Zavisnost estetike lica od sagitalnih i vertikalnih odnosa vilica

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Dependence of the face aesthetic from sagittal and vertical jaw relations

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KRATAK SADRŽAJ

Savremena ortodoncija se ne može ni zamisliti bez plana terapije koji pored odnosa vilica i položaja zuba treba da obuhvata i karakteristike mekih tkiva lica. ***Cilj*** *ovog istraživanja je bio da se na osnovu ankete ustanove karakteristike lica u zavisnosti od sagitalnih i vertikalnih odnosa vilica, koje se smatraju estetski prihvatljivim, a na koje se tokom ortodontske terapije može delovati.* ***Materijal i metod:*** *Istraživanje je sprovedeno na osobama uzrasta od 23 do 30 godina koje su snimane digitalnim aparatom u standardnim uslovima. Odabrani su desni profilni snimci tri ispitanika: po jednog sa prvom, drugom i trećom okluzalnom klasom. Ovi snimci su kompjuterski obrađeni tako da je svaki od njih modifikovan u novih šest oblika. Modifikacije su podrazumevale mezijalno i distalno pomeranje maksile i mandibule, kao i povećanje i smanjenje visine donje trećine lica.* ***Rezultati*** *su pokazali da se ravan profil koji je najčešće prisutan kod eugnatih odnosa vilica smatra najlepšim, mada se i blago konveksni profil vrlo često smatra atraktivnim. Konveksni profil se sreće kod distalnih odnosa vilica i u zavisnosti od stepena izraženosti utiče na atraktivnost lica. Mezijalni odnos vilica, kada mandibula prevazilazi u sagitalnom pravcu maksilu, najčeće vodi konkavnom profilu koji je estetski najmanje prihvatljiv.*

Ključne reči: mekotkivni profil, atraktivnost lica.

SUMMARY

Treatment plan in contemporary orthodontics cannot be imagine without analyzing soft tissue facial characteristics besides assessment of jaw and dental relationships. ***Aim****. Using a questionnaire, we aimed this study at establishing facial characteristics, in relation to sagittal and vertical facial ratios, which are considered aesthetically acceptable, and which could be altered by the means orthodontic treatment.* ***Material and Method****. The research was conducted in persons from 23 to 30 years of age whose photographs were taken in standard conditions. Photographs of three patients with different facial profiles were chosen (Class I, Class II and Class III). Every photo was modified in six new profiles by changing facial features. This included mesial and distal shift of maxilla and mandible, as well as increase and decrease of lower facial height.* ***Results****. The results showed that straight profile, which is most often present in normal jaw relationships, is considered the most beautiful, furthermore slightly convex profiles are also considered very attractive. Convex profile is connected with distal jaw relationship and its intensity affects facial attractiveness. Concave profile in patients with mesial jaw relationship is aesthetically the least acceptable.*

Key words: soft tissue profile, facial attractiveness.

Rođenjem ortodoncije kao posebne naučne discipline nastala je i potreba za procenom mekotkivnih struktura lica kao sastavnim delom dijagnostičkog postupka. Još su pioniri ove nauke Angle i Case istakli važnost estetike lica kao parametar koji ne bi smeo da bude manje vrednovan pri planiranju terapije.

Savremena ortodontska praksa sve više pažnje posvećuje problematici estetike lica pre i posle terapije. Pored postizanja pravilne okluzije i ispravljanja funkcionalnih poremećaja plan terapije mora voditi računa o eventual-

Together with the birth of orthodontics as a special scientific discipline, a need for soft tissue facial structure evaluation as an integral part of the diagnostic procedure appeared. Back at the beginning of the 20th century, the pioneers of this science, Angle and Case, have stressed the importance of facial aesthetics as a parameter that shouldn't be underestimated during the treatment planning.

Contemporary orthodontic practice pays more and more attention to the problem of facial aesthetics before and after treatment. Besides attaining proper occlusion and correcting functional disorders, treatment plan should

nim estetskim promenama koje se mogu javiti kao rezultat terapije [1]. Narušavanje harmonije lica se može smatrati neuspehom ortodontske terapije bez obzira na rezultate u lečenju okluzalnih i funkcionalnih poremećaja [2]. Poboljšanje arhitektonike lica bi trebao da bude jedan od ciljeva ortodontske terapije, ponekad i u kombinaciji sa hirurškim lečenjem [3].

