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CASE REPORT
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IZRADA OPTURATOR PARCIJALNE PROTEZE NAKON SUBTOTALNE MAKSILEKTOMIJE-PRIKAZ SLUČAJA

THE MANUFACTURE OF OBTURATOR PARTIAL DENTURE AFTER MAXILLECTOMY-CASE REPORT

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Sažetak

Uvod: Resekcija maksile otvara oronazalnu i/ili oroantralnu komunikaciju koja ozbiljno otežava različite funkcije orofacijalnog sistema, kao što su žvakanje, gutanje i govor. Osim toga, narušen je simetričan i prijatan izgled pacijenta, narušeni su njegovo psihičko stanje, radna sposobnost i socijalni život.

Prikaz slučaja: U radu je prikazan pacijent protetički rehabilitovan nakon parcijalne maksilektomije.

Zaključak: Bliska saradnja maksilofacijalnog hirurga i specijaliste stomatološke protetike može rezultirati uklanjanjem nastalih promena na maksili i izradom opturator proteze, koja unapređuje funkcije orofacijalnog sistema i kvalitet života pacijenta uopšte.

Ključne reči: opturator proteza, maksilektomija

Abstract

Introduction: Maxillary resection opens oronasal and / or oroantral communication, which seriously complicates various functions of the orofacial system, chewing, swallowing and speech. In addition, the symmetrical and pleasant appearance of the patient, his mental state, working ability and social life are disturbed.

Case report: The manuscript shows a patient who was prosthetically repaired after a partial maxillectomy.

Conclusion: The close cooperation of a maxillofacial surgeon and a specialist in prosthodontics can result in the removal of the changes on the maxilla and the creation of an obturator denture that improves the functions of the orofacial system and the quality of life of the patient in general.

Key words: denture obturator, maxillectomy

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Uvod

Opturator proteze koriste se za zatvaranje kongenitalnih ili stečenih komunikacija dveju unutrašnjih šupljina glave, u najvećem broju slučajeva usne i nosne ili sinusne šupljine. Stečeni defekti najčešće nastaju nakon uklanjanja malignog tkiva i različitog su oblika i veličine. Komunikacije između oralnih šupljina otežavaju funkciju žvakanja i gutanja hrane, otežavaju govor, narušavaju izgled pacijenta i, samim tim, smanjuju kvalitet života pacijenta nakon uklanjanja tumora¹. Ove proteze najčešće zatvaraju otvore na koštanom tkivu, ali se mogu nastaviti i na meke oralne strukture, što predstavlja poseban izazov, s obzirom na to da se koristi akrilat, koji je tvrd i neugljiv materijal².

Opturator proteze izrađuju se neposredno nakon operacije (hirurški ili imedijatni opturatori) kao interim ili prelazni opturatori. Privremeni opturatori koriste se tokom perioda oporavka dok se definitivni opturatori izrađuju nakon definitivnog zarastanja tkiva^{3,4}. Retencija i stabilizacija opturator proteza vrši se na preostalim zubima, a poslednjih decenija i na implantatima^{1,5}. Veći izazov mogu predstavljati opturator proteze na bezubim grebenima, jer je jako teško postići retenciju ventilnim učinkom³.

Laboratorijske faze izrade opturator proteza identične su fazama izrade parcijalne akrilatne proteze, uz modelaciju nastavka za zatvaranje komunikacije na radnom modelu. S obzirom na potpunu različitost kliničkih slučajeva, ne postoje dva ista opturatora.

Materijal za izradu opturator proteza je toplo polimerizovani akrilat⁶. Podlaganja opturatora hladno polimerizovanim akrilatom apsolutno su kontraindikovana zbog nadražajnog dejstva ovog materijala na oralna tkiva i iritirajućeg mirisa monomera. Umesto toga, do potpunog zarastanja tkiva rane izrađuju se privremeni opturatori. Definitivni opturator izrađuje se tek nakon potune stabilizacije resekcijske šupljine⁷.

Prikaz slučaja

Pacijentkinji O. Đ. staroj 43 godine, ustanovljena je dijagnoza adenocističnog karcinoma gornje vilice (Adenoid cystic carcinoma (ACC)) prilikom čega je, u sklopu terapije urađena je desna subtotalna maksilektomijana Odeljenju za maksilofacijalnu hirurgiju Klinike za dentalnu medicinu u Nišu.

Introduction

Obturator dentures are used to close congenital or acquired communications of the two internal cavities of the head, in most cases the oral and nasal or sinus cavities. Acquired defects usually occur after the removal of malignant tissue and are of different shapes and sizes. Communications between the oral cavities complicate the function of chewing and swallowing food, speech, impair the patient's appearance and, thus, reduce the patient's quality of life after tumor removal¹. These dentures usually close the openings on the bone tissue, but they can also be extended to soft oral structures, which is a special challenge, since acrylate is used, which is a hard and inflexible material².

