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Cervical metastasis of maxillary squamous cell carcinoma

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Abstract. A retrospective study of maxillary squamous cell carcinoma (SCC) patients attending a department of oral and maxillofacial surgery was performed for the period 2000–2010. The clinical information of 100 cases treated during this period was acquired and analyzed. Patient survival was calculated using the Kaplan–Meier method. For these 100 cases, the total metastatic rate was 34.0% and occult metastatic rate was 27.5%. Positive lymph nodes were mostly detected at levels I–III. There was no significant difference in metastatic rate between the primary sites of maxillary gingiva and hard palate. Tumours involving the gingival–buccal sulcus presented a significantly higher risk of metastasis. Advanced stage (T3/4) was significantly correlated with a higher metastasis rate. The pathological grade also showed a significant relationship with metastasis. Twenty-four patients presented regional recurrence. Elective neck dissection could significantly reduce the recurrence rate. The overall 3-year and 5-year survival rates were 66.3% and 56.7%, respectively. Both the T and the N stages had a significant impact on survival rates. Selective neck dissection from level I to III is recommended for T3/4 stage cN0 patients, especially those with gingival–buccal sulcus involvement.

Keywords: squamous cell carcinoma; maxillary gingiva; hard palate; cervical metastasis; elective neck dissection.

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Squamous cell carcinoma (SCC) is the most common malignant tumour of the oral cavity, accounting for more than 80% of all oral cancers. Cervical metastasis is one of the well-known behaviours of oral SCC, and it may have a distinct influence on the prognosis and clinical outcome for the patient. It is well documented that oral SCCs of the tongue, floor of the mouth, and mandibular gingiva have a strong tendency for cervical metastasis. Elective neck dissection (END) is already well accepted in these patients.[1,2] However, the management of the cN0 neck patient with hard palate, maxillary alveolar, or gingival SCC remains on a 'watch and wait' basis due to the low metastatic rate. Only recently have studies focused on the cervical metastasis of maxillary SCC.[3–9] However, prospective and evidence-based studies are still lacking and the treatment of the clinical negative neck remains controversial.

The aim of this retrospective study was to determine the incidence of cervical metastasis of SCC of the maxilla and to define the risk factors and outcome of cervical metastasis. We also sought to propose recommendations in relation to the treatment strategy for the clinically negative neck.

Patients and methods

A series of cases of SCC originating from the hard palate and maxillary alveolus or gingiva, treated in the department of oral and maxillofacial surgery of the university hospital between 2000 and 2010, were reviewed. Clinical information including the primary site of the tumours, TNM staging, pathological staging, and type of neck dissections, as well as other demographic and clinical data, were retrieved from the electronic medical record system (EMRS) of the hospital. A total of 137 patients fulfilled the inclusion criteria, which were the following:

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(1) pathologically confirmed primary SCC of the hard palate and maxillary alveolus or gingiva; (2) primary treatment comprising surgery only. Exclusion criteria were the following: (1) SCC originating from the nasal cavity or paranasal sinus; (2) primary tumour invading the soft palate, oropharynx, or retromolar area; (3) adjunctive radiotherapy given after surgery.

All patients were staged according to the Union for International Cancer Control (UICC) TNM classification based on a complete clinical examination of the head and neck as well as computed tomography (CT) or magnetic resonance imaging (MRI) scan. In all cases, the primary tumour sites were treated with radical resection aimed at 1.5-cm margins. The margins were confirmed intraoperatively by frozen section. For patients with clinically positive lymph nodes (cN+), a radical or modified radical neck dissection was performed at the same time. However, there was no standard protocol for the negative neck (cN0). In most of the early cases, a 'watch and wait' approach was applied. END was carried out in some of the more recent cases. Patients were followed up every 3 months in the first 2 years, then every 6 months until the fifth year, and then annually after 5 years. Local recurrence and regional failure were determined by clinical as well as radiographic examinations, and histopathology if necessary. Salvage surgery was performed if delayed metastasis or regional failure was confirmed. Radiotherapy was recommended to patients with a pN+ neck after neck dissection.

