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The incidence of malignancy in neoplasms of the submandibular salivary gland

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Summary

Objective. To test the validity of the reported high incidence (50%) of malignancy in neoplasms of the submandibular salivary gland, and to compare it with that of the parotid gland.

Methods. This is a retrospective analysis of major salivary gland neoplasms in 127 patients who were treated between August 1988 and December 2004 (15½ years) at Kalafong Hospital, Pretoria.

Results. All but 1 of the patients were black. There were 100 benign and 27 malignant tumours. Thirty tumours were in the submandibular gland, including 3 malignant tumours, i.e. 10%. Of 97 parotid gland tumours, 24 (24.7%) were malignant.

Conclusion. The 10% incidence of malignancy in neoplasms of the submandibular gland in our series is much lower than the 50% reported in the literature. We postulate that race (black ethnicity) is probably a factor in this low incidence.

Approximately 3 - 6% of head and neck neoplasms occur in the major and minor salivary glands.[1] The majority of these neoplasms arise in the parotid gland (70 - 80%), whereas 10 - 15% are found in the submandibular gland and 5 - 10% in the sublingual and minor salivary glands.[2,3]

It is generally believed that there is a 50% incidence of malignancy in neoplasms of the submandibular salivary gland,[1-6] which is substantially higher than the 20 - 25% quoted for the parotid gland.[1-7]

We suspected that malignant tumours of the submandibular gland would be rare in our black patient population. A retrospective analysis was therefore conducted to ascertain the incidence of malignancy in neoplasms of the submandibular gland, and to compare it with that of the parotid gland.

Patients and methods

All patients presenting with major salivary gland neoplasms over a 15½-year period (August 1988 - December 2004) were included in the study. Patient data were extracted from the computerised database of the Department of Surgery, Kalafong Hospital. Final histological diagnoses of submandibular and parotid gland tumours were correlated with histopathological reports of resected specimens, or the occasional biopsy of locally advanced cancers. Neoplasms were classified into benign or malignant tumours, including various subtypes of each. The World Health Organization's histological classification of salivary gland tumours was used.[8]

Results

A total of 127 patients fitted the inclusion criteria for analysis, of which 126 were black patients. Only 1 patient was white, a female with cancer of the parotid gland. There were 100 benign and 27 malignant tumours in 55 male and 72 female patients, aged 16 - 86 years (mean 44.8) (Table I). Thirty tumours were in the submandibular salivary gland, including 3 malignant tumours (10%): 2 adenoid cystic carcinomas and 1 squamous cell carcinoma. The 27 benign tumours (90%) were all pleomorphic adenomas. Of 97 parotid gland tumours, 24 (24.7%) were malignant and 73 (75.3%) benign (Table II). Two patients in this group presented with locally recurrent tumours: 1 with carcinoma and 1 with pleomorphic adenoma.

TABLE I. GENDER AND AGE OF PATIENTS

	Male	Female	Mean age (yrs)(range)
Total cases	**55**	**72**	**44.8 (16 - 86)**
Submandibular tumour cases			
Malignant	**2**	**1**	**43.4 (30 - 55)**
Benign	**11**	**16**	**39.9 (16 - 78)**
Parotid tumour cases			
Malignant	**14**	**10**	**54.3 (20 - 86)**
Benign	**28**	**45**	**43.5 (15 - 81)**

Discussion

Our finding of a 10% incidence of malignancy in neoplasms of the submandibular salivary gland in black patients is at variance with the high incidence of 50% reported in the Western literature.[1-6] The reasons for this low incidence is not

TABLE II. DISTRIBUTION AND TYPE OF SALIVARY GLAND TUMOURS

	Parotid gland	Submandibular gland
Malignant tumours		
Mucoepidermoid carcinoma	**11**	
Adenoid cystic carcinoma	**3**	**2**
Acinic cell carcinoma	**4**	
Malignant pleomorphic tumour	**1**	
Epithelial-myoepithelial carcinoma	**1**	
Squamous cell carcinoma	**1**	**1**
Adenocarcinoma	**1**	
Carcinoma, undifferentiated	**1**	
Lymphoma	**1**	
Subtotal	**24 (24.7%)**	**3 (10%)**
Benign tumours		
Pleomorphic adenoma	**66**	**27**
Warthin's tumour	**3**	
Monomorphic adenoma	**2**	
Cystadenoma	**1**	
Myoepithelioma	**1**	
Subtotal	**73 (75.3%)**	**27 (90%)**
Total	**97**	**30**

clear. Race or referral patterns may play a role, and our series might have been too small to be representative.

However, submandibular gland neoplasms are uncommon, as reflected by the 31 cases reported by Theron and Middlecote.[9] This series of 217 cases of salivary gland neoplasms was larger than ours, although they included 48 minor salivary gland tumours. Six of the 31 submandibular tumours were malignant, i.e. 19.4%, which is also much lower than the reported incidence. These 6 cancers included 2 mucoepidermoid carcinomas and 4 carcinomas of unspecified nature, while the 25 benign tumours consisted of 23 pleomorphic and 2 monomorphic adenomas.

The Bloemfontein series consisted of 124 black and 93 white patients.[9] Although the authors addressed the racial distribution of certain specific tumours, they did not give a racial breakdown of their 31 submandibular tumours. We suspect that the major portion of these would have occurred in blacks (B. D. Middlecote – personal communication, 2006). In Western literature quoted in this paper the race of patients is not mentioned.[1-6] We therefore assume that the vast majority of patients in these reports were white.

Possible referral bias of potentially malignant cases to a cancer hospital, viz. Memorial Sloan Kettering Cancer Center (MSKCC), may play a role in the high incidence of malignancy reported for the submandibular gland.[1,3] This factor does not seem to be applicable to the parotid gland, however, as the 25% incidence of malignancy reported by MSKCC[1,3] corresponds to ours (24.7%), and that of other general hospitals.[2,7,9]

To conclude, the 10% incidence of malignancy in neoplasms of the submandibular salivary gland in our series is much lower than that reported elsewhere. The 19.4% incidence in the Bloemfontein series supports this figure. We postulate that race (black ethnicity) is probably a factor in this low incidence of malignancy in the submandibular gland.

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