Obturator dentures are made immediately after surgery (surgical or immediate obturators) as interim or transitional obturators. Temporary obturators are used during the recovery period while definitive obturators are made after definitive tissue healing^{3,4}. Retention and stabilization of obturator dentures is performed on the remaining teeth, and in recent decades on implants^{1,5}. A greater challenge may be the denture obturator on edentulous ridges, as it is very difficult to achieve retention by the valve effect³.

The laboratory stages of making an obturator denture are identical to the stages of making a partial acrylic denture, with the modeling of the extension to close the communication on the working model. Due to the complete diversity of clinical cases, there are no two same obturators.

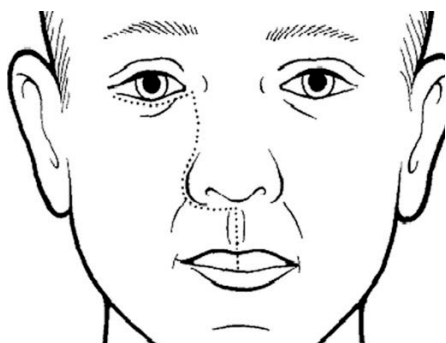
The material for making the obturator denture is hot polymerized acrylate⁶. Obturator relining with cold polymerized acrylate is absolutely contraindicated due to the irritating effect of this material on oral tissues and the irritating odor of monomers. Instead, temporary obturators are made until the wound tissue is completely healed. The definitive obturator is made only after complete stabilization of the resection cavity⁷.

Case report

Patient O.Đ. at the age of 43, was diagnosed adenoid cystic carcinoma (ACC) of maxillae, where a right subtotal maxillectomy was performed at the Department of Maxillofacial Surgery of the Clinic for Dental Medicine in Niš.

Klasični Weber–Fergussonov pristup moguće je modifikovati Dieffenbacovom incizijom u zavisnosti od prostiranja i prirode tumora. Nakon pristupanja medijalnom kantnoj regiji, inciziju je moguće proširiti lateralno inferiorno u odnosu na donji kapak u jedan od nabora kao na primeru modifikaciji⁸ (slika 1).

Nakon intervencije, u martu 2016. godine pacijentkinja je protetički zbrinuta na Odeljenju za stomatološku protetiku iste klinike. Terapija je obuhvatila izradu gornje parcijalne akrilatne opturator proteze u cilju popunjavanja defekta nastalog uklanjanjem tumora, kao i nedostatka zuba. Protetska rehabilitacija donje vilice nije bila potrebna, jer je pacijentkinja imala svoje, prirodne zube (slika 2).



Slika 1. Šema hirurškog terapijskog pristupa⁹
Figure 1. Scheme of surgical therapeutic approach⁹

Pre uzimanja preliminarnog otiska u predeo defekta postavljena je vazelinska gaza sa ciljem da se spreči zapadanje otisnog materijala u eksponirane šupljine. Odgovarajućom standardnom kašikom uzet je otisak gornje vilice ireverzibilnim hidrokolidom (*Phas Plus, fast setting chromatic dust free, Zhermark Italy*). Istim materijalom uzet je i otisak zuba antagonista. Izlivanjem preliminarnog otiska dobijen je anatomski model na kome je izrađena individualna kašika od hladno polimerizovanog akrilata, kojom je zatim uzet precizniji funkcionalni otisak gornje vilice i defekta. Kao otisni materijal korišćeni su kondenzacioni silikoni (*Elite Hd+Light Body, Zhermark Italy*), kako bi se dobio radni model velike preciznosti. Na definitivnom radnom modelu izrađena je zagrižajna šablona, nakon čega su, u ustima pacijentkinje, određeni međuvični odnosi, korišćenjem očuvane visine zagrižaja i habitualnog okluzalnog obrasca (slika 3).

The classical Weber – Fergusson approach can be modified by Dieffenbac incision depending on the extent and nature of the tumor. Once the medial canthal region is approached, the incision may be extended laterally inferior to the lower eyelid in one of the folds as in the modification⁸ (Figure 1).

After the intervention, in March 2016, the patient was prosthetically taken care of at the Department of Dental Prosthetics at the same Clinic. The therapy included the production of an upper partial acrylic obturator denture in order to fill the defect caused by the removal of the tumor, as well as the lack of teeth. Prosthetic rehabilitation of the lower jaw was not necessary, because the patient had her own teeth (Figure 2).



