

# Early Tongue Carcinoma – Clinical and Demographic Characteristics

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## Abstract

**Objective:** To evaluate the clinical and demographic features of early-stage tongue squamous cell carcinoma (SCCT), with emphasis on age, sex distribution, tumor localization, and macroscopic presentation.

**Materials and Methods:** A retrospective review of 72 patients with histologically confirmed T1 and T2 SCCT treated at the Department of Maxillofacial Surgery, University Hospital "Alexandrovska," was conducted. Variables assessed included patient age, sex, tumor location, and lesion morphology.

**Results:** The mean age at diagnosis was 55.74 years, with a male predominance (male-to-female ratio of 1.48:1. Young patients ( $\leq 40$  years) accounted for 16.7% of cases, with a higher male predominance in this subgroup (3:1). The most common tumor site was the lateral border of the tongue (73.6%), followed by the ventral surface (23.6%). Lesions were nearly equally distributed between the right and left sides. Macroscopically, exophytic (30.88%) and ulceroinfiltrative (29.41%) lesions were most common, while erythroleukoplakia (22.06%) and flat lesions such as erythroplakia and leukoplakia (5.88% and 7.35%, respectively) were associated with smaller tumor size, suggesting early-stage presentation.

**Conclusion:** Early SCCT most commonly affects patients over 40 years of age, though younger cases are increasing in frequency, particularly among males. Lateral tongue remains the most prevalent site. Lesions such as erythroplakia and leukoplakia may represent the earliest clinical manifestation of SCCT.

**Keywords:** tongue cancer, early cancer, demographics, clinical characteristics

## Introduction

Squamous cell carcinoma of the tongue (SCCT) is the most common form of malignant tumor affecting the oral tongue. The disease occurs predominantly in middle-aged and elderly patients, with the highest incidence reported between the ages of 55 and 74 (1, 2, 3), and a mean age at diagnosis ranging from 60 to 64 years (4, 5, 3). Patients under the age of 45 represent approximately 5.5% of all cases (3), while the incidence of early SCCT in individuals under 40 is 0.2 per 100,000 (3). In recent decades, an increase in incidence among younger age groups has been noted, with a meta-analysis reporting a frequency of 9.7% for the period 2014–2019 (8), and 7.8% in Bulgaria (5).

The disease is more common in males, with a male-to-female ratio of approximately 1.6:1 (9). Among younger patients, this difference is even more pronounced—62% of cases occur in men, compared to 38% in women (9).

In terms of anatomical distribution, about 50% of cases in young patients affect the lateral border of the tongue, 17–22% the ventral surface, 24–26% the anterior two-thirds, and only 7% the dorsum (9). This distribution is consistent with patterns observed in older patients.

Clinically, SCCT most frequently presents as an exophytic mass (42.6%) or ulcer (35.2%), and less commonly as erythroplakia (8.8%) or leukoplakia (5.5%) (10). Early-stage tumors, however, more often present as red or white plaques, or mixed erythroleukoplakic lesions (16). Some authors suggest that the earliest tumors commonly appear as erythroplakia, whereas more advanced stages are characterized by exophytic, ulceroinfiltrative, or mixed lesions (12, 13, 15, 16).

### Aim

The aim of this study was to investigate the clinical and demographic characteristics of patients with early-stage (T1 and T2) squamous cell carcinoma of the tongue.

### Material and Methods

A total of 72 cases of early-stage (T1 and T2) squamous cell carcinoma of the oral tongue were examined. All cases were diagnosed and treated at the Clinic of Maxillofacial Surgery, University Hospital "Alexandrovska". From a total of 116 patients with tongue carcinoma, 72 met the criteria for T1 and T2 stages. Parameters analyzed included age, sex, tumor localization, and macroscopic appearance of the lesion.

