

cess of osseointegration and their possible effect on dental implants, will be explained in detail for the purpose of their possible and more simple application in the daily practice of every clinician engaged in dental implantology. Accordingly, we will present our guidelines for pre and post surgical treatment of implanted, medically compromised patients.

## Dentalna sagitalna klasična tomografija i višeslojni CT u planiranju usadaka

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Uspješna implantacija zahtijeva točnu obavijest o stanju alveolarne kosti i o preciznoj lokaciji mandibularnoga kanala u donjoj čeljusti i sinusa u gornjoj čeljusti. Ozljeda neurovaskularnoga snopa unutar kanala rezultira parestezijama lica, a perforacija maksilarnoga sinusa povećava mogućnost upalnih procesa i uzrok je neuspješnih implantacija. Klinička ocjena kao jedina metoda procjene planiranja usatka nije dovoljna. Kada se planira ugraditi usadak, prijeko je potrebno znati visinu i širinu alveolarnoga grebena kako bi se izabralo odgovarajući usadak. Ortodontomografija prikazuje alveolarnu kost u dvije projekcije i ne daje odgovarajuću obavijest o anteriorno posteriornom promjeru alveolarnoga grebena. Ubrzo je shvaćeno da sagitalni slojevi daju odgovarajuću predoperativnu obavijest o stanju i anatomske pojedinosti alveolarnoga grebena za potrebe planiranja usadaka. U našem izlaganju prikazujemo dva moguća načina prikaza sagitalnih slojeva kroz gornju i donju čeljust upotrebom specijaliziranog ortodontičkoga uređaja uz usporedbu s višeslojnim CT-om. Objema se metodama odgovarajuće prikazuju željene pojedinosti.

## Dental Saggital Classical Tomography and Multi-layer CT in the Planning of Implants

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Successful implantation requires information on the condition of the alveolar bone and precise location of the mandibular canal in the lower jaw and the sinus in the upper jaw. Injury to the neurovascular bundle in the canal results in facial paresthesia, while perforation of the maxillary sinus increases the possibility of inflammatory processes and is the cause of unsuccessful implantation. Clinical evaluation, as the only method of assessment for planning an implant is insufficient. For implant planning knowledge of the height and width of the alveolar ridge is essential for the choice of an adequate implant.

Orthopantomography shows the alveolar bone in two projections and does not provide adequate information on the anterior posterior diameter of the alveolar ridge. It was soon realised that saggital layers give the relevant preoperative information on the condition and anatomic details of the alveolar ridge for implant planning. In our presentation we present two possible ways of showing saggital layers through the upper and lower jaws by the use of a specialised device and comparison with a multi-layer CT. Both methods adequately show the desired details.

## Radiološka i protetička procjena prije implantoprotetičke terapije

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Jedan od osnovnih uvjeta uspješnosti terapije oseointegrirajućim usadcima jest dobro predkirurško planiranje. Svrha je ovoga rada prikazati na slučaju djelomične bezubosti u distalnom dijelu man-

dibule mogućnosti radiološke i protetske ocjene prije kirurškoga tretmana. Na modelu čeljusti učinjeno je dijagnostičko navoštavanje. Nakon toga izrađena je šablona iz vakuum termoplastične folije. Metalne kuglice poznatoga promjera stavljene su u pozicije navoštanih zuba kako bi se radiološkom tehnikom ocijenila mogućnost implantacije u predviđenim pozicijama. Učinjen je klasični ortopantomogram te na temelju njega i slojeviti tomogram s točnim presjecima mandibule na položajima budućih usadaka. Na temelju rendgenskih nalaza određen je položaj i duljina usadaka. Prikazan je klasičan dvofazni kirurški protokol te operacijska tehnika s intraoralnim preprotetskim šablonama. Uporabljene su usadci Astratech microthread koničnoga profila kako bi se promjerom usatka što više približili promjeru budućega zuba. Dužina usatka određena je u skladu s navedenom radiološkom raščlambom tako da je usadak na poziciji 35 kraći od usadaka 34 i 37 zbog anatomske pozicije foramena mentale. Pri kirurškome pozicioniranju usatka osim pozicije koja je određena šablonom usadci su u okomitome smjeru pozicionirani u skladu s biološkom širinom sluznice i u konačnici parodontološko estetskim zahtjevima. Rezultati prikazuju uspješnost terapije nakon dobra planiranja i pripreme. Prikazana je prednost slojevite tomografije u planiranju i određivanju anatomske-morfoloških karakteristika donje čeljusti koja nam daje sigurnost u izboru dužine, a osobito širine usatka. Predkirurško planiranje je postupak kojime možemo predvidjeti položaj usatka i estetiku budućega protetskog rada te tako olakšati kirurški zahvat.

## Radiographic and Prosthetic Assessment Prior to Implantoprosthesis Therapy

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One of the fundamental pre-conditions for successful therapy by osseointegrating implants is good pre-surgical planning. The aim of this work

is to present the possibilities of radiographic and prosthetic evaluation prior to surgical treatment in the case of partial edentulousness in the distal part of the mandibula. Diagnostic wax-up is done on a model of the jaw. After which a pattern is made of vacuum thermoplastic foil. Metal pellets of known diameter are placed in the positions of the waxed-up teeth to enable radiographic evaluation of the possibility of implantation in the planned positions. Classical orthopantomography is performed on the basis of which a multi-layer tomogram is done with exact cross-sections of the mandibula in the positions of future implants. On the basis of radiographic findings the position and length of the implants are determined. The classical two-phase surgical protocol is described and surgical technique with intraoral preprosthetic patterns. Astratech microthread implants of conical profile are used to ensure that the implant diameter is as close as possible to the diameter of the future tooth. The length of an implant is determined in accordance with the cited radiographic analysis, so that the implant in position 35 is shorter in relation to implants 34 and 37, due to the anatomic position of the foramen mentale.

During surgical positioning of implants, apart from the position which is defined by the pattern, in the vertical direction the implants are positioned in accordance with the biological width of the mucous membrane and finally with periodontal aesthetic requirements. The results show the success of the therapy following good planning and preparation. The advantage is shown of multi-layer tomography in planning and determining the anatomical-morphological characteristics of the lower jaw, which provides assurance in the choice of length and particularly the width of the implant. Pre-surgical planning is a procedure by which it is possible to foresee the position of an implant and aesthetics of future prosthetic work, and thus to facilitate the surgical intervention.