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PRIKAZ SLUČAJA  
 CASE REPORT

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## PREPROTETSKO I PROTETSKO ZBRINJAVANJE PACIJENATA SA POVREDAMA I DENTOFACIJALNIM ANOMALIJAMA - PRIKAZ SLUČAJA

## PRE-PROSTHETIC AND PROSTHETIC TREATMENT OF PATIENTS WITH INJURIES AND OROFACIAL ANOMALIES - A CASE REPORT

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### Sažetak

**Uvod** Stomatologija je nauka koja se bavi suzbijanjem, prepoznavanjem i otklanjanjem svih patoloških promena orofacijalnog sistema. Povrede orofacijalne regije su učestale poslednjih godina i ako se adekvatno ne saniraju, mogu dovesti do trajnih deformiteta i nemogućnosti adekvatnog stomatoprotetskog zbrinjavanja.

**Prikaz slučaja** Ovaj rad predstavlja hirurško-protetski tretman i rehabilitaciju 49-godišnjeg pacijenta sa traumatskim povredama gornje i donje vilice, promenom vertikalne dimenzije okluzije i skeletne klase III malokluzije, koja je bila prisutna i pre povređivanja. Pacijent je došao na kliniku kao hitan slučaj zbog sanacije povreda i bolova nastalih nakon pada sa visine, poremećenih funkcija orofacijalnog regiona (funkcija ishrane, gutanja, govora), otoka i kompromitovane estetike. Nakon postavljanja dijagnoze, pacijent je zbrinut hirurškim tretmanom, repozicijom i osteosintezom mini pločicama. Po završetku hirurškog tretmana, pacijent je poslat na dalji protetski tretman. Nakon svih uobičajenih i dodatnih posebnih individualnih procedura, pacijentu su urađene mobilne protezске nadoknade. Gornjom i donjom totalnom mobilnom zubnom protezom postignuti su zadovoljavajući rezultati u smislu rekonstrukcije vertikalne dimenzije okluzije, funkcije žvakanja, gutanja, fonetike i estetike stomatognatnog sistema.

### Abstract

**Introduction** Dentistry is the science that deals with the prevention, recognition and elimination of pathological changes in the orofacial system. Injuries in the orofacial region have become more frequent in recent years, and if these injuries are not properly treated, they may lead to permanent deformity and inability for adequate stomatoprosthetic treatment.

**Case Report** This paper presents a surgical-prosthetic treatment and rehabilitation of a 49-year-old patient with traumatic injuries of the upper and lower jaw, changed vertical dimension of occlusion and skeletal class III malocclusion which was present before injury. The patient came to the clinic as an emergency due to injury and pain caused by falling from height, disturbed function of the orofacial region (feeding, and swallowing, speech), swelling and compromised aesthetics. After the diagnosis was made, the patient was treated surgically, by means of reposition and osteosynthesis with miniplates. Upon completion of the surgical treatment, the patient was referred for further prosthetic treatment. After all the usual and additional special individual procedures, the patient was treated with upper and lower total dentures. Treatment with upper and lower total removable dental prosthesis in this patient gave satisfactory results in terms of the reconstruction of the vertical dimension of occlusion, the functions of chewing, swallowing, phonetics and esthetics of the stomatognathic system.

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 stomatologiju Niš. Sva prava zadržana

**Zaključak** Dobro isplanirane i pravilno sprovedene hirurško-protetske procedure dovode do zadovoljavajućih rezultata po završetku preprotetskog i protetskog tretmana i rehabilitacije.

**Cljučne reči:** traume, dento-facijalne anomalije; hirurško-protetska rehabilitacija

**Conclusion** A well-planned and properly performed surgical-prosthetic procedure leads to satisfactory results upon completion of preprosthetic and prosthetic treatment and rehabilitation.

