

# Functional and Aesthetic Rehabilitation of Patients with Oncologic Defects of Lower Oral Cavity\*.

## Part one: Preprosthetic Surgery

Funkcionalna i estetska rehabilitacija pacijenata s onkološkim defektima donjeg dijela usne šupljine.  
Prvi dio: preprotetska kirurgija

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### Summary

*An operative method of preprosthetic reconstruction of the lower oral cavity by means of a free split thickness skin graft actually a modification of Obwegeser's "totale Mundbodenplastik", was used in patients with defects after resection of lower oral cavity cancer.*

*The objective of the operation is to make the tongue mobile, to reshape the lingual and vestibular sulci, and to provide for a wide denture bearing area.*

*The skin graft healing, tongue mobility, postoperative scars and width of the denture bearing area were evaluated on post-operative days 7 and 21. The results were quite satisfying, indicating the described method to provide necessary preconditions for prosthetic rehabilitation on some patients.*

**Key words:** *postoperative defects, lower oral cavity, preprosthetic surgery, split thickness skin graft*

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### Introduction

As a result of primary wound closure after intraoral resection of a cancer of lower oral cavity (with or without radical neck dissection), performed by straining the healthy-looking borders

\* Oncologic defect of lower oral cavity = intraoral defect after resection of a cancer localised under the incisal and occlusal surfaces of lower teeth, including the mandible, the vestibular sulcus, the floor of the mouth and the tongue.

of the surrounding mucous membrane, the functions of mastication and speech are impaired (3). In such a situation, considering a denture is quite problematic from the prosthetic standpoint. Fixation of the tongue remainder to the bottom of oral cavity, reduction of the lingual and vestibular sulci, the bone loss after marginal resection of the mandible, the scars and intraoral space reduction, make prosthetic reconstruction practically

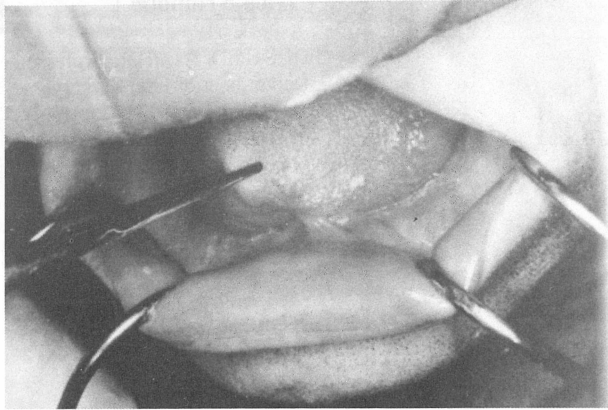


Figure 1. *Loss of alveolar bone, tongue fixation and sulci reduction after intraoral cancer resection*

Slika 1. *Gubitak alveolarne kosti, fiksacija jezika, redukcija sulkusa nakon intraoralne resekcije karcinoma*

impossible (4) (Fig. 1). A corrective surgical intervention on such displaced soft and hard tissues of the lower oral cavity is the necessary prerequisite for prosthetic rehabilitation in such patients.

### Method

The aim of the preprosthetic surgery is to mobilize the tongue and to extend the sublingual and vestibular sulci by disengaging the strained mucous membrane and transplanting the free split thickness skin graft on bleeding surface. So, a wide denture bearing area is obtained, a surface on which a stable dental prosthetic can be built (1,5).

The operative method is based on Obwegeser's *totale Mundbodenplastik* (6). If possible, an impression should be taken and an acrylic splint with extended lingual and vestibular flanges should be made according to the model before the operation. The splint can also be made during the operation.

The split thickness skin graft, 10 x 5 cm large and 0.30 — 0.45 mm thick, is taken from the inner side of the patient's upper arm and put into a 0.9% sodium chloride solution (7). The incision from one retromolar region to the other traverses the scar of the resected tumor or the remaining crest. The tongue is separated from its background and the vestibular mucosa disconnected from submucosa by blunt preparation. The mylo-

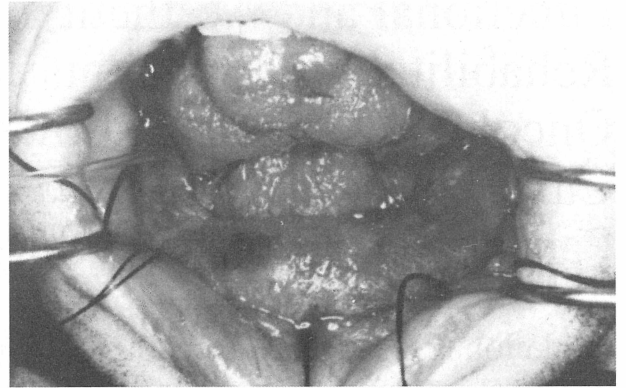


Figure 2. *Surgically prepared recipient site*

Slika 2. *Kirurški preparirana površina*

hyoid muscles are dissected and the exposed mandible trimmed up to the periosteum or to the thin stratum of connective tissue covering the area of resected mandible (Fig. 2). The vestibular flap of mucous membrane is fixed by transcutaneous sutures in the depth of the fornix. The split thickness skin graft is sutured to the margins of the mucous membrane of the tongue covering its ventral surface (Fig. 3), adapted to the floor of the mouth and to the lingual and vestibular surfaces of the mandible, and fixed with the previously prepared acrylic splint (Fig. 4). The splint can be adapted to the background by means of a thermoplastic material (Xantigen BAYER). The splint is removed on the day 7.

