



Original Article

Histopathological Pattern of Salivary Gland Tumors

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ABSTRACT

Background: The tumors of the salivary glands are uncommon head and neck neoplasms. The aim of this study was to evaluate the relative frequencies, types, site distribution and the histopathological features of salivary gland tumors.

Materials and Methods: This was a retrospective study of 176 cases of salivary gland tumors collected from medical record section and department of pathology at B.P.Koirala Memorial Cancer Hospital from Jan. 2005 to Dec. 2010. Tumors were analyzed based on demographics, anatomic location and histopathological type.

Results: Out of 176 cases, 66 (37.5 %) were benign and 110 (62.5 %) were malignant with M:F ratio of 1.7:1. The mean age observed was 44.76 years with age range of 12 to 75 years. Pleomorphic adenoma was found to be the commonest benign tumor (72.7 %), followed by Warthin tumor (15.1%), monomorphic adenoma (3.0 %) and basal cell adenoma (3.0 %). The mucoepidermoid carcinoma was the most common malignant tumor (38.1 %), followed by adenoid cystic carcinoma (25.4%), acinic cell carcinoma (10.9%), adenocarcinoma NOS (6.3%), carcinoma ex pleomorphic adenoma (5.4%) and unclassified malignant tumor (4.5 %). Parotid was the most common site for the location of tumors (70.4%) followed by submandibular (19.3%) and minor salivary glands (10.2 %).

Conclusion: Pleomorphic adenoma was the commonest salivary gland tumor observed in both sexes. Mucoepidermoid carcinoma was the most common malignant salivary gland tumor. The parotid gland was the most common site of origin in both benign and malignant tumors.

INTRODUCTION

Salivary gland tumours are rare, comprising approximately 3% to 10% of the neoplasm of the head and neck region.¹ The global incidence of these tumours is 0.4–13.5 per 100,000 persons annually.³⁻⁵ Approximately 80% of the salivary gland tumours are found in the parotid gland and 10 to 15% in the submandibular gland.⁶ Around 80% parotid tumours and 50% of submandibular tumours are benign.⁷ Salivary gland tumours were observed in all ages

but the highest incidence is observed in 3rd and 4th decades for benign tumours and 4th and 5th decades for malignant tumours.⁸ The aim of this study was to recognize various histomorphology of salivary gland tumours, their frequency, age and site distribution.

MATERIALS AND METHODS

The data for the present study was obtained from the medical record section and department of pathology from January 2005 to December 2010. Information regarding age, gender, tumor location and tumor size were determined for each salivary tumor type. The frequencies of different benign and malignant salivary tumors in both major and

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minor glands were identified. All the biopsy specimens were fixed in 10% formol-saline, then processed into paraffin embedded sections and stained with hematoxylin and eosin (H&E). The histopathology of all tumors was reviewed and classified according to the World Health Organization (WHO) histological typing of salivary gland tumors.

RESULTS

Out of 34,978 biopsies reported at B.P.Koirala Memorial Cancer Hospital during the study period, 176 cases were related to salivary gland tumor. Of the 176 cases, 66 (37.5%) were benign and 110 (62.5%) were malignant, representing a ratio of 1:1.6 respectively. Male were more affected by both benign and malignant tumors. The highest incidence for benign tumors was in the 3rd and 4th decade, where as for malignant tumor it was the 4th and 5th decade of life. The mean age observed for all salivary gland tumors was 44.76 years with age range of 12 to 75 years (Table 1). The most common site of occurrence for both benign and malignant tumors was parotid gland (Table 2). Distribution of benign salivary gland tumors are shown in Table 3. Of

Table 1: Age wise distribution of salivary glands tumors

Age Distribution	Benign tumors	Malignant tumors	Total No. of Patient
<20	4	6	10
21 – 30	12	10	22
31 – 40	22	16	38
41 – 50	10	36	46
51 – 60	8	14	22
61 – 70	6	18	24
> 70	4	10	14

benign salivary gland tumors, pleomorphic adenoma (fig. 1) was the most common histologic type followed by warthin's tumor (fig. 2).

Distribution of malignant tumors in salivary glands is shown in Table 4. Mucoepidermoid carcinoma (38.1%) was most common among the malignant salivary gland tumors. Parotid was the most common site of occurrence

Table 2: Distribution of tumor according to sex and site

Sex	Total	Parotid gland		Submandibular gland		Minor salivary gland	
		Benign	Malignant	Benign	Malignant	Benign	Malignant
Male	112 (63.6%)	32 (48.5%)	46 (41.8%)	6 (9.0%)	16 (14.5%)	3 (4.5%)	9 (8.1%)
Female	64 (36.4%)	20 (30.3%)	26 (23.6%)	4 (6.0%)	8 (7.2%)	1 (1.5%)	5 (4.5%)

