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Utjecaj stabilnosti gornje proteze na zadovoljstvo pacijenata

The influence of upper denture stability on patients' satisfaction

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Sažetak

Svrha: Željela se ispitati stabilnost gornjih proteza simulirajući žvačnu funkciju te ustanoviti povezanost između stabilnosti gornje proteze i zadovoljstva pacijenata protezama. **Ispitanici i postupci:** Istraživanje je provedeno na 54 pacijenta te je kliničkim pregledom ocijenjena stabilnost gornjih pomičnih proteza, a podaci o zadovoljstvu pacijenata protezama dobiveni su ispunjavanjem upitnika. Razlika među kvalitativnim varijablama ispitana je χ^2 testom. **Rezultati:** Stabilnost gornje proteze u funkciji ocijenjena je kao zadovoljavajuća u 85,19 posto slučajeva (dobra u 29,63 % slučajeva + zadovoljavajuća u 55,56 %) i nezadovoljavajuća (loša) kod 14,81 posto pacijenata. Zadovoljavajuća stabilnost gornje proteze u funkciji bila je statistički značajno povezana s ispitivanim čimbenicima vezanima uz zadovoljstvo pacijenata tim pomagalima ($p < 0,05$). **Zaključak:** S obzirom na dobivene rezultate može se zaključiti da dobra stabilnost proteze pridonosi fiziološkoj udobnosti pacijenata i pozitivno utječe na njegovo zadovoljstvo protezama.

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Uvod

Zahvaljujući razvoju medicine produžen je životni vijek ljudi i zbog toga se povećava broj starijih osoba te je sve više djelomice ili potpuno bezubih pacijenata, unatoč nastojanjima da se sačuva što veći broj zuba (1,2). Zato je protetička rehabilitacija pomičnim protezama (djelomičnim ili potpunim) nužna kod mnogih pacijenata, a vjerojatno će tako biti i u budućnosti (3).

Stabilnost proteze je svojstvo opiranja lateralnim i anteroposteriornim pomacima pri djelovanju sila (4,5). Tkiva na kojima proteza leži ili se na njih oslanja (zubi, alveolarni greben i meka tkiva) jako utječu na njezinu stabilnost (6). Mehanizam stabilizacije potpunih proteza bitno se razlikuje od načela stabilizacije djelomičnih. Čimbenici koji utječu na stabilnost potpunih proteza uključuju anatomske varijacije vezane za visinu i oblik bezuboga alveolarnog grebena, uzajamni odnos gornjeg i donjeg alveolarnog grebena, okluzijsku usklađenost antagonističkih zuba (prirodni ili umjetni), oblik baze proteze te neuromuskularnu kontro-

Introduction

With development of medicine life expectancy is extended, the number of elderly people as well as the number of complete or partial edentulous patients is increasing despite the efforts to preserve as many teeth as possible (1, 2). Therefore, prosthetic treatment with removable (partial or complete) dentures is required in many patients, and this trend will probably be a reality in the future (3).

The denture stability is the resistance to lateral and antero-posterior movements during the exposure to the masticatory forces (4, 5). Denture stability is greatly affected by support provided by the foundation (teeth, residual ridge and soft tissues) on which the denture rests (6). Both complete and partial removable dentures have quite different mechanisms of stabilization. The factors that contribute to stability of complete removable prosthesis include anatomic variations of the patient that determine the residual ridge height and conformation, residual ridge relationships, occlusal harmony between antagonistic teeth (natural or ar-

