

## Original Article

### Tongue Squamous Cell Carcinoma: A Clinical Study

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#### ABSTRACT

**Background and Objectives:** Squamous cell carcinoma of the tongue (SCCOT) is the most common malignant neoplasm in oral cavity. At the time of the diagnosis of SCCOT regional metastases with a high mortality rate are common, which is due to the extensive lymphatic system drainage of the tongue. Although the level of healthcare has significantly improved, the survival rate is still low with an unsatisfactory cure rate. The present study was designed to establish a clinical review on adults with SCCOT and to determine whether the rate of SCCOT has been changed over the 20-year.

**Methods:** A cohort of 102 patients was recruited for this retrospective study. The study was carried out by reviewing the medical reports and case notes of patients with histologically confirmed SCCOT.

**Results:** The peak incidence was observed between 60 and 70 years. Stage I disease was found in 24, stage II in 64, stage III in 10 and stage IV in four patients. Seventy-three patients were treated with combined therapy; surgery and radiation, whereas, 29 patients received only surgery. The overall 5-year survival was 60%. Thirty patients developed tumor recurrence including 12 local, 12 nodal, four locoregional, and two distant. Thirty-four patients died during the follow-up period, six with persistent disease, and 62 remained cancer free, giving a mortality and morbidity rate of 39%.

**Conclusion:** This study recommends aggressive early treatment of patients with SCCOT including resection of the primary tumor with a safe margin (1.5cm) in addition to an appropriate neck dissection.

**Keywords:** Tongue, Squamous Cell carcinoma, Survival rate.

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## Introduction

**S**quamous cell carcinoma of the tongue (SCCOT) is the most common malignant neoplasm of the oral cavity and represents approximately 3% of all human malignant tumors (1, 2). Carcinoma of the tongue comprises between 17.6 and 42.8% of all intraoral cancers (3, 4). Between 1948 and 1995, the number of patients with SCCOT at Anderson Cancer Center, Texas, USA, has steadily increased from fewer than 10 patients per year to as many as 52 (5). Moreover, cancer of the tongue has been regarded as a disease that usually affects men between the 6<sup>th</sup> through the 8<sup>th</sup> decades of age with a low survival rate after initial diagnosis due to its high propensity for regional metastasis (6, 7). The present study was designed to establish a clinical review on adults with SCCOT and to determine whether the rate of SCCOT has been changed over the 20-year period between 1984 and 2003.

## Materials and Methods

Between February 1984 and March 2003, 154 patients with histologically confirmed SCCOT (Approximately 20% of all oral and oropharyngeal SCC cases) were referred to Besat Teaching Hospital in Hamedan Province, western Iran. This hospital, as the only facility of this kind, acts as a national referral center for patients with cancer which covers Hamedan Province with an estimated population of 2 million people. We excluded 52 patients who received palliative care. The remaining 102 patients, who underwent surgical treatment, were included in the study. Our policy was to evaluate all patients at a joint head and neck radiation/oncology department. All patients were clinically re-staged according to the 1997 Union for International Cancer Control (UICC), and 1997 American Joint Committee for Cancer Staging and final results reporting in American Joint Committee on Cancer (AJCC) system (8, 9).

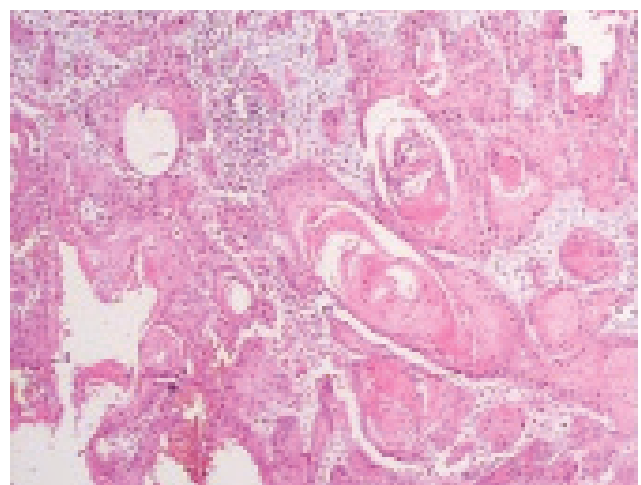
The study protocol was approved the Ethics Committee of Besat Teaching Hospital in accordance with the declaration of Helsinki.