Iako se ravan profil smatra normalnim postoje i varijacije koje takođe treba smatrati normalnim. U zavisnosti od rasne i entičke pripadnosti karakteristike mekotkivnih struktura lica se moraju drugačije posmatrati. U Evropi je najprisutniji ravan profil dok je izrazitije isturen profil karakteristika crne rase. U poređenju sa belom rasom žuta rasa pokazuje blago konveksniji profil [4,5].

Izgled lica igra važnu ulogu u socijalnom životu pojedinca kako privatnom tako i profesionalnom. Opšte je prihvaćeno mišljenje da su atraktivnije osobe sposobnije, pametnije i da lakše pronalaze partnera. Ovo značajno doprinosi samopouzdanju i samopoštovanju osobe. Kao vrlo čest razlog za obraćanje ortodontu je želja za poboljšanjem estetike lica [6,7,8,9].

Cilj ovog istraživanja je bio da se na osnovu ankete ustanove karakteristike lica, u zavisnosti od sagitalnih i vertikalnih odnosa vilica, koje se smatraju estetski prihvatljivim a na koje se tokom ortodontske terapije može delovati.

Materijal i metod

Uzorak koji je obuhvaćen ovim istraživanjem sačinjava 138 slučajno izabranih osoba, 80 devojaka i 58 mladića, starosti od 23 do 30 godina. Među njima nije bilo osoba sa kraniofacijalnim deformitetima. Svi ispitanici su digitalnom kamerom (Kodak CD120) fotografisani iz tri perspektive: an-face, levi i desni profil. Snimci su izvedeni u rezoluciji 1280x960 piksela. Pri snimanju kamera je od lica standardno bila udaljena 80 cm. Ovo rastojanje je kontrolisano referentnim linijama na podu, iza prve je stajao ispitanik ispred posebno pripremljene pozadine, a druga je služila snimatelju da iznad nje postavi kameru. U cilju izbegavanja grešaka sva snimanja je izvršila ista osoba. Da bi snimanje moglo da se izvede pri prirodnom položaju glave, osoba mora da napravi par koraka u mestu, stane uspravno u opuštenom položaju ramena i uputi pogled u visini svojih očiju, na ovaj način se obezbeđuje standardizacija položaja glave i mogućnost ponavljanja istog položaja pri eventualnim kasnijim snimanjima kod longitudinalnih studija. Usne su bile opuštene, u položaju u kome su i inače tokom dana, naočare su morale biti uklonjene a kosa pomerena iza ušne školjke da bi čitav predeo lica i vrata bio jasno vidljiv [10,11,12]. Odabrani su desni profilni snimci tri ispitanika: po jednog sa

also consider possible aesthetic changes that could appear as a result of therapy.[1] Facial harmony disturbance can be considered to be orthodontic treatment failure, regardless of the results obtained in treating occlusal and functional disorders.[2] Improvement of facial architecture should be one of the goals of orthodontic treatment, sometimes combined with surgical therapy.[3]

Even though straight profile is considered normal, there are variations that should also be considered normal. Depending on racial and ethnic background, soft tissue facial characteristics should be evaluated differently. In Europe, the most common is straight profile, while a more protruded one is a characteristic of the black race. Compared to the Caucasian population, yellow race shows a slightly more convex profile.[4,5]

Facial appearance plays an important role in both private and professional social life of an individual. It's a generally accepted opinion that more attractive people are more confident and smart, and that they find partners more easily. This greatly attributes to self-esteem and self-respect of a person. Desire for the improvement of facial esthetics is a very common motive for seeking orthodontic treatment. [6,7,8,9]

Using a questionnaire, we aimed this study at establishing facial characteristics, in relation to sagittal and vertical facial ratios, which are considered aesthetically acceptable, and which could be altered by the means orthodontic treatment.