lu žvačnog procesa (5). Kako bismo postigli optimalnu stabilnost proteze, nužan je precizan otisak tkiva budućeg ležišta, što, pak, omogućuje pravilan smještaj proteze. Upravo se optimalan ležaj proteze, uključujući i palatinalne kosine, opire horizontalnim silama koje djeluju na njezinu destabilizaciju. Velik, četvrtast i širok presjek alveolarnoga grebena, te četvrtast ili koničan oblik alveolarnoga luka, pružaju jak otpor lateralnim silama (5). Polirane površine baze proteze moraju biti oblikom usklađene s aktivnošću okolnih mišića jer njihovim djelovanjem na površini proteze nastaju lateralne i vertikalne sile koje je mogu destabilizirati i pomaknuti iz ležišta. Stabilnost, pak, djelomične proteze primarno ovisi o točnosti prilagodbe ležištu (vertikalno i horizontalno) te o pomičnosti zuba i mekih tkiva na ležištu. Stoga će lošu stabilnost djelomične proteze uzrokovati slaba prilagođenost njezine baze ležištu, izostanak adekvatne potpore ležišta ili oboje (6). Ako je djelomična proteza poduprta zubom ili implantatom te dobro prilagođena ležištu s pravilno oblikovanom bazom, njezina će stabilnost biti dobra. Čak i kada se djelomična proteza primarno oslanja na meka tkiva ležišta, dobro oblikovana baza znatno će ograničiti pomicanje u horizontalnoj ravnini (6). Stalan i miran položaj (tzv. stabilne) proteze (7) trebao bi pozitivno djelovati na zadovoljstvo pacijenata protezama, no kako njihovo zadovoljstvo ima multifaktorsku etiologiju, kvaliteta (tehnička izvrsnost) u izradi proteze nije jedini uvjet za zadovoljstvo (ili nezadovoljstvo) pacijenata (8). Na zadovoljstvo protezama utječe i pacijentovo stajalište prema tim pomagalicama te motivacija za nošenje. Pacijenti s negativnim stajalištem češće su nezadovoljniji (8). Očekivanja su također različita. Nekima su primarni ugodnost i sposobnost žvakanja, a drugima su estetika i retencija mnogo važnije (9).

Nakon vađenja zuba počinje resorpcija rezidualnog alveolarnog grebena. To je kroničan, progresivan i kumulativan multifaktorski proces koji zbog promjena na zahvaćenim koštanim i okolnim mekim tkivima utječe na stabilnost proteza (10,11). Resorpcija kosti ubrzana je u prvoj godini nakon postavljanja proteze, a kasnije je sporija, ali se događa čak i 25 godina nakon vađenja zuba (12). S tkivnim promjenama (resorpcija kosti i skupljanje mekih tkiva) sve je lošija prilagođenost baze proteze njezinu ležištu, a to rezultira sve lošijim funkcioniranjem proteze jer slabe retencija i stabilnost te se mijenja vertikalna dimenzija međučeljsnih odnosa (11,13). U skladu s tim stabilnost proteze može se povezati s ugodom pri žvakanju, odabirom vrste hrane, ili korištenjem sredstava za njezino učvršćivanje. Zbog pretpostavke da postoji povezanost između stabilnosti proteze i čimbenika koji opisuju zadovoljstvo pacijenata protezama, svrha ovog istraživanja bila je ispitati stabilnost gornje proteze u funkciji te ustanoviti njezinu povezanost sa zadovoljstvom pacijenata.

tificial), denture base form, and neuromuscular control of masticatory process (5). In order to ensure optimal denture stability, it is necessary to obtain an accurate impression of denture bearing tissues which provides the correct position of denture. Correct position of denture, including inclined palatal surfaces, resists to horizontal forces that can destabilize the prosthesis. Large, square, broad cross sections of alveolar ridges as well as square or tapered alveolar arches offer a greater resistance to lateral forces (5). Polished denture surfaces have to be formed in accordance with the activity of surrounding muscles because action of the musculature on the denture base generally results in lateral and vertical destabilizing and dislodging forces. Removable partial denture stability depends primarily on the overall quality of adaptation of the prosthesis to the foundation (horizontally and vertically) as well as on the inherent mobility of the teeth and soft tissue forming the foundation, therefore, a non-stable removable partial denture may be due to poorly fitting of denture or lack of adequate support or both (6). If a removable partial denture is solely tooth or implant supported and has a well-fitting, properly designed framework, stability should be relatively good. Even if prosthesis relies primarily on soft tissue support, a well-fitting framework significantly limits movement in a horizontal plane (6). Constant and steady placement of (so-called stabile) denture (7) should positively affect patients' satisfaction, but satisfaction with dentures has a multicausal character, and the quality (technical excellence) of denture is not the only reason for satisfaction (or dissatisfaction) in patients (8). A patient's attitude towards the dentures and motivation for wearing the dentures also affect the patient's satisfaction. Those with negative attitudes are more often dissatisfied (8). The expectations of patients are also different. Some patients are primarily concerned with comfort and the ability to masticate, while in other patients, good esthetics and retention seem to be more important (9).

