

Histomorphological spectrum of salivary gland tumors in a tertiary care hospital—A retrospective study

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Received July 25, 2016. Accepted August 13, 2016

Abstract

Background: Salivary gland tumors are rare, accounting for 3–10% of the total tumors of head and neck region. Approximately 80% of the salivary gland tumors are found in the parotid gland and 10–15% in the submandibular gland. Around 80% of parotid tumors and 50% of submandibular tumors are benign. Salivary gland tumors can show a striking range of morphological diversity between different tumor types and sometimes within an individual tumor mass. Hence, it is important to identify various histomorphological patterns and classify them accordingly.

Objectives: The aim of this study was to recognize various histomorphological patterns of salivary gland tumors, their frequency, age, and site distribution.

Materials and Methods: It was a retrospective study of 96 cases of salivary gland tumors, diagnosed on histopathological examination over a period of 2 years (July 2012 to June 2014) in the Department of Pathology of a tertiary care hospital. Histopathological examination was done on formalin fixed, paraffin embedded tissue sections stained with hematoxylin and eosin.

Result: Out of 96 cases, 60 (62.5%) were benign and 36 (37.5%) were malignant. Benign tumors were frequent in the 3rd and 4th decade, whereas malignant tumors were common in 4th and 5th decades of life. Male:female ratio was 1.6:1. The most common site of occurrence for both benign and malignant tumors was the parotid gland. Pleomorphic adenoma was the most common benign tumor. Mucoepidermoid carcinoma (36.1%) was the most common malignant salivary gland tumor. Parotid was the most common site for mucoepidermoid carcinoma.


Conclusion: Salivary gland tumors are relatively rare. Benign salivary gland tumors are more common than malignant ones. There is a male preponderance. The Parotid gland is the commonest site for occurrence of salivary gland tumors. Pleomorphic adenoma is the most frequent benign tumor whereas mucoepidermoid carcinoma is the most common malignant tumor of salivary glands. Histopathological examination is mandatory in the diagnosis of salivary gland tumors as they have a very wide spectrum of morphological patterns.

KEY WORDS: Salivary gland tumor, Pleomorphic adenoma, Mucoepidermoid carcinoma, Adenoid cystic carcinoma

Introduction

Salivary gland tumors account for 3–10% of the neoplasms of the head and neck region.^[1,2] Global incidence of salivary

gland tumors is 0.4–13.5 per 100,000 persons annually.^[3-5] Approximately 80% of the salivary gland tumors are found in the parotid gland and 10–15% in the submandibular gland.^[6] Around 80% of parotid tumors and 50% of submandibular tumors are benign.^[7] Salivary gland tumors are observed in all ages but the highest incidence is observed in 3rd and 4th decades for benign tumors and 4th and 5th decades for malignant tumors.^[8] Salivary gland tumors can show a striking range of morphological diversity between different tumor types and sometimes within an individual tumor mass. Hence, it is important to identify various histomorphological patterns and classify them accordingly. The aim of this study was to recognize various histomorphological patterns of salivary gland tumors, their frequency, age, and site distribution.

Access this article online	
Website: http://www.ijmsph.com	Quick Response Code: 
DOI: 10.5455/ijmsph.2017.25072016603	

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Material and Methods

The data for the present study was obtained from a tertiary care hospital, from July 2012 to June 2014. Information regarding age, gender, tumor location and tumor size were determined for each salivary gland tumor type. The frequencies of different benign and malignant salivary gland tumors in both major and minor glands were identified. All the biopsy specimens were fixed in 10% formalin, then processed into paraffin embedded sections and stained with hematoxylin and eosin (HE). The histopathology of all tumors was reviewed and classified according to the World Health Organization (WHO) histological typing of salivary gland tumors.

Result

Out of 96 cases, 60 (62.5%) were benign and 36 (37.5%) were malignant, representing a ratio of 1.6:1. The highest incidence of benign tumors was in the 3rd and 4th decade, whereas for malignant tumor it was the 4th and 5th decade of life. Male:female ratio was 1.6:1. The most common site of occurrence for both benign and malignant tumors was the parotid gland.

Among all benign salivary gland tumors, pleomorphic adenoma (Figure 1) was the most common histologic type followed by Warthin's tumor (Figure 2). Mucoepidermoid carcinoma (36.1%) was the most common among the malignant salivary gland tumors. Parotid was the most common site of occurrence for mucoepidermoid carcinoma followed by minor salivary glands and submandibular gland. The submandibular gland was the most common site of occurrence for adenoid cystic carcinoma (Figure 4).

The commonest malignant tumor of the parotid (27.8%) and the minor salivary glands (8.3%) was mucoepidermoid carcinoma (Figure 3). In the submandibular gland, the most common malignant salivary gland tumor was adenoid cystic carcinoma (13.9 %).

