Neck dissection versus "watchful-waiting" in early squamous cell carcinoma of the tongue our experience on 127 cases

Giovanni Dell'Aversana Orabona [a], Paola Bonavolontà [a, *], Fabio Maglitto [a], Marco Friscia [a], Giorgio Iaconetta [b], Luigi Califano, Chair of Department [a]

[a] Department of Maxillo-Facial Surgery, University of Naples, "Federico II", Naples, Italy
[b] Chair of Neurosurgery, University of Salerno, Italy

ARTICLE INFO

ABSTRACT

Background: Early oral squamous cell carcinoma (EOSCC) represents about 90% of the oral cancers especially in older males. The etiology is multifactorial, strongly related to tobacco and alcohol abuse, but also infective agents, Human papillomaviruses (HPV16-18), genetic factors and pre-neoplastic lesions seem to be implicated. There is no consensus in the literature for the treatment of early squamous cell carcinoma of the tongue (stages I—II); both an elective neck dissection policy and a watchful-waiting policy have their proponents in the different centers.

Methods: The records of 127 patients with EOSCC of the tongue treated in our Department between 2007 and 2011, with cN0 neck staging, who underwent resection of the primary tumor with or without elective neck dissection, were reviewed.

Results: We divided the patients into two groups, in Group 1 the 66 patients who received an elective neck dissection 30 days later from the primary surgery have been included, and in Group 2 the 61 patients undergoing "watchful waiting" observation for the development of nodal metastases have been collected.

Statistical calculations were performed using Chi-square and t student test.

Conclusions: A significant difference was found between the two groups as concerns tumor stage and pathologic tumor classification ($p < 0.001$). No significant differences were present between the two groups as concerns mean follow up ($P = 0.2$), relapse rate ($p = 0.3$) and relapse-free survival time ($p = 0.2$).

In T1 stage tumors with depth of infiltration ≤ 4 mm, or low grade (G1-G2), the "watchful waiting" strategy for cervical metastases is appropriate, given the low regional recurrence rate (15%) and overall survival of 100%.

In case of T2 lesions with depth of infiltration ≥ 4 mm or high grade (G3) we prefer to perform the elective neck dissection, with 13% of local recurrence and 100% of survival at 6 years.

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1. Introduction

Early oral squamous cell carcinoma (EOSCC) represents about 90% of the oral cancers, especially in older males. It is mainly observed on the lips and on the tongue. The spread is local through muscle and bone, and metastasizes initially to the anterior cervical lymph nodes and later to the liver and skeleton [1]. The etiology is multifactorial, strongly related to tobacco and alcohol abuse [2], but also infective agents, Human papillomaviruses (HPV16-18) [3], genetic factors and pre-neoplastic lesions seem to be implicated.

The most important risk factor is tobacco because of an interaction that occurs between redox-active metals in saliva, and the low reactive free radicals in cigarette smoke [3].

There is no consensus in the literature for the treatment of early squamous cell carcinoma of the tongue (stages I—II); both an elective neck dissection policy and a watchful-waiting policy have their proponents in the different centers. Jesse et al. [4] have not found any survival benefit to choose the elective neck dissection, but others studies have demonstrated that the watchful-waiting patients had more regional recurrences and extremely poor

salvage rates [5,6].

During the last five years, we have analyzed all the data about the patients affected by head and neck tumors [7,8].

In this study we report our experience in the treatment of 127 patients affected by squamous cell carcinoma of the tongue.

2. Patients and methods

Among 350 cases of oral squamous cell carcinoma of the tongue treated in our Department between 2007 and 2011, the data of 127 patients affected by early oral squamous cell carcinoma of the tongue, with cN0 neck, who underwent resection of the primary tumor, with or without elective neck dissection, were reviewed in order to make a comparison between these different strategies. We included in our study patients with early squamous cell carcinoma of the tongue in stage cTNM: T1-T2 N0 M0. The data we have included are: tumor's size (T), tumor's thickness, the vascular and perineural invasion, the grading, the extracapsular spread, the type of treatment, the pTNM, the recurrence, and outcome. Exclusion criteria were: patients with different histological type of tumors or other localization in the oral cavity. Another exclusion criteria was the cTNM > T2 or the nodal involvement. All patients were staged using the 7th American Joint Committee on Cancer TNM classification and staging of oral cancer.