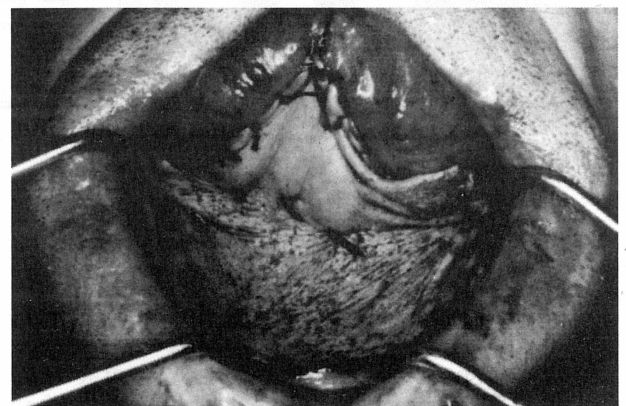


Figure 3. *Split thickness skin graft sutured to the margins of surrounding mucosa*

Slika 3. *Slobodni kožni transplantat poludebljine prišiven na rubove sluznice*

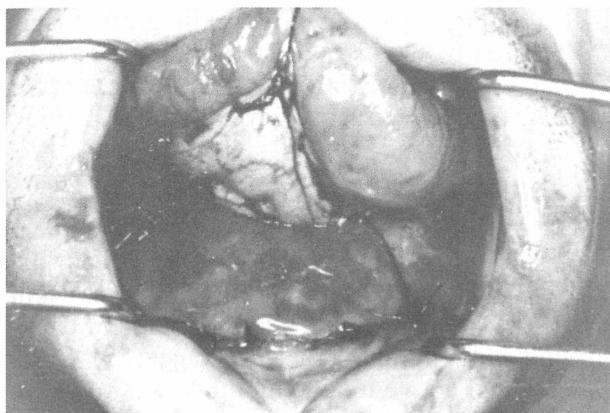


Figure 4. Fixation of the split thickness skin graft with acrylic splint

Slika 4. Fiksacija slobodnog kožnog transplantata poludebljine akrilatnim splintom

## Patients

Between January 7, 1987 and December 31, 1990, 17 patients were operated on at the University clinic for maxillofacial and oral surgery in Zagreb using this method after resection of lower oral cavity cancer. All of them were males, aged 42—74 years, and operated on after intraoral resection of malignant tumor and marginal resection of the mandible. In eight patients, radical neck dissection was also performed. One patient was additionally treated with chemotherapy and radiotherapy. All patients were in good health, and the local finding as well as the general prognosis were good. Impossible prosthetic reconstruction was a common problem in all of them.

During the early postoperative period, the patients were daily observed and the following signs were evaluated on days 7 and 21 postoperatively:

1. wound healing, i.e. adherence of the splint thickness skin graft to the mandible;

2. active mobility of the tongue (good, limited, poor);

3. appearance of postoperative scars on the skin grafts margins (no visible scars, differences in the levels of the graft and the surrounding mucous membrane, tissue shrinkage); and

4. width of the denture bearing area, measured in mm in the midline and both premolar regions.

## Results

Results of the study are presented in Tables 1—4 and Graph 1.

Table 1. Percentage of surface adherence of split thickness skin grafts on postoperative days 7 and 21

Tablica 1. Postotak površine sraštenja kožnog transplantata 7. i 21. postoperativnog dana

Surface adherence percentage	100%		75%		50%		25%	
	7	21	7	21	7	21	7	21
n 17	15/88%	15/88%	2/11%	2/11%				

Table 2. Active tongue mobility in 17 patients on the postoperative days 7 and 21

Tablica 2. Aktivna pomičnost jezika kod 17 ispitanika 7. i 21. postoperativnog dana

Active tongue mobility			
Postoperative day		7	21
n 17	good	15/88.3%	12/70.5%
	limited	2/11.7%	4/23.5%
	poor		1/5.8%

Table 3. Clinical evaluation of postoperative scars on postoperative days 7 and 21

Tablica 3. Klinička procjena postoperativnih ožiljaka 7. i 21. postoperativnog dana

