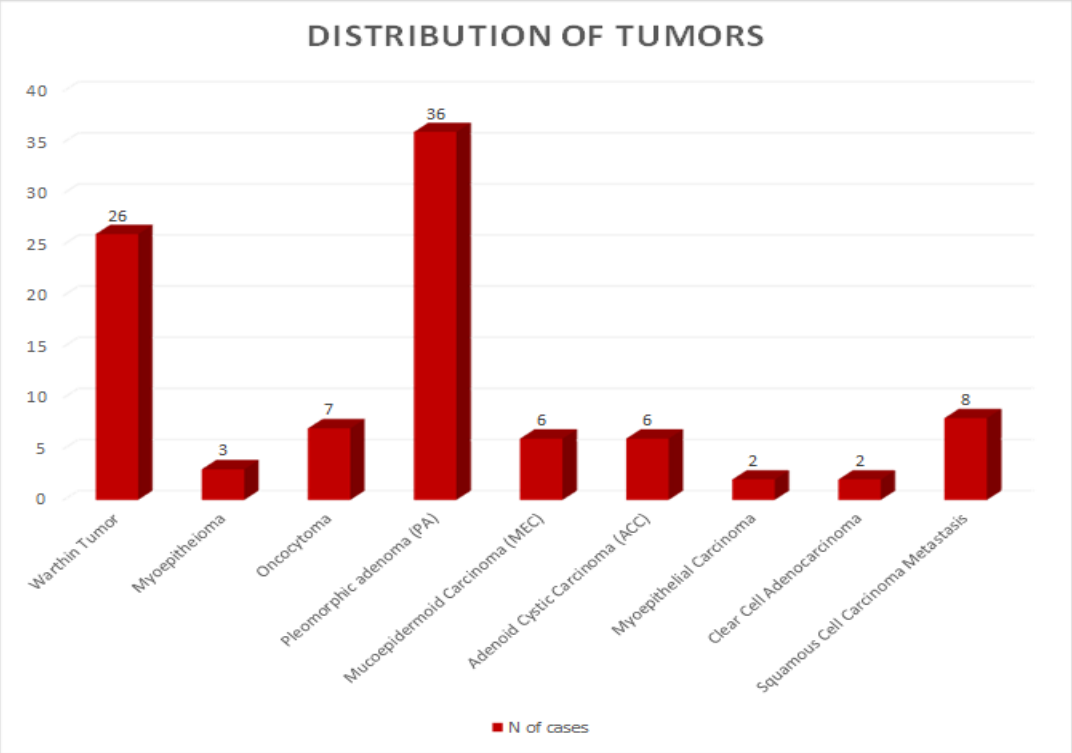

Figure 5: Distribution of all tumors in our study.

Regarding gender, in males, Warthin tumor was the most common benign tumor with 18 cases. However, in females, Pleomorphic adenoma was the most common benign tumor. Regarding malignant tumors, females were more affected in Squamous cell carcinoma metastasis, Myoepithelial carcinoma and Clear cell carcinoma with 5 cases, 2 cases and 2 cases, respectively, while in Mucoepidermoid carcinoma and Adenoid Cystic carcinoma, males and females were equally affected. (2 cases for each). (Figure 6)