The process of the residual alveolar ridge resorption starts after teeth extraction. Residual ridge resorption is a chronic, progressive and cumulative multifactorial process that affects denture stability due to bone and associated soft tissue changes (10, 11). The bone loss is rapid in the first year after placement of dentures, and then continues at a slower pace, continuing even 25 years after teeth extraction (12). Tissue changes (bone resorption and soft tissue shrinkage) lead to poorer-fitted denture base and improper functioning of removable dentures with poor retention, poor stability and changed vertical dimension of the relationship between the mandible and the maxilla (11, 13). In accordance with this, denture stability can be associated with chewing comfort, choice of food, or use of denture adhesives. Assuming that there is a correlation between denture stability and factors related to patients' satisfaction with their dentures, the aim of this study was to examine the stability of the upper denture in function, and to determine the relationship with patient's satisfaction.

Ispitanici i postupci

Ovo istraživanje početak je veće studije koja će se provesti kako bi se ocijenilo zadovoljstvo pacijenata – nositelja pomičnih proteza u Istarskoj županiji. Dosad su u njega uključena 54 pacijenta (u dobi između 35 i 82 godine) s djelomičnom ili potpunom gornjom protezom koji su došli u stomatološku ambulantu Doma zdravlja u Puli radi redovitog pregleda i održavanja svojih proteza, te je ta slučajnost bila i razlog za njihovo uključivanje u istraživanje.

Osim što su uzeti anamnestički podaci iz zdravstvenih kartona pacijenata, kliničkim je pregledom ocijenjena i stabilnost gornje proteze u funkciji. Kriteriji za ocjenu bili su sastavljeni prema čimbenicima koji utječu na stabilnost proteza, a opisali su ih Jacobson i Krol (4,5). Postupak se obavlja pritiskom na okluzalne površine bukalnih kvržica premolara čime se nastoji izvrnuti i pomaknuti protezu prema sagitalnoj ravnini. Stabilnost proteze ocijenjena je kao dobra ako je sagitalni pomak bio do dva milimetra, ili se pojavljivao veliki otpor pri odizanju proteze; zadovoljavajuća je bila kad je sagitalni pomak bio do dva milimetra uz mali otpor pri odizanju proteze, ili ako je sagitalni pomak iznosio od dva do pet milimetara uz velik otpor pri odizanju proteze; loša kad je sagitalni pomak bio veći od pet milimetara uz slab otpor pri odizanju proteze.

Zadovoljstvo protezama procijenjeno je prema odgovorima pacijenata na pitanja iz upitnika s pet pitanja – o nelagodnosti pri žvakanju s protezama; o utjecaju proteze na odabir hrane; o promijenjenom okusu hrane zbog nošenja proteze; o teškoćama tijekom čišćenja proteze i o korištenju sredstva za učvršćivanje proteze. Prva četiri pitanja preuzeta su iz opširnijeg upitnika kojim su se u svojem istraživanju koristili Garrett i suradnici (14), a posljednje su dodali autori istraživanja potaknuti spoznajom da pacijenti češće upotrebljavaju adhezive za učvršćivanje proteza. Pitanja su imala četiri moguća odgovora: često, redovito, povremeno i rijetko.

Rezultati su statistički obrađeni korištenjem računalnog programa SPSS 15,0 (SPSS Inc., Chicago, Illinois, SAD) metodom deskriptivne statistike. Kvalitativna varijabla (stabilnost gornje proteze) i odgovori iz upitnika predstavljeni su u tablicama kontingencije, pri čemu su ocjene stabilnosti proteza kategorizirane na zadovoljavajuću (objedinjuju dobivene ocjene: dobra i zadovoljavajuća) i nezadovoljavajuću, a odgovori iz upitnika sažeti u dvije skupine – redovito (objedinjuju dobivene odgovore često i redovito), te rijetko (objedinjuju dobivene odgovore povremeno i rijetko). Razlika među kvalitativnim varijablama testirana je χ^2 testom.