## Results

All 102 patients had SCCOT (squamous cell carcinoma 100 cases and verrucous carcinoma two cases). There were 67 males and 35 females with the median age of 57 years (age ranged from 40 to 70 years) (Fig.1). The preoperative clinical stages included 24 stage I (23.5%), 64 stage II (67.2%), 10 stage III (9.8%), and 4 stage IV (3.9%) patients (Fig. 2). There were 57, 43 and two cases with well-differentiated, moderately-differentiated and poorly-differentiated squamous cell carcinomas, respectively. The average follow-up examination time was 31 months.



**Fig.1:** Clinical feature of tongue squamous cell carcinoma. (Original)



**Fig. 2:** Pathological feature of tongue squamous cell carcinoma, grade III. (H&E  $\times 100$ )

The most common complaint among 77% of patients was a painless swelling or ulcer. The remaining 23% complained of a dull ache radiating deeply into the ear. The majority of patients (86%) had a median delay in diagnosis of less than 12 months. The typical lesions developed on the lateral border (96%) and on the dorsum of the tongue (4%). The preoperative diagnostic procedures included open biopsy, fine needle aspiration (FNA), ultrasound, computed tomography scan and magnetic resonance imaging.

Thirty patients (29.4%) developed tumor recurrences including 12 local, 12 nodal, four local nodal and two distant metastases. At the final follow-up examination, two patients died of operative complications, 26 died of the carcinoma of the tongue, two died of second primary, four died of other causes, six were alive with a second primary (bronchogenic SCC) developed a year after treatment and they died within the next several months, and 62 remained alive free of tumor. Finally, the 5-year overall survival rate was 60%.

The operations performed for those patients suffering from SCCOT included partial glossectomy in 58 patients (56.8%), hemiglossectomy in 26 (25.5%) and subtotal glossectomy in 18 (17.6%). All patients had some type of neck dissections. Eighty-eight patients had supraomohyoid neck dissection (SOHND) 10 cases underwent radical neck dissection (9.8%) and four cases had bilateral functional neck dissection (3.9%).

Adjuvant radiation therapy was mostly used when the primary tumor had close margins or perineural invasion, multiple lymph nodes contained metastatic tumor or if there was extra capsular extension of tumor outside the lymph node.

## Discussion

The management of SCCOT has been a challenge and still a source of controversy regarding the optimum treatment. Carcinoma of the tongue is considered for its high tendency for regional metastasis and poor prognosis. Cervical metas-

tases preceding distant dissemination are highly complicated factors, but treatment without controlling the primary lesion is inefficient. Modern treatment strategies and dissection techniques, have substantially improved the long-term survival of patients. Particularly, the improvement in survival rate was observed in patients with neck dissection as a primary treatment. These findings, supports this strategy that all patients with SCCOT treated surgically should undergo neck dissection for prognostic and therapeutic purposes. This approach was based on the previous studies of Lydiatt *et al.* and Myers *et al.* (10,5). In the aforementioned studies, loco regional control and survival rate at 5 years were 50% and 33% respectively in patients with negative neck (N0) treated with resection of the primary tumor alone compared with 91% and 55% in patients treated with resection of the primary tumor plus elective neck dissection.

For many years supra omohyoid neck dissection (SOHND) that encompasses levels I to III of neck was applied as the standard treatment method for oral and oropharyngeal squamous cell carcinomas (11). This technique provides an optimal clinical outcome, less postoperative deformity and least functional morbidity. However for tongue SCC, surgeons should closely evaluate and remove any lymph nodes evident within level IV (11).

