Original Research Article Journal of College of Medical Sciences-Nepal, Vol-15, No 3, Jul-Sep 2019

ISSN: 2091-0657 (Print); 2091-0673 (Online) **Open Access**

DOI: 10.3126/jcmsn.v15i3.23809

Pattern of Major Salivary Gland Malignancies in B.P. Koirala Memorial Cancer Hospital

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ABSTRACT

Background: Salivary gland tumors represent a different variety of histological types. The definite diagnosis of type of salivary gland tumor is required for proper treatment planning. The aim of this study was to evaluate the pattern of salivary gland malignancy in B.P. Koirala Memorial Cancer Hospital, Bharatpur, Chitwan. **Methods:** This cross-sectional study was carried out in patients of malignant salivary gland tumor registered in B.P. Koirala Memorial Cancer hospital retrospectively from September 2009 to August 2012. **Results:** Parotid gland was the most common sites for malignant salivary gland tumor (80%) followed by submandibular gland (20%). Mucoepidermoid carcinoma is the most common malignant salivary gland tumor of parotid gland and Adenoid cystic carcinoma was the most common malignant tumor of submandibular gland. Male: Female ratio was 1.5:1 with age range from 12 years to 71 years. Common age group for malignant salivary gland tumor was from 50 to 60 years. **Conclusions:** Parotid was the most common site whereas Mucoepidermoid carcinoma was the most common malignant tumor of major salivary gland.

Keywords: adenoid cystic carcinoma; acinic cell carcinoma; mucoepidermoid carcinoma; parotid gland; submandibular gland; salivary gland tumors.

INTRODUCTION

Salivary gland tumors are usually present as painless enlarging masses. Salivary glands are divided into major (parotid, submandibular and sublingual glands) and minor glands. Embryologically, the salivary glands are tubuloacinar structures arising from invaginations of the somatoderm (ectodermal) and foregut (endodermal). Neoplasms of the salivary glands are rare and account for approximately 3% to 6% of all tumors of the head and neck region.[1] Between 64 to 80% of all primary epithelial salivary gland tumors occur in the parotid gland, 7-11% occur in the submandibular glands, 1% in occur in sublingual glands and 9-23% occur in minor glands.[2] According to the Global Cancer Statistic 2018, the incidence of malignant salivary gland tumor worldwide is 0.3% of total new cases (52,799).[3] Risk of salivary gland malignancy rises with increasing smoking and alcohol consumption, ionizing irradiation is also a well documented cause.[2] Patients are frequently old age and the cure rates are very poor for most histological types. It is very important to distinguish between benign from malignant tumors for further treatment planning of the patient. Fine Needle Aspiration along with imaging techniques such as CT scan and MRI are used for diagnostic purpose, but in most cases surgical excision of the tumor is required for definitive diagnosis.[4] Thus, definitive diagnosis of histopathological type of salivary gland tumor pay a major role for management of these tumors.

METHODS

This cross-sectional study was conducted from September 2009 to August 2012 in the department of Pathology of B.P Koirala Memorial Cancer Hospital. The records of the patients were obtained retrospectively from the medical record section of the hospital which is the secondary source of data collection. Age, sex, site of tumor and histopathological types of tumor were recorded and descriptive analysis was done to calculate frequency, percentage and their relations. Aim of the study is to provide the overview of disease pattern of major salivary gland tumor in B.P. Koirala Memorial Cancer Hospital. It also help in planning the strategies to treat the disease. Inclusion criteria: All the major salivary gland malignancy registered in this hospital were included in this study. Exclusion criteria: Minor salivary gland tumor and benign salivary gland tumor were excluded in this study. Ethical clearance was taken from B.P. Koirala Memorial Cancer Hospital. All the biopsy specimens were fixed in 10% buffered formalin, routine processing of the tissue was done and staining was done with Hematoxylin and Eosin stain. Immunohistochemistry was also done in the required cases. The histopathology diagnosis of all the cases were again reviewed and classification of tumor was

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done according to the World Health Organization (WHO) histological type of Salivary gland tumors.

RESULTS

During these three years study period, total of 45 cases of malignant salivary gland tumors were present. There were 27 male and 18 female with a male to female ratio of 1.5:1. The common age group of malignant salivary gland tumors was 50 to 60 years. The youngest age was 12 years and the oldest age was 71 years (Table 1).

Table 1. Age distribution of malignant salivary gland tumors.

Age distribution	Male	Female
<20	1 (3.70%)	0 (0%)
21-30	1 (3.70%)	1 (5.55%)
31-40	3 (11.11%)	3 (16.66%)
41-50	5 (18.51%)	2 (11.11%)
51-60	10 (37.03%)	8 (44.44%)
61-70	5 (18.51%)	3 (16.66%)
>70	2 (7.40%)	1 (5.55%)
Total	27 (60%)	18 (40%)

In these series, malignant salivary gland tumor was predominantly located in parotid (36 cases) followed submandibular gland (9 cases). During our study period, there was no any case of malignant salivary gland tumor in sublingual gland. The most common site for salivary gland malignancy was parotid gland (80%) and the second most common site is submandibular gland (20%) (Table 2).

Table 2. Sex distribution of malignant salivary gland tumors.

