

SQUAMOUS CELL CARCINOMA OF THE MOBILE TONGUE: AN EMERGING EPIDEMIOLOGICAL PROFILE BEYOND CLASSICAL RISK FACTORS IN A SERIES OF 30 CASES.

Abstract:

Background: Squamous cell carcinoma of the mobile tongue has traditionally been associated with tobacco and alcohol exposure. However, the occurrence of tumors in patients without these classic risk factors, particularly women who neither smoke nor drink alcohol, raises the possibility of additional associated factors.

Objective: To describe the epidemiological and clinical profile of squamous cell carcinoma of the mobile tongue in a recent series and to assess the frequency of non-traditional associated factors, particularly chronic dental-related mechanical irritation.

Patients and methods: This was a single-center retrospective study of 30 patients with histologically confirmed squamous cell carcinoma of the mobile tongue treated over a four-year period. Tumors of the base of tongue and oropharyngeal sites were excluded. Demographic characteristics, tobacco and alcohol exposure, chronic mechanical irritation, its dental origin, and anatomical concordance with the tumor were recorded.

Results: The series included 18 men (60%) and 12 women (40%), with a mean age of 64.1 years. Smoking was reported in 17 patients (56.7%) and alcohol consumption in 11 (36.7%). Thirteen patients (43.3%) neither smoked nor consumed alcohol. Chronic mechanical irritation was identified in 15 patients (50%), with anatomical concordance between the irritated area and the tumor in 14 (46.7%). Among women, 11/12 (91.7%) were non-smokers, 11/12 (91.7%) did not consume alcohol, and 10/12 (83.3%) had chronic mechanical irritation.

Conclusion: This series demonstrates a heterogeneous epidemiological profile of mobile-tongue squamous cell carcinoma, with a substantial proportion of patients lacking the classic alcohol- and tobacco-related exposures, particularly among women. The high frequency of chronic dental-related mechanical irritation is a noteworthy finding that warrants evaluation in larger cohorts.

Keywords: squamous cell carcinoma; mobile tongue; epidemiology; women; non-smoker; alcohol; chronic trauma; mechanical irritation.

Introduction

Squamous cell carcinoma is the predominant histological malignancy of the oral cavity. The mobile tongue is one of its main sites of origin and is particularly exposed to chronic mechanical insults.

The traditionally recognized risk factors are tobacco and alcohol consumption, although oral squamous cell carcinoma can also occur in patients without these exposures. Recent literature describes a subgroup of oral squamous cell carcinomas occurring outside conventional exposure patterns, with frequent tongue involvement and a higher proportion of women [1,2,5,6]. The major established risk factors for oral cavity squamous cell carcinoma and their underlying mechanisms have been extensively reviewed [7].

Tobacco and alcohol exposure may also act synergistically in oral squamous cell carcinogenesis [8]. In this context, chronic mechanical trauma and irritation of the oral mucosa have been proposed as potential co-factors in carcinogenesis. Fractured teeth, irregular dental restorations, ill-fitting prostheses, or traumatic dental surfaces may produce repeated microtrauma, particularly along the lateral border of the tongue.

The evidence remains controversial. A meta-analysis found a significant association between chronic mechanical irritation and oral squamous cell carcinoma, suggesting a possible co-factor rather than an independent risk factor [3]. Conversely, a systematic review concluded that the available evidence is insufficient to establish a causal role for chronic mechanical trauma in oral carcinogenesis [4].

In our clinical practice, we observed a particular profile of patients with mobile-tongue squamous cell carcinoma: women without alcohol or tobacco exposure and frequent local dental-related mechanical irritation. The aim of this study was therefore to describe the epidemiological profile of our series and to report the frequency of local mechanical factors.

Patients and methods

This was a single-center retrospective study of 30 patients with histologically confirmed squamous cell carcinoma of the mobile tongue treated over a four-year period.

Patients with histologically confirmed squamous cell carcinoma located in the mobile tongue, corresponding to the anterior two-thirds, were included. Tumors of the base of tongue and oropharyngeal sites were excluded.

Demographic data included age and sex. The classical risk factors assessed were tobacco smoking and alcohol consumption.

A specific assessment of chronic mechanical irritation or trauma was performed. Dental origin was considered when a traumatic crown or prosthesis, a fractured or severely damaged tooth, or an irregular or sharp dental edge was present. Anatomical concordance between the traumatic area and tumor location was recorded when clearly identifiable.

Tumor characteristics included location, side, clinical size, and cervical lymphadenopathy. Histopathological data included confirmation of squamous cell carcinoma and degree of differentiation. CT and MRI performed as part of staging were not subjected to detailed radiological analysis.

The analysis was primarily descriptive. Qualitative variables were reported as counts and percentages and quantitative variables as means. Given the limited sample size, subgroup comparisons were interpreted cautiously.

Results

The series included 30 patients, 18 men (60%) and 12 women (40%). The mean age was 64.1 years. Smoking was reported in 17 patients (56.7%) and alcohol consumption in 11 (36.7%). Thirteen patients (43.3%) neither smoked nor consumed alcohol.