Matter and method

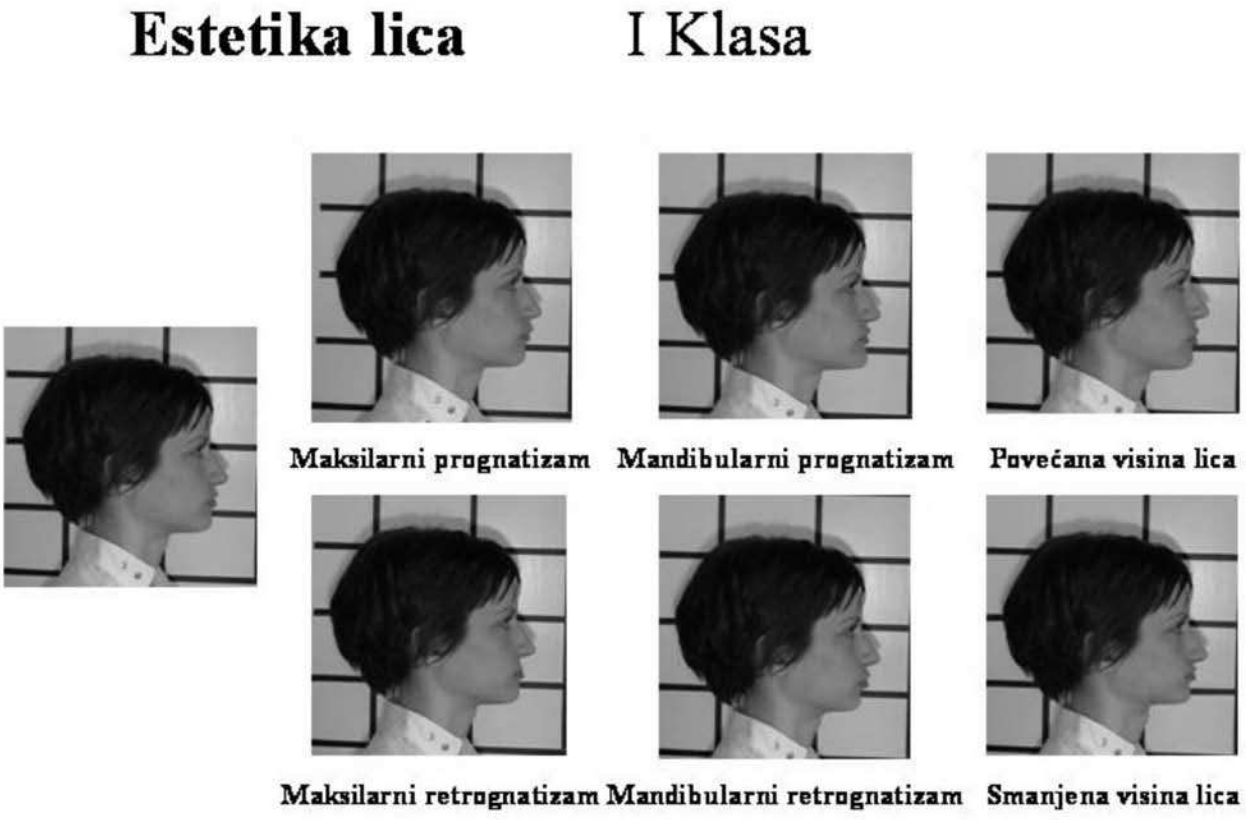
The sample, which is covered in this research, consists of 138 randomly chosen persons, 80 girls and 58 boys, age from 23 to 30 years. There were no persons with cranial facial deformities. All the testeds were photographed with digital camera (Kodak CD120), from three angles: an – face, left and right profile. The shoots were made in resolution of 1280x960 pixels. During the photographing the camera was standard 80cm away from the face. This distance was controlled with the referent lines on the floor, behind one the tested was standing in front of the specially prepared background, and the other was made for the shooter to put the camera above it. In the aim of avoiding the mistakes the same person made all the shootings. To do the shooting in the natural position of the head, the person had to make a couple of steps on the standing location, to stand upright with the shoulders relived and to look in the same heights of the eyes. This was the way to provide standardization of the head position and the possibility to repeat the same position in the eventual repeated shootings at longitudinal studies. The lips were relaxed, in the position that was normal during the day, the glasses were moved away, the hair were moved behind the ear, so that the whole face surface was clearly seen[10,11,12]. There were choosen right profile shootings of the three testeds:

prvom, drugom i trećom okluzalnom klasom. Ovi snimci su kompijuterski obrađeni tako da je svaki od njih modifikovan u novih šest oblika. Modifikacije su podrazumevale mezijalno i distalno pomeranje maksile i mandibule, kao i povećanje i smanjenje visine donje trećine lica. Na ovaj način je za svaku osobu dobijeno po sedam fotografija desnog profila lica: originalni snimak i modifikovani snimci: sa isturenom maksilom, sa maksilom povučenom unazad, sa isturenom mandibulom, sa mandibulom povučenom unazad, sa povećanom vertikalnom dimenzijom donje trećine lica i sa smanjenom vertikalnom dimenzijom donje trećine lica.

