

# Incidence of Squamous Cell Carcinoma of the Tongue: Retrospective Clinical Study

Mustafa Mohammed Abdulhussain<sup>1\*</sup>, Maha Mohammed Al-Sayyid<sup>2</sup>

<sup>1</sup>Department of Oral Pathology, College of Dentistry, Mustansiriyah University, Baghdad, Iraq

<sup>2</sup>Oncology Teaching Hospital, Medical City, Baghdad, Iraq

## ABSTRACT

**Background and Objectives:** In oral cavity, the most common malignant neoplasm is the squamous cell carcinoma (SCC). Usually it represents about 90%–95% of all malignant neoplasms. Although the tongue SCC mostly affects older aged over 40 years of age, the young aged groups can also be affected. The aim of this retrospective clinical study was to evaluate the clinical parameters of SCCOT in both young and old aged patients.

**Methods:** A total of 126 patients were included for this retrospective study. The age groups were divided into three groups, first group <40 years, second group between (40–60 years) and third group >60 years. The medical charts and case notes of each patient histologically diagnosed with squamous cell carcinoma of the tongue (SCCOT) were reviewed and analysed.

**Results:** The peak incidence of SCCOT was observed in second group 63 (50%) cases. According to gender, the women experienced more frequent SCCOT than men (64(50.8)/62(49.2)) respectively. The lateral third part of the tongue was more affected than other parts 34 (27%) cases. The higher incidence of poorly differentiated SCCOT was between 40 to 60 years of age group. Sixty patients were cured with combined therapy; surgery and radiation, whereas, only 20 patients were treated by surgery. The remaining other patients were with unknown results.

**Conclusion:** The most incidence of SCCOT was observed in the age group >40 years and the early detection of tongue cancer is very important especially in young aged group and they should be treated early by resection of the primary tumor with surrounding areas of neck.

**Key words:** Squamous cell carcinoma, Clinical parameters, Tongue, Survey, Differentiation

**HOW TO CITE THIS ARTICLE:** Mustafa Mohammed Abdulhussain\*, Maha Mohammed Al-Sayyid, Incidence of squamous cell carcinoma of the tongue: Retrospective clinical study, J Res Med Dent Sci, 2018, 6(6): 252-256

**Corresponding author:** Mustafa Mohammed Abdulhussain  
**e-mail** ✉: mustafa80moh@yahoo.com  
**Received:** 13/12/2018  
**Accepted:** 31/12/2018

## INTRODUCTION

The estimated incidence of non-melanoma skin cancer in the USA is >1000000 cases per year, of which roughly 20%-30% are squamous cell carcinoma. It is located mainly in the tongue, especially in the lateral posterior border. Squamous cell carcinoma of the tongue (SCCOT) generally affects old aged patients, most of them with a history of high tobacco and alcohol consumption [1]. SCCOT represents approximately 3% of all human malignant tumors [2]. Because of increasing the incidence of SCC of tongue especially in young adults, the recent years have showed increasing attention [3].

Generally, the young or under the age of 40 years are rarely affected with oral cancer. The real etiological factors (carcinogenic factors) of the patients over than 40 years are mainly due to tobacco and alcohol.

Therefore, some studies suggest that these factors recognized as carcinogenic in older patients and may be

related to the etiology of oral cancer in young adults [4]. In regarding the clinical course and prognosis of SCCOT between young and old patients, there is an expand deal of controversy present. Several studies have stated that old patients exhibit worse clinical results when compared with young patients [5,6].

However, some other studies stated that many of these patients never smoked tobacco or drank alcoholic beverages, or the duration of exposure to these agents would be too short may induce malignant transformation [7]. The high aggressiveness of tumor can be shown in young patients when compared to patients in the older age ranges [4,8].

There are considerable controversy exists in the literature regarding the clinical course of young patients with head and neck squamous cell carcinoma (SCC). Typically, this malignancy occurs in patients older than 50 years of age, after many years of tobacco and alcohol use [9]. In this study, we emphasized on the fact that the SCCOT can occur in any age but the high incidence in older patients over than 40 years and the rarity of SCCOT in young patients and studying of etiologic and differential diagnosis of such a disease in these age groups.