Rezultati

Prosječna dob pacijenata uključenih u istraživanje bila je 60,76 godina. Prosječno trajanje djelomične ili potpune bezubosti u gornjoj čeljusti bilo je 18,48 godina u rasponu od jedne do 52 godine. Gornje pomične proteze uključene u istraživanje prosječno su bile stare 5,52 godine u rasponu od jedne do 15 godina.

Stabilnost gornje proteze u funkciji ocijenjena je kao zadovoljavajuća (objedinjene dobivene ocjene: dobra 29,63 %

Material and Methods

This study is the beginning of a larger study in region of Istria with the aim to assess patients' satisfaction with removable dentures. So far, this study included 54 patients (from 35 to 82 years of age) which wore upper partial or complete dentures. Also, all the patients came to the dental practice of Public Health Center Pula for regular check-up and maintaining of their removable dentures and this "coincidence" was the inclusion factor for participating in this study.

The anamnestic data were collected from medical records of participants and the stability of removable upper denture in function was assessed by clinical examination. The criteria for assessment of upper denture stability were formed according to factors affecting denture stability described by Jacobson and Krol (4, 5). The procedure is based on a pressure on the occlusal surfaces of premolar buccal cusps, which seeks to upset and shift removable denture against the sagittal plane. The stability was assessed as good - the sagittal shift up to 2 mm, or there was high resistance to the removal of denture, satisfied - the sagittal shift up to 2 mm with easy removal of denture, or sagittal shift between 2 and 5 mm, but with high resistance to denture removal, and poor sagittal shift more than 5 mm with easy denture removal.

Patients' satisfaction with their dentures was assessed according to the answers from a questionnaire which consisted of five questions: chewing discomfort with dentures; choice of food affected by wearing a denture; changed taste of food by wearing a denture; cleaning difficulties with denture, and use of denture adhesive. The first 4 questions were taken from a more extensive questionnaire used in the study conducted by Garrett et al. (14) except the last one added by authors of this study encouraged by knowledge about substantial use of denture adhesives among patients. All questions had four possible answers: mostly, frequently, occasionally, and rarely.

The results were statistically analyzed using computer software SPSS 15.0 (SPSS Inc., Chicago, Illinois, USA) by method of descriptive statistics. Qualitative variable (upper denture stability) and the answers from the questionnaire were presented in contingency tables. The grades of denture stability were categorized as satisfactory (consolidate obtained grades: good and satisfactory) and unsatisfactory, while the answers from the questionnaire were aggregated into two groups; frequently (consolidate obtained answers: mostly and frequently), and rarely (consolidate obtained answers: occasionally and rarely). The difference in qualitative variables was tested for significance by χ^2 -test.

Results

The average age of patients included in this study was 60.76 years. Period of complete or partial edentulousness in the upper jaw was from 1 to 52 years with the average duration of 18.48 years. The removable upper dentures included in this study were on average 5.52 years old in range from 1 to 15 years.

The stability of the upper denture in function was assessed as satisfactory (consolidated obtained grades: good

+ zadovoljavajuća 55,56 %) kod 85,19 posto pacijenata i nezadovoljavajuća (loša) kod njih 14,81 posto.

Među pacijentima sa zadovoljavajuće stabilnom gornjom protezom njih 82,6 posto je rijetko osjećalo žvačnu nelagodu, a 17,4 posto redovito. Povezanost između zadovoljavajuće stabilnosti gornje proteze i rijetke žvačne nelagode bila je statistički značajna ($p < 0,05$, tablica 1).

29.63% + satisfactory 55.56%) in 85.19% of patients, and unsatisfactory (poor) in 14.81% of patients.

Among the patients with satisfactory upper denture stability, 82.6% of patients felt discomfort rarely, and 17.4% of patients frequently felt chewing discomfort when wearing the upper denture. Connection between satisfactory upper denture stability and rarely present chewing discomfort was statistically significant ($p < 0.05$, Table 1).