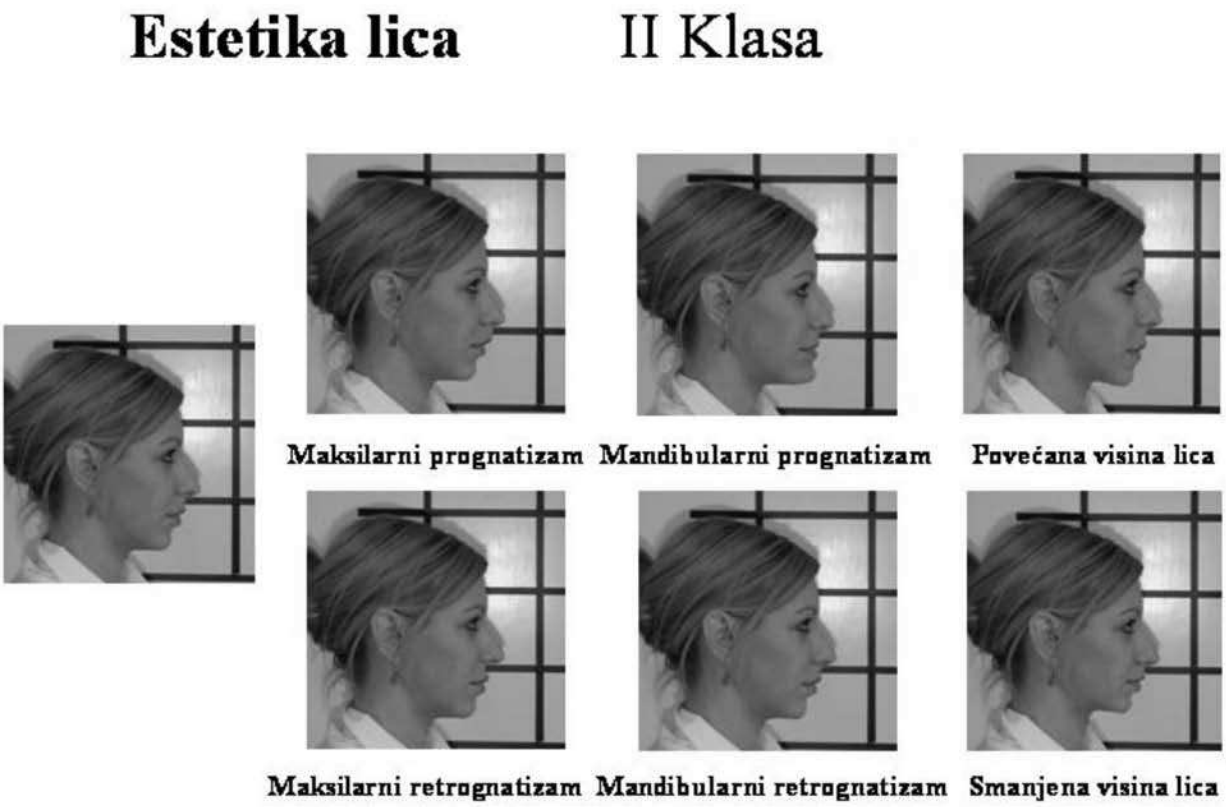
Estetika ovih sedam profila, u tri okluzalne klase, je procenjivana od strane 90 ispitanika. Sve tri grupe profila (I , II i III klasa) su vrednovane ocenama od 1 za estetski najlošiju varijantu, do 7 za estetski najprihvatljiviju.

one of each with the first, second and third occlusal class. Those shootings were computerised so that each of them was modified into the new six shapes. The modification understood mezial and distal movements of maxilla and mandible, the same as the increase and decrease of the lower third of the face. In this way, for each person there were seven photographs of the right face profile: original shooting and modified shooting: with protruded maxilla, with regressive maxilla, with protruded mandible, with regressive mandible, with increased vertical dimension of the lower third of the face and with decreased vertical dimension of the lower third of the face.

