



## Oral Squamous Cell Carcinoma: A Clinicopathological Study of 342 Thai Cases

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### Abstract

**Aim:** To conduct a clinicopathological review of oral squamous cell carcinoma (SCC) and to analyze it with respect to gender, age at diagnosis, clinical presentation, lesion location, and histological grading.

**Methods and Materials:** Information on the clinicopathological characteristics of SCC was obtained from pathology reports of 342 cases.

**Results:** The male to female ratio was 1:1 and the incidence increased with age. Among the patients 4.7% were younger than 40 years and males were predominant in this subgroup. The alveolar ridge and gingiva were the most commonly affected sites (50%). The majority of the SCC cases presented as ulcers or masses. Swelling and/or pain were the first signs and/or symptoms in most patients (52.6%). The age at diagnosis in relation to the site of occurrence varied. Conventional SCC was the most common subtype (88%). Well-differentiated SCC was the most common histological grading (78.6%).

**Conclusion:** In the present study, the incidence of SCC was age-related and showed equal gender distribution.

**Clinical Significance:** Routine examination of the oral cavity by dental practitioners and other health care providers aids in the early detection of premalignant and malignant oral disease. Dentists can play a significant role in disseminating information regarding oral cancer.



**Keywords:** Squamous cell carcinoma, oral, incidence, Thais

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### Introduction

Oral cancer is a serious cause of morbidity and mortality worldwide. Among oral cancer subtypes,

squamous cell carcinoma (SCC) is the most prevalent malignant neoplasm.<sup>1-5</sup> SCC can affect all areas of the oral cavity but the most common reported sites are the tongue<sup>1,6-12</sup> and the floor of the mouth.<sup>7,8,13,14</sup> SCC was reported more commonly in men than in women.<sup>9,14-16</sup> Barasch et al.<sup>17</sup> reported gender-specific predilections at different oral subsites; the male to female ratio was greatest for the floor of mouth and lowest for the gingiva. SCC has been regarded as a neoplasm affecting the elderly. However, there is now an increasing trend for occurrence in younger patients. The relative frequencies of SCC reported in patients younger than 40 years ranged from 6.6% to 18.4%.<sup>11,18-20</sup>

Early SCC often presents as a white patch (leukoplakia) or red plaque (erythroplakia), or a mixed red and white lesion (erythroleukoplakia). Superficial ulceration may develop with time. As the lesion grows, it may become an exophytic mass with a fungating or papillary surface. Many early SCCs are asymptomatic; however, more advanced carcinomas will often be painful.<sup>1</sup>

Although other variants of SCC are rare, they have been listed in the WHO classification of tumors of the oral cavity and oropharynx. Those include verrucous carcinoma (VC), basaloid squamous cell carcinoma (BSCC), papillary squamous cell carcinoma (PSCC), spindle cell carcinoma, acantholytic carcinoma, adenosquamous carcinoma, and cuniculatum carcinoma.<sup>21</sup> VC is a low-grade variant of SCC characterized by a papillary or warty exophytic mass of well-differentiated keratinized epithelium.<sup>21</sup> The tumors occur mainly in older men and the most common sites are lower lip and hard palate.<sup>3</sup> BSCC is considered a high-grade variant of SCC and tends to have an aggressive behavior<sup>22,23</sup> and may manifest as an ulcerated or exophytic firm mass.<sup>3</sup> The most commonly affected sites are the tongue, floor of the mouth, palate, buccal mucosa, and gingiva.<sup>22,23</sup> BSCC is most prevalent among men in the sixth to seventh decades of life. PSCC is an uncommon but distinct subtype of head and neck SCC. PSCC occurs most often as a solitary lesion with an exophytic or papillary growth. The larynx is the most common site of occurrence; however, cases involving the oral cavity have been reported. PSCC tends to affect men more than women and most commonly occurs in older adults.<sup>24</sup>

In consideration of all types of cancer in Thailand, oral cancer ranked fifth among men and sixth among women<sup>25,26</sup> and is still a constant problem among Thais. Therefore, the aim of this study was to conduct a clinicopathological review of oral SCC in a Thai population and to analyze the data with respect to gender distribution, age at diagnosis, clinical presentation, lesion location, and histological grading.

