



## Review Article

## A literature review on oral basaloid squamous cell carcinomas, with special emphasis on etiology

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## ABSTRACT

In the recent years, basaloid squamous cell carcinomas (BSCCs) have gained attention because of (1) observation of a relative increase in the number of tumors arising particularly in head and neck sites, (2) identification of human papillomavirus (HPV) in BSCCs arising predominantly in the oropharynx, and (3) controversies that exist regarding the biological aggressiveness of the tumor. The objective of the present review was to address the issues mentioned above by focusing primarily on oral BSCCs, using literature that has been published in the English language up to 2013. According to the literature review, oral BSCCs were found to be relatively more common in elderly patients with a mean age of 64 years. A male predominance with a male/female ratio of 3:1 was observed. The predominant site was the tongue, with almost half of the reported cases occurring at this site, followed by the floor of the mouth and palate. With reference to habit history, majority were found to be tobacco and alcohol users. However, only 3 studies revealed data on HPV status of purely oral BSCC, and according to the results of these studies, of the 17 tumors tested, 4 had harbored high-risk HPV. Furthermore, most oral BSCCs were in an advanced clinical stage, namely, stage III or IV with T3 or T4 lesions and cervical lymph node metastasis at initial presentation, whereas 41% of patients had presented with local recurrences and 45% had died of the disease. In conclusion, although, the present literature review found enough evidence to consider tobacco and alcohol as risk factors for the development of oral BSCC, steps should be taken to fill the gap in our knowledge that exist with reference to contribution of oncoviruses, particularly HPV in the etiology of oral BSCC.

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### 1. Introduction

Basaloid squamous cell carcinoma (BSCC) was originally described as a malignant tumor composed of cells showing a basaloid pattern and intimately associated with squamous cell carcinoma, carcinoma in situ, or focal squamous differentiation, by Wain et al [1] in 1986. Basaloid squamous cell carcinoma is considered as a tumor that predominantly arises in elderly men. In addition, these tumors have been identified in numerous head and neck sites including oral cavity [2–18], oropharynx [1,6,19–23], hypopharynx [16,24–26],

esophagus [27–29], and sinonasal region [30]. Basaloid squamous cell carcinomas are also considered as more aggressive tumors showing a poorer survival compared with squamous cell carcinoma by some authors [15,21,31], whereas others disagree with this observation [12,16,18,27].

In recent years, BSCCs have gained attention owing to observation of a relative increase in the number of tumors arising particularly at head and neck sites, identification of human papillomavirus (HPV) in BSCCs arising predominantly in the oropharynx [8,10,29,32] and its correlation to etiopathogenesis of the tumors, and controversies that exist regarding the biological aggressiveness of the tumor [12,15,16,21,27,31,32].

Because these tumors occur in multiple head and neck as well as non-head and neck sites, it is difficult to assess the tumor characteristics for a given site because most articles focusing on the subject of BSCCs have included tumors from several sites [1,19,24]. This same difficulty also arises when focusing on other characteristics

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such as contribution of different etiological factors toward the development of tumors and biological aggressiveness. Therefore, the present review will primarily focus on oral BSCCs, with special emphasis given to the etiopathogenesis, using literature that has been published in the English language up to 2013.

## 2. Materials and method

### 2.1. Literature review

Initially, a literature review of “head and neck BSCC” was performed via either Hinari, PubMed, or PubMed Central Web sites to obtain all full-text articles provided free of charge on the aforementioned subject. All articles thus acquired were screened to obtain clinicopathologic data on oral BSCC. Based on the literature review [2–16], 15 full-text articles including case reports were found to contain data on oral BSCC (Table 1). These publications were used to gain knowledge on the clinicopathologic characteristics of oral BSCC.

## 3. Results

Table 2 shows the summary of the clinicopathologic features of oral BSCC. According to the literature review, habit history was available in less than half of the patients included in the sample, and evaluation of it resulted in identifying more than two-thirds of the patients as tobacco and alcohol users. Only 3 studies revealed data on HPV status of purely oral BSCC, and according to the results of these studies, of the 17 tumors tested, 4 had harbored high-risk HPV. Furthermore, the authors of the present study performed immunohistochemical investigations using p16 antibody, considered as a surrogate marker for HPV16, on 6 oral BSCC samples. However, none of the samples showed p16 positivity (unpublished data).