### Results

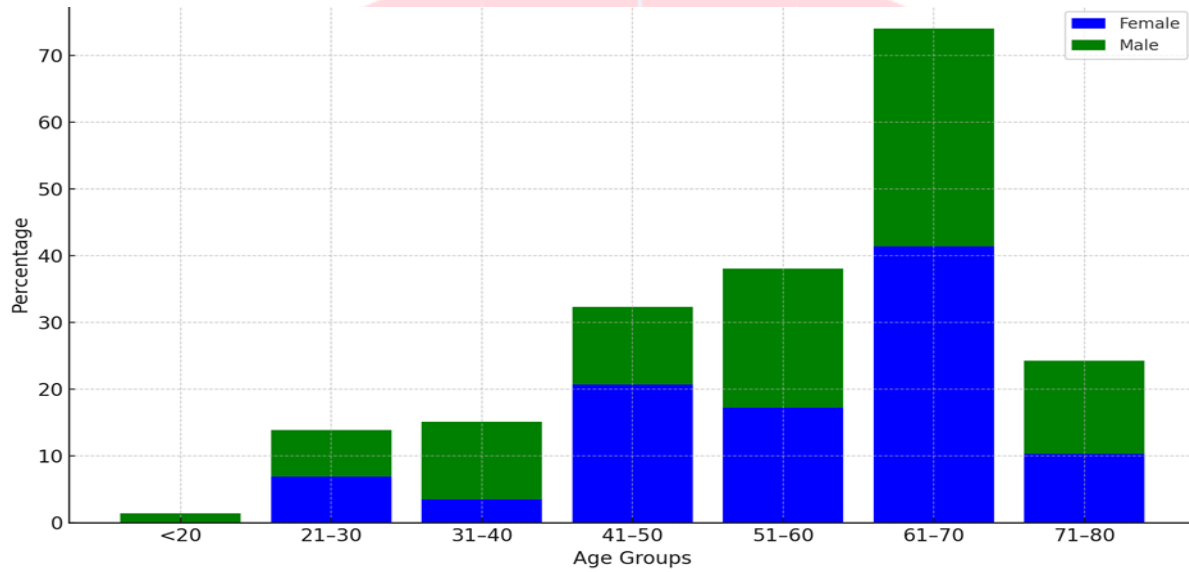
#### Age Distribution:

The mean age at diagnosis for the entire group was 55.74 years. The youngest patient was 17 years old, and the oldest was 80. The mean age for men was 54.44 years, and for women – 57.66 years. (Table 1.) (Figure 1) (Figure 2)

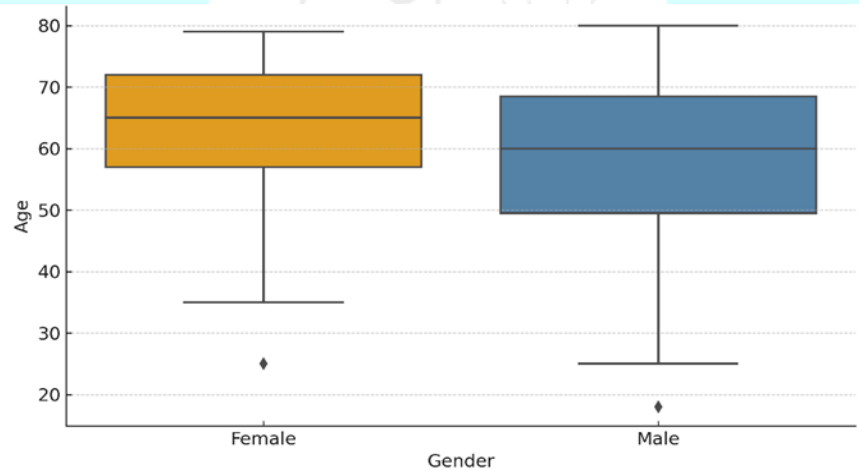
**Table 1. Age Distribution by 10-Year Intervals**