In our study, all 24 patients with stage I disease were operated on and seven were given adjuvant irradiation. All stage II lesions (64 cases) were excised, and adjuvant radiation therapy was used in 52 patients. The 5-year overall and relapse-free survival did not differ among patients with stage I and II disease. Mitchell *et al.* found a 5-year overall survival rate of 89% and 69% for patients with stage I and stage II lesions respectively (12). Nyman *et al.* reported 66% and 67% five year relapse-free survival rate for stage I and II disease respectively (13). In the present study, the 5-year overall survival rate was 60% and 5-year relapse-free survival rate for stage I and

II disease was 65.9%. All 10 cases with stage III lesions were treated by combined resection and adjuvant radiation therapy and all stage IV lesions (4 patients) were treated by surgery and radiation that resulted in a 5-year overall survival rates of 21.4% and 16.6% respectively. The survival rate in the case of tongue tumor for stage III and IV was reported as only 27 % (1).

Histological differentiation had no prognostic impact, which was in agreement with outcomes reported by Nyman *et al.* (12), and Pernot *et al.* (13) but it was in contrast to some other studies (14, 15). The surgical margin is considered as an independent prognostic factor that affects both overall and relapse-free survival (16). In head and neck cancers the incidence of local recurrence is higher with positive histological resection margin than negative histological resection margin. The reported incidences of local recurrence rate in positive margin ranged from 29% to 70% and 4% to 38% for negative resection margin (6). The 5- and 10-year overall survival rates in patients with clear surgical margins were 72% and 64% respectively compared with 21% and 0% for those whose margins were involved (17). Local recurrence could still occur in patients with histologically clear resection margins and it might be due to the failure of the histologic detection of tumor at the margin, micro metastasis skip beyond the resection margin or tumor implantation during surgery (6). The local recurrence rate of negative resection margin was 11.7% in the present study. Perineural infiltration has been reported to be a poor prognostic histological feature in head and neck cancer (17, 18). The incidence of local recurrence increases significantly with presence of the histologic feature of perineural infiltration (6). Perineural infiltration was more reliable prognostic factor than the tumor stage, three-dimensional size, and other histological factors in the prediction of local recurrence (6). Perineural infiltration was also considered as a poor prognostic factor for survival owing to the high incidence of recurrence (6). Patients who

had local or regional recurrence had shorter survival periods. The patients with regional recurrence fared poorly and those with local recurrence did even worse (5). Our finding of a low proportion of cases living in rural (six cases) or semi-urban (three cases) areas corresponds with figures showing a genuine trend towards higher head and neck cancer rates in urban compared with rural or semi-urban communities (19).

In this retrospective sampling, 40% of patients had a history of moderate to heavy tobacco smoking for more than 20 years. However it is still controversial that may be this exposure to tobacco smoke may be too short for malignant transformation to occur (20). Furthermore, 32.2% of the sample had never smoked and only 6% of the patients had a history of drinking alcohol.

Moreover, approximately 38% of all cases in this study had exposure to tobacco, opiate, or alcohol. Although this study was clearly limited by its design as a retrospective review and by the small number of patients, our findings were consistent with previous study reporting an association between malignant head and neck tumors and the joint consumption of tobacco and alcohol (7). However, a recent study revealed that these risk factors act independently, increasing the risk of cancer compared to the non-smoking, non-drinking population (1). Other information obtained from the patients' past medical history such as family history of cancer, did not appear to be predictable for survival (1).

## Conclusion

We recommend aggressive early treatment of patients with SCCOT including resection of the primary tumor with a safe margin (1.5 cm) in addition to an appropriate neck dissection. In a region with such high prevalence of head and neck cancer, more effort should be directed towards the importance of early cancer detection to improve overall survival and lifestyle as well as the chance of preserving the tongue. It is important to focus on reducing risk factors



and also to take into account the various other prognostic factors.

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The authors declare that there is no conflict of interests.