Tablica 1. Povezanost između stabilnosti gornje proteze u funkciji i čimbenika koji se odnose na zadovoljstvo pacijenata protezama (1 – žvačna nelagoda; 2 – utjecaj nošenja proteze na odabir hrane; 3 – utjecaj nošenja proteze na promjenu okusa hrane, 4 – teškoće pri čišćenju proteze; 5 – korištenje sredstva za učvršćivanje proteze)

Table 1 Relationship between stability of the upper denture in function and factors related to patients' satisfaction with their dentures (1-chewing discomfort, 2-choice of food affected by wearing a denture, 3-changed taste of food by wearing a denture, 4-cleaning difficulties with denture, 5-use of denture adhesive).

Čimbenici koji se odnose na zadovoljstvo pacijenata • Factors related to patients' satisfaction		Stabilnost gornje proteze u funkciji • Stability of the upper removable denture in function		
		Zadovoljavajuća • Satisfied	Nezadovoljavajuća • Unsatisfied	Ukupan broj ispitanika • Total number of participants
	Ukupan broj ispitanika • Total number of participants	46 (85.19%) (100%)	8 (14.81%) (100%)	54 (100%)
1	Redovito • Frequently	8 (17.4%)	6 (75%)	14 (25.9%)
	Rijetko • Rarely	38 (82.6%)	2 (25%)	40 (74.1%)
	χ^2 - test	$\chi^2=5.888$, $df=1$, $p < 0.05$		
2	Redovito • Frequently	8 (17.4%)	6 (75%)	14 (25.9%)
	Rijetko • Rarely	38 (82.6%)	2 (25%)	40 (74.1%)
	χ^2 - test	$\chi^2=5.888$, $df=1$, $p < 0.05$		
3	Redovito • Frequently	2 (4.30%)	4 (50%)	6 (11.1%)
	Rijetko • Rarely	44 (95.7%)	4 (50%)	48 (88.9%)
	χ^2 - test	$\chi^2=7.19$, $df=1$, $p < 0.05$		
4	Redovito • Frequently	4 (8.7%)	4 (50%)	8 (14.81%)
	Rijetko • Rarely	42 (91.3%)	4 (50%)	46 (85.19%)
	χ^2 - test	$\chi^2=4.606$, $df=1$, $p < 0.05$		
5	Redovito • Frequently	4 (8.7%)	4 (50%)	8 (14.81%)
	Rijetko • Rarely	42 (91.3%)	4 (50%)	46 (85.19%)
	χ^2 - test	$\chi^2=4.606$, $df=1$, $p < 0.05$		

Kod 82,6 posto pacijenata sa zadovoljavajuće stabilnom gornjom protezom nošenje proteze rijetko je utjecalo na odabir hrane, a kod 75 posto onih s nezadovoljavajućom stabilnošću proteze redovito, što je bilo i statistički značajno ($p < 0,05$, tablica 1).

Među pacijentima sa zadovoljavajuće stabilnom gornjom protezom 4,3 posto redovito su osjećali promjene u okusu hrane, a njih 95,7 posto ističu da im se to događalo rijetko, što je također bilo statistički značajno ($p < 0,05$, tablica 1).

Kod većine pacijenata (91,3 %) sa zadovoljavajuće stabilnom gornjom protezom poteškoće pri čišćenju bile su rijetke, što je bilo i statistički značajno ($p < 0,05$, tablica 1). Također se 91,3 posto pacijenata sa zadovoljavajuće stabilnom protezom rijetko kad koristilo sredstvom za učvršćivanje proteze, što je opet bilo statistički značajno ($p < 0,05$, tablica 1).

The choice of food was rarely affected by denture wearing in 82.6% of patients with satisfactory upper denture stability, but frequently in 75% of patients with unsatisfactory upper denture stability, which was also statistically significant ($p < 0.05$, Table 1).

Among patients with satisfactory upper denture stability, 4.3% of patients frequently felt changed taste of food, while 95.7% of patients rarely felt changed taste of food, which was statistically significant ($p < 0.05$, Table 1).

In the majority of patients (91.3%) with satisfactory upper denture stability, cleaning difficulties were present rarely with statistical significance ($p < 0.05$, Table 1). Also, 91.3% of the patients with satisfactory upper denture stability rarely used denture adhesive ($p < 0.05$, Table 1).