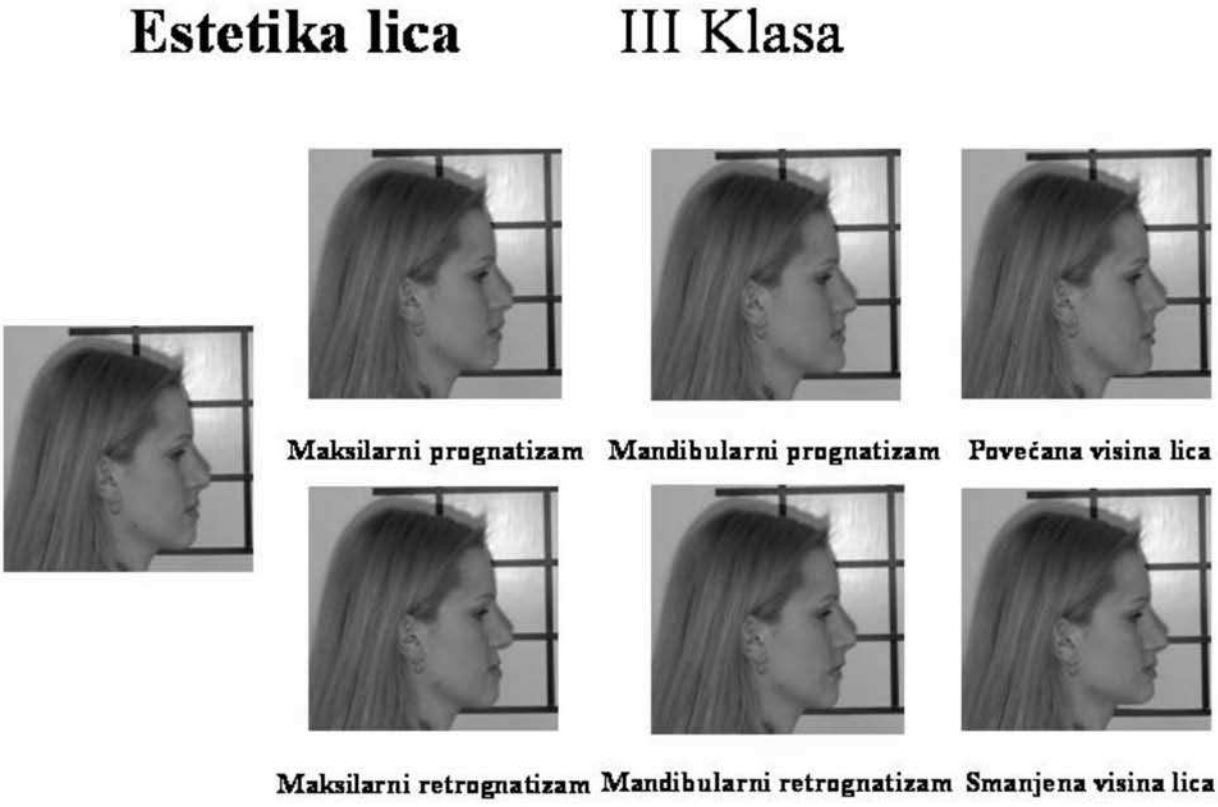
The aesthetics of those seven profiles, in three occlusal classes, was estimated from 90 testeds. All three groups of profiles (I, II and III class) were marked from 1, for the aesthetically worst variant to 7, for the aesthetically the most acceptable variant,



Slika 1.
Figure 1.



Slika 2.
Figure 2.



Slika 3.
Figure 3.

Rezultati

Distribucija ocena estetike lica profila I klase i njegovih modifikacija pokazuje najviše vrednosti za ravne i umereno konveksne profile, a najmanje za konkavne i smanjenu visinu viličnog sprata lica.

Distribucija ocena estetike lica profila II klase i njegovih modifikacija pokazuje najviše vrednosti za blago konveksne i ravne profile, a najmanje za izrazito konveksne i smanjenu visinu viličnog sprata lica.

