Quality of Life Assessment for Intraoral Reconstruction

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Summary

The aim of the investigation was to compare the three most commonly used methods of reconstruction of the oral cavity in the University Hospital "Dubrava", after resection of intraoral carcinoma. In a group of 50 patients, with no statistically significant differences with regard to the stage of disease, local flaps (19 patients), regional pectoralis major flap (11 patients) and free forearm flap (20 patients) were compared. A clinical questionnaire was prepared for evaluation of the success of reconstruction, consisting of two parts. The first part of the questionnaire contained general information on the patient and data on the tumour. The second part of the questionnaire consisted of questions on postoperative functional and aesthetic results. Apart from comparison of the three methods of reconstruction, we also investigated on a sample of 55 patients which parameters were most important for the success of the reconstruction and whether and in what way reconstruction has an effect on postoperative quality of life on a sample of 55 patients.

Analysis of the obtained data indicated that none of the three methods of reconstruction were superior in all parameters compared to the other two methods. Free forearm flap did not statistically significantly show the expected theoretic advantage over the regional pectoralis major flap, although it scored higher in almost all parameters.

The stage of the disease and extent of resection are the most significant parameters for postoperative result of reconstruction, regardless of the type of flap.

Key words: *oral reconstruction, local flaps, forearm flap, pectoralis major flap, quality of life.*

Acta Stomat Croat
2002; 47-50

ORIGINAL SCIENTIFIC PAPER
Received: February 18, 2002

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Introduction

The oral cavity is by volume a relatively small space where a very complex interaction of function and structure occurs, unifying a multitude of singular functions enabling individual normal life sustaining functions as well as enabling social interaction. These functions include speech, mastication, swallowing, saliva retention, taste and oral hygiene. In addition, the oral cavity also has an important function in respiration and aids in the protection of the respiratory tract.

Treatment of oral cancer has not drastically changed in the past few decades and is primarily surgical (1). A lesser or greater functional invalidity is present following surgical therapy, depending on the extent of the resection and the method of reconstruction. In addition, surgical therapy also influences the esthetic appearance of the patient (2). With regard to the patient's postoperative quality of life, oral cancer is one of the most traumatic locations of cancer onset (3). The degrading of function and the resulting esthetic defect, effects the postoperative quality of life. A large number of quality of life definitions exist. For the most part, the definitions are based on the patient's subjective evaluation of postoperative results as well as the patient's satisfaction with the individual degree of function. As it is difficult to define this concept, it is also difficult to "measure" postoperative quality of life. Today most authors agree that a patient questionnaire is the method of choice. The head and neck region is specific in regard to the parameters necessary for the evaluation of quality of life and thus standard oncology questionnaires are not automatically applicable (4, 5). It is for this reason that a specific questionnaire was created for this anatomic region. The quality of life of operated patients has significantly increased in the past few decades, primarily due to advances in reconstructive surgical techniques and immediate defect reconstruction, as the patients' quality of life is primarily graded against the success of reconstruction. The surgeon now has the option of choosing between more operative reconstructive techniques. At the Department of Maxillofacial Surgery, University Hospital Dubrava, Zagreb, Croatia, the most commonly used techniques, depending on the size and location of the tumor, are local flaps (myomucosal island tongue (6) and nasolabial (7, 8)), pectoralis major flap (9-11) and microvascular free forearm flap (12). The aim of the present study was to evaluate the success rate of local, pectoralis major and microvascular flaps in oral reconstruction as well as to conclude whether or not the reconstruction method influences postoperative quality of life. General patient characteristics were also analyzed in order to establish which general characteristics as well as which tumor parameters influence postoperative quality of life.

Patients and methods

Choice of reconstructive method depends on tumor size and location as well as the patient's general health status therefore the randomization of patients often is unethical and therefore impossible. The investigation was performed at the Department of Maxillofacial Surgery, University Hospital "Dubrava", Zagreb from 1st January 1996 to 31st December 1997. A total of 55 patients with oral cancer were evaluated (21 local flaps, 11 pectoralis major flaps and 23 microvascular flaps). Two investigations were conducted. The first included 50 patients. In order to equalize the three investigated patient groups according to reconstruction type, the groups were limited to patients who had primary cancer of the tongue and floor of the mouth without statistical difference between stages of disease, continuity of the mandible preserved following tumor resection and no signs of recurrence at a minimum of three month follow-up. The second investigation included all 55 patients regardless of the primary site of the tumor. The data was collected through a specially designed questionnaire during the regular follow-up visits. The questionnaire was designed based on previous reports, own experience, demographic specifics and the purpose of the investigation. The questionnaire consisted of two sections. The first section dealt with general patient characteristics (sex, age, occupation, education, marital status, area of habitation and family status) and tumor specifics (stage, type of operation, postoperative radiation therapy). The second section consisted of direct questions concerning the postoperative evaluation of oral function and esthetic appearance (Figure 1). A series of categorized replies were offered for each question depending on the investigated parameter. The patient could choose only one of the possible answers. The replies were scored. Certain postoperative parameters were evaluated and scored by both the patient and the physician (first author). The results were analyzed by relevant statistic methods: Kruskal-Wallis test and Wilcoxon Rank Sum test for continuous variables, Fisher exact test for categorial variables and Duncan test for multiple mean values comparison.