Age group	Total number (%)	Male (%)	Female (%)
Under 20 years	1 (1,4%)	1 (2,3%)	0 (0%)
21-30 years	5 (7%)	3 (7%)	2 (6,9%)
31-40 years	6 (8,3%)	5 (11,6%)	1 (3,5%)
41-50 years	11 (15,3%)	5 (11,6%)	6 (20,7%)
51-60 years	14 (19,4%)	9 (20,9%)	5 (17,2%)
61-70 years	26 (36,1%)	14 (32,6%)	12 (41,4%)
71-80 years	9 (12,5%)	6 (14%)	3 (10,3%)

**Figure 1. Distribution of Patients by Age Group and Gender**



**Figure 2. Distribution of age based on gender**

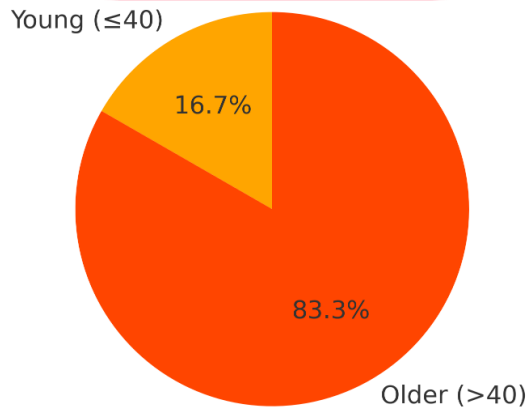


Most patients were aged over 40 (83.3%). Younger patients ( $\leq 40$  years) accounted for 12 cases, or 16.7% of the study group. Among young patients, males were predominant—9 cases (75%), while females represented 3 cases (25%). (Table 2.) (Figure 3.) (Figure 4.)

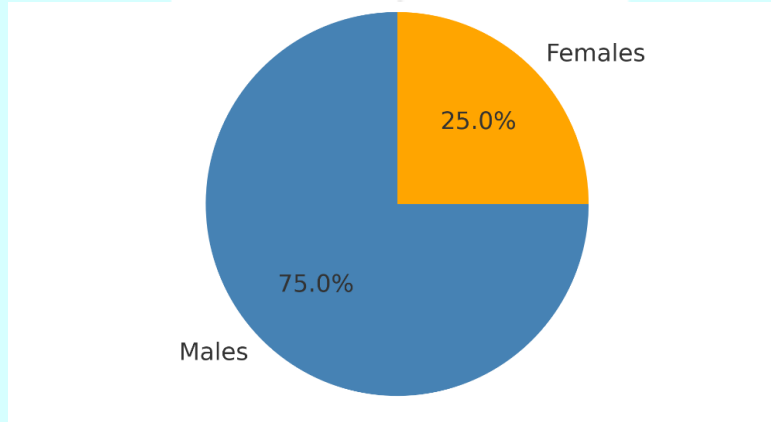
**Table 2. Distribution of Patients by Age Group and Gender**

Age Group	Total Number (%)	Male (%)	Female (%)
Young ( $\leq 40$ years)	12 (16.7%)	9 (20.9%)	3 (10.3%)
Older ( $>40$ years)	60 (83.3%)	34 (79.1%)	26 (89.7%)