## MATERIAL AND METHODS

Between January 2009 and September 2018, 126 patients with histologically confirmed SCCOT were referred to the Specialist Surgeries Hospital, Medical city, Baghdad, Iraq. All the reports recorded in this 9 years' period were observed and studied carefully and 126 histopathologically proven cases of SCCOT were found from a total of 325 reports of tongue lesions. The data of age, gender, anatomical area of tumor, grading, smoking status and alcohol intake were extracted from this reports. The incomplete information was completed through the clinical files or the histopathological requesting form of tumor. To keep the privacy of patients, all the information was recorded anonymously. Having coded and recorded the collected data; they were analysed using descriptive statistics such as mean, standard deviation, frequency tables by SPSS software, version 14. Survival and time to disease progression curves were calculated using the method of Kaplan-Meier [10]. Survival and progression free survival was calculated from the time of diagnosis to death or relapse respectively.

## RESULTS

The peak incidence of SCCOT was observed in second group 63 (50%) cases. According to gender, the women experienced more frequent SCCOT than men (64 (50.8)/62 (49.2)) respectively. In most cases the lateral third part of the tongue was more affected than other

parts 34 (27%). The higher incidence of poorly differentiated SCCOT was between 40 to 60 years of age group. Sixty patients were cured with combined therapy; surgery and radiation, whereas, only 20 patients were treated by surgery. The remaining other patients were with unknown results. The records of histopathological biopsies specimens were studied in the present study which included 325 biopsies specimen of the tongue lesions. It was observed that most incidences-nearly 38.8%, 126 patients were affected by SCCOT and the remaining biopsies were not malignant lesions. An incidence of 49.2% (62 cases) in men and 50.8% (64 cases) in women was observed. The mean age of these patients was  $56.5 \pm 12$  years (range, 22 to 90). Regarding the variable of gender; for men the highest incidence was among 40-60 years old, 27% (34) cases, and the lowest was among <40 years old 6.3% (8) cases of age groups. But, for women the highest frequency was in both 40-60 years and >60 years of age group 23% (29) cases and also the lowest was among <40 years old 4.8% (6) cases. The highest prevalence rate of acquisition was between 40-60 years of age 50% (63) cases. There were 62 men and 64 women (Table 1). The risk factors such as smoking status were more frequent in age groups >40 years than in <40 years of age group 58.8% (74) cases and 6.3% (8) cases respectively. While for alcohol consumption were more frequent in age groups >40 years than in age group <40 years 15% (19) cases, 3.2% (4) cases respectively (Table 1).

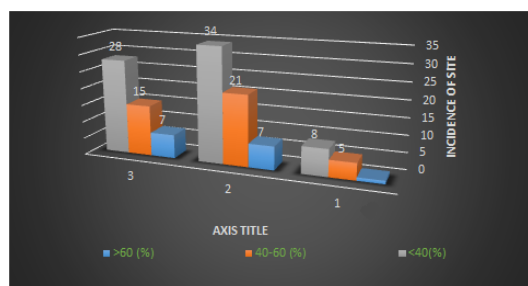
**Table 1: The incidence of Squamous cell carcinoma of the tongue in the gender, grading, smoking status and alcohol consumption according to age groups with the percent**