## Methods and Materials

All 342 cases of oral SCC were diagnosed in conjunction with the Department of Oral Pathology at Chulalongkorn University Dental School from January 1, 1987, through December 31, 2007. Information regarding gender, age at diagnosis, site of occurrence, clinical presentation and symptoms, time before seeking medical care as well as the histological differentiation of the SCC was obtained from pathology reports. Histological differentiation was graded as well, moderate, or poorly differentiated in accordance with Pindborg et al.<sup>27</sup>

## Statistical Analysis

Data was analyzed using SPSS for Windows (version 11.5; SPSS Inc., Chicago, IL). The Chi-square test and the t-test were used to test the significance between groups. The level of significance was set at  $p < .05$ .

## Results

Following a review, 342 cases of oral SCC were obtained with adequate data for analysis. This included 6 cases of carcinoma *in situ*. The study sample consisted of patients who lived in the central and northeastern regions of Thailand. There were 173 men and 169 women; thus, the male to female ratio was approximately 1:1. The patients were between 26 and 93 years of age (median age 64 years). The mean ages of men and women were not significantly different ( $62.1 \pm 12.2$  years and  $63.8 \pm 12.5$  years, respectively;  $p = .180$ ). Figure 1 presents the distribution of patients with SCC by age group and gender, showing the highest incidence (33.9%) in the age range of 60-69 years and the lowest incidence (0.9%) between 20 and 29 years. Most subjects

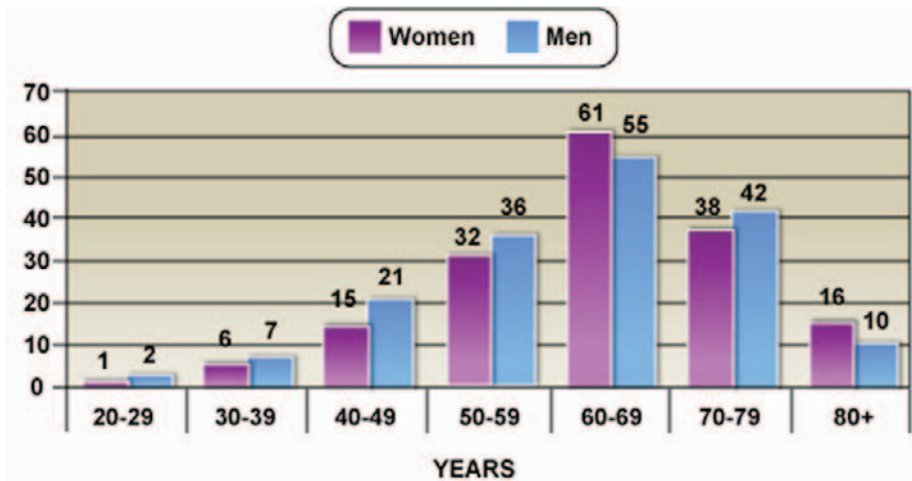


Figure 1. Distribution of patients with SCC in relation to age and gender.

Table 1. Distribution of SCC by site of occurrence and gender.

Site of Occurrence	Men n (%)	Women n (%)	Total n (%)	M:F
Alveolar ridge and gingiva	86 (25.1)	85 (24.9)	171 (50.0)	1:1
Tongue	30 (8.8)	13 (3.8)	43 (12.6)	1:0.4*
Buccal mucosa	16 (4.7)	23 (6.7)	39 (11.4)	1:1.4
Palate	13 (3.8)	8 (2.3)	21 (6.1)	1:0.6
Lip and Labial mucosa	1 (0.3)	19 (5.6)	20 (5.9)	1:19**
Floor of mouth	13 (3.8)	2 (0.6)	15 (4.4)	1:0.1*
Multiple site	14 (4.1)	19 (5.5)	33 (9.6)	1:1.4
Total	173 (50.6)	169 (49.4)	342 (100.0)	1:1

\*p<.01, \*\*p<.001

(77.2%) ranged in age from 50 to 79 years. The incidence of SCC in both sexes increased with advancing age in the age range of 20-69 years. Sixteen of the patients (4.7%) were younger than 40 years and men predominated (1.3:1).