Results

In the first study, a total of 50 patients were analysed and divided into three groups: 19 patients with local flap, 11 patients with pectoralis major flap and 20 patients with free microvascular forearm flap reconstruction. The patients did not defer statistically significantly with respect to general char-

acteristics (age, gender, occupation, level of education, marital status, habits and postoperative radiation therapy). Statistically significant differences in mean point values between the three groups were recorded according for the following variables: postoperative speech, saliva retention, esthetic result of the donor site as evaluated by patient and postoperative quality of life (Table 1). The local flap significantly scored better in all of the aforementioned parameters when compared to the pectoralis major flap, while the other pairs did not display any significant differences. Following postoperative "decanilement" and nasogastric tube removal, the esthetic result of the donor site according to the physician's evaluation showed that the local flap scored significantly higher than the microvascular or pectoralis major flap, while the comparison of the microvascular flap and pectoralis major flap did not show significant difference. According to the physician's evaluation, functional and esthetic results of the pectoralis major flap were scored significantly lower than the other two flaps. Local and microvascular flaps were not scored significantly different. No statistically significant difference was disclosed in comparison with the physician's scores of postoperative speech, mastication, weight gain, postoperative esthetic or functional results as evaluated by the patient, postoperative prosthetic rehabilitation, length of hospitalization, local complications and postoperative return to work (Table 1).

The second investigation analyzed the dependence of successful reconstruction on individual general patient characteristics, tumor information and type of resection. This analysis of 55 patients (21 local flaps, 11 pectoralis major flaps and 23 microvascular flaps) disregarded the type of reconstruction utilized. The general data on the individual patient and tumor were correlated with postoperative functional and esthetic parameters. Statistic analysis showed that the statistically significant parameters for some functional and esthetic reconstruction succes rates were only the type of operation (Table 2) and stage of disease (Table 3).

Discussion

Current literature has recently published many reports of comparisons of different types of oral cavity reconstruction, however the total sum of data is relatively small and in some cases contradictory (13-15).

During the sixties and seventies, flaps and new defect closure techniques were introduced, facilitating the reconstruction of large defects of the oral cavity. These reports however spoke very little of the functional and esthetic results and the patients' quality of life. Bakamjian and Littlewood were among the first authors to "measure the quality of reconstruction" (16). In 1964 they reported on the improvement of speech and tongue mobility following the use of the cervical skin flap in the reconstruction of the oropharynx. More recent papers generally deal with microvascular flaps in oral cavity reconstruction (17, 18), however papers that deal with the pectoralis major flap are still being published (19). McConnel et al. (20) published a study comparing functional postoperative results (speech and swallowing) following primary closure, myocutaneous and microvascular flap reconstruction. Tumor localization and size of resection was the same in all three studied groups. They concluded that primary closure gave equal or superior functional results than the use of flaps in patients with comparable tumor localization and extent of resection.

The head and neck region requires specific assessment, from the specifics of the region itself to the patient's general health status. Evaluation of both postoperative results and patient's quality of life can show the advantage of certain reconstructive techniques.

At the Department of Maxillofacial Surgery, Clinical Hospital "Dubrava", Zagreb, Croatia, surgical therapy is the fundamental therapy for all intraoral cancer cases where there is no contraindication for the operation. All three methods of reconstruction, local flaps, pectoralis major flap and microvascular forearm flap, have a role in the reconstruction of defects of the oral cavity. Furthermore, all three techniques have their advantages and disadvantages. Even though local flaps have not been mentioned in recent articles, we included nasolabial and tongue flaps in this study, as they certainly have their place in reconstruction of the oral cavity.

According to the results of the investigation, local flaps are most often utilized for reconstruction of the anterior floor of the mouth defects (89.5%).

On the other hand, a pectoralis major flap was used in 72.7% of patients for reconstruction following resection of primary carcinoma of the tongue, while the microvascular flap was used for both reconstruction of primary carcinoma of the tongue (45%) and of the floor of the mouth (55%). The forearm flap is most versatile for adaptation and suited for reconstruction of tongue defects as well as the floor of the mouth. "Decanilement" and the introduction of food through the mouth was statistically better scored for local flaps. The advantages of the microvascular flap over the pectoralis major flap were hypothesized, although the results showed no statistically significant difference. Following the physician's evaluation of the total postoperative functional and esthetic results, pectoralis major flap displayed statistically significant poorer results, probably due to the extent of tumor and neck resection. No statistically significant difference was evident in regard to local complications, which differs from previously published data (19).

Based on our study, none of the three methods was superior to the other two in all parameters. The local flap displayed partially better results in certain parameters when compared to the other two methods as it is utilized in less extensive resections. In addition, the use of the tongue and nasolabial flaps does not require the involvement of the neck. The microvascular flap did not display the expected significant difference when compared to the pectoralis major flap, although it received higher scores in almost all parameters. In specific head and neck parameters (speech, feeding and appearance), a difference was noted only in postoperative speech where the local flap is better than the pectoralis major flap while other pairs did not display a statistically significant difference. According to the results of the investigation, the stage of disease and extent of resection are the most significant studied parameters that effect postoperative functional and esthetic results. Reconstructive technique is not the only deciding factor in quality of life assessment, as the extent of resection and the sacrifice of neck structures also play an important role. We may conclude that early disease detection is not only a prognostic factor, but also plays an important role in postoperative quality of life.

During the course of the investigation we noticed that patients following forearm flap reconstruction had better speech in the early term following reconstructive surgery than in later term follow-up. The patients themselves volunteered this information during the interview, regardless of our questions. However the time period for patient follow-up, as well as the number of patients with reconstruction, are insufficient for concluding a statistically significant result. A probable cause of this deterioration of speech ability is flap atrophy and tissue scarring. On the other hand, patients following pectoralis major reconstruction and local flaps showed no deterioration of speech ability where it either remained the same or showed some minimal improvement.