**Figure 3. Age Distribution: Young ( $\leq 40$ ) vs. Older ( $>40$ ) Patients**

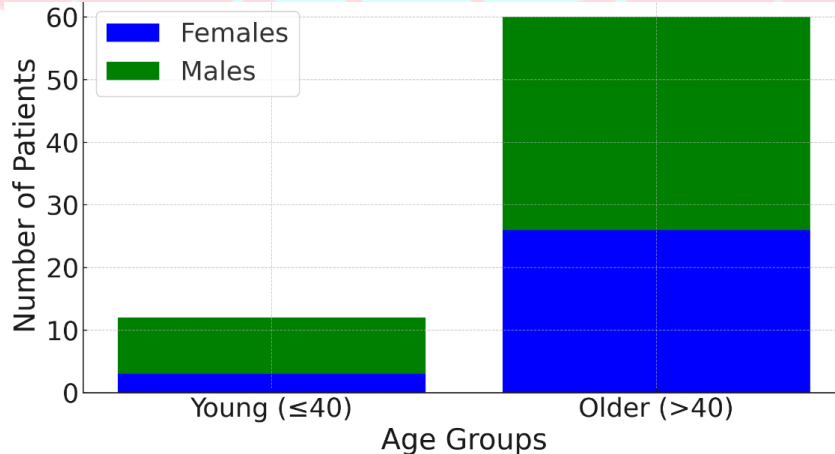


**Figure 4. Gender distribution in young patients**



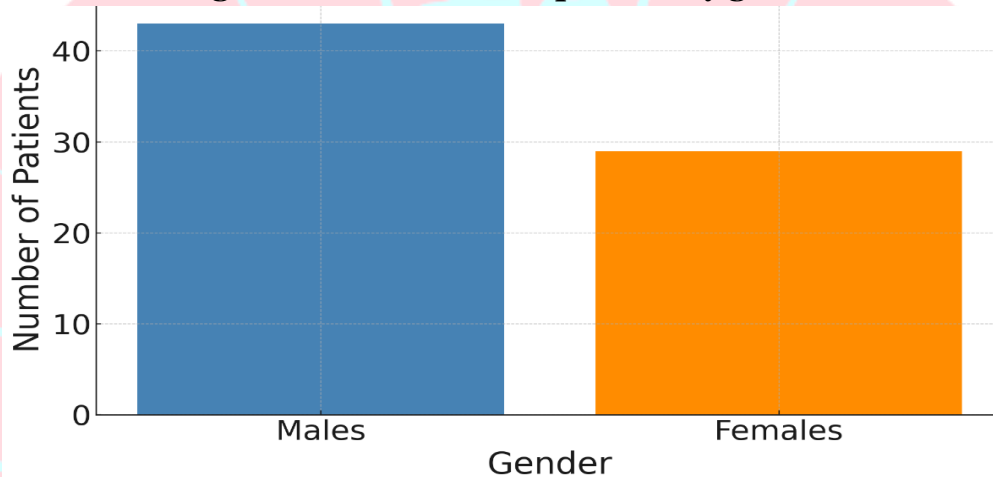
In the male group, young patients accounted for 20.9% of all men; in the female group, they represented 10.3%. (Figure 5.)

**Figure 5. Distribution of Patients by Age Group and Gender**

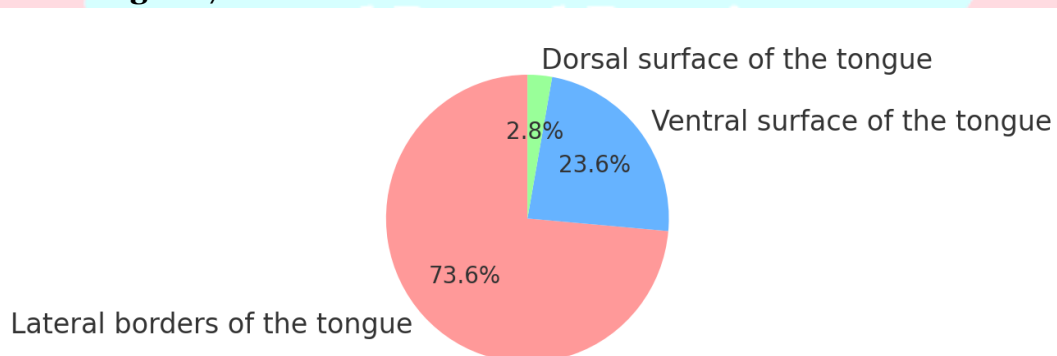


**Gender Distribution:**

There were 43 male patients (59.7%) and 29 female patients (40.3%). The male-to-female ratio was 1.48:1. (Figure 6.)

**Figure 6. Distribution of patients by gender****Tumor Localization:**

The most frequent site was the lateral border of the tongue (ICD Co2.1) – 53 cases (73.6%). This was followed by the ventral surface (Co2.2) – 17 cases (23.6%), and the dorsal surface (Co2.0) – only 2 cases (2.8%). (Figure 7.)