Table 1 shows the distribution of SCC by site of occurrence and gender. Alveolar ridge and gingiva were the most common locations (50%), followed by tongue (12.6%), buccal mucosa (11.4%), palate (6.1%), lip and/or labial mucosa (5.8%), and floor of the mouth (4.4%). Thirty-three patients (9.6%) exhibited SCC at more than one location. Differences in sites of occurrence between men and women were observed. SCC on the floor of the mouth and tongue was more common in men (1:0.1 and 1:0.4, p<.01) whereas SCC of the lip was more common in women (1:19, p<.001). SCC was found on the lower alveolar

ridge more frequently than the upper alveolar ridge and was located in the posterior region of arches more often than the anterior region. For tongue SCC, the lateral border of the tongue was the preferred site. For lip SCC, the lower lip was affected more often than the upper lip.

The clinical presentation of SCC in relation to gender is shown in Figure 2. There were no differences in the clinical presentation of SCC between men and women (p=.124). The majority of the SCC cases presented as ulcers (45%) or masses (43.3%). The remaining manifested as a swelling or leukoplakia and/or erythroplakia. In addition, 13 patients who presented with masses also had ulceration on the surface of the tumors and another 3 patients who presented with ulceration also had a fistula on the facial skin.

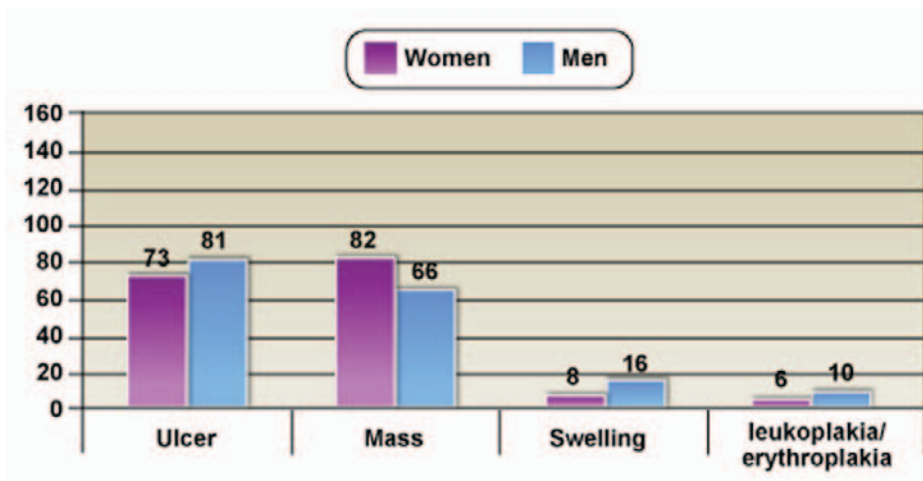


Figure 2. Clinical presentations of SCC in relation to gender.

Table 2. Presenting symptoms in SCC patients.

Symptoms	n (%)
Pain and/or swelling	180 (52.6)
Burning/itching	24 (7.0)
Numbness	12 (3.5)
Bleeding	10(2.9)
Difficulty in swallowing	2 (0.6)
Asymptomatic	59 (17.2)
Unspecified	69 (20.2)

Note: 14 patients presented with multiple symptoms.

Table 3. Mean age at diagnosis in SCC patients in relation to site of occurrence.

Site of occurrence	Age at diagnosis (yrs) Mean $\pm$ SD
Floor of mouth	58.0 $\pm$ 9.5
Tongue	58.9 $\pm$ 11.9
Multiple sites	62.1 $\pm$ 14.4
Alveolar ridge and gingiva	62.7 $\pm$ 12.0
Palate	64.1 $\pm$ 14.5
Buccal mucosa	67.1 $\pm$ 11.9
Lip and labial mucosa	69.3 $\pm$ 8.4

Table 2 lists the presenting symptoms in our SCC subjects; we were unable to specify symptoms in 69 patients. More than half of the patients (52.6%) presented with pain and/or swelling. Other symptoms included burning or itching (7%), numbness (3.5%), bleeding (2.9%), and

difficulty in swallowing (0.6%). Fourteen patients had more than one symptom and 59 patients were asymptomatic.

Table 3 presents the mean age at the diagnosis of SCC patients in relation to site of occurrence. The

age at diagnosis was highest in patients who had SCC on the lip and/or labial mucosa ( $69.3 \pm 8.4$  years) and lowest in patients who had SCC in the floor of mouth ( $58.0 \pm 9.5$  years).