**Key words:** trauma, dentofacial anomaly, surgical-prosthetic rehabilitation

## Uvod

Stomatologija je definisana kao evaluacija dijagnoze, prevencija ili lečenje nehirurških i hirurških ili srodnih bolesti, poremećaja ili stanja usne duplje, koja obuhvataju maksilofacijalnu i susedne oblasti, kao i povezane strukture njihovog uticaja na ljudsko telo, pod uslovom da od strane stomatologa, u okviru obima njegovog obrazovanja, obuke, znanja i iskustva, bude u skladu sa etikom profesije.<sup>1</sup>

Traumatske povrede orofacijalne regije su veoma česta pojava u stomatologiji, a nedovoljno isplanirano i neadekvatno saniranje može dovesti do trajnih deformiteta i nemogućnosti adekvatnog stomatoprotetskog zbrinjavanja.<sup>2</sup> U nekim slučajevima traumatske povrede ne predstavljaju rizik po život pacijenta, ali dugoročni efekti ovakvih povreda mogu biti ozbiljni. Kod takvih pacijenata nastaju poremećaji kako u izgledu tako i u funkciji.<sup>3,4</sup> U cilju uspešnijeg protetskog zbrinjavanja potrebno je sve deformitete i anomalije sanirati preprotetskim hirurškim, konzervativnim i ortodontskim tretmanom. U rešavanju kompleksnih slučajeva, kod kojih je, pored traume, prisutna i dentofacijalna anomalija, malokluzija, neophodan je multidisciplinarni pristup i saradnja lekara različitih specijalnosti. Jedna od najtežih dentofacijalnih anomalija jeste malokluzija III klase. Ovu kompleksnu anomaliju karakterišu odstupanja u razvoju mandibule i maksile u sagitalnoj ravni, gde je donja vilica prerazvijena u odnosu na gornju. Kod pacijenata sa ovom vrstom anomalije često su kompromitovane estetika i funkcija.<sup>5-7</sup> Etiologija malokluzija klase III je multifaktorijalna zbog interakcije naslednih i faktora sredine. Ako su tu prisutne još i traume, tretman takvih poremećaja je jako komplikovan.<sup>8</sup> Rehabilitacija i tretman ovakvih pacijenata je jako zahtevan i jedan je od vodećih ciljeva moderne stomatologije.<sup>9,10</sup>

## Prikaz slučaja

Pacijent starosti 49 godina primljen je kao hitan slučaj na Kliniku za stomatologiju u Nišu, u Organizacionu jedinicu za Maksilofacijalnu hirurgiju, 18.06.2012. godine, radi

## Introduction

Dentistry is defined as the evaluation of diagnosis, prevention or treatment of nonsurgical or surgical, or related diseases, disorders or conditions of the oral cavity, which include maxillofacial and adjacent areas, as well as the associated structures of their influence on the human body, provided by a dentist within the scope of his education, training, knowledge and experience and in compliance with professional ethics<sup>1</sup>.

