

Quality of Life in Patients Surgically Treated for Oral Carcinoma

SUMMARY

Background/Aim: The aim of this study was to examine quality of life in patients who were surgically treated for oral carcinoma. **Material and Methods:** The study included patients surgically treated over a 3-year period (2014-2016). Data on patients, tumor type and localization, disease status according to the TNM classification, type of surgical intervention and time since surgery were collected from the medical records. Post-surgery functional and aesthetic results were evaluated using the adapted University of Washington Quality of Life questionnaire. **Results:** Forty patients were included in the study. Male patients were more prevalent (27 vs 13) ($\chi^2=4.225, p<0.05$). Ratio of planocellular vs adenocarcinoma was 35 vs 5 ($\chi^2=11.404, p=0.0007, \alpha=0.05$). Osteotomy was performed in 52.5% of patients, and surgical intervention in the soft tissue was performed in 47.5%. Patients who had recovered >1 year showed better mood (Mann-Whitney test, $p=0.036, \alpha=0.05$), functions of speech (Mann-Whitney test $p=0.008, \alpha=0.05$) and chewing (Mann-Whitney test $p=0.04, \alpha=0.05$), as well as patients who had soft tissue surgery (chewing: Mann-Whitney test $p=0.016, \alpha=0.05$; speech: Mann-Whitney test $p=0.043, \alpha=0.05$). Patients with T1 stage tumors considered their looks less disfigured and had fewer problems in appearing in public, compared with patients with T3 and T4 stage (Dunn's test, CI -95%). Interest in sex was significantly diminished in patients older than 30 years (Kruskal-Wallis test ($p=0.013, \alpha=0.05$)). **Conclusions:** The stage of disease, range of resection and success of reconstruction were decisive parameters for postoperative quality of life. Early detection of disease is of utmost importance for both survival and quality of life of patients with carcinoma.

Key words: Oral Cancer, Quality of Life, Post-Surgical Recovery, Stomatognathic Function

Andelija Petrović¹, Goran Keković², Slobodan Sekulić³, Slavko Mojsilović¹

¹ Institute for Medical Research, University of Belgrade, Belgrade, Serbia

² Institute for Biological Research "Siniša Stanković", University of Belgrade, Belgrade, Serbia

³ Department of Neurology, Medical Faculty Novi Sad, University of Novi Sad, Novi Sad, Serbia

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Introduction

The incidence of malignant tumors localized in the oral cavity is 3.4% in Europe. In relation to all localizations of malignant tumors, the oral cavity is the eighth most frequent, and the ninth most frequent cause of death¹. The most common histopathological type of oral carcinoma, accounting for over 90% of cases, is oral squamous-cell carcinoma². Studies indicate an increase in the incidence of this tumor over the last few years^{2,3}. Despite the currently available therapeutic strategies that

involve excision of malignant tissue in combination with radiotherapy and chemotherapy, the five-year survival rate is below 53%.

Most planocellular carcinomas are diagnosed late, in the third or fourth stage of disease, which significantly reduces the chances of survival and impairs quality of life⁴. Oral carcinoma usually causes a serious decrease in the patient's quality of life. Following the diagnosis and treatment, the parts of the orofacial region that are most frequently affected are swallowing, chewing, salivation and speech.

In addition, family life and social relationships also can be impaired, causing isolation and loss of general cognitive, social, emotional or physical functions⁵. Therefore, therapeutic success should not be measured only by the absence of relapse or metastases, but also on the basis of characteristics that indicate quality of life. A panel of researchers under the authority of the World Health Organization proposed a unifying and transcultural definition of QOL as “the perception of the individual on his or her position in life, within the cultural context and value system he or she lives in, and in relation to his or her goals, expectations, parameters and social relations”⁶. Patients may consider quality of life more important than survival at all costs. Therefore, quality of life must be taken into account when choosing treatment.

The aim of our research was to examine quality of life in patients who underwent surgical treatment for oral carcinoma at the Clinic for Maxillofacial Surgery of the Clinical Center of Vojvodina in Novi Sad.

Material and Methods

The study was approved by the Ethics Committee of the Clinical Center of Vojvodina and registered under the number 00-05/195. All subjects gave a written consent to participate in the study, and all data received from patients were treated as confidential, thus protecting their privacy.

The research was carried out in the form of a retrospective study at the Clinic for Maxillofacial Surgery at the Clinical Center of Vojvodina in Novi Sad. The study included patients with established diagnosis of oral cancer who were surgically treated in the period 2014-2016.