Rasprava

Na uspjeh protetičke rehabilitacije djelomičnim ili potpunim protezama utječu biološki i mehaničko-fizikalni čimbenici (4). Stabilnost pomičnih proteza otpor je na horizontalne, lateralne i/ili rotacijske sile. Primarno se temelji na

Discussion

Biological and mechanical-physical factors affect the success of prosthetic rehabilitation with partial or complete dentures (4). The removable denture stability is the resistance to horizontal, lateral, and/or rotational forces. Denture sta-

dobro prilagođenoj bazi proteze i osigurava fiziološku udobnost pri nošenju (1,4,5,7). Na stabilnost proteze utječe odnos njezine baze i tkiva ležišta, odnos vanjske površine i ruba proteze s okolnim orofacijalnim mišićima, okluzija te oblik alveolarnog grebena – širok greben omogućuje bolju stabilnost nego onaj oštar poput noža (5,15). Nedostatak stabilnosti često negativno djeluje na čimbenike koji se odnose na retenciju i ležište proteze. Kod proteze koja se lako pomiče u reakciji na lateralne sile može se prekinuti rubni ventil ili pomaknuti baza proteze iz pravilnog položaja prema tkivima ležišta (1,4,5). U ovom je istraživanju kod većine ispitanika stabilnost gornje proteze u funkciji ocijenjena kao zadovoljavajuća. Kod samo njih 14,81 posto sagitalni pomak bio je veći od pet milimetara i proteza se lagano odizala. Pomična proteza dobro prilagođena ležištu, kad je izložena okluzalnom pritisku, manje se pomiče od lošije prilagođenih. Raspon pomicanja dobro prilagođenih proteza varira od 0 do 1,4 milimetra na strani pritiska, te od 0,1 do 1,6 milimetara na suprotnoj strani (16).

Zadovoljstvo pacijenata protezama ovisi o mnogo čimbenika – o stanju koštanog tkiva i sluznice ležišta proteze, prilagodljivosti neuromuskularnog mehanizma, individualnom osjećaju sigurnosti pri nošenju, utjecaju okolnih mišića na krila proteze, viskoznosti sline, dobi pacijenta, položaju okluzalne ravnine, okluziji, higijeni, vrsti hrane itd. (7,15). Upravo promjene na ležištu proteze zbog resorpcije alveolarnog grebena rezultiraju lošijom retencijom i stabilnošću proteze, što se, pak, odražava na zadovoljstvo pacijenata (12). Većina pacijenata u ovom istraživanju samo je rijetko imala spomenute poteškoće vezane za zadovoljstvo sa svojim protezama. Prema podacima iz literature pacijenti s opsežnim gubitkom zuba doživljavaju velika ograničenja koja se odnose na njihove dnevne aktivnosti, odabir hrane i uživanje u jelu (1,17). U ovom istraživanju nošenje proteze redovito je utjecalo na odabir hrane kod samo 25,9 posto pacijenata. Liedberg i suradnici (3) ističu kako je kod nositelja proteza žvačna sposobnost znatno smanjena, te zato dvadesetak posto njih rjeđe jedu tvrdu hranu u usporedbi s pacijentima koji imaju gotovo sve prirodne zube. U istraživanju Garretta i njegovih kolega (14) više od 55 posto pacijenata bilo je umjereno do potpuno zadovoljno lošim prijanjanjem proteza. Suprotno tome Berg (18) navodi veći postotak nezadovoljnih pacijenata s obzirom na mogućnost žvakanja i estetiku, uglavnom s donjim protezama. Većina pacijenata s protezama uči prihvaćati funkcijska ograničenja proteza i postiže određeni stupanj zadovoljstva tako što se navikavaju na postupne promjene u prilagođenosti proteze ležištu (14). Ovisno o izraženosti promjena ležišta i dotrajalosti proteze obavlja se njihovo podlaganje, ugađanje rubova, korekcija okluzije, rebaziranje ili se izrađuju nove. Time se poboljšava retencija i stabilnost proteze, pa ona ponovno postaje funkcionalna (19). Opisani su mogući razlozi za povećanje zadovoljstva pacijenata nakon podlaganja starih ili izrade novih proteza – bolja retencija, stabilnost i okluzija; pozitivan učinak očekivanja pacijenata od učinjenog zahvata i placebo-učinak nakon promjena na starim protezama (14). Dobra stabilnost proteze u ovom je istraživanju pozitivno djelovala na zadovoljstvo pacijenata. Značajna povezanost između stabilnosti proteze i smanjenog