Slika 2. Defekt nastao nakon desne kompletne maksilektomije
Figure 2. Defect caused by right complete maxillectomy

Before taking the preliminary impression, a vaseline gauze was placed in the area of the defect in order to prevent the impression material from falling into the exposed cavities. The upper jaw impression was taken with an irreversible hydrocolloid (*Phase Plus, fast setting chromatic dust free, Zhermark Italy*) with an appropriate standard tray. The antagonist's tooth impression was taken with the same material. By pouring the preliminary impression, an anatomical model was obtained on which an individual tray was made of cold polymerized acrylate, which was then used to take a more precise functional impression of the upper jaw and the defect. Condensation silicones (*Elite HD + Light Body, Zhermark Italy*) were used as the impression material, in order to obtain a working model of high precision. On the definitive working model, a occlusal rim was developed, after which intermaxillary relationships were determined in the patient's mouth, using the preserved bite height and habitual occlusal pattern (Figure 3).



Slika 3. Kontakti zuba opturator parcijalne proteze i zuba antagonista u habitualnoj okluziji. Modelacija proče proteze u potpunosti imitira izgubljeno tkivo alveolarnog grebena

Figure 3. Contacts of partial denture obturator teeth and antagonist teeth in habitual occlusion. Modeling of the prosthesis completely mimics the lost alveolar ridge tissue

Nakon prenošenja modela na artikator, postavljeni su zubi, koji su morfološki i po boji u potpunosti odgovarali preostalim zubima u gornjoj vilici¹. Nakon probe modela, u ustima pacijentkinje, proteza je definitivno izrađena od toplo polimerizovanog akrilatnog materijala (*Triplex Hot, Ivoclar Vivadent, Lihtenštajn*). Proteza je obrađena i visoko ispolirana (slika 4).

Pacijentkinji je opturator proteza nameštena uz pažljivu adaptaciju, kako se ne bi oštetila prethodno traumatizovana susedna tkiva. Retenciona kukica na desnom centralnom sekutiću i gornjem desnom prvom molaru prilagođene su konveksitetu zuba. Asimerija lica značajno je ublažena, defekt na vilici je zatvoren, a govor je bio prilično razumljiv. Pacijentkinji su data sva uputstva kako da koristi i održava opturator protezu.



Slika 4. Izrađena opturator proteza
Figure 4. Produced denture obturator

After transferring the model to the articulator, teeth were placed that morphologically and in color completely corresponded to the remaining teeth in the upper jaw¹. After testing the model in the patient's mouth, the denture was definitely made of hot polymerized acrylic material (*Triplex Hot, Ivoclar Vivadent, Liechtenstein*). The denture was machined and highly polished (Figure 4).

The denture obturator was handed over to the patient with careful adaptation, so as not to damage the previously traumatized surrounding tissues. The retention clasps on the right central incisor and upper right first molar are adjusted to the convexity of the teeth. The asymmetry of the face was significantly alleviated, the defect on the jaw was closed, and the speech was quite understandable. The patient was given all instructions on how to use and maintain the denture obturator.



Slika 5. Izgled izrađene proteze *en face* i iz profila. Postignuti optimalni estetski efekti i korigovana asimetrija lica

Figure 5. Appearance of the prosthesis made *en face* and from the profile. Optimal aesthetic effects and corrected facial asymmetry were achieved

Diskusija

Subtotalna maksilektomija težak je invaliditet pacijenta, koji, osim remećenja orofacijlnih funkcija dovodi do značajne asimetrije lica. Posledice operativnog zahvata smanjuju ili onemogućavaju radnu sposobnost pacijenta, remete njegov društveni život, otežavaju komunikaciju sa okolinom i remete psihičko stanje obolelog. Kvalitet života pacijenta ozbiljno je narušen, stoga su izrada opturator proteze i zatvaranje novonastalih komunikacija šupljina u lobanji veliki izazov koji sem zdravstvenog ima i izuzetan socijalni značaj.

Svrha terapije opturator protezom nakon parcijalne i totalne resekcije maksile jeste uspostavljanje adekvatnih funkcija žvakanja, govora i gutanja, kao i prihvatljivog izgleda pacijenta¹⁰. Prednost terapije opturator protezom je mogućnost rane inspekcije svakog nastalog oštećenja, kao i rana dijagnostika eventualnih recidivantnih promena, jeftinim sredstvom visoke efikasnosti. Ova vrsta nadoknade treba hermetički da zatvori stvorenu šupljinu i spreči nakupljanje hrane i tečnosti, kao i nastanak infekcije. Zato se od korisnika opturator proteza zahteva besprekorna higijena, posebno imajući u vidu da je akrilat porozan, hrapav i jako sklon nakupljanju biofilma¹¹. Ekstenzija opturator proteza smanjuje fluktuaciju vazduha kroz šupljinu i nazalni govor¹².