The interval before seeking medical care was known in 315 patients and is shown in Figure 3. Most patients (62.9%) sought medical care within the first three months.

Table 4 lists the variants of SCC in relation to gender. Conventional SCC was the most common subtype in both sexes (88%). The other variants were VC (10.5%), BSCC (0.9%), and PSCC (0.6%). VC was found more frequently in women (7% vs. 3.5%) whereas BSCC and PSCC affected only men.

Table 5 shows the histological differentiation of SCC in relation to gender and age at diagnosis. Well-differentiated SCC was the most common (78.6%) type identified, followed by moderately and poorly differentiated SCC (13.2% and 8.2%, respectively). Well-differentiated SCC was more common in women, whereas moderately and poorly differentiated SCC were more common in men ( $p=.010$ ). With regards to age at diagnosis, moderately differentiated SCC was seen at a lower mean age ( $58.2 \pm 13.2$  years) when compared to well differentiated ( $63.7 \pm 12.3$  years) and poorly differentiated SCC ( $63.6 \pm 9.8$  years) ( $p=.020$ ). In addition, poorly differentiated SCC was found more commonly (73.1%) in patients who were 60 years of age and older. No poorly differentiated SCC was observed in

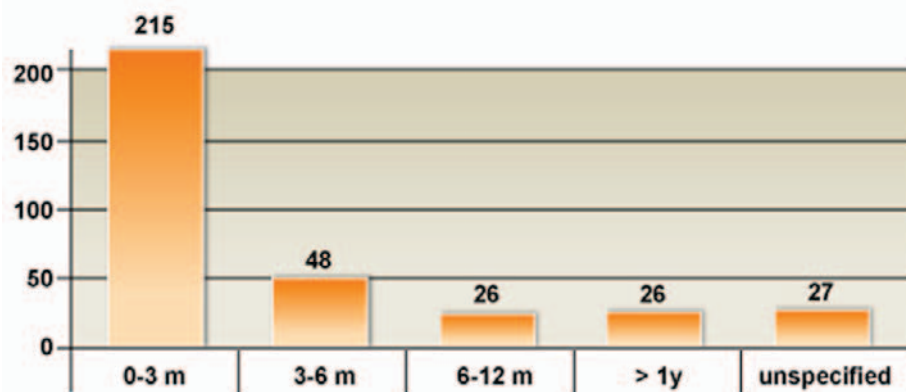


Figure 3. Time interval before seeking medical care in SCC patients.

Table 4. Distribution of SCC variants in relation to gender.

Variants	Men n (%)	Women n (%)	Total n (%)
Conventional SCC	156 (45.6)	145 (42.4)	301 (88.0)
Verrucous carcinoma	12 (3.5)	24 (7.0)	36 (10.5)
Basaloid SCC	3 (0.9)	0 (0.0)	3 (0.9)
Papillary SCC	2 (0.6)	0 (0.0)	2 (0.6)

Table 5. Histological differentiation of SCC in relation to gender and age at diagnosis.

Grading*	Men n (%)	Women n (%)	Total n (%)	Age (yrs) ** Mean $\pm$ SD
Well differentiated	125 (36.5)	144 (42.1)	269 (78.6)	63.7 $\pm$ 12.3
Moderately differentiated	28 (8.2)	17 (5.0)	45 (13.2)	58.2 $\pm$ 13.2
Poorly differentiated	20 (25.9)	8 (2.3)	28 (8.2)	63.6 $\pm$ 9.8

\* $p=.010$ , \*\* $p=.020$

patients younger than 40 years of age.

In this study, 26 out of 342 (7.6%) cases experienced a recurrence of tumor or developed a second malignant tumor at other sites.