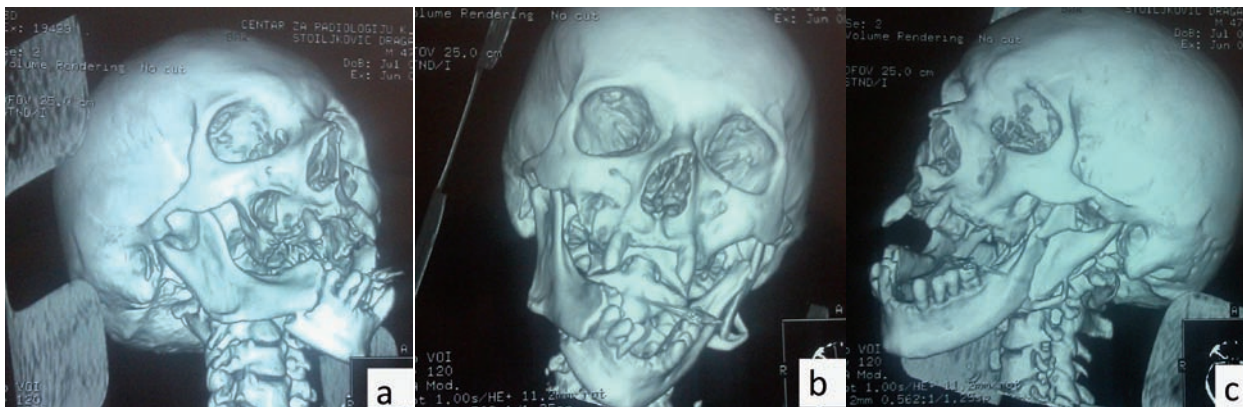
Traumatic injuries of the orofacial region are very common in dentistry and poorly planned and inadequate treatment of these injuries can lead to permanent deformity and lack of adequate stomatoprosthetic rehabilitation.<sup>2</sup> In some cases, traumatic injuries do not present a risk to the life of the patient but long-term effects of these injuries can be severe. In such patients, disorders occur both in appearance and in function.<sup>3,4</sup> In order for prosthetic rehabilitation to be successful, all deformities and anomalies should be treated by pre-prosthetic surgical, conservative and orthodontic therapy methods. Solving complex cases in which the trauma presents the addition to already present dentofacial anomalies, such as malocclusion, requires a multidisciplinary approach and the cooperation of doctors of various specialties. One of the most difficult dentofacial anomaly is the class III malocclusion. This complex anomaly is characterized by variations in the development of the mandible and maxilla in the sagittal plane, where the lower jaw is overdeveloped in relation to the upper jaw. Patients with this malocclusion often have compromised functions<sup>5</sup> and aesthetics.<sup>6-7</sup> Etiology of Class III malocclusions is multifactorial, because of the interaction of hereditary and environmental factors. With the addition of trauma, the treatment of such disorders is very complicated.<sup>8</sup> Rehabilitation and treatment of these patients is very demanding and is one of the major goals of modern dentistry.<sup>9,10</sup>

## Case Report

A patient aged 49 years, was admitted as an emergency to the Clinic of Dentistry in Niš, or-

lečenja povreda zadobijenih pri padu sa visine. Iz dostupne medicinske dokumentacije konstatuje se da je nakon hospitalizacije, kliničkog i radiološkog pregleda (Aquilion™ 64 CFX CT scanner Toshiba), postavljena dijagnoza i utvrđen prelom tela mandibule sa desne strane, kao i ugla mandibule sa leve strane (Slika 1a, 1b, 1c).

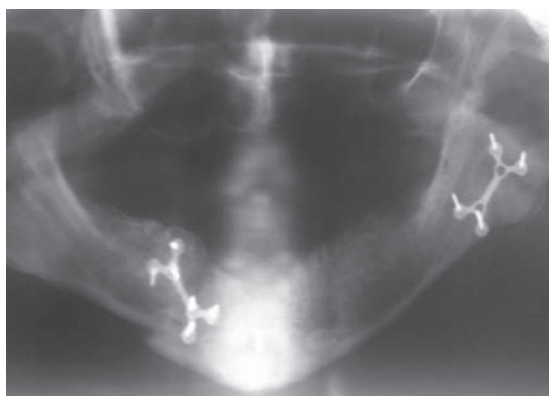
ganizational unit of Maxillofacial Surgery, on the 18<sup>th</sup> of June 2012, for treatment of injuries sustained in a fall from a height. On the basis of the available medical documentation, after hospitalization, clinical and radiological examinations (Aquilion™ 64 CFX CT Scanner Toshiba), diagnosis was made, and mandible body fracture on the right side and the angle of the mandible fracture on the left side were determined (Figure 1a, 1b, 1c).



*Slika 1a, 1b, 1c. Snimak načinjen multislajsnim CT-om po prijemu pacijenta na Kliniku*  
**Figure 1a, 1b, 1c.** Video made by multislice CT after admission of the patient to the clinic

Nakon preoperativne pripreme, urađena je hirurška intervencija repozicije fragmenata mini pločicama, tj. repositio sanguina fragmentorum corpori mandibulae lat. dex. osteosynthesis cum mini plate n. i. repositio sanguina fragmentorum anguli mandibulae lat. sin. osteosynthesis cum mini plate n. i. Oseointegracija koštanih fragmenata stimulisana je nanočestičnim biokompozitom na bazi hidroksiapatita i polimera, a sa sposobnošću lokalnog dopremanja lekova. Postoperativni tok je protekao uredno (Slika 2.).