According to our protocol, all patients underwent echography of the neck, routine Computed Tomography (CT) or Magnetic Resonance (MR) of the head and neck and total body Pet-CT; furthermore, biopsy of the lesion.

All patients underwent surgical excision of the primary tumor. We divided the patients into two groups, in Group 1 the 66 patients who received an elective neck dissection (Level I-III) 30 days later from the primary surgery have been collected, and in Group 2 the 61 patients undergoing watchful waiting observation for the development of nodal metastases have been included.

We evaluated the tumor depth and grading, the vascular and perineural invasion; in all the cases the depth of the tumor invasion was not exceeding 4–5 mm. We decided to perform elective neck dissection in patients with tumor thickness ≥4 mm or G3 tumor grade.

Statistical calculations were performed using the Statistical Package for Social Sciences (version 17.0, SPSS Inc., Chicago, IL, USA). Chi-square test was used in order to compare tumor stage, pathologic tumor classification and relapse rate between the two Groups. Student' t-test was used to compare mean follow-up and overall relapse-free survival between the two groups. Survival curves were calculated using the Kaplan–Meier method. The significance level for all analyses was set at $p < 0.05$.

3. Results

All 127 patients (68 females, 59 males, mean age 59.4 ± 14.2 years) included in the study, received biopsy before surgery. As mentioned before, in the Group 1, 66 patients (29 females and 37 males, mean age 52.4 ± 16.0 years) were included. Mean follow-up was 41.6 ± 13.0 months (range, 10–58).

Among them, 12 patients (18.2%) had cT1 stage tumor, and 54 patients (81.8%) had a cT2 stage tumor. Fourteen cases (21,2%) had pathologic tumor classification (pT1), and 52 cases (78,8%) showed a pathologic tumor classification (pT2). In 2 patients (3%) vascular and perineural invasion was present. Eight patients (12,2%) had positive pathologic nodes (pN+) without extracapsular spread and 58 cases had pN0 (87,8%). Margins were positive in 5 cases (7,6%). In these cases, the second line treatment was surgical radicalization in 3 of them (4,5%), and radiation therapy (RT) in the other two patients (3%) previously treated by reconstructive surgery. In case of

vascular and perineural invasion radiation therapy was performed. No patient developed clinical distant metastases (cM0). Eight patients (12,2%) had a tumor recurrence (range of relapse: from 13 to 28 months) that required another surgical treatment. Overall relapse-free survival was 37.9 ± 15.0 months (Table 1).

In the Group 2, 61 patients (39 females and 22 males, mean age 60.4 ± 11.9 years) were included. Mean follow-up was 38.0 ± 16.7 (range, 9–66) months.

Among them, 50 patients (82%) had a cT1 stage tumor, 11 patients (18%) had a cT2 stage tumor. Forty-five patients (73,7%) had pT1, and 16 patients (26,3%) had pT2. Sixty-one patients (100%) had negative clinical nodes (cN0).

Margins were positive in 3 cases (4,9%); In case of positive margins, the second line treatment was surgical radicalization. Five patients (8,2%) had a local recurrence (range of relapse: from 12 to 18 months) that required another surgical treatment. Overall relapse-free survival was 34.2 ± 16.4 months (Table 2).

A significant difference was found between the two groups regarding the tumor stage and the pathologic tumor classification (p < 0.001). No significant differences were present between the two groups as concerns mean follow-up (P = 0.2), relapse rate (p = 0.3), and relapse-free survival time (p = 0.2) (Fig. 1).

4. Discussion

The goal of treatment for early oral squamous cell carcinoma of the tongue is to ensure a complete excision of the primary tumor with at least a 2-cm margin of clinically normal tissue during the first surgical procedure.

Table 1
Baseline patient characteristics by Elective Neck Dissection policy group (Group 1).