| Variables                   | Age groups (years) |           |           | Total (%) |
|-----------------------------|--------------------|-----------|-----------|-----------|
| Gender                      | <40 (%)            | 40-60 (%) | >60 (%)   |           |
| Men                         | 8 (6.3)            | 34 (27)   | 20 (15.9) | 62 (49.2) |
| Women                       | 6 (4.8)            | 29 (23)   | 29 (23)   | 64 (50.8) |
| Total                       | 14 (11.1)          | 63 (50)   | 49 (38.9) | 126 (100) |
| F-test=0.9 Non significant  |                    |           |           |           |
| <b>Grading</b>              |                    |           |           |           |
| Well                        | 6 (4.8)            | 23 (18.3) | 26 (20.6) | 55 (43.5) |
| Moderately                  | 5 (4)              | 31 (24.6) | 20 (15.9) | 56 (44.5) |
| Poorly                      | 2 (1.5)            | 8 (6.3)   | 5 (4)     | 15 (12)   |
| Total                       | 13 (10.3)          | 62 (49.2) | 51 (40.5) | 126 (100) |
| F-test=1.04 Non significant |                    |           |           |           |
| <b>Smoking status</b>       |                    |           |           |           |
| Smoker                      | 8 (6.3)            | 36 (28.6) | 38 (30.2) | 82 (65.1) |
| Non-Smoker                  | 6 (4.8)            | 26 (20.6) | 10 (7.9)  | 42 (33.3) |
| Unknown                     | 0 (0)              | 1 (0.8)   | 1 (0.8)   | 2 (1.6)   |
| <b>Alcohol consumption</b>  |                    |           |           |           |
| Yes                         | 4 (3.2)            | 10 (7.9)  | 9 (7.1)   | 23 (18.3) |
| No                          | 9 (7.1)            | 51 (40.5) | 36 (28.6) | 96 (76.2) |

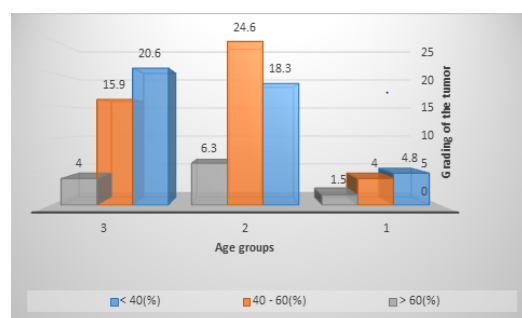
|         |         |         |         |         |
|---------|---------|---------|---------|---------|
| Unknown | 1 (0.8) | 2 (1.6) | 4 (3.3) | 7 (5.6) |
|---------|---------|---------|---------|---------|

In regarding to site of the tumours on the tongue, the highest incidence occurrence was observed in the lateral third part of the tongue for people in between 40-60 years of age groups 27% (34) cases. While the lowest incidence of occurrence was in the anterior third part of the tongue in age group <40 years only 0.8 % (1) case (Figure 1). The histological analysis of each case was indicated in this study, the highest frequency of well differentiated SCCOT was in >60 years of age groups 26 (20.6%) cases, while the highest incidence of moderately and poorly differentiated was observed between 40-60 years of age groups 24.6% (31) cases. While the poorly differentiated as well as lowest incidence was found in <40 years of age groups 24.6% (31) cases and 6.3 % (8) cases respectively. In a total number of patients, 82 (65.1%) had a history of smoking and the non-smokers were 42 (33.3%), while alcohol consumption patients were 18.3% (23) patients and non-alcohol consumption were 76.2% (96) patients (Figure 2).

Most patients (80%) had a median delay in diagnosis of less than 1 year. The preoperative diagnostic procedures included open biopsy, fine needle aspiration (FNA), ultrasound, computed tomography scan and magnetic resonance imaging. At the final follow-up examination, sixty patients were cured with combined therapy; surgery and radiation, whereas, only 20 patients were treated by surgery. The remaining other patients with unknown results were cured after the follow-up period. Finally, the 5-year overall survival rate was 50%.