After preoperative preparation was performed, surgical repositioning of fragments with miniplates was done, i.e. Repositio sanguina fragmentorum corpori mandibulae lat. dex. osteosynthesis cum mini plate n. i. repositio sanguina fragmentorum anguli mandibulae lat. sin. osteosynthesis cum mini plate n. i. Improved osseointegration of bone fragments was stimulated with nanoparticled biocomposite based on hydroxyapatite and polymers, with drug delivery properties. The postoperative course was uneventful (Figure 2 ).



*Slika 2. Ortopantomogram nakon završene hirurške intervencije*  
**Figure 2. Panoramic radiograph after completion of surgery**

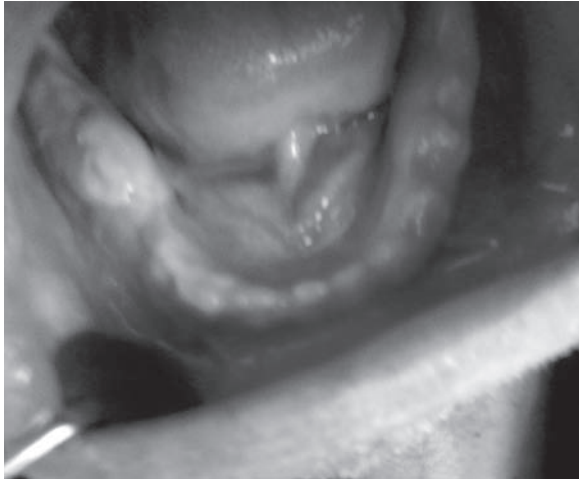
Nakon perioda zarastanja čvrstih i mekih tkiva (Slika 3, 4), pacijent je upućen na dalji

After a period of hard and soft tissue healing (Fig. 3, 4), the patient was referred for further treatment for prosthetic rehabilitation of eden-



protetski tretman radi sanacije bezubosti gornje i donje vilice, kao i poremećenih funkcija orofacijelne regije (žvakanja, gutanja, govora), vertikalne dimenzije okluzije i kompromitovane estetike.

tulous jaws, and disturbed functions of orofacial region (chewing, swallowing, speech), lowered vertical dimension of occlusion and compromised aesthetics.



*Slika 3. i 4. Prikaz stanja u usnoj duplji nakon oporavka od hirurške intervencije*  
**Figure 3. and 4. Presentation of the oral cavity status after recovery from surgery**

Nakon anamneze, kliničkog pregleda i pomoćnih dijagnostičkih metoda, kod pacijenta je osim navedenog postoperativnog statusa, dijagnostikovana i dentofacijalna anomalija, tj. malokluzija III klase, koja je bila prisutna i pre traumatske povrede, tj. dok je pacijent imao svoje zube. Analizom profila lica uočava se da je u biometrijskom polju gornja usna postavljena iza nosne vertikale, a donja usna i brada su pozicionirane ispred nazalne vertikale, što u potpunosti odgovara progenom profilu lica (Slika 5).

After anamnesis, physical examination and ancillary diagnostic methods, additional to his postoperative status, the patient was diagnosed with a dentofacial anomalie, i.e. class III malocclusion, which was also present before the trauma, while the patient still had his own teeth. The analysis of the facial profile showed that in the biometric field, the upper lip was placed behind the nasal vertical, and the lower lip and chin were positioned in front of the nasal vertical, which fully meets the progenic facial profil (Figure 5).