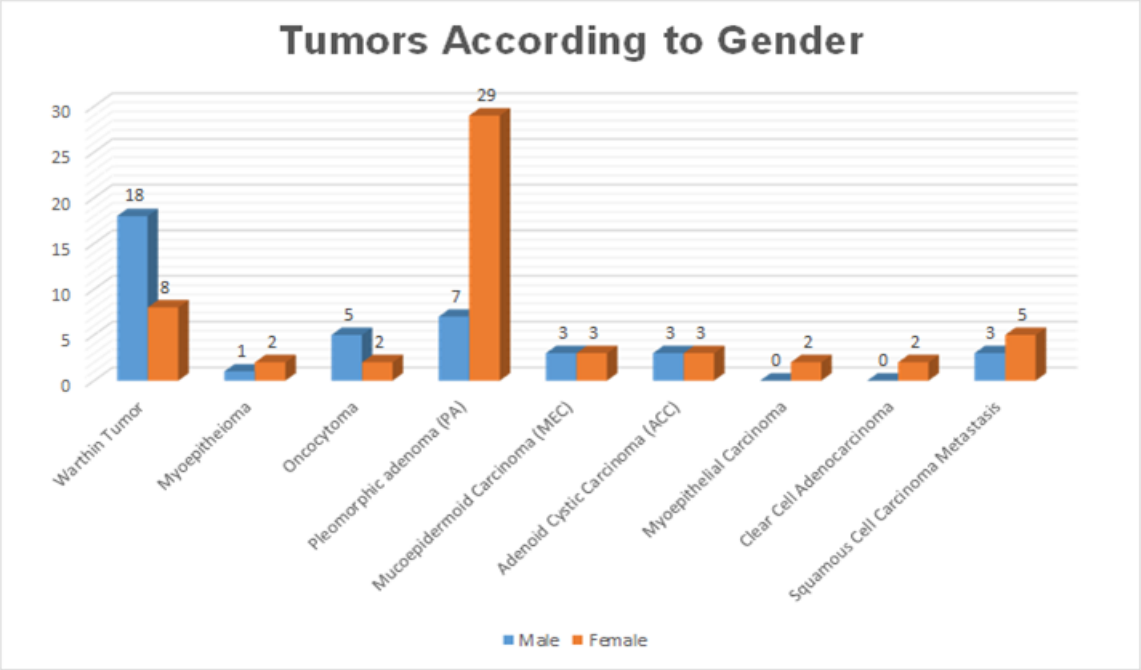

Figure 6: Tumors distribution according to gender.

The correlation between tumors and gender was statistically significant ($p < 0.05$).

Oncocytoma was the only tumor affecting patients between 0-10 years old, moreover, Pleomorphic adenoma was the most common tumor in patients

between 11-60 years old. However, Warthin tumor was the most common in patients older than 60 years old. (Figure 7)

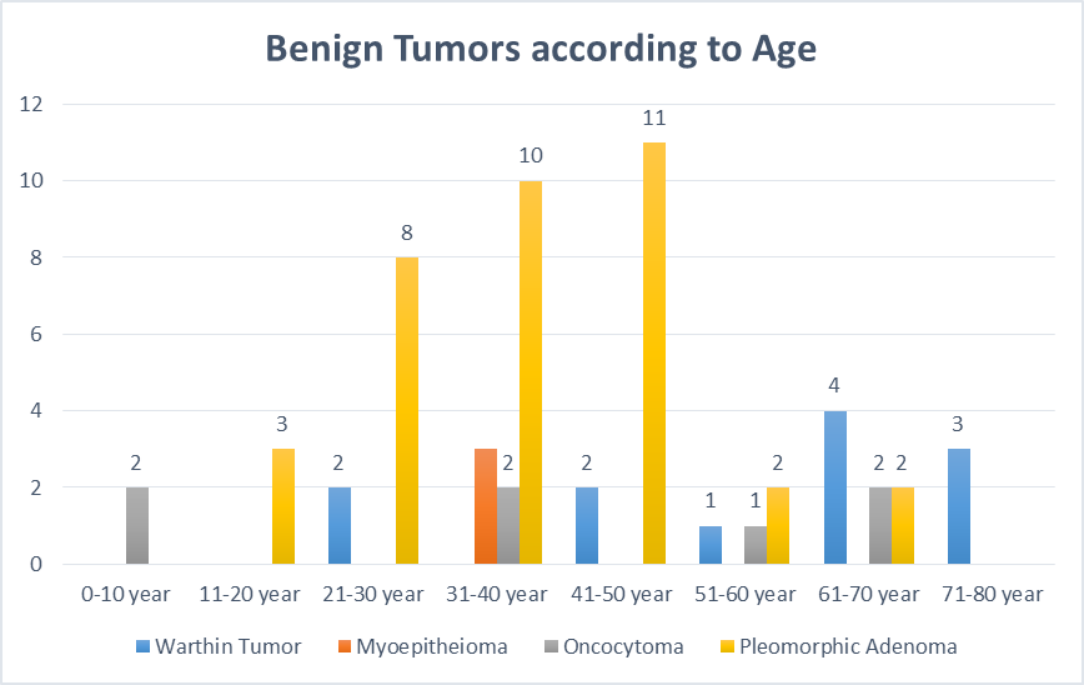

Figure 7: Distribution of benign tumors in correlation to age.

The correlation between benign tumors and age was statistically significant ($p < 0.05$).

Mucoepidermoid carcinoma was the only malignancy affecting patients between 11-20 years old, moreover, Adenoid cystic carcinoma was the only malignancy in patients between 31-40 years old. Myoepithelial carcinoma was the only malignancy in patients between 51-60 years old and Squamous cell carcinoma metastasis was the most prevalent malignancy in those between 41-50 years old and those older than 60 years old. (Figure 8).