**Figure 1: Frequency of sites of the tongue cancers according to the distribution of age groups**



**Figure 2: Frequency of grading of the tumours according to the distribution of age groups**

## DISCUSSION

In this retrospective clinical study of patients with SCCOT in the Specialist Surgeries Hospital, Medical city, Baghdad, Iraq over a period of 9 years, some information about demographics and treatment outcomes of SCCOT can be obtained from this study despite of patient's cohort was not large. The 5-year overall survival (OS) rate of our study was 50% that does not differ greatly from other retrospective studies that stated the average of 3 years in the survival rate while other study is 5 years at 16% and 49% [11,12]. The results of this study and also other studies found it difficult to analyse all patients with tongue cancers, treated with multiple intent treatment while other studies analyse all patients with tongue cancers and all oral cavity cancers together. The tongue is the most common site for oral cancers in patients under 40, which is similar to that observed in older patients of our study [7]. Some studies showed that squamous cell carcinoma incidence is rare in children and young adults under the age 40 years and these results come in accordance with current study [1,7,8]. Our results from the decade 2009 to 2018 presented increased proportion of SCCOT in young adults and also Atula et al. in Finland found that percentage of SCCOT cases occurring in young adults increased from 5.3% per year for the decade 1953 to 1962 to 7.2% per year for the decade 1983 to 1992 [13]. Similarly, in another study by Myers et al. incidence of SCCOT in young adults was found to be gradually increasing during the past 22 years [3]. The patients with oral cancer of age under 40-year-old were considered as a young patient by most authors however, others consider under 20 or 30 years as the reference ages [4]. There is still controversy regarding the prognosis of SCC in young patients. Some authors consider the lesion in the young to be aggressive, thus the prognosis will be poor when compared with that of older patients [8]. In the treatment of SCCOT in the young patients, some authors have stated that needs to a more aggressive treatment, while others recommend that the treatment should be instituted in a similar fashion to those with older age [8,14]. In regarding to the differentiation of tumor, our current study results showed the proportion of poorly-differentiated tumours in the older group more than 40 years greater than in young under 40 years however, some other studies consistent with our study such as Manuel et al. and Atula et al. [13,15], while Veness et al. reported that the proportion of poorly-differentiated tumours in the young group was greater than in the old group [16]. Similarly, Siegelmann-Danieli et al. stated that tumor pathogenesis tended to predict clinical course of tumor of the tongue as noted in our study [17]. Several studies have shown that young patients tend to present a greater locoregional recurrence rate and a smaller survival rate when compared to that of older patients [7,18]. Whereas others have described a similar prognosis for both age ranges [13]. According to age group, several studies attempt to

recognize between SSCOT in young and old patients, so some these studies consider 40 years is used to define older and younger patients, while the others consider the age range from 20 to 39 years for differentiation [19,20]. There were different clinical features can be seen in young or young adults of 40 years of age compared to adults over 40 years of age. Also, some studies have stated that the older adults have a higher 5-year survival rate compared to young aged patients, so these groups of age can be studied in separate studies [19,21,22]. While Garavello et al., study showed conflicted opinion about the survival rate (20%) within two years in the young patients with and noted that the young aged group was an independent predictor of worse survival [23]. In addition to that, Yamazaki et al. found a fact that the elderly patients have worse prognosis [24]. The main etiological factors of the tongue cancer are smoking tobacco and drinking alcohol and considered as a risk factors, but our results in this study showed that these factors have less effect especially in young aged group when compared to older patients similar to results of some other studies [3,13,22,25]. According to hereditary field, SCCOT in young patients can be considered as a different disease with special different characterized features [26]. In addition to exposure to carcinogens, the genetic factors may have a role in pathogenesis of oral cancer, so any change or damage of the DNA of some patients may results in oral cancer [27,28]. In Indian study, one of the conclusions of Kurikose et al. in their study comparing between the tongue cancer in young and older patients found that the smoking and alcohol drinking more associated with older patient than young patients, this is consistent with our study [29]. But in other studies such as Miller et al., in their study of the habits of 39 adults under 40 years showed that most of the patients had heavy smoking and drinking habits [4,30]. In some cases, the chronic mechanical continuous trauma may be one of the possible factors that result in tongue cancer such as sharp edges of the tooth or ill-fitting dentures especially if the anchoring attachments in the etiology of oral cancer were lost [31]. Vargas et al., study of SCCOT in group of women less than 40 years of age noted that young aged patients with anterior tongue cancer have higher rates of recurrence and the interval to recurrence of older patients longer than that of young patients [9]. Several recent studies have stated that the incidence of SCCOT was increased in young individuals. Park et al., found that 23 patients (27.1%) out of 85 patients were <40 years old age [32]. While Liao et al., found 76 patients (25.8%) out of 296 patients were <40 years old age [33]. However, the results of our study presented 14 (11.1%) out of 126 patients with tongue SCC were <40 years old age. The current study reported that the percentage of men slightly more than women in the young group which presented 8 patients (6.3%) for men and 6 patients (4.8%) for women, these results were incompatible with other studies such as Popovtzer et al. and Friedlander et al. [18, 22,33].