Furthermore, the literature review also revealed the biological aggressiveness of the tumor, with 41% presenting with local recurrences and 45% dying of the disease. In addition, most oral BSCCs were in an advanced clinical stage, namely, stage III or IV with T3 or T4 lesions and cervical lymph node metastasis at initial presentation.

## 4. Discussion

Basaloid squamous cell carcinoma is a distinct subtype of squamous cell carcinoma with a characteristic clinical and histopathologic profile (Figs. 1 and 2). Furthermore, the tumors show a high

**Table 2**  
Clinicopathologic characteristics of oral BSCC, based on literature survey

Characteristic	No. (%)	Total sample size
Age		70
<58 y	28 (40.00)	
>58 y	42 (60.00)	
Sex		86
Male	65 (75.58)	
Female	21 (24.42)	
Habit history		
Tobacco use		
Yes	42 (89.36)	47
No/Unknown	5 (10.64)	
Alcohol use		45
Yes	28 (62.22)	
No/Unknown	17 (37.78)	
Site		112
Tongue	48 (42.86)	
Floor of the mouth	27 (24.11)	
Palate	9 (8.03)	
Retromolar region	9 (8.03)	
Buccal mucosa	1 (0.90)	
Gingiva/Alveolar ridge	12 (10.71)	
Oral mucosa (site not specified)	6 (5.36)	
Size of the tumor		83
T1–2	27 (32.53)	
T3–4	56 (67.47)	
Nodal status		77
No	28 (36.36)	
N+	49 (63.64)	
Stage		56
I/II	15 (26.79)	
III/IV	41 (73.21)	
Recurrences		62
Present	26 (41.94)	
Absent	36 (58.06)	
Treatment		
Surgery		60
Yes	56 (93.33)	
No	4 (6.67)	
Radiotherapy		51
Yes	33 (64.71)	
No	18 (35.29)	
Chemotherapy		50
Yes	11 (22.00)	
No	39 (78.00)	
Outcome		77
No evidence of disease	24 (31.18)	
Alive with disease	9 (11.69)	
Dead of disease	35 (45.45)	
Dead of other causes	5 (6.49)	
Lost to follow-up	4 (5.19)	

**Table 1**  
Summary of publications from which data on oral BSCCs were obtained

No.	Authors of the study	No. of cases studied
1	Mane et al [2]	8
2	Choussy et al [3]	4
3	Rachel et al [11]	1
4	Satish and Kumar [4]	1
5	Friedrich et al [5]	7
6	Hirai et al [6]	2
7	Ereno et al [7]	10
8	Begum and Westra [8]	6
9	Jayasooriya et al [9]	9
10	Cabanillas et al [10]	4
11	De sampaio Goes et al [12]	17
12	Ide et al [13]*	30
13	Paulino et al [14]	5
14	Coppola et al [15]	8
15	Luna et al [16]	2
	Total	119

\* Although, the literature review [13] is based on 46 oral BSCCs, the total sample is considered as 30 because reference nos. 13 to 15 included in the study of Ide et al is considered separately.

proliferative activity (Fig. 3). Immunohistochemically, the tumors express both low- and high-molecular-weight cytokeratins (Figs. 4 and 5). Owing to the rarity of the tumor, most investigators who have studied the clinicopathologic characteristics of BSCCs, especially with reference to head and neck BSCCs, have used tumors that occurred in multiple sites [1,19,24]. Therefore, difficulties were encountered when compiling clinicopathologic characteristics based on literature review of primarily oral BSCC for the present study. Separating purely oral cavity BSCCs from oropharyngeal tumors was also problematic because lesions occurring at the base of the tongue and palate were considered as belonging to the oropharynx by some, whereas others have included these tumors as arising from the oral cavity [32,33]. However, subsequently, a review article based on 92 cases of purely oral BSCCs was also identified [17]. Most findings of this study corresponded with the findings of the present study, except for the commonest site of occurrence.

Tobacco use in the form of either smoking or betel chewing, together with alcohol, is considered the main etiological agents responsible for the development of most variants of oral squamous cell carcinoma (OSCC) including oral BSCC. However, recent evidence

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