	All patients (n = 66)
Sex	
Male	37 (56%)
Female	29 (44%)
Median age	52.4 ± 16.0 years (range, 28–87)
Follow up	41.6 ± 13.0 months (range, 10–58)
Depth of infiltration	
≤3(mm)	20 (30,3%)
>3 ≤ 4(mm)	26 (39,3%)
>4(mm)	20 (30,3%)
Clinical Tumor stage	
cT1	12 (18.2%)
cT2	54 (81.8%)
Clinical Nodal stage	
cN0	66 (100%)
cN1	0
Tumor grade	
1	4 (6%)
2	11 (16,7%)
3	51 (77,3%)
Clinical distant metastases	none
Pathological Tumor stage	
pT1	14 (21,2%)
pT2	52 (78,8%)
Pathological Nodal Stage	
pN0	58 (87,8%)
pN1	8 (12,2%)
Extracapsular spread	None
Vascular invasion	2 (3%)
Perineural invasion	2 (3%)
Margins positive	5 (7,6%)
• Second line treatment	
Surgical radicalization	3 (4,5%)
Radiation Theraphy	2 (3%)
Tumor recurrence	8 (21,2%)
• Second line treatment	
Surgical treatment	8 (21,2%)
Overall relapse-free survival	37.9 ± 15.0 months

Table 2
Baseline patient characteristics by Watchful-waiting policy group (Group 2).

	All patients (n=61)
Sex	
Male	22 (%)
Female	39 (%)
Median age	60.4 ± 11.9 (range, 39–82) years
Follow up	38.0 ± 16.7 (range, 9–66) months
Depth of infiltration	
≤3(mm)	52 (85,2%)
>3 ≤ 4(mm)	9 (14,8%)
>4(mm)	–
Clinical Tumor stage	
cT1	50 (82%)
cT2	11 (18%)
Clinical Nodal stage	
cN0	61 (100%)
cN1	–
Tumor grade	
1	37 (60,7%)
2	24 (39,3%)
3	–
Clinical distant metastases	none
Pathological Tumor stage	
pT1	45 (73,7%)
pT2	16 (26,3%)
Margins positive	3 (4,9%)
• Second line treatment	3 (4,9%)
Surgical radicalization	
Tumor recurrence	5 (8,2%)
• Second line treatment	
Surgical treatment	5 (8,2%)
Overall relapse-free survival	34.2 ± 16.4 months

Unfortunately there are a small number of cases that have an aggressive behavior and are associated to a poor prognosis [6].

Many factors, such as tumor growth type, size, differentiation, mode of invasion, mitotic activity, microvascular invasion, and histological grade of malignancy have been reported to be risk factors for the development of cervical lymph node metastasis that indicate a poor prognosis [9–11].

We believe, according to the literature, that the tumor thickness is a major predictive factor for cervical lymph node metastasis and is related with survival and local recurrence [12–14].
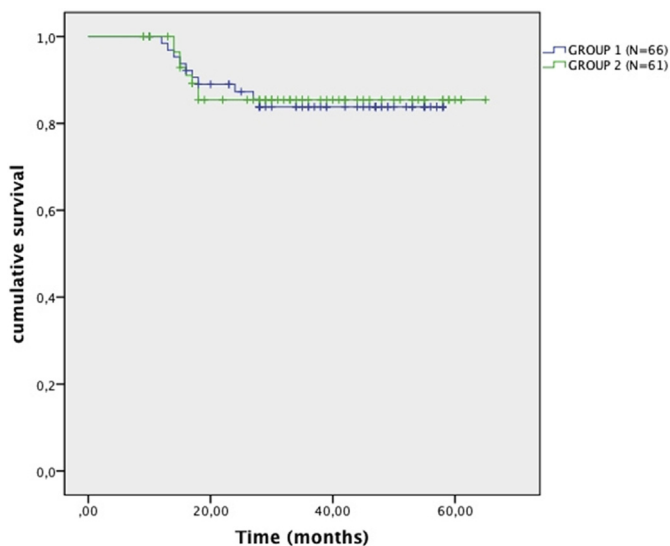

Fig. 1. Cumulative survival until relapse in the two groups (Group 1, Elective neck dissection; Group 2, watchful waiting observation for development of nodal metastases).