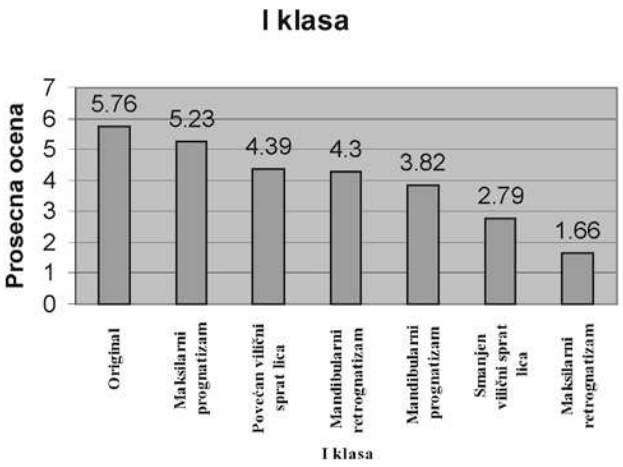
Distribucija ocena estetike lica profila III klase i njegovih modifikacija pokazuje najviše vrednosti za ravne profile i smanjenu visinu viličnog sprata lica, a najmanje za konkavne profile.

Results

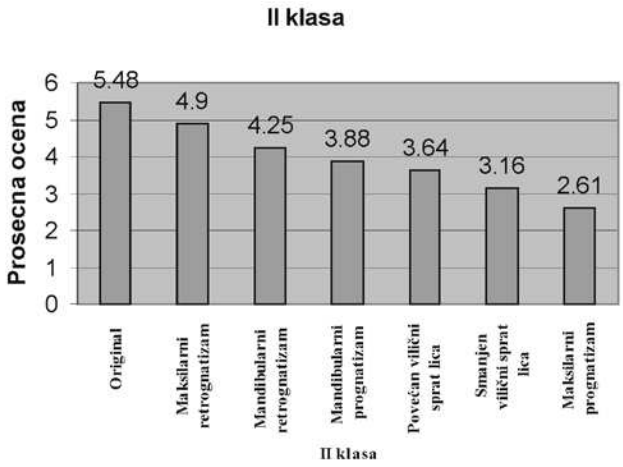
The distribution of the marks for the face aesthetic of the first class profile and its modifications showed the best values for the flat and moderately convex profiles, and the lowest for the concave profiles and decreased jaw floor of the face.

The distribution of the marks for the face esthetic of the second-class profile and its modifications showed the best values for the moderately convex and flat profiles and the lowest for distinctly convex profiles and the decreased jaw floor of the face.

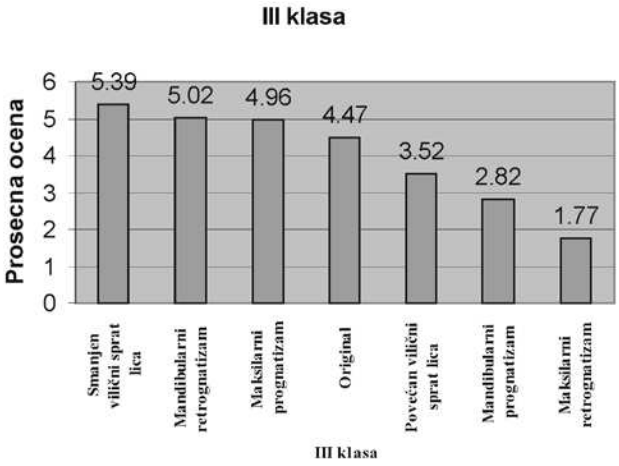
The distribution of the marks for the face aesthetic of the third class profile and its modifications showed the best values for the flat profiles and the decreased jaw floor of the face and the lowest for the concave profiles.



Grafikon 1. Prosečne ocene originalnog profila I okluzalne klase i njegovih modifikacija
Graph 1. Average marks for original Class I profile and its modifications



Grafikon 2. Prosečne ocene originalnog profila II okluzalne klase i njegovih modifikacija
Graph 2. Average marks for original Class II profile and its modifications



Grafikon 3. Prosečne ocene originalnog profila III okluzalne klase i njegovih modifikacija
Graph 3. Average marks for original Class III profile and its modifications

Diskusija

Uticaj koji izgled lica jedne osobe ima na njegovo okruženje se ne sme zanemariti. Dok se osobe sa pravilnim karakteristikama lica smatraju inteligentnijim i omiljene su u društvu, istovremeno se osobama sa nepravilnostima u izgledu lica pripisuju negativne osobine: agresija, neiskrenost, zloba, itd. [6,7]. Potreba za korekcijom izgleda lica, zbog pomenutih razloga, je čest motivacioni faktor za pristupanje ortodontskoj terapiji [8].