bility primarily relies on a well fitting denture base, and ensures the patient's physiological comfort of denture wearing (1, 4, 5, 7). The factors that contribute to denture stability are the relationship of the denture base to the underlying tissue, the relationship of the external surface with border to the surrounding orofacial musculature, the occlusion, and the ridge form: a broad ridge tends to offer better stability than a knife-edge ridge (5, 15). The lack of stability often makes ineffective the factors involved in retention and support. A denture that shifts easily in response to laterally applied forces can cause a disruption in the border seal or move the denture base from a correct position with respect to the supporting tissues (1, 4, and 5). In this study the stability of the upper denture in function was assessed as satisfactory in the majority of participants. In only 14.81% of patients the sagittal denture shift was more than 5 mm with easy denture removal. A well-fitting removable denture exhibited a lesser amount of movement than the poorly fitting ones when occlusal pressure was applied. The range of well-fitting dentures movement varied from 0 to 1.4 mm on the chewing side and from 0.1 to 1.6 mm on the other side (16).

Many factors may influence patients' satisfaction with their dentures: quality of bone tissue and oral mucosa of denture bearing area, the adaptability of the neuromuscular mechanism, individual feeling of security by denture wearing, influence of the surrounding muscles on denture flanges, viscosity of saliva, patient's age, position of occlusal plane, occlusion, hygiene, type of food, etc. (8,14). Tissue changes that occur on denture bearing area due to alveolar ridge resorption lead to poorer denture retention and stability which consequently affects patients' satisfaction (13). In this study, the majority of patients had rarely mentioned difficulties related to their satisfaction with their dentures. According to data from literature, patients with considerable tooth loss experienced a significant disability that imposed on their daily living activities, choice of food, and enjoyment of food in particular (1,17). In this study, choice of food was frequently affected by denture wearing in only 25.9% of patients. Liedberg et al. (3) stated that for all denture wearers masticatory ability is markedly reduced, so they reduce the intake of hard food by about 20% compared to those with almost complete natural dentitions. In a study conducted by Garrett et al. (14), more than 55% of the patients were moderately to fully satisfied with their poorly fitting dentures. On the contrary, Berg (18) encountered a larger number of patients who were dissatisfied with their dentures with regard to the chewing ability and esthetics, especially with lower ones. Most of denture wearers learned to accept functional limitations of dentures and established a certain satisfaction level adjusting to gradual changes in denture fit (14). Depending on the level of tissue changes and deterioration of denture, denture relining, adapting of denture margins, occlusion corrections, denture rebasing or making a new dentures are all indicated. This improves denture retention and stability, and consequently denture becomes functional again (19). There are described possible explanations for the improvement of patients' satisfaction after denture relining or making new dentures: better retention, stability and occlu-

osjećaja žvačne nelagode te odabira hrane u ovom istraživanju podudara se s rezultatima istraživanja Brunella i Mandikosa (20). Garrett i suradnici (14) pronašli su znatnu povezanost između zadovoljstva protezama i osjećaja ugone tijekom žvakanja, što je znatno koreliralo sa sposobnošću žvakanja, užitkom u jelu, odabirom hrane te zaostalom hranom ispod proteze. U istraživanju Knezovića i suradnika (9) zadovoljstvo pacijenata gornjom djelomičnom protezom uglavnom je bilo povezano s estetikom, žvakanjem, govorom te rijetko prisutnim bolnim senzacijama ispod baze proteze. Kombinirajući te čimbenike opisana je varijabilnost općeg zadovoljstva pacijenata protezama, uz navod kako je estetski-vizualni efekt mnogim pacijentima važniji od funkcionalnosti proteze (9).