Data were collected from patients' medical records (medical histories, electronic database, operational protocol, and accompanying clinical, radiological and laboratory documentation) kept at the Clinic for Maxillofacial Surgery of the Clinical Center of Vojvodina in Novi Sad. Medical documentation was used to obtain data on the type of tumor, tumor localization, stage of disease, type of surgery and time since surgery.

Five tumor localizations were distinguished: cheeks; movable part of the tongue; the floor of the mouth; the gingiva; and the hard palate. If a tumor was present in two of the stated localizations, the larger localization was chosen. Classification of tumor stages was done according to the TNM classification system: T1 - tumor is up to 2 centimeters in diameter; T2 - tumor is from 2 to 4 centimeters in diameter; T3 - tumor is greater than 4 centimeters in diameter; T4 - tumor affects bone structures, carotid artery, deep tongue muscles, facial skin, mastication area, or maxillary sinus.

For the purpose of this research, i.e., for the evaluation of postoperative functional and aesthetic results in our patients, we used the University of Washington

Quality of Life Questionnaire (UW-QOL v4)⁷, which was adapted based on clinical experience and population specificity. The questionnaire consisted of 19 questions and it was divided into four parts: sociodemographic characteristics, harmful habits before and after surgery, function of the stomatognathic system and psychosocial characteristics. The questionnaire was designed as the multiple-answer type, and the subjects had to circle one or more of possible responses. The questionnaire was filled in during regular check-ups at the specialist polyclinic of maxillofacial surgery of the Clinical Center of Vojvodina in Novi Sad. Data were processed and analyzed using the SPSS software (IBM, version 20).

Results

In this research we identified 40 available patients who were diagnosed with oral cancer and surgically treated at the Clinic for Maxillofacial Surgery at the Clinical Center of Vojvodina in Novi Sad. The total number of patients treated surgically was greater, but not all of them were available for the questionnaire, or the data from their medical documentation were incomplete.

Among the 40 subjects, there were more men than women (27 vs. 13; 67.5% vs. 32.5%). Under the assumption of the zero hypothesis that the ratio would be 20:20 (50%: 50%), the Chi square test showed statistical significance ($\chi^2 = 4.225 > 3.841$, $p < 0.05$, $\alpha = 0.05$), signifying that male subjects were more frequently affected with the examined types of tumors. The largest number of subjects belonged to the age range 50-70 years, and the average age was 63 years.

Nineteen subjects (47.5%) had completed secondary education. The most common type of carcinoma was planocellular carcinoma, found in 35 (87.5%) subjects, while adenocarcinoma was present in only 5 subjects (12.5%), which was statistically significant according to the Chi square test ($\chi^2=11.404$, $p=0.0007$, $\alpha=0.05$). Carcinomas were most frequently localized in the movable part of the tongue, in 14 subjects (35%); other localizations were the floor of the mouth, in 9 (22.5%), the gingiva in 8 (20%), the hard palate in 5 (12.5%) and the cheek in 4 (10%) subjects. Fifteen subjects (37.5%) were in the second stage and 11 (27.5%) in the third stage of disease.

In 52.5% of subjects osteotomy of the jaw was performed, while in the remaining 47.5% surgical intervention in the soft tissue was performed, i.e., wide excision of the tumor until clinically healthy surrounding tissue. Age, gender and education did not show statistically significant correlations with the observed characteristics of quality of life, except interest in sex, which was statistically significantly lower in older subjects. Namely, patients were divided into three

groups (<30 years, 30< and <60 years, >60 years) and the Kruskal-Wallis test (p=0.013, α=0.05) and post-hoc analysis (Dunn's test, CI-95%) showed that there is a greater interest in sexual intercourse in subjects under 30 years of age, compared with subjects aged 30-60 years and those over 60 years of age.