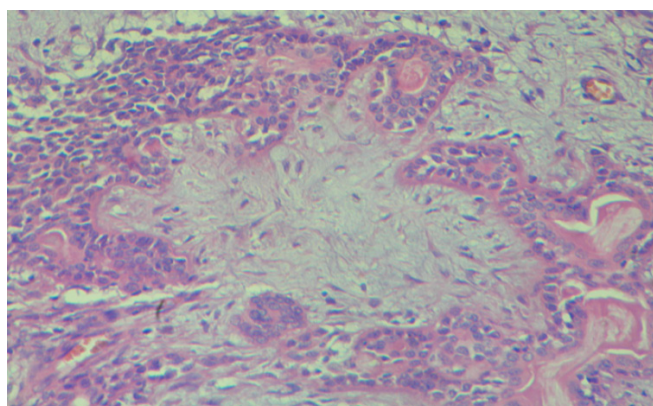


Figure 1: Pleomorphic adenoma showing both epithelial and mesenchymal components (HE stain, X200)

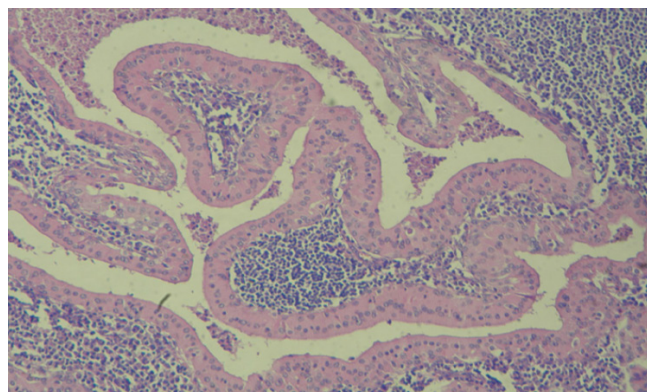


Figure 2: Warthin's tumor. The papillary projection exhibits oncocytic lining cells and an underlying lymphoid stroma (HE stain, X 200).

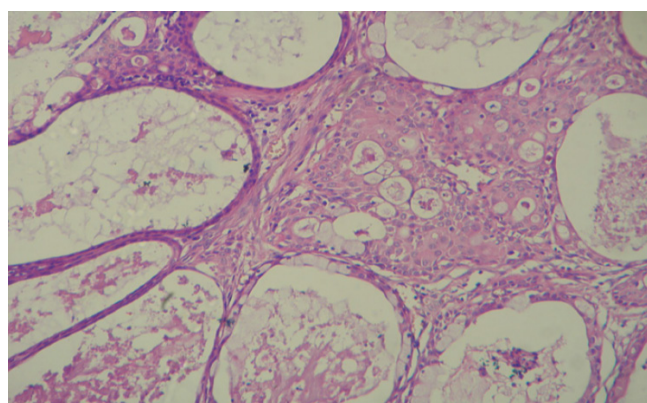


Figure 3: Low-grade mucoepidermoid carcinoma showing glandular spaces with mucous secreting cells and intermediate cells (HE stain, X200).

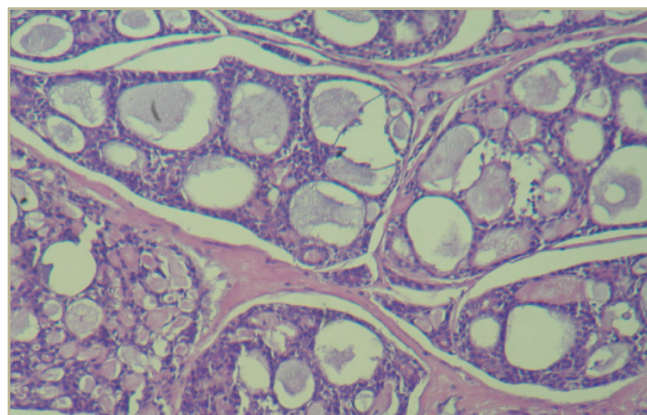


Figure 4: Typical adenoid cystic carcinoma showing a cribriform pattern (HE stain, X 200).

DISCUSSION:

In the present study, out of 96 cases of salivary gland tumors, 60 (62.5%) were benign and 36 (37.5%) were malignant. Mean age observed was 43.8 years with an age range of 12–75 years. Benign salivary gland tumors were

more common in the age group of 31–40 years and the peak age incidence observed for malignant salivary gland tumors was 41–50 years. A male preponderance was noted with a male:female ratio of 1.6:1. Parotid was the commonest site of neoplasia (77.1%) in this series followed by submandibular gland (17.7%) and minor salivary glands (5.2%). In the present study, pleomorphic adenoma was the most common benign salivary gland tumor at all locations. Out of total 38 pleomorphic adenomas in our study, the majority occurred in the parotid gland (N=29; 48.3%) followed by submandibular gland (N=7; 11.6%) and minor salivary glands (N=2; 3.3%). Out of all reported cases of pleomorphic adenoma, 24 were males and 12 were females with a male to female ratio of 2:1. Out of 12 cases reported as Warthin tumor, the majority involved parotid gland (N=9; 15%) followed by submandibular gland (N=3; 5%). Mucoepidermoid carcinoma was more common in the parotid gland (N=10; 27.8%) followed by minor salivary glands (N=2; 8.3%) and submandibular gland (N=1; 2.7%). The most common malignant salivary gland tumor observed in submandibular salivary gland was adenoid

