

INTRA-ORAL MINOR SALIVARY GLANDS NEOPLASMS; THE PATTERN AND MANAGEMENT

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ABSTRACT: Objective: To determine the relative frequency and distribution of various types of intra-oral minor salivary gland tumours and their treatment modalities. **Design:** Retrospective descriptive study. **Setting:** Muhimbili National Hospital (MNH), TANZANIA; at the department of Oral Surgery and Oral pathology **Period:** From 1993 to 2008. (16 years). **Data source:** Hospital based data **Methodology:** The information was retrieved from files and included; age, gender as well as their location, histological types and treatment modalities. Microscopic slides of all cases were reviewed and where necessary paraffin sections were re-cut and subsequently stained by haematoxylin and Eosin. Special stained such as Periodic acid Schiff and/or mucicarmine were also performed in controversial cases. Tumours were classified according to the World Health Organization's Histological Typing of salivary gland tumours. Data were entered in the computer and analysed by SPSS. Statistical analysis was performed by student's t-test, and the difference were considered at 0.05 significance level. **Results:** A total of 33 cases of intra-oral minor salivary gland tumours were studied. Out of these, 13 cases were benign and 20 were malignant. The male to female ratio for both benign and malignant tumours was 1:1.7. The age range for those with benign tumours was 16-78 years while for malignant ones was 17-76 years. Females were more affected than males in both benign and malignant neoplasms. There was a statistically significant difference in the mean age of occurrence of intra-oral minor salivary gland tumours in female compared to males ($P=0.003$). With regard to the location of minor salivary gland tumours, the palate was the most affected site (51.5%). Pleomorphic adenoma was the most frequent tumour located on the palate (52.9%). Similarly, the majority of malignant tumours were located on the palate (38%) followed by the Cheek (23.8%) and included adenocarcinoma, adenoicycstic carcinoma and mucoepidermoid carcinoma. Most malignant tumours were treated by adjuvant radiation therapy. Pleomorphic adenoma located on the palate was treated by excision with 1cm clinical margins at its periphery and including the overlying epithelium and periosteum. However, pleomorphic adenoma located on other mucosa sites was treated by peripheral excision with 1cm margin. With regard to monomorphic adenoma, conservative surgical excision including a rim or margin of normal uninvolved tissue was done. **Conclusion:** Palate was the common site for intraoral minor salivary gland tumours and that the percentage of the palatal cases were higher in benign than in malignant tumours. The mean age of occurrence of minor intraoral salivary gland tumours was higher in female patients than that of male patients.

Key words: Minor salivary glands, intra-oral, Tumours, Treatment.

INTRODUCTION

Salivary gland tumours are common and constitute 2-6.5% of all head and neck neoplasms¹. Tumours of minor salivary gland origin account less than 25% of all salivary gland neoplasms¹. A major prevalence of minor salivary gland tumors in females over males in black patients have been reported by several authors². Most studies have

shown that minor salivary gland tumours are common in

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females than males^{3,4,5,6}. In South Africa a male-female ratio has been reported to be 1:4 and 1:1.6² while in United States, United Kingdom, Australia and the Netherlands, the male-to-female ratio for minor salivary gland tumours was estimated to range from 1:0.6 to 1:1.2.

Studies in the world literature have shown that the malignant minor salivary gland tumours occurred more in old age when compared to benign minor salivary gland tumours¹. Other studies have reported that the palate was the most common site for minor salivary gland tumours and that approximately 40-80% of all tumours occurred in this site^{7,8,9}. Also the percentage of benign tumours occurring in the palate was higher than that of malignant tumours^{10,11}, and that the palate was the predominant site even for malignant minor salivary gland tumours^{10,11}.

Surgery is the treatment of choice for minor salivary gland neoplasms and the site and histology dictate the surgical approach to specific tumour. Neck dissections are recommended for clinically positive necks and in patients with high – grade tumours. Also radiation or chemotherapy is used as adjuvant therapy in high-grade tumours. Reports from several parts of the world have shown differences in the incidence of salivary gland tumours^{12,13}. Variation in the frequency of each histological type has also been reported^{12,13}. In Tanzania and particularly our centre, epidemiological analysis of intra-oral minor salivary gland tumours is very scarce. Epidemiological data of these tumours in the various parts of the world can be helpful for a better understanding of the biological and clinical characteristics.

The purpose of the present study was to determine the relative frequency and distribution of various types of intra-oral minor salivary gland tumours and their treatment modalities at Muhimbili National Hospital and provide data which will form the basis for comparison with other different racial / populations in other countries.

METHODOLOGY

Study design

Retrospective descriptive study.

Files from the department of Oral Surgery and Oral Pathology Muhimbili National Hospital were retrieved for cases of intraoral minor salivary gland tumours for the past 16 years from 1993 to 2008. Information about age and gender of the patient, as well as the tumour location and treatment modalities were obtained from these files. Microscopic slides of all cases were reviewed and where necessary sections were recut and stained routinely with haematoxylin and eosin. Special stains such as periodic acid-schiff and mucicarmine were also performed. All tumours were classified according to the World Health Organization's Histological Typing of salivary gland tumours (1992). Data were entered in the computer and analysed by SPSS. Statistical analysis was performed by student's t-test, and the difference were considered at 0.05 significance level.