Gubitak zuba, delova alveolarnog grebena i tvrdog nepca, nakon parcijalne resekcije maksile, remete biostatičku i biodinamičku ravnotežu orofacijalnog sistema. U prikazanom slučaju unilateralnog palatomaksilarnog oštećenja, koncentracija sila najjača je u prednjem delu proteze.

Discussion

Subtotal maxillectomy is a severe disability of the patient, which, in addition to disrupting orofacial functions, leads to significant facial asymmetry. The consequences of the surgical procedure reduce or disable the patient's ability to work, disrupt his social life, make communication with the environment more difficult and disrupt the patient's mental state. The quality of life of the patient is seriously impaired, so making an obturator denture and closing the newly formed communications of the cavities in the skull is a great challenge which, in addition to health, also has an exceptional social significance.

The purpose of obturator denture therapy after partial and total resection of the maxilla is to establish adequate chewing, speech, and swallowing function, as well as an acceptable patient appearance¹⁰. The advantage of obturator denture therapy is the possibility of early inspection of any damage, as well as early diagnosis of possible recurrent changes, with a cheap high-efficiency tool. This type of compensation should hermetically close the created cavity and prevent the accumulation of food and fluids, as well as the occurrence of infection. Therefore, the user of the obturator denture requires impeccable hygiene, especially bearing in mind that acrylate is porous and rough and very prone to biofilm accumulation¹¹. The obturator denture extension reduces air fluctuation through the cavity and nasal speech¹².

Loss of teeth, parts of the alveolar ridge and hard palate after partial resection of the maxilla disturbs the biostatic and biodynamic balance of the orofacial system.

Da bi se obezbedile dobra retencija i stabilizacija opturator proteze, izrađena je kukica na susednom retencionom zubu, a korišćena je i podminiranost same komunikacije¹⁰. Prenos mastikatornog pritiska namenjenog izgubljenim zubima isključivo je gingivalan, te se mogla očekivati i dodatna resorpcija okolnog koštanog tkiva i dislokacija mekih tkiva. Gubitak optimalne retencije i stabilizacije može se rešiti podlaganjem opturator proteze ili izradom noveproteze. Podlaganje je bolje izvesti toplopolimerizovanim, nego hladno polimerizovanim akrilatom, s obzirom na moguće alergijske i toksične reakcije sluzokože sa kojom ovaj materijal dolazi u kontakt¹³.

Pacijentkinja se nakon tri meseca javila na kontrolui bila je zadovoljna funkcijom i izgledom protetske nadoknade. Nisu uočene promene na retencionom zubu kao ni na preostalim zubima. Pacijentkinja je naučila da se služi opturator protezom pri žvakanju, govoru i gutanju. Poboľšan je socijalni život pacijentkinje.

Nakon tri godine nije bilo recidiva tumora, a izrađena opturator proteza je i dalje bila funkcionalna. Pacijentkinja je bila radno sposobna i aktivno učestvovala u svim životnim aktivnostima.

Zaključak

Opturator parcijalna proteza dobro je terapijsko sredstvo za sanaciju komunikacija nastalih nakon subtotalne maksilektomije. Pacijentkinji su vraćene funkcije žvakanja, gutanja, govora, poboljšani su izgled lica i kvalitet života.

In the case of shown unilateral palatomaxillary damage, the concentration of forces is strongest in the anterior part of the denture. In order to ensure good retention and stabilization of the obturator denture, a clasp was made on the adjacent retention tooth, and the undermining of the communication itself was used¹⁰. The transmission of masticatory pressure intended for lost teeth is exclusively gingival, and additional resorption of the surrounding bone tissue and soft tissue dislocation could be expected. Loss of optimal retention and stabilization can be solved by relining an obturator denture or making a new one. The relining is better reported with warm than cold polymerized acrylate, given the possible allergic and toxic reactions of the mucous membrane with which this material comes into contact¹³.

After three months, the patient came for a check-up and was satisfied with the function and appearance of the prosthetic replacement. No changes were observed on the retention tooth as well as on the remaining teeth. The patient learned to use the denture when chewing, speaking and swallowing. The social life of the patient is improved.

After three years, there was no recurrence of the tumor, and the obturator denture was still functional. The patient was able to work and actively participated in all life activities.

Conclusion

A partial denture obturator is a good therapeutic tool for repairing communications that have occurred after subtotal maxillectomy. The patient regained the function of chewing, swallowing, speech, and improved her appearance and quality of life.

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