*Slika 5. Progeni profil lica*  
**Figure 5. Progenic facial profile**

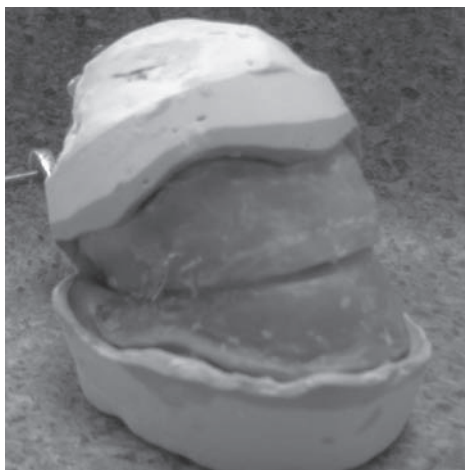
Po dolasku na Odeljenje stomatološke protektike, pacijent se požalio, pre svega, na poteškoće pri žvakanju, gutanju i govoru, i bolove u zglobovima, dok je estetika bila u drugom planu. Nakon kompletne analize, odlučili smo se za izradu gornje i donje totalne zubne proteze. Odgovarajućim standardnim kašikama uzeti su preliminarni otisci gornje i donje vilice (Hydrogum 5, Zhermack, Italy) i izliveni anatomski modeli, koji su poslužili za izradu individualnih kašika. Nakon obrade kašika, uzeti su funkcionalni otisci (Zeta, Zhermack, Italy) i izliveni definitivni radni modeli, na kojima su izrađeni šabloni, koji su poslužili za određivanje međuviličnih odnosa i postavu zuba (Slika 6, 7, 8).

After coming to the organization unit for dental prosthetics, the patient complained primarily of difficulties in chewing, swallowing and speech, and pain in the TMJ, while the aesthetic was of secondary importance. After a complete analysis, we decided to treat the patient with upper and lower complete dentures. Appropriate standard trays were used to take preliminary impressions of the upper and lower jaws (Hydrogum 5, Zhermack, Italy) and anatomical models were casted, so that the individual trays could be made on them. After the process of adjusting the trays, the functional impressions were taken (Zeta, Zhermack, Italy) and definitive work models were casted. On that models, wax rims were made, and used to determine intermaxillary relations and placement of acrylic teeth (Figure 6, 7, 8).



*Slika 6, 7. Preliminarni radni modeli gornje i donje vilice*

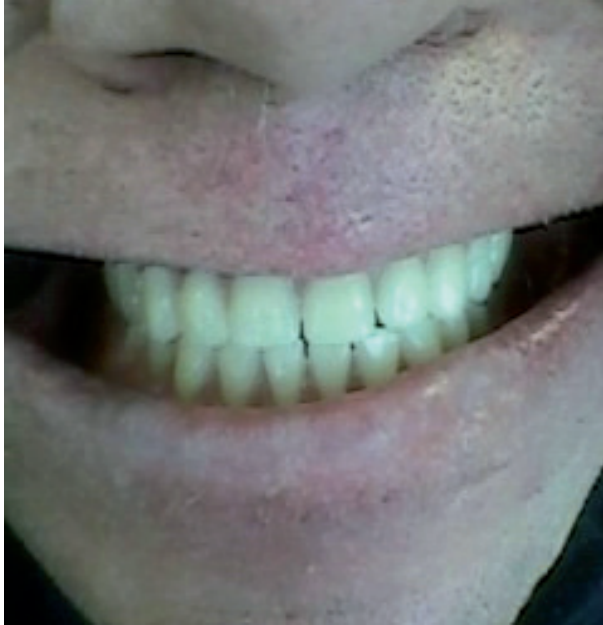
*Figure 6, 7. A definitive working model of the upper and lower jaw with reconstructed jaw relationships without wax rims*



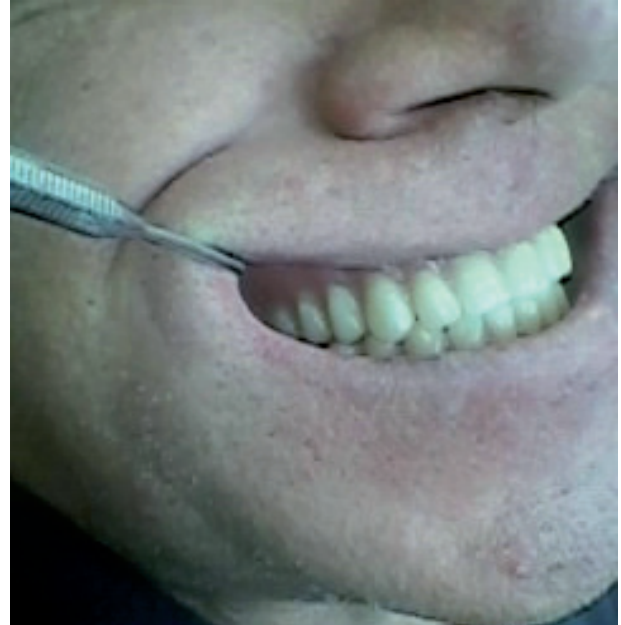
*Slika 8. Definitivni radni model sa rekonstruisanim međuviličnim odnosima*