**Figure 7. Distribution of the tumors based on localization****Laterality:**

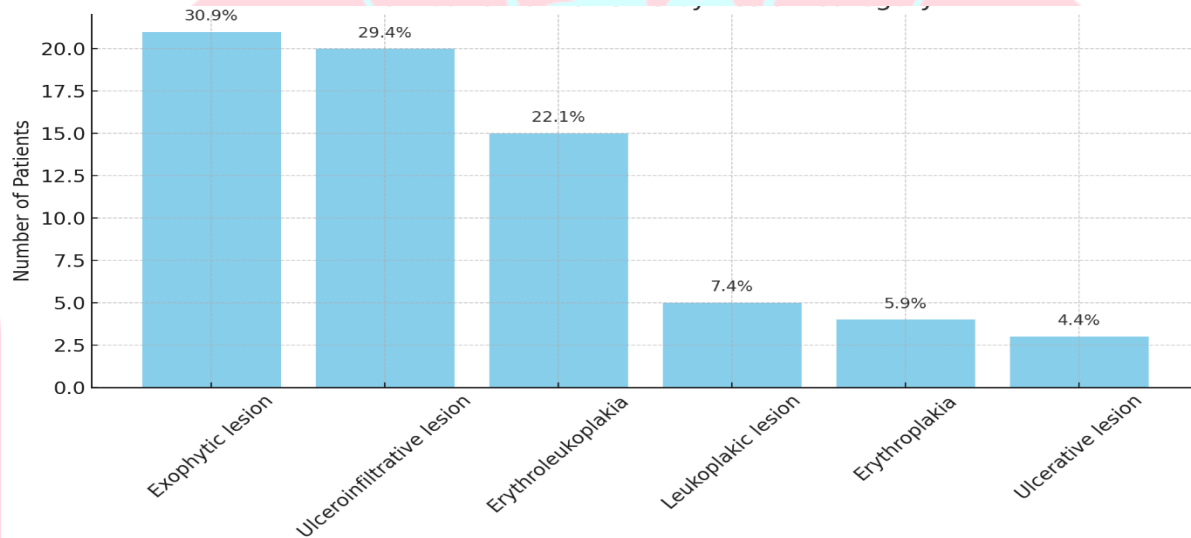
Tumor location was nearly evenly distributed between the right and left sides: 32 cases (51.6%) were right-sided and 30 cases (48.4%) left-sided. Ten cases were excluded from this analysis due to missing data.

**Macroscopic Appearance:**

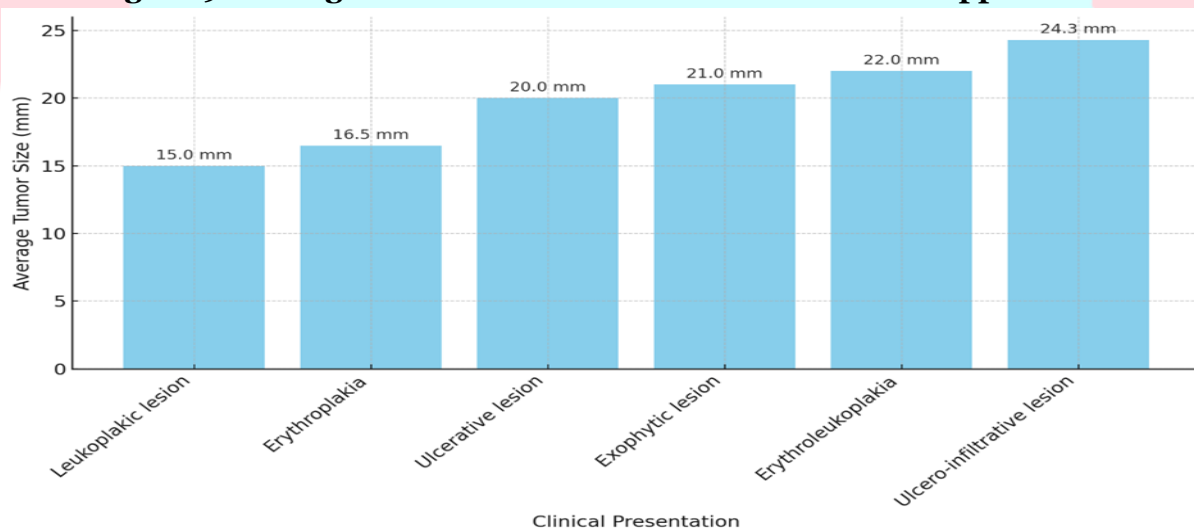
In 30.88% of patients (21 cases), the lesion was described as exophytic, followed by 29.41% of cases (20 patients) where the lesion had an ulcero-infiltrative appearance. Erythroleukoplakia was observed in 22.06% (15 cases). Carcinoma presenting as leukoplakia was found in 7.35% (5 cases),

