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Salivary gland tumours in a northern Chinese population: a 50-year retrospective study of 7190 cases

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Abstract. The aims of this study were to investigate the epidemiological and clinical characteristics of epithelial salivary gland tumours in a northern Chinese population and to evaluate the current TNM classification system. A demographic and descriptive analysis of 7190 epithelial salivary gland tumours was performed. There were 4654 benign tumours and 2536 malignant tumours. The percentage of tumours located in the parotid, submandibular, sublingual, and minor salivary glands was 62.66%, 9.92%, 2.57%, and 24.85%, respectively; 22.26%, 35.76%, 92.97%, and 61.89% of the tumours, respectively, were malignant. Over 90% in the tongue and maxillary sinus were malignant. Warthin tumour, salivary duct carcinoma, and squamous cell carcinoma were predominant in males, while basal cell adenoma, myoepithelioma, and pleomorphic adenoma were predominant in females. Further, 2.55% of the tumours were in children and adolescents: 44.81% of the tumours were malignant, as opposed to 35.02% in adults. According to the 7th TNM classification, the percentages of T3 and stage III tumours were approximately 10%. Salivary gland tumours show distribution patterns according to histological type, location, and patient age and sex. The limitations of the current TNM classification of salivary gland carcinoma should be considered and revisions made.

Key words: salivary gland; tumour; histological type; TNM classification; epidemiology.

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Salivary glands are widely distributed in the oral and maxillofacial region and include the three paired major salivary glands and 600–1000 minor salivary glands located in the lip, buccal region, palate, tongue, retromolar area, paranasal sinus, etc.[1,2] They are associated with a highly heterogeneous group of tumours that show great diversity in the morphological features of their cells and tissues[1].

The global annual incidence of salivary gland tumours is 0.4–13.5 cases per 100,000 individuals.[1] Further, the frequency of malignant salivary gland neoplasms ranges from 0.9 to 2.6 cases per 100,000 individuals.[3–6] According to data from the seven main dental schools in China, salivary gland tumours account

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for one-third of all oral and maxillofacial tumours.[7] It has been reported that of the 69,902 cases of oral and maxillofacial tumours registered at these seven schools, 23,010 were cases of epithelial salivary gland tumour, accounting for 32.92% of all oral and maxillofacial tumours.[7]

The World Health Organization (WHO) histological typing of salivary gland tumours of 2005 identifies 10 subtypes of benign epithelial salivary gland tumour and 24 subtypes of malignant tumour.[8] The usual tumour of the salivary gland is a tumour in which the benign variant is less benign than a usual benign tumour, and the malignant variant is less malignant than a usual malignant tumour.[9] Benign salivary gland tumours, in particular pleomorphic adenomas, are prone to recurrence and malignant transformation. In patients with malignant salivary gland tumours such as adenoid cystic carcinoma, despite recurrence and distant metastasis, the survival rate is quite good.[10] Nonetheless, more data are needed to clarify the clinicopathological features of this specific group of tumours.

The histopathological findings are sufficient for the diagnosis and treatment of benign epithelial salivary gland tumours. However, for malignant tumours, apart from histopathological examination, the extent of tumour spread is an important index. The TNM classification of malignant tumours is based on the primary tumour size, local tumour invasion, lymph node metastasis, and distant metastasis. It is the most widely used system for describing and classifying the anatomical extent of cancer spread. However, there are some limitations to the current T classification of primary salivary gland tumours. For example, the number and proportion of tumours classified in the T3 subgroup are low, often accounting for less than one-tenth of the whole group of T classes (T1, T2, T3, and T4).[11,12] It is therefore possible that this group of tumours is underestimated with the current T classification system.

The authors' institution is one of the largest research centres on salivary gland diseases in China and has gathered data on 7190 cases of salivary gland tumours over the last 50 years, from 1963 to 2012. The aims of this study were to investigate the epidemiological and clinical characteristics of epithelial salivary gland tumours in a northern Chinese population and to evaluate the validity of the current TNM classification of salivary gland carcinoma. This is the first such study in this population, which makes the findings highly valuable in this field of study.

Materials and methods

Research participants

This study included patients admitted and treated at a stomatology institute between January 1963 and December 2012, who were diagnosed with an epithelial salivary gland tumour.

Research methods

All of the medical information relating to the patients, including sex, age, location of the tumour, pathological findings, and extent of the tumour, was collected and analyzed using SPSS version 13.0 software (SPSS Inc., Chicago, IL, USA).

With regard to malignant tumours, the clinical staging was carried out according to the 2010 criteria of the International Union Against Cancer (UICC).[13] The criteria for staging of squamous cell carcinoma (SCC) were used for the clinical staging of the minor salivary gland tumours.[13]

Results

Distribution of tumours according to histological type

A total of 7190 patients underwent surgical treatment over the 50-year period at the stomatology institute. Among these patients, 4654 (64.73%) had benign epithelial salivary gland tumours and 2536 (35.27%) had malignant tumours.

This case series encompassed almost all of the WHO histological types of epithelial salivary gland tumour, except for sebaceous lymphadenocarcinoma and metastasizing pleomorphic adenoma. In this study, pleomorphic adenoma was the most common salivary gland tumour. There were 3062 cases of pleomorphic adenoma, accounting for 42.59% (3062/7190) of all epithelial salivary gland tumours and 65.79% (3062/4654) of benign salivary gland tumours. There were 751 cases of mucoepidermoid carcinoma, accounting for 10.45% (751/7190) of epithelial salivary gland tumours and 29.61% (751/2536) of malignant salivary gland tumours. This was the most common malignant epithelial salivary gland tumour. The most common epithelial salivary gland tumours were pleomorphic adenoma, Warthin tumour, mucoepidermoid carcinoma, adenoid cystic carcinoma, and basal cell adenoma, in descending order of their incidence. The data are presented in detail in Tables 1 and 2.

Table 1. Location and histopathological type of benign epithelial salivary gland tumours.

	Major salivary gland			Minor salivary gland							Total (%)
	Parotid	Submandibular	Sublingual	Palate	Buccal	Tongue	Lip	Retromolar	Maxillary sinus	Nose	
Pleomorphic adenoma	2044	438	8	431	49	6	30	51	2	3	3062 (65.79)
Warthin tumour	930	4	0	1	1	0	0	1	0	0	937 (20.13)
Basal cell adenoma	326	5	2	3	4	0	0	1	0	0	341 (7.33)
Myoepithelioma	118	9	1	47	2	0	3	1	3	0	184 (3.95)
Cystadenoma	46	1	1	22	4	1	6	3	0	0	84 (1.80)
Oncocytoma	32	1	1	1	0	0	0	1	0	0	36 (0.77)
Canalicular adenoma	3	0	0	0	1	0	2	0	0	0	6 (0.13)
Ductal papilloma	1	0	0	1	0	0	0	0	0	0	2 (0.04)
Sebaceous adenoma	1	0	0	0	0	0	0	0	0	0	1 (0.02)
Lymphadenoma	1	0	0	0	0	0	0	0	0	0	1 (0.02)
Total (*n*), (%)	3502 (75.25)	458 (9.84)	13 (0.28)	506 (10.87)	61 (1.31)	7 (0.15)	41 (0.88)	58 (1.25)	5 (0.11)	3 (0.06)	4654 (100)

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