The incidence of lymph node metastasis increased when the tumor depth exceeded 4 mm. If at least 1 node has clinical signs of invasion, a reasonable presumption is that others may be involved, and must be removed by elective neck dissection (Level I-III).

The surgical treatment of the cN0 neck in oral squamous cell carcinoma is still controversial, because of its uncertainty on the patient prognosis.

In the literature, the incidence of occult nodal metastasis has been reported to be 30%–40% [14–16].

On the basis of the high incidence of occult nodal metastasis reported in the literature, elective neck dissection has been suggested as primary treatment of T1–T2 tongue squamous cell cancer with cN0 neck [17–20].

With increasing sensitivity and specificity of imaging modality to detect early nodal metastasis, the negative predictive value of imaging to exclude occult nodal metastasis has much improved. Thus, the watchful waiting policy has been advocated again. Tsang et al. [21] demonstrated that salvage neck dissection may not be effective for controlling nodal recurrence in T2 tumors of the oral cavity, and watchful waiting policy should only be adopted for patients with T1 disease, tumor thickness ≤ 4 mm, grading ≤ G2, and who are able to undergo close follow-up. The elective treatment of the neck lymph nodes, either in the form of elective neck dissection or radiotherapy, should seriously be considered in patients with T2 tumors of the oral cavity, tumor thickness >4 mm or grading > G2.

Yuen showed that elective neck dissection markedly reduces the nodal recurrence rate [5]. He described in 2009 a survival rate of 89% at 5 years after elective neck dissection, versus 87% of survival in patients who underwent a watchful-waiting policy, after surgical removal of the tumor. Other studies have also shown that the elective neck dissection improves survival rates in patients with early tongue cancer and other oral cavity cancers [19,20,22–24]. Although some Authors consider the elective neck dissection in early tongue cancer a staging procedure that provides indication for adjuvant treatment [25,26]. Yu et al. [27] in 2006 reported a survival rate of 5 years in 100% after elective neck dissection, versus 68,7% of survival in patients that were only observed.

Different results were found by Yuen et al. who reported a survival rate of 5 years in 66% of patients after the elective neck dissection, versus 63% of survival in patients that were only observed [28].

Other studies have shown that the elective neck dissection alone has a therapeutic effect in the early treatment of nodal diseases at levels I, II and III [26,29].

In effect, the elective neck dissection has both, therapeutic effects and guides for further adjuvant treatment. On the contrary, salvage surgery of nodal recurrence in head and neck cancer has been shown to be only moderately effective in controlling the disease, with a 5-year tumor-free survival rate of 32% [30].

All the cases of nodal recurrence in this study occurred less than 18 months after the initial operation for the tongue cancer. These nodal recurrences are probably due to micrometastasis already present in the lymph nodes that failed clinical detection. By improvements in imaging technologies, a more accurate preoperative nodal staging is now possible without resorting to pathologic staging. Ultrasound-guided fine-needle aspiration cytology study, can achieve high positive and negative predictive values [31].

Thus, we can now more confidently consider that cN0 neck is genuinely negative for lymph node metastasis.

Melkane, and more recently Sagheb in a prospective study, suggest that the sentinel node biopsy appears to be an excellent staging method in early oral cancers and can guide the surgeon's strategy [32,33].

In conclusion in our opinion, for tumors of the tongue at T1

stage, with thickness ≤4 mm, grading ≤ G2, the watchful-waiting strategy for cervical metastases is appropriate, given the low regional recurrence rate (15%) and overall survival of 100%. In case of T2 lesion, tumor thickness >4 mm or grading > G2, we prefer to perform the elective neck dissection, with 13% of local recurrence and 100% of survival at 6 years. Furthermore in case of vascular or perineural invasion we strongly recommend radiation therapy.

Conflict of interest statement

None to declare.

Ethical approval

We confirm the patients permission.

Synopsis

In this paper, we report on 127 cases of early oral squamous cell carcinoma of the tongue. This is significant because there is not general consensus about the treatment of the tumor in this stage. The paper should be of interest to readers in the areas of Maxillo-Facial surgery and head and neck surgery.

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