Postoperative scars			
Postoperative day		7	21
n 17	no scars	15/88.3%	12/70.5%
	level differences	2/11.7%	4/23.5%
	tissue shrinkage		1/5.8%

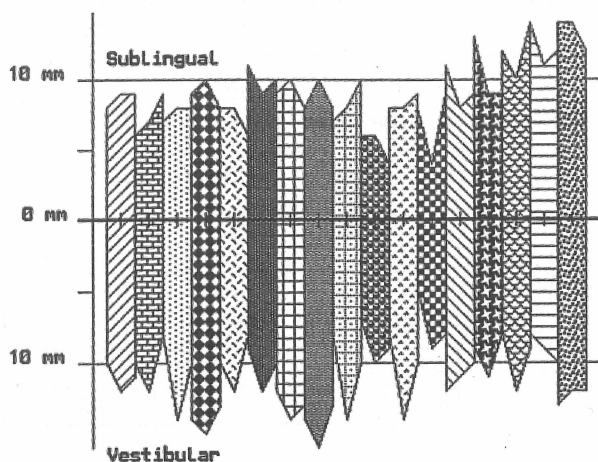
Table 4. Mean values and standard deviations of transplanted skin grafts immobile surfaces in 17 patients

Tablica 4. Prosječne vrijednosti i standardne devijacije nepomične površine kožnog transplantata u 17 pacijenata

		Sublingual sulcus			
		Right premolar area	Midline	Left premolar area	
n 17	$\bar{x}$	9.47	8.76	9.05	10 mm
	SD	2.52	2.16	2.28	0 mm
	SD	2.54	1.99	1.78	
	$\bar{x}$	9.70	12.29	10.01	10 mm
		Vestibular sulcus			

Table 1 shows high percentages of skin graft healing. In two (11.7%) cases only, partial necrosis involving  $\leq 25\%$  of the graft was found.

Table 2 shows good active mobility of the tongue in 15 (88.3%) patients on postoperative day 7, in 12 (70.5%) patients on postoperative day 21. Limited tongue mobility on day 21 was found in four (23.5%) patients and poor tongue mobility in one patient (5.8%) only.



Graph 1. Real immobile surfaces in 17 patients on day 21 after split thickness skin grafting

Grafikon 1. Realno nepomične površine primijenjenog slobodnog kožnog transplantata poludebljine kod 17 pacijenata nakon 21. dana

On postoperative day 21, differences in the levels of the skin graft and of the surrounding mucosa were found in five patients and tissue shrinkage in two patients. In the remaining ten patients, no scars were observed (Table 3).

As there had been practically no immobile surface in the lower oral cavity before the prepros-

thetic surgery, postoperative skin grafted surfaces actually increased the denture-bearing area (Graph 1). Mean values of these surfaces are presented in Table 4.

## Discussion and conclusion

Results of the study were consistent with the known characteristics of split thickness skin grafts, i.e. good adherence to the recipient background and minimal tissue shrinkage (2,8). Good passive and active tongue mobility was found in two thirds of the patients, scars did not compromise the prosthetic rehabilitation in any of the patients, and the denture bearing surface was wider in all the 17 patients (Fig. 5).

Based on the results obtained, the surgical method described can be recommended as an



Figure 5. Surgically created denture bearing area with split thickness skin graft

Slika 5. Kirurški oblikovano područje ležišta proteze posredstvom slobodnog kožnog transplantata poludebljine

efficient precondition for prosthetic rehabilitation in some patients with oncologic defects of the lower oral cavity.

**FUNKCIONALNA I ESTETSKA REHABILITACIJA PACIJENATA  
S ONKOLOŠKIM DEFEKTIMA DONJEG DIJELA USNE  
ŠUPLJINE. PRVI DIO: PRETPROTETSKA KIRURGIJA**

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**Sažetak**

*Prikazana je operativna metoda pretprotetske rekonstrukcije područja donjeg dijela usne šupljine koja se koristi slobodnim kožnim režnjem poludebljine. Radi se o modifikaciji totalne plastike dna usne šupljine prema Obwegeseru, a primijenjena je kod pacijenata s onkološkim defektom nakon provedene resekcije tog područja.*

*Svrha je operativnog zahvata da se mobilizira jezik, da se oblikuju lingvalni i vestibularni sulkusi kako bi se protezi priskrbilo što veće ležište.*

*Zarašćivanje režnja, mobilnost jezika, postoperativni ožiljci i prostranost protezne baze ocjenjuju se 7. i 21. postoperativnog dana.*

*Postignuti rezultati koji su u potpunosti zadovoljavali, potvrđuju da je opisana metoda svrsishodna i da se može smatrati dobrim preduvjetom za protetsku opskrbu kod mnogih pacijenata koji imaju onkološki defekt u području donjeg dijela usne šupljine.*

*Ključne riječi: postoperativni defekti, donji dio usne šupljine, pretprotetska kirurgija, slobodni kožni režanj*

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