Table 1. Quality of function of the stomatognathic system in relation to characteristics of oral carcinoma

Functions of the stomatognathic system	Tumor type (%)		T stage (%)				Regional metastases (%)		Localization (%)				
	a	b	T1	T2	T3	T4	Ne	Da	1	2	3	4	5
Swallowing													
Same as before surgery	27.5	7.5	12.5	15	7.5	0	30	5	5	12.5	5	5	7.5
I cannot swallow certain solid foods	35	2.5	10	7.5	12.5	7.5	22.5	15	10	12.5	10	2.5	2.5
I can swallow only liquid foods	15	2.5	5	5	7.5	0	12.5	5	5	5	5	0	2.5
I cannot swallow because bites go "wrong way" and choke me	10	0	0	7.5	2.5	0	7.5	2.5	2.5	5	0	2.5	0
Chewing													
Same as before surgery	22.5	5	15	10	2.5	0	27.5	0	0	15	5	2.5	5
I chew only soft foods	37.5	2.5	10	7.5	17.5	5	17.5	22.5	15	12.5	2.5	5	5
I cannot chew soft foods either	27.5	5	2.5	17.5	10	2.5	27.5	5	7.5	7.5	12.5	2.5	2.5
Speech													
Same as before surgery	22.5	7.5	20	5	5	0	25	5	5	15	0	2.5	7.5
I have problems to pronounce some words, but others understand what I want to say	52.5	2.5	7.5	27.5	17.5	2.5	40	15	17.5	15	15	5	2.5
When I speak only family and friends can understand me	10	0	0	0	5	5	5	5	0	5	5	0	0
When I speak others cannot understand me	2.5	2.5	0	2.5	2.5	0	2.5	2.5	0	0	0	2.5	2.5

a – planocellular Ca; b – adenocarcinoma

Table 2. Quality of function of the stomatognathic system in relation to surgical intervention and time since operation

Functions of the stomatognathic system	Surgical intervention		Time since operation	
	Limited to soft tissue	Osteotomy	< 1 year	> 1 year
Swallowing				
Same as before surgery	22.5%	12.5%	12.5%	22.5%
I cannot swallow certain solid foods	17.5%	20%	22.5%	15%
I can swallow only liquid foods	5%	12.5%	7.5%	10%
I cannot swallow because bites go "wrong way" and choke me	2.5%	7.5%	2.5%	7.5%
Chewing				
Same as before surgery	20%	7.5%	5%	22.5%
I can chew only soft foods	20%	20%	20%	20%
I cannot chew soft foods either	7.5%	25%	20%	12.5%
Speech				
Same as before surgery	22.5%	7.5%	7.5%	22.5%
I have problems to pronounce some words, but others understand what I want to say	20%	35%	22.5%	32.5%
When I speak only family and friends can understand me	2.5%	7.5%	10%	0%
When I speak others cannot understand me	2.5%	2.5%	5%	0%

Regardless of the presence or absence of metastases, in both groups the chewing function worsened, more pronounced in the group with metastases (Mann-Whitney test, $p=0, \alpha=0.05$).

The Mann-Whitney test showed that the type of surgical intervention had a statistically significant effect on distribution of responses related to the chewing function. Patients who had soft tissue surgery reported statistically significantly fewer chewing problems ($p=0.016, \alpha=0.05$).

In addition, the type of surgical intervention had a statistically significant effect on distribution of responses related to speech. The function of speech was significantly better in patients who had soft tissue surgery (Mann-Whitney test $p=0.043, \alpha=0.05$).

Time since surgery had a statistically significant effect on the chewing function. Distribution of responses showed that patients who recovered for more than one year were having fewer problems with chewing (Mann-

Whitney test $p= 0.04, \alpha=0.05$). Likewise, the recovery time had a statistically significant effect on distribution of responses related to speech; the function of speech was significantly better in subjects who recovered for more than one year (Mann-Whitney test $p=0.008, \alpha=0.05$).

The stage of tumor (T1, T2, T3, T4 - four patient groups) had a statistically significant effect on subjects' appearances in public (Kruskal-Wallis test, $p=0.028, \alpha=0.05$). Post-hoc analysis (Dunn's test, CI -95%) showed that subjects at T1 stage regarded their appearance less severely disfigured or non-disfigured and had fewer problems to appear in public places compared with subjects at T3 and T4 stages.

Time since surgery, i.e., length of recovery had a statistically significant effect on distribution of responses related to subjects' mood (Mann-Whitney test, $p=0.036, \alpha=0.05$). Recovery lasting for more than one year has contributed to the improvement of subjects' mood.