RESULTS

A total of 33 cases of intraoral minor salivary glands tumours were retrieved from files of the department of Oral Surgery and Oral Pathology Muhimbili National Hospital.(from 1993 to 2008) Out of these 13 cases were benign and 20 cases were malignant. The male to female ratio for benign and malignant tumours were 1:1.7 and 1:1.5 respectively. The age of those affected ranged from 16-78 years for benign and 17-76 years for malignant neoplasms. Females were more affected in both benign and malignant tumours compared to males. The mean ages of the patients for benign, malignant and all tumours by sex are summarized in Table I.

The benign tumours showed a slight predilection for older patients than the malignant tumours but the differences were not statistically significant ($P = 0.632$). However the mean age of occurrence of intra-oral minor salivary gland tumours in female patients was higher than that of male patients and the differences were statistically significant ($P = 0.003$). Majority of the minor intra-oral salivary gland tumours were found to occur in the 2nd, 5th and 7th decades. [Table II].

Table-I. Summary of intraoral minor salivary gland tumours

Tumour type	M. F. Ratio	Age Range	Mean age ±SD (years)		
			Total	Male (n=14)	Female (n=19)
All tumours (n=33)	1:1.36	16 - 78	47.76±20.32	36.86±18.84	55±18.21
Benign (n=13)	1:1.17	16 - 78	49.46±24.28	30.0±17.03	66±15.30
Malignant (n=20)	1:1.15	17 - 76	46.15±17.85	42.0±19.18	48.92±17.19

Table-II. Age and sex distribution of intraoral minor salivary gland tumours

Age group (yrs)	All tumours	Benign tumours		Malignant tumours	
		Male	Female	Male	Female
40-186	3	1	-	1	1
40-69	6	3	-	2	1
20-29	3	-	1	1	1
30-39	3	-	-	2	1
40-49	5	1	-	-	4
50-59	6	1	1	1	3
60 +	7	-	5	1	1
Total	33	6	7	8	12

The peak incidence for the patients with benign tumours was in the 7th decade and that of the malignant tumours was in the 5th decade. The females were slightly more affected in both benign and malignant tumours compared to males [table-II].

Among the minor salivary gland tumours, the palate was the most frequent location (51.5%) followed by cheek (21.2%), floor of the mouth (18.2%), upper lip (6.1%) and tongue (3%). Pleomorphic adenoma was the most frequent tumour located on the palate (52.9%) followed by adenocarcinoma (29.4%), adenocystic carcinoma (11.8%) and mucoepidermoid carcinoma (5.9%). The Majority of malignant tumours were located on the palate (38%), Cheek (23.8%) floor of the mouth (19%), Tongue (9.5%) and upper lip (9.5%) and included adenocarcinoma, adenoidcystic carcinoma and mucoepidermoid carcinoma. Monomorphic adenoma

was located mainly on the cheek (Table III).

Due to the fact that the majority of these tumours were malignant, they were mostly treated by wide excision followed by adjuvant chemoradiation therapy. For pleomorphic adenoma affecting the palate, excision with 1 cm clinical margins at its periphery and including the overlying epithelium and periosteum was carried out. As for pleomorphic adenomas in other mucosal site, peripheral excision with 1 cm margin was done. With regard to monomorphic adenomas, conservative surgical excision including a rim or margin of normal uninvolved tissue was done (Table IV).

DISCUSSION

The current study reviewed 33 cases of intraoral minor salivary gland tumours and showed predominance of malignant over benign tumours, results which differed

Table-III. Histological type and location of minor salivary gland tumours

Histological type	Location					
	Palate	Buccal	Tongue	Floor of the mouth	Upper lip	Total
Pleomorphic adenoma	9	1	-	2	-	12
Monomorphic adenoma	-	1	-	-	-	1
Adenocarcinoma	5	3	1	1	2	12
Adenocystic carcinoma	2	2	-	1	-	5
Mucoepidermoid carcinoma	1	-	-	2	-	3
Total	17	7	1	6	2	33

Table-IV. Histological diagnosis in relation to treatment

Histological diagnosis	Treatment
Pleomorphic adenoma [12]	Excision with 1-cm clinical margin at its periphery including epithelium and periosteum
Monomorphic adenoma [1]	Conservative local excision including margin of normal uninvolved tissues
Adenocarcinoma [12]	Wide excision and adjuvant radiotherapy
Adenocystic carcinoma [5]	Wide excision and adjuvant radiotherapy
Mucoepidermoid carcinoma [3]	Wide excision and adjuvant radiotherapy

from what have been reported in the previous series^{1,14,15}. It is important to consider that the present study had a higher percentage of malignant tumours and was conducted in a hospital that is a referral centre for cancer patient evaluation and treatment. These studies^{1,14,15} including the current one are from special institutions, such as major cancer-referring centre. Therefore, the relative incidence of benign versus malignant tumours reflects character of each institution. On the other hand, the higher percentage of intraoral malignant minor salivary gland tumours may result from the “harvesting effect” with majority of our referrals from surgeons who treat the benign minor salivary gland tumours and refer the malignant minor salivary gland tumours to our centre.