Table 3: Distribution of benign tumors in salivary glands

Tumor type	Parotid glands	Submandibular	Minor salivary glands	Total
Pleomorphic adenoma	36 (54.5%)	8 (12.1%)	4 (6.0%)	48 (72.7%)
Warthin's tumor	8 (12.1%)	2 (3.0%)	-	10 (15.1%)
Monomorphic adenoma	2 (3.0%)	-	-	2 (3.0%)
Basal cell adenoma	2 (3.0%)	-	-	2 (3.0%)
Myoepithelioma	1 (1.5%)	-	-	1 (1.5%)
Schwannoma	2 (3.0%)	-	-	2 (3.0%)
Lipoma	1 (1.5%)	-	-	1 (1.5%)

Table 4: Distribution of malignant tumours in salivary glands

Tumor type	Parotid glands	Submandibular glands	Minor salivary gland	Total
Mucoepidermoid carcinoma	26 (23.6%)	6 (5.4%)	10 (9.0%)	42 (38.1%)
Adenoid cystic carcinoma	10 (9.0%)	14 (12.7%)	4 (3.6%)	28 (25.4%)
Acinic cell carcinoma	8 (7.2%)	4 (3.6%)	-	12 (10.9%)
Adenocarcinoma NOS	7 (6.3%)	-	-	7 (6.3%)
Carcinoma Ex pleomorphic adenoma	6 (5.4%)	-	-	6 (5.4%)
Unclassified malignant tumor	5 (4.5%)	-	-	5 (4.5%)
Squamous cell carcinoma	4 (3.6%)	-	-	4 (3.6%)
Basal cell carcinoma	2 (1.8%)	-	-	2 (1.8%)
Polymorphous low grade adenocarcinoma	2 (1.8%)	-	-	2 (1.8%)
Metastatic undifferentiated carcinoma	2 (1.8%)	-	-	2 (1.8%)

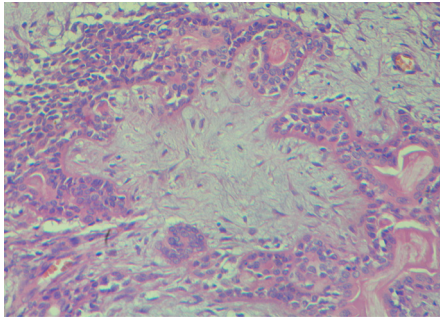


Figure 1: Pleomorphic adenoma showing both epithelial and mesenchymal components (HE stain, X200).

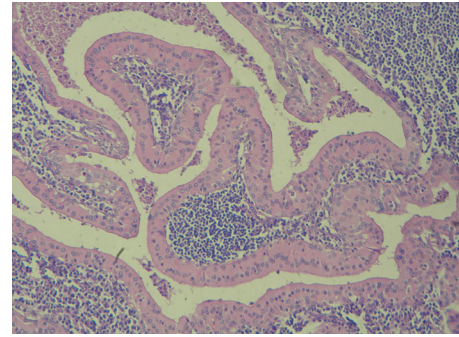


Figure 2: Warthin's tumour. The papillary projection exhibits oncocytic lining cells and an underlying lymphoid stroma (HE stain, X 200).

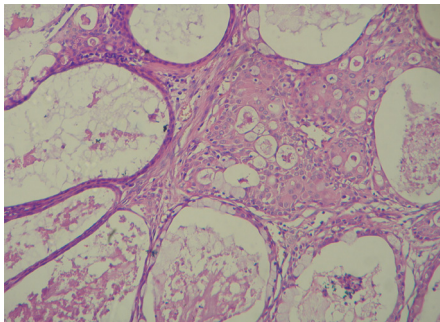


Figure 3: Low-grade mucoepidermoid carcinoma showing glandular spaces with mucous secreting cells and intermediate cells (HE stain, X200).

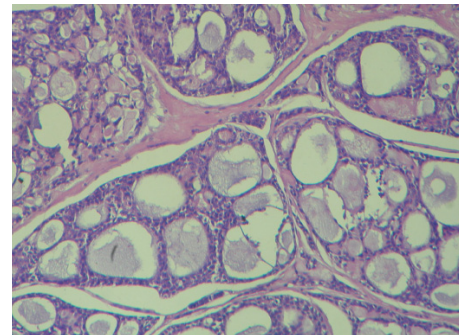


Figure 4: Typical adenoid cystic carcinoma showing cribriform pattern (HE stain, X 200).

for mucoepidermoid carcinoma followed by minor salivary glands and submandibular gland.

Submandibular gland was the most common site of occurrence for adenoid cystic carcinoma (fig.4). Parotid was the third most common site of occurrence for acinic cell carcinoma (7.2 %) followed by submandibular gland (3.6 %). All cases of carcinoma ex pleomorphic adenoma, basal cell carcinoma, adenocarcinoma, squamous cell carcinoma, metastatic undifferentiated carcinoma involved only the parotid gland.

The commonest malignant tumor of parotid (23.6 %) and the minor salivary glands (9.0 %) was mucoepidermoid carcinoma. In the submandibular gland the most common malignant salivary gland tumor was adenoid cystic carcinoma (12.7 %).