Table 3. Subjective psychosocial characteristics in relation to characteristics of oral carcinoma

Psychosocial characteristics	Type of tumor (%)		T stage (%)				Regional metastases (%)		Localization (%)				
	a	b	T1	T2	T3	T4	No	Yes	1	2	3	4	5
Looks													
No changes in my looks	27.5	2.5	17.5	10	2.5	0	27.5	2.5	2.5	17.5	5	2.5	2.5
Changes are minor	35	7.5	10	12.5	17.5	2.5	25	17.5	12.5	10	7.5	7	7.5
My looks bother me and limit my activities	17.5	0	0	7.5	7.5	2.5	10	7.5	7.5	2.5	5	2.5	0
My appearance is disfigured	7.5	2.5	0	5	2.5	2.5	10	0	0	5	2.5	0	2.5
Mood													
Great, the illness does not affect it	22.5	5	12.5	7.5	7.5	0	22.5	5	5	10	5	0	7.5
Generally good, the illness only occasionally affects it	37.5	7.5	10	22.5	10	2.5	35	10	15	15	5	5	5
Neither good nor depressive	7.5	0	2.5	0	2.5	2.5	2.5	5	0	2.5	5	0	0
Sometimes I am depressed because of my illness	12.5	0	2.5	2.5	5	2.5	10	2.5	2.5	7.5	2.5	0	0
I am extremely depressed about my illness	7.5	0	0	2.5	5	0	2.5	5	0	0	2.5	5	0
Appearance in public													
No problems whatsoever	50	12.5	25	22.5	15	0	52.5	10	10	22.5	12.5	5	12.5
A little problem	32.5	0	2.5	12.5	10	7.5	20	12.5	12.5	12.5	5	2.5	0
A considerable problem	5	0	0	0	5	0	0	5	0	0	2.5	2.5	0
A great problem	0	0	0	0	0	0	0	0	0	0	0	0	0
Interest in sex													
No problems whatsoever	27.5	5	10	15	7.5	0	27.5	5	7.5	17.5	0	2.5	5
A little problem	27.5	2.5	7.5	5	12.5	5	17.5	12.5	10	10	5	0	5
A considerable problem	15	2.5	10	5	0	2.5	15	2.5	2.5	5	7.5	0	2.5
A great problem	17.5	2.5	0	10	10	0	12.5	7.5	2.5	2.5	7.5	7.5	0

a – planocelullar Ca; b – adenocarcinoma

Table 4. Subjective psychosocial characteristics in relation to the type of surgical intervention and time since surgery

Psychosocial characteristics	Surgical intervention		Time since operation	
	Limited to soft tissue	Osteotomy	< 1 year	> 1 year
Looks				
No changes in my looks	22.5%	7.5%	10%	20%
Changes are minor	15%	27.5%	17.5%	25%
My looks bother me and limit my activities	5%	12.5%	10%	7.5%
My appearance is disfigured	5%	5%	7.5%	2.5%
Mood				
Great, illness does not affect it	15%	12.5%	2.5%	25%
Generally good, illness only occasionally affects it	20%	25%	27.5%	17.5%
Neither good nor depressive	5%	2.5%	5%	2.5%
Sometimes I am depressed because of my illness	5%	7.5%	5%	7.5%
I am extremely depressed about my illness	2.5%	5%	5%	2.5%
Appearance in public				
No problems whatsoever	32.5%	30%	22.5%	40%
A little problem	15%	17.5%	17.5%	15%
A considerable problem	0%	5%	5%	0%
A great problem	0%	0%	0%	0%
Interest in sex				
No problems whatsoever	17.5%	15%	12.5%	20%
A little problem	12.5%	17.5%	12.5%	17.5%
A considerable problem	10%	7.5%	7.5%	10%
A great problem	7.5%	12.5%	12.5%	7.5%

Discussion

The epidemiological data obtained in our study in terms of the average age of patients (the seventh decade of life) and the significantly higher proportion of male patients are comparable with other literature data^{1,3}. Age is a significant risk factor, as indicated by the fact that about 90% of oral carcinomas were detected in people older than 45 years, which can be explained by prolonged exposure to carcinogens, such as long-term smoking, alcohol consumption, exposure to human papillomavirus, and poor nutrition. In addition, men more often smoke and consume strong alcoholic drinks compared with women, which results in a higher prevalence of oral carcinoma⁸.

In Europe, the USA and Asia, the most common localization of oral carcinoma is the frontal two thirds of the tongue, accounting for 30-50% of all intraoral carcinomas, followed by carcinoma of the floor of the mouth. The findings we obtained are in accordance with literature data^{9,10,11}. On the other hand, in certain regions of Asia, the most common site of oral carcinoma is in the buccal region, followed by the frontal two thirds of the tongue. This difference may be explained by the different habits of some populations in Asia, who have the habit of chewing tobacco and betel nuts, as opposed to, for example, residents of Europe and North America who

more often smoke cigarettes and consume strong alcoholic drinks¹².