*Figure 8. The definitive working model with reconstructed jaw relationships with wax rims*

Nakon probe modela proteza, one su date na definitivno završavanje, kivetiranje i obradu. U toku predaje proteza pacijentu su data sva neophodna uputstva za njihovo korišćenje i održavanje higijene. Po završetku kombinovane hirurško-protetske terapije, uspeh lečenja prikazanog kompleksnog problema bio je očigledan (Slike 9, 10).



After the model dentures were tried on in the mouth, the dental technician continued with the process of their definitive fabrication. Upon receiving the dentures, the patient was given all the necessary instructions for their use and maintenance of hygiene. After completion of the combined surgical-prosthetic therapy, success in the treatment of this complex problem was evident (Fig. 9, 10).



*Slika 9, 10. Protetske nadoknade u ustima pacijenta*  
*Figure 9, 10. Dentures in the mouth*

Donja trećina lica je sada u normalnim proporcijama. Gornja usna je podržana od strane gornjih prednjih zuba i blago protrudira u frontalnom pravcu. Progeni izgled više nije glavna karakteristika lica pacijenta. Funkcije orofacijalnog regiona su se vratile u normalne okvire (izgovor, gutanje i žvakanje), dok je bol u temporomandibularnim zglobovima (TMZ) delimično smanjen nakon predaje proteza. Kompletan nestanak tegoba od strane TMZ usledio je nekoliko meseci nakon završene protetske rehabilitacije pacijenta, nakon adaptacije na rekonstruisanu visinu zagrižaja. Pacijent je izjavio da je njegovo žvakanje znatno poboljšano. Estetski izgled pacijenta je u potpunosti zadovoljavajući.

### **Diskusija**

Preprotetski hirurški i protetski tretman predstavljaju opciju izbora za rešavanje ovog kompleksnog slučaja.<sup>11</sup> Defekti dentofacijal-

The lower third of the face is now within normal proportions. The upper lip is supported by the upper front teeth and mildly protruded in the frontal direction. Progenic appearance is no longer the main characteristic of the patient's face. The functions of the orofacial region are now within normal boundaries (pronunciation, swallowing and chewing), and pain in the temporomandibular joint (TMJ) was partially reduced after wearing the total dentures. The complete disappearance of the TMJ symptoms followed few months after the completion of patients rehabilitation and his adaptation to the appropriate vertical dimension of occlusion. The patient stated that his chewing significantly improved. The aesthetic appearance of the patient is satisfactory.

### **Discussion**

Pre-prosthetic surgical treatment and prosthetic treatment present an option of choice for solving this complex case<sup>11</sup>. Defects of dentofacial structures may arise as a result of trauma,