Most studies have shown that minor salivary gland tumours are more common in females than males¹⁵. The tendency for female predominance has been reported to be especially marked in benign tumours^{17,18} with male to female ratio ranging from 1:1.8¹⁹ to 1:2.4¹⁷. A high proportion of female was also found in the present study with ratio of 1:1.17 and 1:1.5 for benign and malignant tumours respectively. As this study was conducted on black population, the findings tends to confirm studies done in South Africa² that there is a major prevalence of minor salivary gland tumours in females over males in black patients.

In our study, the benign tumours showed a slight predilection for older patients than the malignant tumours but the difference was not statistically significant. However the mean age of occurrence of intraoral minor salivary gland tumours in female patients was higher than that of male patents and the difference was statistically significant. On the other hand, a study done by Waldrom et al²⁰, revealed that the patients with benign tumours were 5 years younger than those with malignant tumours although there was no statistically significant difference. These findings suggest a possible wide variation in the presentation of intra-oral minor salivary gland tumours in different populations.

The palate was the most common site for minor salivary gland tumours(51%).Moreover, the percentage of the

palatal cases was higher in benign tumours than in the malignant tumours. A number of studies have also reported that the palate was the most common site for minor salivary gland tumours^{1,8,17}.

Studies^{1,14,15,17} have shown pleomorphic adenomas to be the most common minor salivary gland tumours with the incidence ranging from 33%⁹ to 70%⁴ of all tumours. In the present study, a higher prevalence (36.4%) of this tumour was encountered. The prevalence recorded by this study is only of those tackled by our hospital and not necessarily the occurrence in the population at large. However, the figures certainly give an idea of their frequency of occurrence.

Adenocarcinoma was the second most frequent tumour located on the palate and the commonest malignant tumour encountered in the minor intra-oral salivary glands. These findings indicated that the palate was the most preferred site for this tumour; followed by buccal mucosa and upper lip and is comparable to what has been reported by Everson et al. and Spiro¹³. The tumour was exclusively found in minor salivary glands. Due to the fact that the tumour typically presents as a slow-growing palatal mass with intact surface, such a behaviour most consistently mimics a pleomorphic adenoma. When the site of affection is upper lip; adenoidcystic carcinoma, low-grade mucoepidermoid carcinoma, or canalicular adenoma should be considered. Adenoidcystic carcinoma was the third frequent minor salivary gland tumour which was located on the palate and also the most frequent malignant tumour of the intra-oral minor salivary glands. However, apart from being located in the palate, adenoidcystic carcinoma was also found in other intra-oral minor salivary glands but in low frequency.

Studies have reported that the most common malignant minor salivary gland tumour is adenoidcystic carcinoma^{14,18} and mucoepidermoid carcinoma^{1,4,14}. Our findings were different from these previous studies as adenocarcinoma was the commonest malignant tumour of minor salivary glands followed by adenoidcystic carcinoma and mucoepidermoid carcinoma. There have been reports suggesting a difference in the pattern of

occurrence of malignant salivary gland tumours in Americans, Europeans, Asians and Africans^{10,11}. Therefore, the pattern of occurrence of malignant minor salivary gland tumours shown by the present study underscores a different pattern of occurrence of minor salivary tumours among different ethnic groups. Regarding monomorphic adenomas only one case was located on the cheek. Monomorphic adenomas represent 20% of benign minor salivary glands^{10,11}. Some of them arise from major salivary glands especially the parotid gland (myoepithelioma and basal cell adenoma). Because the monomorphic adenoma of the present case arose from intraoral minor salivary glands.

The treatment of choice for minor salivary gland neoplasms is surgery. Surgical approach to these tumours depends on the site and histology of the tumour. Neck dissections are recommended for clinically positive necks and in those with high-grade tumours. Similarly radiation is used as adjuvant therapy in high grade tumours²¹. In our study benign and low-grade malignant tumours of the palatal mucosa such as pleomorphic adenomas and low-grade mucoepidermoid carcinoma and adenocarcinomas were treated by a soft tissue excision with documented margins. They were excised with a 1-cm margin of clinically uninvolved tissues around its periphery to and including the palatal periosteum. The fact that the periosteum serves as an effective anatomic barrier, the palatal bone does not require excision even if a "cupped out" pressure resorption has taken place. Wide excision in the form of partial or hemimaxillectomy was carried out in the treatment of malignant tumours of the palatal mucosa such as intermediate and high grade adenoidcystic carcinoma. Radiotherapy was added as an adjuvant for high grade lesions. Also chemotherapy could be used as an adjuvant. In our setup radiation was used because most patients cannot afford cost of chemotherapy and in some cases inavailability of drugs could be the case. Monomorphic adenoma was treated by conservative local excision of the soft tissue including margin of normal uninvolved tissues.

CONCLUSIONS

Our study concluded that the palate was the common site

for intraoral minor salivary gland tumours and that the percentage of the palatal cases were higher in benign than in malignant tumours. The mean age of occurrence of minor intraoral salivary gland tumours was higher in female patients than that of male patients.

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