76 **Table 1. Epidemiological characteristics and local factors**

Variable	Overall (n=30)	Women (n=12)	Men (n=18)
Age, mean $\pm$ SD	64.1 $\pm$ 11.2 years	—	—
Age, median [range]	67.5 [36–81] years	—	—
Smoking	17/30 (56.7%)	1/12 (8.3%)	16/18 (88.9%)
Alcohol consumption	11/30 (36.7%)	1/12 (8.3%)	10/18 (55.6%)
Neither smoking nor alcohol	13/30 (43.3%)	11/12 (91.7%)	2/18 (11.1%)
Chronic irritation / trauma	15/30 (50.0%)	10/12 (83.3%)	5/18 (27.8%)
Traumatic crown / prosthesis	10/30 (33.3%)	7/12 (58.3%)	3/18 (16.7%)
Fractured / severely damaged tooth	9/30 (30.0%)	—	—
Traumatic dental edge	12/30 (40.0%)	—	—
Trauma–tumor concordance	14/30 (46.7%)	9/12 (75.0%)	5/18 (27.8%)

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78 Chronic mechanical irritation was identified in 15 patients (50%). A dental origin was identified in these
79 cases. A traumatic crown or prosthesis was found in 10 patients (33.3%), a fractured or severely damaged
80 tooth in 9 (30%), and a traumatic dental edge in 12 (40%). Anatomical concordance between the irritated area
81 and tumor location was observed in 14 patients (46.7%).

82 Among the 12 women, 11 (91.7%) were non-smokers, 11 (91.7%) did not consume alcohol, and 10 (83.3%)
83 had chronic mechanical irritation. A traumatic crown or prosthesis was identified in 7 women (58.3%), and
84 anatomical concordance between the traumatic area and tumor was observed in 9 (75%).

85 All 30 tumors initially arose from the free border of the mobile tongue. Two patients (6.7%) had extension
86 toward the tip of the tongue and five (16.7%) had extension toward the floor of the mouth.

87 **Table 2. Tumor characteristics, stage, and histological grade**

Variable	Result
Clinical size, mean	2.22 cm
Clinical size, median [range]	2.0 [1–3] cm
Clinical cervical lymphadenopathy	11/30 (36.7%)
Extension toward the tip	2/30 (6.7%)
Extension toward the floor of the mouth	5/30 (16.7%)
T1N0M0	5/30 (16.7%)
T2N0M0	10/30 (33.3%)
T2N1M0	3/30 (10.0%)
T3N0M0	2/30 (6.7%)
T3N1M0	6/30 (20.0%)
T3N2M0	1/30 (3.3%)
T4N1M0	2/30 (6.7%)
TNM to be verified	1/30 (3.3%)

Well differentiated	16/30 (53.3%)
Moderately differentiated	11/30 (36.7%)
Poorly differentiated	3/30 (10.0%)

Discussion

The main finding of this series is the substantial proportion of patients without the classic alcohol- and tobacco-related risk factors. In our population, 43.3% of patients neither smoked nor consumed alcohol. This feature was particularly marked among women, 91.7% of whom had neither tobacco nor alcohol exposure.

This observation aligns with the growing body of literature on oral squamous cell carcinomas occurring outside conventional exposure patterns. Recent studies describe a subgroup without traditional toxic exposures, with frequent tongue involvement and a higher proportion of women [1,2].

The second notable finding was the high frequency of chronic mechanical irritation. This was identified in half of the patients, and anatomical concordance between the traumatic area and the tumor was observed in 46.7% of cases.

A meta-analysis reported an association between chronic mechanical irritation and oral squamous cell carcinoma, with an overall relative risk of 2.56. However, the authors suggested that this association may represent a co-factor rather than an independent risk factor [3].

This hypothesis should nevertheless be interpreted cautiously. A systematic review concluded that the available evidence was insufficient to establish a causal relationship between chronic mechanical trauma and oral carcinogenesis [4].

Our findings therefore do not allow us to conclude that fractured dental crowns, damaged teeth, or traumatic dental edges are responsible for tumor development. Rather, they show that these factors were frequently associated with tumors in our series, particularly among women without alcohol or tobacco exposure.

The value of this observation is therefore primarily hypothesis-generating. The presence of chronic irritation directly adjacent to the tumor in a substantial proportion of patients without classic risk factors could justify prospective studies comparing the frequency of dental trauma in patients with tongue carcinoma and matched controls.

Limitations

This study has several limitations: its retrospective design, the limited sample size of 30 patients, the absence of a control group, and the risk of information bias in the retrospective assessment of mechanical irritation. The study period also does not allow us to demonstrate a true temporal increase in incidence among women. We therefore describe an epidemiological profile observed in our series rather than a population-level incidence trend.

Conclusion

In this series of 30 mobile-tongue squamous cell carcinomas, a substantial proportion of patients lacked the traditional alcohol- and tobacco-related risk factors. This feature was particularly marked among women. The high frequency of chronic dental-related mechanical irritation and the frequent anatomical concordance with

tumor location are clinically noteworthy. These findings do not establish causality but suggest that local mechanical factors may represent a potential co-factor or associated marker in some patients.

Declarations

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