DISCUSSION

In the present study of 176 cases of salivary gland tumors, 66 (37.5%) were benign and 110 (62.5%) were malignant. However; other studies have noted predominance of benign tumors over the malignant ones.⁹⁻¹¹ Since our study was based at cancer hospital where diagnosed malignant cases are referred for further management; it may have led to predominance of malignant ones.

In the present series mean age observed was 46.7 years with an age range of 12 to 75 years. Benign salivary gland tumors were more common in age group of 31 to 40 years and the peak age incidence observed for malignant salivary gland tumors was 41 to 50 years. Chatterjee et al. observed large number of benign cases in third decade followed by fourth decade.¹² Malignancy reported in his study was predominant in the 5th decade.

In the present study a male preponderance was noted with a male: female ratio of 1.7:1. This is in agreement with series reported by Potdar GG et al¹³ Spiro et al¹⁴. However; this was in contrast to the series reported by Dandapat et al¹⁵ and Rewsuwan et al¹⁶ who reported a female preponderance in their series. Parotid was the commonest site of neoplasia (70.5 %) in this series followed by submandibular gland (19.3%) and minor salivary glands (10.2 %). This is in conformity with other workers, viz., Gore et al.¹⁷

In the majority of case series, Pleomorphic adenoma was the most common benign salivary gland tumor encountered in parotid, submandibular and minor salivary glands.^{12,13,18-20} Similar findings were observed in the present study where pleomorphic adenoma was the most common benign salivary gland tumor at all locations. Out of total 48 pleomorphic adenomas in our study, majority occurred in the parotid gland (N=36; 54.5 %) followed by submandibular gland

(N=8; 12.1%) and minor salivary glands (N=4; 6.0%). Out of all reported cases of pleomorphic adenoma, 32 were males and 16 were females with a male to female ratio of 2:1. Potdar GG¹³ reported 183 cases of pleomorphic adenomas, out of which 101 were involving parotid gland. Warthin tumor (14.29%) was the 2nd commonest benign tumors as quoted by Chung et al.²¹ Eight cases (12.1%) of Warthin tumor were involved in the parotid gland followed by (N=2; 3.0 %) of in submandibular gland which is similar to what has been reported by Eveson et al.²²

One case of lipoma was seen in our study. Literature review reveals that these are rare neoplasms of parotid, however occasional cases have been reported in the parotid gland.²³ Schwannoma presenting as primary salivary gland neoplasm is a recognized entity.²⁴ These are thought to arise from the radicals of facial nerve. We observed two cases (3.0 %) of schwannoma, all affecting parotid gland.

Mucoepidermoid carcinoma was the most common malignant salivary gland tumor of parotid constituting 26 (23.6 %) of all malignant salivary gland tumors in the present series. Mucoepidermoid carcinoma was reported to be the most common malignant salivary gland tumor of parotid by Richardson et al¹⁸ and Spiro et al.¹⁴ In our study mucoepidermoid carcinoma was more common in parotid gland (N=26; 23.6 %) followed by minor salivary glands (N=10; 9.0 %) and submandibular gland (N=6; 5.4 %). Richardson et al.¹⁹ reported 61 cases of mucoepidermoid carcinoma and parotid (N=52) was reported to be the most common site of occurrence followed by minor salivary glands (N=6) and submandibular gland (N=3).

The most common malignant salivary gland tumor observed in submandibular salivary gland was adenoid cystic carcinoma accounting for (12.7 %) of all malignant salivary gland tumors. Similarly, Potdar et al¹³, Richardson et al¹⁸, and Rewsuwan et al¹⁶ also found adenoid cystic carcinoma to be the most common malignant tumor of submandibular glands. Vergas et al¹⁹, reported five cases of adenoid cystic carcinoma in their series accounting for 4% of all cases or 20% of malignant tumors. It was also reported to be the second most common malignant salivary gland tumor in their series. In contrast to the present study, Lima et al²⁵ and Rewsuwan et al¹⁶ reported adenoid cystic carcinoma to be the most common malignant salivary gland tumor in their series.

Carcinoma ex pleomorphic adenoma is an infrequent aggressive malignancy that is believed to evolve from a pre-existing benign adenoma. It accounts for 3.6% (range, 0.9%–14%) of all salivary neoplasms and for 11.7% (range, 2.8%–42.4%) of salivary malignancies.²⁶ We found 6 cases (5.4 %) of carcinoma ex pleomorphic adenoma of the parotid gland.

Polymorphous low grade adenocarcinoma(PLA) occurs

almost exclusively in minor salivary gland and its origin in a major salivary gland is considered rare. Although several report have described PLGA of the parotid gland.^{27, 28} We found two cases (3.0 %) of PLGA in parotid gland.

Primary squamous cell carcinoma of salivary gland is rare. Batsakis et al indicated that the true incidence to be 0.3% to 1.5%.²⁹ We found only 4 (3.6 %) of squamous cell carcinoma in parotid gland in our series.

CONCLUSION

Salivary gland tumors are rare. Male and the parotid gland were the most affected and pleomorphic adenoma was the most frequent lesion, followed by mucoepidermoid carcinoma and adenoid cystic carcinoma.

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