Iako su dobiveni rezultati bili očekivani, razumljivi i u skladu s podacima iz literature, ograničenje ovog eksperimentalnog istraživanja povezano je s malim brojem ispitanika i kratkim upitnikom. Taj upitnik dosad nije bio testiran, no prva četiri pitanja preuzeta su iz istraživanja Garretta i suradnika (14) i dala su korisne rezultate. Posljednje, peto pitanje – korištenje adheziva za učvršćivanje proteze – dodali su autori s namjerom da posluži kao jednostavan pokazatelj loših proteza (slabije retencije i stabilizacije), a čega ispitanici možda nisu ni svjesni zbog zadovoljstva svojom protezom (zapravo lošom) tijekom njezina nošenja.

U nastavku istraživanja, s više ispitanika, pokazana ograničenja ove eksperimentalne studije poslužiti će za dodatno planiranje kako bismo dobili vjerodostojnije rezultate.

Zaključak

Kod većine ispitanika stabilnost gornje proteze u funkciji ocijenjena je kao zadovoljavajuća i dobra. Prema dobivenim rezultatima zaključuje se da je stabilnost gornje proteze povezana s pacijentovim zadovoljstvom, odnosno da dobra stabilnost i fiziološka udobnost proteze pozitivno utječu na zadovoljstvo pacijenata uz rijetko prisutnu žvačnu nelagodu; nošenje proteze rijetko utječe na odabir hrane i rijetko mijenja njezin okus; rijetke su teškoće pri čišćenju proteze te se rijetko upotrebljavaju sredstva za njezino učvršćivanje.

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Izjava

Nema sukoba interesa.

positive effects on patients' expectations as the interventions were made; a placebo effect of modifications made to the old dentures (14). In this study, good denture stability positively influenced patients' satisfaction. A statistically significant correlation of denture stability with rarely present chewing discomfort and choice of food in this study complied with the results of Brunello and Mandikos (20). Garrett et al. (14) noted a significant correlation between overall satisfaction with dentures and chewing comfort, and both of these perceptions correlated significantly with chewing ability, eating enjoyment, food choices, and food particles under dentures. In a study conducted by Knezović et al. (9), patients' satisfaction with upper partial denture was significantly correlated with esthetics, chewing, speech, and rarely presented pain sensations under the denture base. The combination of these factors explained the variability of the patients' general satisfaction with their dentures with a statement that, for many patients, the esthetic appearance is more important than denture functionality (9).

Although the results obtained in this study were expected, reasonable, and also in accordance with literature data, this pilot study had limitations with regard to the small number of participants and a short questionnaire. This questionnaire has not been tested but first four questions were taken from the study of Garrett et al. (14) due to appreciable results obtained. The last, fifth question – use of denture adhesive – was added by authors because it can serve as a simple indicator of poor dentures (poorer denture retention and stability) which patients do not need to be aware of because they attained a certain satisfaction level with their denture (poor denture) through the period of denture wearing.

Limitations of this "pilot study" will be used for additional planning in order to get more reliable results in further research with more participants.

Conclusion

In most cases, the upper denture stability in function was assessed as satisfactory and good. According to the results, it can be concluded that upper denture stability is related to patient's satisfaction. Good denture stability and physiological comfort positively affected patients' satisfaction with rarely present chewing discomfort; wearing a denture rarely affected the choice of food, and changed taste of food; cleaning difficulties were rarely present and denture adhesives were used rarely.

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Transparency declaration

No conflict of interest.

Abstract

Objective: The aim of this study was to examine the stability of the upper denture simulating masticatory function and to determine possible correlation between upper denture stability and patient's satisfaction with their dentures. **Material and Methods:** The study was conducted on 54 patients. The upper removable denture stability was assessed by clinical examination and the data about patient's satisfaction were collected by filling out the questionnaire. The difference among qualitative variables was tested for significance by χ^2 -test. **Results:** The stability of the upper removable denture in function was assessed as satisfactory in (good in 29.63% + satisfactory in 55.56%) 85.19 % of patients, and unsatisfactory (poor) in 14.81% of patients. Satisfactory upper denture stability in function was statistically significantly correlated with all factors related to patient's satisfaction with dentures ($p < 0.05$). **Conclusions:** According to the results, it can be concluded that good denture stability contributes to the physiologic comfort of the patients and positively affects patients' satisfaction with their dentures.

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Key words

Dentures; Denture Retention; Personal Satisfaction; Alveolar Bone Loss.

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