In our study, we did not find the association between quality of life and tumor localization. Data on quality of life and localization of oral carcinoma are scarce. There is only one published study and its authors also found no difference in quality of life in relation to tumor localization¹³.

All our patients underwent surgical treatment with the aim of radical tumor excision and maximum preservation of important structures and functions. However, quality of life after surgery was not in all patients at a desired level. Similarly, the application and scope of surgical interventions were accompanied with poor quality of life in the postoperative period in other studies as well^{14,15}.

Despite reconstructive surgery, surgical treatment of oral carcinoma may result in severe consequences both in terms of function and aesthetics. Surgery of the head and neck tumors can result in damage to the functions of chewing, swallowing, speech, salivation, and have cosmetic effects^{5,6}. Although the basic questionnaire on quality of life we used was adapted in other studies as well, the data about these functions in the postoperative period are similar. Our findings show that the functions of speech, chewing and swallowing were the same as before

surgery in 30-40% of patients, while in other patients the stomatognathic system was changed in varying degrees. Similar results were obtained in other studies^{6,16}.

As shown in a study conducted at the University of Brescia, Italy, chewing is significantly worse in patients who undergo segmental resection of the mandible. It is estimated that the functional ability of chewing and swallowing in such patients often does not exceed 50% of preoperative chewing ability. The reason is that in order to provide a border with the healthy tissue, often very wide resections of soft and bony tissue of the face and oral cavity must be performed, which causes great defects and significant functional disorders. In addition, in our study resections were most frequently performed in patients with carcinomas of the floor of the mouth and the tongue, when partial resections were made. In these patients, the tongue is most often fixed for the remaining preserved mucous membrane of the lower lip, which leads to ankyloglossia and consequent difficulty in chewing¹⁷.

Time since surgical intervention, i.e., the period of postoperative recovery has also been shown to have an impact on quality of life in these patients. Functioning of the stomatognathic system, ability and readiness for social contacts decline during the first year after surgery. Quality of life in terms of the functions of speech, chewing and mood was statistically significantly worse in our patients who had less than a year of recovery, compared with those who had been recovering for more than a year. It is considered that physical and mental exhaustion caused by surgery also play a role, and patients with more than a year of recovery show better results in terms of quality of life, which is influenced also by a better perspective of the disease itself and treatment^{6,11,16}.

Although there was no statistical significance, percentage of patients (37.5%) with considerable problems in sexual life in our study is comparable to the absence of sexual intercourse in one third of patients in another, so far, the only published study that dealt with an identical group of patients¹⁸. Possible causes could be physical consequences of cancer treatment, such as tiredness and erectile dysfunction.

In addition to physical effects, cancer also has psychological consequences, including anxiety, frustration, anger, sadness, and feelings of inadequacy^{19,20}.

Treatment and rehabilitation of patients with oral carcinoma is specific because this region involves complex interrelated structures and functions. The oral cavity is not a large area, but it is very important for speech, chewing and swallowing, and therefore anatomical defects after surgical treatment leave functional disability. Facial deformities, as well as speech and feeding difficulties are the most apparent problems. Considering the patients' postoperative quality of life, oral carcinoma represents one of the most traumatic forms of carcinoma for both the patient and his or her environment and careers²¹.

The patient's quality of life should be equally important as his or her healing. The percentage of patients surviving treatment is a measure of successfulness of the tumor treatment, but quality of life of operated patients is primarily a measure of the success of reconstruction. Successful reconstruction is essential for good quality of life of oncological patients with tumors in the head and neck regions. Postoperative functional deficits depend largely on the method of closing the defect. However, first and foremost, prevention and detection of early-stage carcinoma would provide the greatest contribution, by reducing mortality and improving the prognosis and quality of life of the patients^{14,15}.

Conclusions

The quality of life in terms of the functioning of the stomatognathic system and the psychosocial condition is diminished varyingly in a large number of patients after surgical treatment of oral carcinoma. It is certain that disease stage, resection extent and reconstruction method are decisive parameters for postoperative quality of life. For this reason, early detection of the disease is essential for both survival and quality of life.

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Correspondence

Slavko Mojsilović
Institute for Medical Research
University of Belgrade, Belgrade, Serbia
e-mail:slavko@imi.bg.ac.rs