Sagitalni i vertikalni odnosi vilica bitno utiču na izgled lica. Ravan profil koji je najčešće prisutan kod eugnatih odnosa vilica se smatra najlepšim, mada se i blago konveksni profili vrlo često smatraju atraktivnim [25]. Konveksni profili se sreću kod distalnih odnosa vilica i u zavisnosti od stepena izraženosti utiču na atraktivnost lica. Mezijalni odnos vilica, kada mandibula prevazilazi u sagitalnom pravcu maksilu, najčešće vodi konkavnom profilu koji je estetski najneprihvatljiviji [13,14].

Očigledno je da na varijabilnost izgleda lica pored različitih oblika nosa najviše utiče najvarijabilnija kost facijalnog skeleta – mandibula [15,16].

Vertikalne proporcije lica, po mišljenju De Smit-a i Dermaut-a [17], imaju veliki uticaj na estetiku lica. Lica sa promenjenom vertikalnom dimenzijom viličnog sprata, na koji se može delovati ekstruzijama ili intruzijama zuba, bilo da je ona smanjena (starački izgled) ili povećana (long face) se smatraju neuglednim.

Tokom ortodontske i ortognatohirurške terapije dolazi i do promena mekotkivnog profila. Ove promene se u zavisnosti od načina planiranja i izvođenja tretmana mogu odraziti pozitivno ili negativno na estetiku lica. Pomeranja skeletnih i dentalnih struktura povlače za sobom i pomeranja mekotkivnih koja ih pokrivaju, ali stepen ovih pomeranja nije isti u gornjoj i donjoj vilici. Meka tkiva koja okružuju mandibulu daleko više prate promene položaja skeletnih struktura u poređenju sa mekim tkivima maksile[18]. Ovo treba imati na umu pri izradi plana terapije. Korekcija položaja vilica dovodi do izmena u izgledu profila, konkavni i konveksni profili se koriguju, približavaju se ravnom, dovođenjem vilica u eugnat odnos. Kod konveksnih profila, kod kojih postoji distalni zagrižaj, najčešće se primenjuje funkcionalna i ekstrakciona terapija, dok je primena hirurškog tretmana dosta ređa [19,20,21]. Kada su u pitanju konkavni profili vrlo često je zbog korekcije estetike lica potrebno preduzeti hiruršku korekciju [1] ili u slučajevima pseudoprogenija terapiju facijalnom maskom [22].

Razvoj tehnike je omogućio korišćenje kompjuterske tehnologije u dijagnostici i planiranju terapije. Omogućena je relativno laka modifikacija fotografija lica radi prezentovanja mogućnosti i dometa ortodontskog i hirurškog tretmana pacijentu i roditeljima [23,24]. Ovaj vid modifikacije

Discussion

The influence, which a person face look has on a person's surrounding, mustn't be neglected. While the persons with the regular face features think to be more intelligent, more sociable favourite, the persons with irregular face features, in the other hand, are meant to be aggressive, dishonest, mean etc.[6,7] The need too correct the face, because of the previously mentioned reasons, is the most often motivation factor for orthodontic therapy.[8]

Sagittal and vertical relations of the jaws essentially influence the face look. The flat profile, which is present at eugnatic jaws relations, is considered to be the prettier, although, the slightly convex profile is often considered to be attractive. The convex profile is met at distal relations of the jaws, and, depending on the level of the expressiveness it influence on the attractiveness of the face. Mesial relation of the jaws, when mandible overcome maxilla in sagittal direction, most often lead to concave profile which is aesthetically the least acceptable. [13,14]

It is obvious that on the variability of the face look influences the most, besides the different shapes of the nose, the most variable bone of the facial skeleton - mandible.[15,16]

The vertical proportion of the face, according to De Smit and Dermaut[17], has the great influence on the aesthetic of the face. The faces with a change in a vertical dimension of the jaw floor, on which it is possible to influence with extrusions or intrusions of teeth, either they are reduced (the aged look) or increased (long face), are considered to be ordinary.