## Discussion

In this study, 95% of SCC patients were older than 40 years and the incidence of SCC in men and women increased significantly with advancing age. This is in agreement with reports from other parts of the world indicating age-specific incidence rates for oral cancer. In agreement with most studies, the number of SCC cases was noted as the highest in the seventh decade and lowest in the third decade.<sup>9,28</sup> The male to female ratio is approximately 1:1 in most age groups; this finding supports the increasing trend of SCC developing in women. This finding is also consistent with Vatanasapt et al.,<sup>29</sup> who stated oral cancer in Thailand shows similar occurrence rates for men and women. In the present patient sample, the relative frequency of SCC (4.7%) in patients younger than 40 years of age is comparable to the previous published data.<sup>11,18,19</sup> Males were found to be predominant in the younger age groups, as previously reported.<sup>11,30-33</sup>

The present study is in agreement with most reports confirming conventional SCC as the most common variant of SCC. The second most common variant of SCC in the subject sample was VC and women were affected more than men. The BSCC and PSCC cases in the present study were all men; this is also consistent with previous studies reporting BSCC and PSCC more common in men.<sup>23,24</sup> When analyzed by site of occurrence, significant differences in age at diagnosis were noted. Floor of the mouth involvement was seen in the youngest age group and lip cancer was seen in the oldest age group. This finding is consistent with previous studies reporting that tongue and floor of the mouth cancer were more common in younger patients.<sup>11,30,33-35</sup>

In agreement with Nigerian studies,<sup>15,36</sup> the lower alveolar ridge and gingiva were found to be the most common sites of occurrence for SCC in the present study. However, this finding is in contrast to most studies reporting the tongue as the most common site. In spite of both studies

being conducted among Thai people, the present findings differed from the Chiang Mai study of Thai subjects.<sup>10</sup> This may be explained by the difference in the sample selected. The subjects in the present study were a dental school-based population residing in the central and northeastern parts of Thailand whereas the subjects in the Chiang Mai study were a medical hospital-based population residing in the northern part of Thailand. The present findings are in agreement with previous investigators that the lower lip was affected by SCC more often than the upper lip.<sup>37-39</sup> These findings indicate lip carcinoma occurs more often in patients living in rural areas. Antonides et al.<sup>40</sup> also reported a higher incidence of lip cancer in rural dwellers and in outdoor workers. This may be explained by the fact these subjects are more exposed to sunlight than those living in the city. A long history of actinic damage has been documented as a major cause of lip carcinoma.<sup>38</sup>

In agreement with Barasch et al.,<sup>13,17</sup> results of the present study confirmed a gender-specific predilection for the development of SCC. The male to female ratios were greater for tongue and floor of the mouth locations but lower for lip and labial mucosal SCC.

Most of the SCC cases in the present sample presented as ulcers or masses. This result is similar to that of other investigations.<sup>39,41</sup> No gender-related differences in the clinical presentations of oral SCC were found in the present study and the data, in agreement with most studies, showed well differentiated SCC to be the most common histological subtype.<sup>15,20,32,38,41,42</sup>

When analyzed by age, the present data indicated moderately differentiated SCC occurred at a lower mean age when compared to other histological subtypes. This was similar to the recent finding of Rebeiro et al.,<sup>33</sup> who reported half of the SCCs in the young patient group were moderately differentiated. However, these findings were contrary to those of Odukoya et al.,<sup>15</sup> who reported seeing poorly differentiated SCC in the lowest mean age group. The present study analysis showed well differentiated SCC was more common in women, whereas moderately and poorly differentiated SCC were more common in men. This finding is in contrast to Barasch et al.,<sup>17</sup> who reported the grading of SCC was not different when analyzed by gender. However, the present study found no difference in histological grade

when analyzed by the site of occurrence to be in agreement with their findings.

Multiple site involvement was observed in 9.6% of the patients in the study. The most commonly affected locations in this group were the alveolar ridge in combination with other oral subsites (69.7%) and the tongue with extension to the floor of the mouth (21.2%). However, there were no differences in histological differentiation between the group with multiple-site involvement and those with single-site involvement.

More than half of these patients sought medical care within the first three months. Swelling and/or pain were the most common first signs and symptoms in patients who sought early treatment. Those presenting complaints were bothersome or serious enough to motivate patients to see the dentist.

Interestingly, in 38 of 171 cases of SCC on the alveolar ridge and gingiva, the lesions were noted because of a lack of wound healing following tooth extraction or exfoliation. This is of interest to dentists in that SCC sometimes mimicks periodontitis and routine radiographs should be done before the extraction of teeth.

## Conclusion

In the present study, the incidence of SCC was age-related and showed equal gender distribution.

## Clinical Significance

Routine examination of the oral cavity by dental practitioners and other health care providers aids in the early detection of premalignant and malignant oral disease. Dentists can play a significant role in disseminating information regarding oral cancer.

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