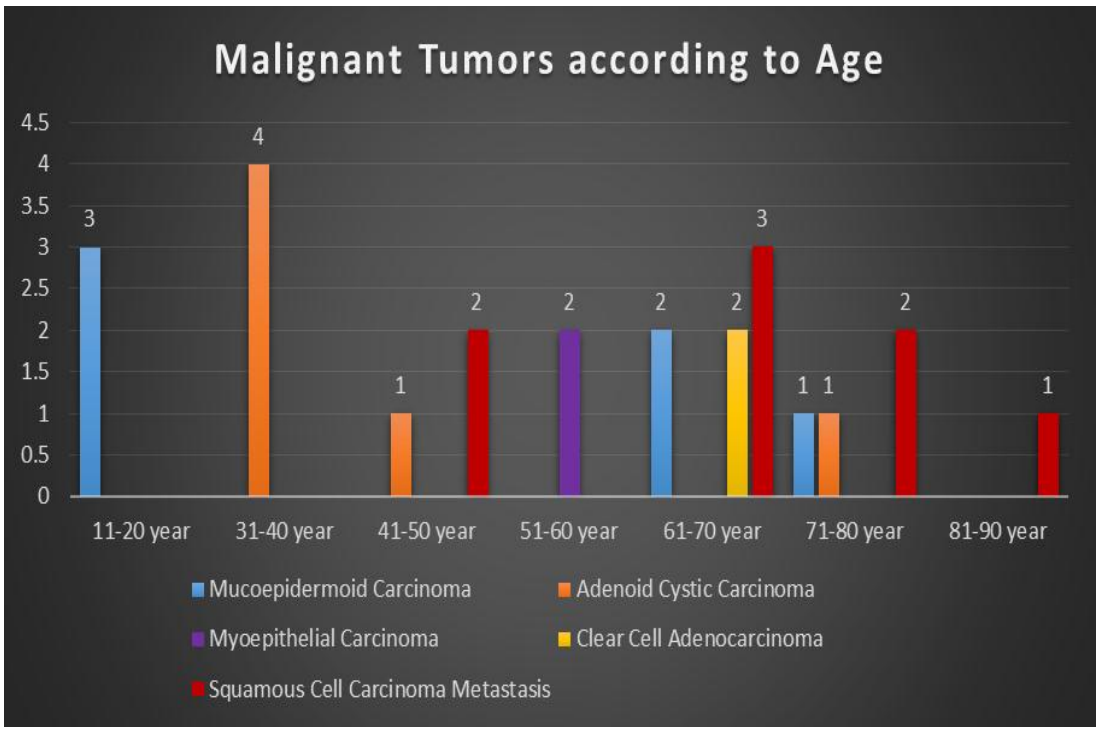

Figure 8: Distribution of malignant tumors in correlation to age.

The correlation between malignant tumors and age was not statistically significant (p >0.05) so their results were not shown.

DISCUSSION

SGNs as a whole are more common in females according to the WHO (World Health Organization) and other articles.[12, 13] However, some studies states that these tumors have a male predominance.[14, 15, 16] In our study, we had 96 patients of which 56 of them were females (58.3%) and 40 were males (41.7%). (Figure 2)

Similar studies showed that the prevalence of benign and malignant tumors was 70.3% and 29.7%, respectively.[17] Moreover, a Brazilian study showed a prevalence of 74.8% benign and 25.2%.[13, 14] In our study, the results were similar to literature; we had 75% benign and 25% malignant. (Figure 3)

Two similar studies[13,18] showed that the most common gland for salivary neoplasms was the parotid gland. In our study, the neoplasms (benign or malignant) were found either in the parotid gland (most common, 89.6%), and in the submandibular gland (10.6%). (Figure 4)

The most common benign tumor in our study was pleomorphic adenoma followed by Warthin tumor, while the most common malignant tumor was squamous cell carcinoma metastasis compared to similar studies[18] in which the mucoepidermoid carcinoma was the most common. (Figure 5)

Most of the pleomorphic adenomas were found in females, which is concordant to similar studies.[13,18,19] Warthin tumor was predominant in males, which has been stated in other literature.[13,14, 17, 19] Squamous cell carcinomas metastasis was more common in females in our study; nevertheless, we could not find any studies that discuss the gender predominance of malignant salivary gland tumors. (Figure 6)

The average age of presentation of SGNs was 53.3 years old in a similar study.[18] In our study, there was a statistical correlation between the age and benign tumor types (p<0.05). The peak incidence was 41-50 years old. Pleomorphic adenoma and Warthin tumor were the two most prevalent benign tumors between 41-50 years old and 61-70 years old, respectively. It should be noted that the risk of salivary gland cancer increases with age.[20] We did not find a statistical correlation between the age and malignant tumor types (p>0.05). Nevertheless, Squamous cell carcinoma metastasis was the most common malignancy overall.

CONCLUSION

Salivary gland tumors are uncommon neoplasms that usually arise in the parotid gland showing some predilection for females. Benign tumors are by far more common than malignant tumors. Pleomorphic adenoma and squamous cell carcinoma metastasis were the most common benign and malignant tumors reported in this series, respectively.

Compliance with Ethical Standards

Funding: This study was not funded by any institution.
Conflict of Interest: The authors of this study have no conflict of interests regarding the publication of this article.
Ethical approval: The names and personal details of the participants were blinded to ensure privacy.

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