## CONCLUSION

In conclusion, the most incidence of SCCOT was observed in the age group >40 years and the early detection of tongue cancer is very important especially in young aged group who presented worse survival rate and needs to resect of the primary tumor with safe area of its margin also dissection around the neck. In our study, patients with age <40 years did not present a worse survival in comparison to older tongue cancer patients of similar stage. In addition to these findings, the aggressive tongue cancers need further research to reach the etiology of tongue cancer in these young patients knowing that many of them not drink alcohol or smoke cigar and do not have any other predisposing risk factor. It is important to know the risk factors to reduce or prevent these factors.

## CONFLICT OF INTEREST

The authors declared no potential conflicts of interests with respect to the authorship and/or publication of this paper.

## REFERENCES

1. Konicke K, Lopez-Luna A, Muñoz-Carrillo JL, et al. The microRNA landscape of cutaneous squamous cell carcinoma. *Drug Discov Today* 2018; 23:864-70.
2. Brandizzi D, Gondolfo M, Velazco ML, et al. Clinical features and evolution of oral cancer: A study of 274 cases in Buenos Aires, Argentina. *Med Oral Patol Oral Cir Bucal* 2008; 13:544-8
3. Myers JN, Elkins T, Roberts D, et al. Squamous cell carcinoma 3. of the tongue in young adults: Increasing incidence and factors that predict treatment outcomes. *Otolaryngol Head Neck Surg* 2000; 122:44-51.
4. Oliver RJ, Dearing J, Hindle I, et al. Oral cancer in young adults: Report of three cases and review of the literature. *Br Dent J* 2000; 188:362-5.
5. Davidson BJ, Root WA, Trock BJ, et al. Age and survival from squamous cell carcinoma of the oral tongue. *Head Neck* 2001; 23:273-9.
6. Lee CC, Ho HC, Chen HL, et al. Squamous cell carcinoma of the oral tongue in young patients: A matched-pair analysis. *Acta Otolaryngol* 2007; 127:1214-7.
7. Burzynski NJ, Flynn MB, Faller NM, et al. Squamous cell carcinoma of the upper aerodigestive tract in patients 40 years of age and younger. *Oral Surg Oral Med Oral Pathol* 1992; 74:404-8.
8. Torossian JM, Baziat JL, Philip T, et al. Squamous cell carcinoma of the tongue in a 13-years-old boy. *J Oral Maxillofacial Surg* 2000; 58:1407-10.
9. Vargas H, Pitman KT, Johnson JT, et al. More aggressive behavior of squamous cell carcinoma of the anterior tongue in young women. *Laryngoscope* 2000; 110:1623-6.