During the orthodontic or ortho-gnato-surgical therapy, there are soft tissue profile changes. Those changes, depending on the way of planning and performing the treatment, can reflect positive or negative on the face aesthetic. The movements of dental and skeletal structure bring with them the movement of the soft tissue structures that cover them, but the level of those movements is not the same in the lower and the upper jaw. The soft tissues of mandible follow the changes of the skeletal structures much more then maxillary soft tissues[18]. This should be considered while making the plan for the therapy. The correction of the jaw location leads to the changes in the profile look; concave and convex profile is corrected, they moved to the flat by leading the jaws into the eugnatic relation. At the convex profiles, where there is distal bite, the most often therapy is functional and extraction therapy, while the surgery is very rare.[19,20,21]. When the concave profile is at stake, it is very often needed, for the correction of the face aesthetic, to do the surgery[1], or in the cases of pseudo progeny to do the facial mask therapy[22].

The development of the technique enables the use of computer technology in diagnostics and therapy planning. Relatively easy photography modification is possible, for the presentation of the possibilities and the reach of the orthodontic and surgical treatment to the patient and its parents.[23,24] This aspect of the profile modification was used during this research to check the influence of the different sagittal and vertical relations of the jaws to the face aes-

profila je korišćen tokom ovog istraživanja da bi se proverio uticaj koji različiti sagitalni i vertikalni odnosi vilica imaju na estetiku lica. Modifikacija profila I , II i III klase je omogućila da se odnosi vilica posmatraju kod osoba sa različitim klasama i time bez dvoumljenja utvrdi koji odnosi se smatraju estetski prihvatljivim a koji ne. Kao što je bilo i očekivano, kada su različiti sagitalni odnosi vilica u pitanju, najpovoljnije su ocenjeni ravni i blago konveksni profili i to kod sve tri klase, a najnepovoljnije konkavni profili. Vertikalni odnosi vilica su takođe ocenjeni prema očekivanjima, najprihvatljivijim se u sve tri klase smatraju proporcionalni odnosi gde je vilični sprat lica usaglašen sa nosnim i čeonim. Kod I i II klase je smanjenje vertikale viličnog sprata vodilo staračkom izgledu koji je vrlo loše ocenjen. Nasuprot tome kod III klase gde postoji prerazvijenost mandibule smanjenje vertikale je uticalo na poboljšanje estetike, dok je njeno povećanje vodilo izduženom licu koje je ocenjeno lošije.

Zaključak

Tokom planiranja ortodontske i ortodontsko hirurške terapije neophodno je analiziraiti i odnose mekotkivnih sa skeletnim i dentoalveolarnim strukturama zbog uticaja koji ova terapija ima na estetiku lica. Pri tome treba imati na umu da su estetski najprihvatljivija lica sa ravnim i blago konveksnim profilom i usaglašenim spratovima lica, a najneprihvatljivija lica sa konkavnim profilom i promenama u vertikalnoj dimenziji viličnog sprata.

thetic. The modifications of the first, second and the third class profile enable the observation of the jaw relations at the persons with the different classes and to determine, with no doubt, which relations are aesthetically acceptable, and which are not. As it was expected, when the different sagittal jaw relations are at stake, the most satisfactory was marked the flat, slightly convex profile, and that happened with all three classes, and the most unsatisfactory was concave profile. The vertical relations of the jaws are also marked as expected; the most satisfactory with all three classes were the proportional relations, where the jaw floor was coordinated with one of the nose and forehead. At the first and second class the decrease of the vertical of the jaw floor lead to the aged looks which was very badly marked. On the contrary, at the third class where over development of the mandible existed, the decrease of vertical influenced on the improvement of the aesthetic, while its increase led to the long face, which was badly marked.

Conclusion

During the planning of the orthodontic and surgical therapy it is necessary to analyse the relations of the soft tissue structures with skeletal and dento alveolar structures because of the influence of this therapy on the face aesthetic. According to that it should be kept on mind the most excepted faces are with flat or mildly convex profiles and coordinated face floors, and the most un excepted faces are with concave profile and the changes in the vertical dimension of the jaw floor.

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