nih struktura mogu nastati kao posledica trauma, oboljenja ili kongenitalnih anomalija. U zavisnosti od lokalizacije defekta kod ovakvih pacijenta, javljaju se problemi sa govorom, žvakanjem, gutanjem, kao i estetski problemi, a mogu se javiti i depresija i posttraumatski stresni poremećaj.<sup>12-15</sup> Najučestalija mesta na kojima dolazi do frakture mandibule jesu kondil, telo i ugao mandibule, a nešto ređe dolazi do frakture ramusa, koronoidnog i alveolarnog nastavka.<sup>16</sup> Pravovremena terapijska procedura i fiksacija frakturiranih fragmenata omogućava brzo ozdravljenje i povratak narušenih funkcija. Mnoge tehnike se mogu koristiti za stabilizaciju i fiksaciju fragmenata. Fiksacija mora biti kruta kako bi se omogućilo zarastanje koštanog tkiva.<sup>3,17,18</sup> Radiografija igra presudnu ulogu u postavljanju dijagnoze i sprovođenju terapijskih procedura. Standardna radiografija može da da približni uvid u nastalu situaciju, ali je za precizno pozicioniranje fragmenata potrebno uključivanje kompjuterizovane tomografije<sup>19,20</sup>. Rut i saradnici smatraju da je primena CT snimanja potisnula panoramsku radiografiju i da je postala zlatni standard za analizu i dijagnostiku fraktura mandibule<sup>21</sup>. Temporomandibularni poremećaj (TMD) je takođe prisutan kod pacijenata sa traumom i malokluzijom III klase. Ovi poremećaji su posledica trauma, smetnji u žvakanju, gubitka okluzalne vertikalne dimenzije (OVD) i teškog psihološkog stanja pacijenta.<sup>22</sup> Pacijent ima teškoća u izgovoru i otežanu mastikatornu funkciju.<sup>23,24</sup> Gornjom i donjom totalnom mobilnom zubnom protezom kod pacijenta uspostavljeni su izgubljeni međuvilični odnosi, postignuti zadovoljavajući rezultati u rekonstrukciji vertikalne dimenzije okluzije, funkcije žvakanja, gutanja, fonetike i estetike stomatognatnog sistema.

## **Zaključak**

Na osnovu prikazanog slučaja može se zaključiti da se traume orofacijalnog sistema, kombinovane sa malokluzijama III klase, kod odraslog pacijenta mogu uspešno lečiti koristeći kombinaciju hirurške i protetske terapije. Dobro isplanirane i pravilno sprovedene hirurško-protetske procedure dovode do zadovoljavajućih rezultata na kraju preprotetske i protetske rehabilitacije. Primena kombinovanih preprotetskih i protetskih procedura kod pacijenta sa traumom

disease or congenital anomalies. Depending on the localization of the defect, the problems regarding speech, chewing, and aesthetics can be found in this type of patients, and can be accompanied by depression and post-traumatic stress disorder<sup>12-15</sup>. The most common fracture localizations in the mandible are the condyle, the body and the angle of the mandible and somewhat rarer are fractures of the ramus, coronoid and alveolar process<sup>16</sup>. Timely therapeutic procedure and fixation of fractured fragments allows for fast recovery and the return of damaged functions. Many techniques can be used for the stabilization and fixation of the fragments. Fixation must be rigid to allow healing of bone tissue<sup>3, 17, 18</sup>. Radiography plays a crucial role in the diagnosis and implementation of treatment procedures. Standard radiographs may give an initial insight into the situation but the precise positioning of fragments can be seen only after including computerized tomography<sup>19,20</sup>. Ruth and colleagues believe that the use of CT scans has suppressed panoramic radiography and has become the gold standard for the analysis and diagnosis of fracture mandibule<sup>21</sup>. Temporomandibular disorder ( TMD) is also present in patients with trauma and class III malocclusion. These disorders are the result of trauma, disturbances in chewing, loss of vertical dimension of occlusion (OVD), and severe psychological condition of the patient<sup>22</sup>. The patient has difficulty in pronunciation and disturbed masticatory function<sup>23,24</sup>. Upper and lower total removable dental prosthesis in this patient established the lost jaw relations, achieved satisfactory results in the reconstruction of the vertical dimension of occlusion, the functions of chewing, swallowing, phonetics and esthetics of the stomatognathic system.

## **Conclusion**

Based on the case presented, it can be concluded that the trauma of the orofacial system combined with class III malocclusion in an adult patient can be successfully treated using a combination of surgical and prosthetic treatment. A well-planned and properly performed surgical-prosthetic procedure leads to satisfactory results after pre-prosthetic and prosthetic rehabilitation. Application of combined pre-prosthetic and prosthetic procedures in patient

i dentofacijalnom anomalijom vratila je izgubljene funkcije gutanja, žvakanja, govora i estetike u zadovoljavajućem vremenskom intervalu.

with trauma and dentofacial anomaly has returned his lost functions of swallowing, chewing, speech and aesthetics in a satisfactory time frame.

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