Tumor Type	Male	Female
Mucoepidermoid Carcinoma	16 (59.25%)	10 (55.55%)
Adenoid Cystic Carcinoma	8 (29.62%)	6 (33.33%)
Acinic Cell carcinoma	2 (7.40%)	1 (5.55%)
Salivary Duct carcinoma	0 (0%)	1 (5.55%)
Non Hodgkin Lymphoma	1 (3.70%)	0 (0%)
Total	27 (60%)	18 (40%)

Mucoepidermoid carcinoma was the most common malignant tumor of parotid and accounted for 66% of all malignant tumor in parotid, followed by Adenoid cystic carcinoma (22%), Acinic cell carcinoma (5%), Salivary duct carcinoma (3%) and Non Hodgkin Lymphoma (3%). In submandibular gland, Adenoid cystic carcinoma was the most common malignant salivary gland tumor (66%) followed by Mucoepidermoid carcinoma (22%) and Acinic cell carcinoma (11%) (Table 3).

Table 3. Histological distribution of malignant salivary gland tumor in Parotid gland (80%) and in Submandibular gland (20%).

Parotid gland	Number of patients	Percent
Mucoepidermoid Carcinoma	24	66%
Adenoid Cystic Carcinoma	8	22%
Acinic Cell Carcinoma	2	5%
Salivary Duct carcinoma	1	3%
Non Hodgkins Lymphoma	1	3%
Submandibular gland		
Adenoid Cystic Carcinoma	6	66%
Mucoepidermoid Carcinoma	2	22%
Acinic Cell Carcinoma	1	11%

DISCUSSION

Malignant salivary gland tumors have a relatively low incidence as compared to other head and neck malignancy. Malignant Salivary gland tumors account for more than 0.3% of all malignancies and approximately 7% of all head and neck cancers.[5] According to an epidemiological study done in Sweden from 1960 to 1989 showed only 85 new cases of malignant salivary gland tumor per year.[6] In our study total 45 cases of malignant salivary gland tumors were present during three years study period. In our study, the common age for malignant salivary gland tumor was 50 to 60 years and Male:Female ratio was 1.5:1. Similarly, in different study done by various authors Gonzalez et al.,[7] Aliyu et al.,[8] Bashir et al.[9], Jaafari-Ashkavandi et al.,[10] there was a predominance of salivary gland malignancy in the male group and malignant salivary gland tumor usually occur in older age group. In parotid gland, the commonest malignancy is the mucoepidermoid carcinoma followed by the adenoid cystic carcinoma. In both cases high histological grade or adverse pattern affects prognosis adversely. Histological differential is crucial in predicting the biological behavior of salivary neoplasms. Low-grade malignant tumors usually have an excellent prognosis whereas high grade tumors usually have an increased risk of regional and distant metastasis, and are associated with poor prognosis.[11] Similar to our study, in other study done by Siro, Mucoepidermoid carcinoma is the most common malignant salivary gland cancer which consist of one-third of cases.[12] Shishegar et al. had done comparison of distribution of salivary gland tumors in Iran and other countries where they found parotid was the most common site for malignant salivary gland tumor and the Mucoepidermoid carcinoma was the most common malignant tumor with a prevalence ranging from 4-12%.[13] In our study in parotid gland, Mucoepidermoid carcinoma (66%) was the most common malignant salivary gland tumor followed by Adenoid cystic carcinoma (22%), Acinic cell carcinoma (5%), Salivary duct carcinoma (3%) and Non-Hodgkins Lymphoma (3%). In study done by Jones AS et al., in the Submandibular gland, Adenoid cystic carcinoma are common (43%) whereas Mucoepidermoid carcinoma and Adenocarcinoma accounting for 17 and 11 percentage respectively.[14] In the various studies done by Victor Shing Howe To et al.,[15] Vargas et al.,[16] Rajdeo et al.[17] and Elumelu et al.[18] that Mucoepidemoid was the most common malignant salivary gland tumor of parotid gland which is similar to our study. In our study Adenoid cystic carcinoma (66%) is the most

common malignant salivary gland tumor of submandibular gland, followed by Mucoepidermoid carcinoma (22%) and Acinic cell carcinoma (11%). In the ten years study of salivary gland tumor done by Bashir S et al, they reported Adenoid cystic carcinoma was the most common malignancy in submandibular gland (12.90%).[9] Grading of Adenoid cystic carcinoma was done as cribriform or tubular (Grade I), less than 30% solid (Grade II) and greater than 30% solid (Grade III).[19] The cribriform variant demonstrated worse prognosis in terms of local recurrence rate (up to 47%).[4] Histologically, salivary gland tumors represent the most heterogeneous group of tumors in the body.[20] The World Health Organization (WHO) described 24 different histological subtypes in its 2005 classification of salivary gland tumors and also highlight that there is some geographic variation in the frequency of tumor types.[21] The limitation of this study is that only major malignant salivary gland tumors are included in this study whereas minor malignant salivary gland tumors are not included in this study so pattern of minor malignant salivary gland is not present in this study.

CONCLUSIONS

The most common site for malignant salivary gland tumor was Parotid gland where as second most common site was submandibular gland. Mucoepidermoid carcinoma is the most common malignant salivary gland tumor of parotid gland and Adenoid cystic carcinoma was the most common malignant tumor of submandibular gland. An accurate histopathology diagnosis of malignant salivary gland tumors is essential for further treatment of the patient.

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Citation: Sahi R, Karmacharya D, Gautam DK, Karki AB, Shrestha A. Pattern of Major Salivary Gland Malignancies in B.P Koirala Memorial Cancer Hospital. JCMS Nepal. 2019; 15(3):202-5.