Table 1: Age wise distribution of salivary gland tumors

Age group (years)	Benign tumors	Malignant tumors	No. of cases
<20	3	1	4
21-30	8	1	9
31-40	20	6	26
41-50	18	14	32
51-60	6	8	14
61-70	3	4	7
>70	2	2	4
Total	60	36	96

Table 2: Distribution of salivary gland tumors according to sex and site

Sex	Total	Parotid gland		Submandibular gland		Minor salivary glands	
		Benign	Malignant	Benign	Malignant	Benign	Malignant
Male	61	31	15	6	5	2	2
Female	35	18	9	2	3	1	2

Table 3: Distribution of benign tumors in salivary glands

Tumor type	Parotid gland	Submandibular gland	Minor salivary gland	Total
Pleomorphic adenoma	29	7	2	38
Warthin's tumor	9	3	-	12
Monomorphic adenoma	3	1	-	4
Myoepithelioma	3	-	-	3
Basal cell adenoma	1	-	-	1
Schwannoma	1	-	-	1
Lipoma	1	-	-	1

Table 4: Distribution of malignant tumors in salivary glands

Tumor type	Parotid gland	Submandibular gland	Minor salivary glands	Total
Mucoepidermoid carcinoma	10	1	2	13
Adenoid cystic carcinoma	4	5	1	10
Carcinoma ex- pleomorphic adenoma	3	-	-	3
Adenocarcinoma NOS	2	-	-	2
Unclassified malignant tumor	2	-	-	2
Basal cell carcinoma	2	-	-	2
Squamous cell carcinoma	2	-	-	2
Metastatic undifferentiated carcinoma	1	-	-	1
Acinic cell carcinoma	1	-	-	1
Polymorphous low-grade adenocarcinoma	-	-	-	-

cystic carcinoma accounting for 27.7% of all malignant tumors. Mucoepidermoid carcinoma was the most common malignant salivary gland tumor constituting 13 cases (36.1%) of all malignant salivary gland tumors in the present series.

Chatterjee *et al.* observed a large number of benign cases in the 3rd decade followed by 4th decade.^[9] Malignancy reported in his study was predominant in the 5th decade. The male:female ratio is in agreement with series reported by Potdar GG *et al.*,^[10] Spiro *et al.* ^[11] and Gore *et al.*^[12] In the majority of case series, pleomorphic adenoma was the most common benign salivary gland tumor encountered in all salivary glands.^[9-10,13-15] One case of lipoma was seen in our study. Literature review reveals that these are rare neoplasms of the parotid.^[16] Schwannoma presenting as primary salivary gland neoplasm is thought to arise from the radicals of the facial nerve. We observed one case of schwannoma, affecting parotid gland. Mucoepidermoid carcinoma was reported to be the most common malignant salivary gland tumor of parotid by Richardson *et al.*^[13] and Spiro *et al.*^[11] Carcinoma ex pleomorphic adenoma is an infrequent aggressive malignancy that is believed to evolve from a pre-existing benign adenoma. We found 3 cases (8.3 %) of carcinoma ex-pleomorphic adenoma of the parotid gland among malignant tumors. Polymorphous low-grade adenocarcinoma (PLGA) occurs almost exclusively in the minor salivary gland and its origin in a major salivary gland is considered rare. Although, several reports have described PLGA of the parotid gland, we did not find any case of PLGA in this study. Primary squamous cell carcinoma of the salivary gland is rare. Batsakis *et al.* indicated that the true incidence to be 0.3– 1.5%. We found 2 cases (5.5 %) of squamous cell carcinoma in parotid gland in our series.

Salivary gland tumors can show a striking range of morphological diversity between different tumor types and sometimes within an individual tumor mass. In such cases, it is difficult to classify them correctly on histopathological grounds only.

Conclusion

Salivary gland tumors are relatively rare. Benign salivary gland tumors are more common than malignant ones. There is male preponderance in the incidence of salivary gland tumors. The Parotid gland is the commonest site for occurrence of salivary gland tumors. Pleomorphic adenoma is the most frequently encountered tumor among all salivary gland tumors. Mucoepidermoid carcinoma is the most common malignant tumor of salivary glands and parotid is the commonest site for the same. Histopathological examination is mandatory in the diagnosis of salivary gland tumors as they have a very wide spectrum of morphological patterns.

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How to cite this article: Amin NS, Shah SA, Prajapati SG, Goswami HM. Histomorphological spectrum of salivary gland tumors in a tertiary care hospital—A retrospective study. *Int J Med Sci Public Health* 2017;6:299-302

Source of Support: Nil, **Conflict of Interest:** None declared.