### References

1. Brandizzi D, Gondolfo M, Velazco M L, Cabrini R L, Lanfranchi H E. 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.
2. Mohtasham N, Babakoochi S, Montaser-Kouhsari L, Memar B, Salehinejad J, Rahpeyma A, *et al.* The expression of heat shock proteins 27 and 105 in squamous cell carcinoma of the tongue and relationship with clinicopathological index. *Med Oral Patol Oral Cir Bucal* 2011 ;16(6):e730-5.
3. Effiom O A, Adeyemo W L, Omitola O G, Ajayi O F, Emmanuel M M, Gbotolorun O M. Oral squamous cell carcinoma: a clinicopathologic review of 233 cases in Lagos, Nigeria *J Oral Maxillofac Surg* 2008;66:1595-9.
4. Imaroon A, Pattanaporn K, Pongsiriwet S, Wanachantararak S, Prapayasatok S, Jittidecharaks S, *et al.* Analysis of 587 cases of oral squamous cell carcinoma in northern Thailand with a focus on young people. *Int J Oral Maxillofacial Surg* 2004;33(1):84-8.
5. Myers JN, Elkins T, Roberts D, Byers R M. Squamous cell carcinoma of the tongue in young adults: increasing incidence and factors that predict treatment outcomes. *Otolaryngol Head Neck Surg* 2000;122:44-51.
6. Yuen P W, Lam K Y, Chan A C, Wei W L, Lam L K. Clinicopathological analysis of local spread of carcinoma of the tongue. *Am J Surg* 1998;175:242-4.
7. Vargas H, Pitman KT, Johnson JT, Galati LT. More aggressive behavior of squamous cell carcinoma of the anterior tongue in young women. *Laryngoscope* 2000;110:1623-6.
8. Sobin LH, Wittekind C . International Union Against Cancer (UICC). TNM classification of malignant tumors, 5<sup>th</sup> ed. Wiley:New York;1997.
9. American Joint Committee on Cancer. AJCC Cancer Staging Manual. 5<sup>th</sup> ed. Philadelphia: Lippincott -Raven;1997.
10. Minamikawa T, Umeda M, Komori T. Reliability of sentinel lymph node biopsy with squamous cell carcinoma of the oral cavity. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2005;99:532-8.
11. Lydiatt DD, Robbins KT, Byers RM, Wolf PF. Treatment of stage I and II oral tongue cancer. *Head Neck* 1993;15:308-12.
12. Nyman J, Mercke C, Lindström J. Prognostic factors for local control and survival of cancer of the oral tongue. A retrospective analysis of 230 cases in western Sweden. *Acta Oncol* 1993;32(6):667-73.
13. Pernot M, Malissard L, Hoffstetter S, Luporsi E, Peiffert D, Aletti P, *et al.* The study of tumoral, radiobiological, and general health factors that influence results and complications in a series of 448 oral tongue carcinomas treated exclusively by irradiation. *Int J Radiat Oncol Biol Phys* 1994;29(4):673-9.
14. Odell EW, Jani P, Sherriff M, Ahluwalia SM, Hibbert J, Levison DA, *et al.* The prognostic value of individual histologic grading parameters in small lingual squamous cell carcinomas. The importance of the pattern of invasion. *Cancer* 1994;74:789-94.
15. Kirita T, Okabe S, Izumo T, Sugimura M. Risk factors for the postoperative local recurrence of tongue carcinoma. *J Oral Maxillofac Surg* 1994;52:149-54.
16. El-Husseiny G, Kandil A, Jamshed A, Khafaga Y, Saleem M, Allam A, *et al.* Squamous cell carcinoma of the oral tongue: an analysis of prognostic factors. *Br J Oral Maxillofac Surg* 2000;38:193-9.
17. Maddox WA, Urist MM. Histopathological prognostic factors of certain primary oral cavity cancers. *Oncology* 1990;4(12):39-42.
18. Carter RL, Tanner NSB, Clifford P, Shaw HJ. Perineural spread in squamous cell carcinomas of the head and neck: a clinicopathological study. *Clin Otolaryngol Allied Sci* 1979;4(4):271-81.
19. Byers RM. Squamous cell carcinoma of the tongue in patients less than thirty years of age. *Am J Surg* 1975;130(4):475-8.
20. Jones JB, Lampe HB, Cheung HW. Carcinoma of the tongue in young patients. *J Otolaryngol.* 1989;18:105-8.