The data collection and statistical analysis were performed using SPSS version 17.0 software (SPSS Inc., Chicago, IL, USA). The χ^2 test or Fisher's exact test was used to determine the incidence of metastasis and correlated factors. Multivariate analysis by logistic regression was also performed. A Kaplan–Meier plot was used to determine the overall survival rate, and a log-rank test was performed to evaluate any statistical significance ($P < 0.05$).

Results

One hundred and thirty-seven patients were included in this study; 59 were male and 78 were female. The median age of patients at the time of diagnosis was 70.1 years (range 44–99 years). Detailed clinical information was available for only 100 of these 137 patients. The follow-up rate was 73.0%. We were unable to make contact with the remaining 37 patients after the primary surgery and were therefore not able to define the exact N stage or the survival rate of these cases; thus they were excluded from the study. The follow-up period ranged from 2 to 140 months and the mean was 45.8 ± 34.2 months.

Of the 100 patients included, nine were diagnosed as cN+ and this was confirmed by histopathological examination after radical neck dissection. The other 91 patients were considered as cN0 cases based on the clinical or radiographic examinations. END was not performed routinely for these cN0 cases and only 34 underwent a selective neck dissection from level I to III. Positive lymph nodes were detected in seven cases. The other 57 patients underwent routine observation and 18 presented with delayed metastasis. There were palpable lymph nodes in the necks of these 18 patients, and lymph nodes larger than 10 mm with suspected liquefaction were examined with CT/MRI scans. Metastasis was confirmed histopathologically, and salvage neck dissections were performed in all of these cases. Hence the overall rate of metastasis was 34.0% (34/100), while the rate of occult metastasis was 27.5% (25/91) (Fig. 1).

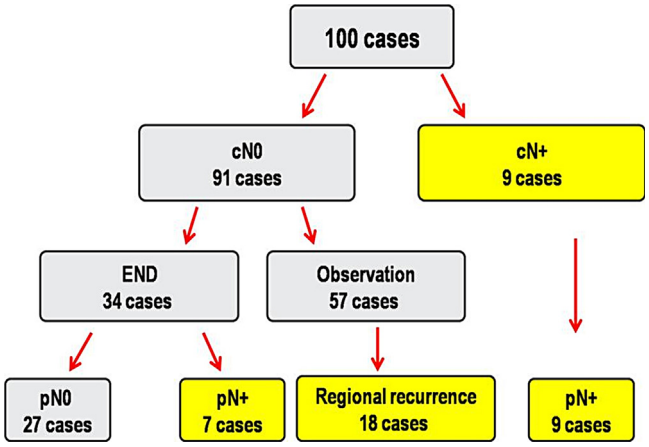

Fig. 1. Flowchart of the case series for cervical metastasis and occult metastasis. The flowchart presents the treatment strategy and outcome for the series of 100 patients and indicates the cervical metastasis and occult metastasis rates of maxillary SCC.

Table 1. Primary site, T stage, N stage, and pathological characteristics of maxillary squamous cell carcinoma patients.

	Total	N stage				N+%	*P*-value
		N0	N1	N2	N3		
T stage							
T1/2	51	44	3	4	0	13.7	0.002
T3/4	49	29	9	11	0	40.8	
Primary site							
Palate	30	22	5	3	0	26.7	0.454
Gingiva	70	46	8	16	0	34.3	
Gingival–buccal sulcus							
Involved	20	6	4	10	0	70.0	<0.01
Not involved	80	62	9	9	0	22.5	
Pathological grade							
I	55	47	4	4	0	14.5	<0.01
II	38	19	6	13	0	50.0	
III	7	2	3	2	0	71.4	

A summary of the details of these 100 cases is presented in Table 1. There was no significant difference in the rate of metastasis according to the primary site ($P = 0.454$), although SCC of the maxillary gingiva showed a higher risk (34.3%) when compared to that of the hard palate (26.7%). Of note, when the tumour involved the gingival–buccal sulcus, the cervical metastasis rate increased to 70.0%, which was significantly different from those without sulcus involvement ($P < 0.01$). Histopathologically, positive lymph nodes were mostly detected at level I (70.5%), followed by levels II (56.8%) and III (13.6%); only 4.5% were found at level IV and none at level V. The rate of metastasis of advanced stage