followed by erythroplakia in 5.88% (4 cases). The rarest form was the ulcerative lesion, recorded in 4.41% (3 cases). (Figure 8.)

**Figure 8. Distribution based on the clinical appearance of the tumors in cT1 and cT2 SCC**



**Figure 9. Average size of the tumor based on the clinical appearance**



In T1 tumors, exophytic (36.1%) and erythroleukoplakic (19.4%) lesions were most common, along with ulcero-infiltrative forms (16.7%). In T2 cases, ulcero-infiltrative lesions dominated (46.7%), followed by erythroleukoplakia (23.3%) and exophytic lesions (26.7%).

The smallest mean lesion sizes were observed in erythroplakia (16.5 mm) and leukoplakia (15.0 mm), supporting longstanding clinical observations that early SCC often manifests as red or white plaques. Larger mean sizes were noted in exophytic (21.0 mm), ulcerative (20.0 mm), and especially ulcero-infiltrative lesions (24.3 mm). (Figure 9.)

## Discussion

Tongue carcinoma is most often diagnosed in middle-aged and older adults, with the peak incidence between 55 and 74 years of age (1, 2, 3). Various studies report a mean diagnostic age of 60–64 years (4, 5, 3). In our cohort, the mean age was slightly lower at 55.7 years, with the peak incidence between 61 and 70 years (36.1%).

SCCT is more common in males, with a sex ratio of 1.48:1, which aligns with previously reported data (6, 7). In our group, 16.7% of patients were under 40 years of age, higher than the 9.7% reported in a meta-analysis (8). Among young patients, the male-to-female ratio was 3:1, similar to findings in other studies (9), which reported 62% male vs. 38% female incidence in younger populations.

Tumor localization within the tongue in our study matched published patterns (10, 11), with the lateral border (Co2.1) being the most frequent site, followed by the ventral surface (Co2.2), and the dorsum (Co2.0) being least affected. Left and right sides were affected almost equally, with a slight predominance on the right.

Clinically, SCCT most often presents as an exophytic mass (42.6%) or ulcer (35.2%), and more rarely as erythroplakia (8.8%) or leukoplakia (5.5%) (10). Some authors describe early oral cancers as presenting predominantly as red patches, while advanced lesions appear as exophytic masses, ulcers, or various plaque types—erythroplakia, erythroleukoplakia, or verrucous leukoplakia (12, 13, 15, 16).

In our study, the most common presentation was the exophytic lesion (30.88%), with a mean tumor size of 20.9 mm. Notably, lesions presenting as erythroplakia or leukoplakia had the smallest average size, supporting the hypothesis—also suggested by other authors—that erythroplakia may be the earliest clinical manifestation of tongue carcinoma (14, 16).

## Conclusion

Early-stage tongue carcinoma predominantly affects adults over 40, although an increasing incidence among younger patients is observed. Men are more commonly affected (1.48:1), and the male predominance is even more pronounced in younger patients (3:1). Our findings support the hypothesis that the earliest clinical presentation of squamous cell carcinoma of the tongue and oral cavity may be in the form of erythroplakia.

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