10. Kaplan EL, Meier PJ. Non-parametric estimation from incomplete observations. *J Am Stat Assoc* 1958; 53:457-81.
11. Gorsky M, Epstein JB, Oakley C, et al. Carcinoma of the tongue: A case series analysis of clinical presentation, risk factors, staging and outcome. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2004; 98:546-52.
12. Aksu G, Karadeniz A, Saynak M, et al. Treatment results and prognostic factors in oral tongue cancer: Analysis of 80 patients. *Int J Oral Maxillofac Surg* 2006; 35:506-13.
13. Atula S, Grénman R, Laippala P, et al. Cancer of the tongue in patients younger than 40 years. A distinct entity? *Arch Otolaryngol Head Neck Surg* 1996; 122:1313-9.
14. Pitman KT, Johnson JT, Wagner RL, et al. Cancer of the tongue in patients less than forty. *Head Neck* 2000; 22:297-302.
15. Manuel S, Raghavan SK, Pandey M, et al. Survival in patients under 45 years with squamous cell carcinoma of the oral tongue. *Int J Oral Maxillofac Surg* 2003; 32:167-73.
16. Veness MJ, Morgan GJ, Sathiyaseelan Y, et al. Anterior tongue cancer: Age is not a predictor of outcome and should not alter treatment. *ANZ J Surg* 2003; 73:899-904.
17. Siegelmann-Danieli N, Hanlon A, Ridge JA, et al. Oral tongue cancer in patients less than 45 years old: Institutional experience and comparison with older patients. *J Clin Oncol* 1998; 16:745-53.
18. Friedlander PL, Schantz SP, Shaha AR, et al. Squamous cell carcinoma of the tongue in young patients: A matched-pair analysis. *Head Neck* 1998; 20:363-8.
19. Sasaki T, Moles DR, Imai Y, et al. Clinicopathological features of squamous cell carcinoma of the oral cavity in patients 40 years of age. *J Oral Pathol Med* 2005; 34:129-33.
20. Annertz K, Anderson H, Björklund A, et al. Incidence and survival of squamous cell carcinoma of the tongue in Scandinavia with special reference to young adults. *Int J Cancer* 2002; 101:95-9.
21. Mosleh-Shirazi MS, Mohammadianpanah M, Mosleh-Shirazi MA, et al. Squamous cell carcinoma of the oral tongue: A 25-year, single institution experience. *J Laryngol Otol* 2009; 123:114-20.
22. Popovtzer A, Shpitzer T, Bahar G, et al. Squamous cell carcinoma of the oral tongue in young patients. *Laryngoscope* 2004; 114:915-7.
23. Garavello W, Spreafico R, Gaini RM, et al. Oral tongue cancer in young 19 patients: A matched analysis. *Oral Oncol* 2007; 43:894-7.
24. Yamazaki H, Inoue T, Koizumi M, et al. Age as a prognostic factor for late local recurrence of early tongue cancer treated with brachytherapy. *Anticancer Res* 1997; 17.
25. Kademani D. Oral cancer, In *Mayo Clinic Proceedings*. Elsevier 2007; 82:878-87.
26. Toner M, O'Regan EM. Head and neck squamous cell carcinoma in the young: A spectrum or a distinct group? Part 1. *Head Neck Pathol* 2009; 3:246-8.
27. Cloos J, Spitz MR, Schantz SP, et al. Genetic susceptibility to head and neck squamous cell carcinoma. *J Natl Cancer Inst* 1996; 88:530-5.
28. Cloos J, Steen I, Joenje H, et al. Association between bleomycin genotoxicity and non-constitutional risk factors for head and neck cancer. *Cancer Lett* 1993; 74:161-5.
29. Kuriakose M, Sankaranarayanan M, Nair MK, et al. Comparison of oral squamous cell carcinoma in younger and older patients in India. *Eur J Cancer B Oral Oncol* 1992; 28:113-20.
30. Miller RH, Lipkin A, Woodson GE, et al. Squamous cell carcinoma of the oral cavity, pharynx and larynx in young adults. *Laryngoscope* 1985; 95:790-3.
31. Orbak R, Bayraktar C, Kavrut F, et al. Poor oral hygiene and dental trauma as the precipitating factors of squamous cell carcinoma. *Oral Oncol* 2005; 41:109-13.
32. Park JO, Sun DI, Cho KJ, et al. Clinical outcome of squamous cell carcinoma of the tongue in young patients: A stage-matched comparative analysis. *Clin Exp Otorhinolaryngol* 2010; 3:161-5.
33. Liao CT, Wang HM, Hsieh LL, et al. Higher distant failure in young age tongue cancer patients. *Oral Oncol* 2006; 42:718-25.