Universitatea de Medicină și Farmacie Carol Davila
Facultatea de Medicină Dentară

Implantul din titan versus

Implantul din zirconiu

Teză de Doctorat

Doctorand:
Miu (Căs. David) Sabina Ileana

Conducător științific:
Prof. Univ. Dr. Ioan Sîrbu

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Elemente de originalitate și perspective pe care le deschide teza
Concluzii generale

Capitolul 1 cuprinde analiza stadiului actual al cunoasterii in domeniu si sunt prezentate aspecte din literatura de specialitate avand relevață ridicată pentru subiectul tezei cuprinzand urmatoarele capitole: Noţiuni de anatomie a oaselor maxilare cu implicații în implantologie; Etiologia, complicaţiile şi clasificările breşelor edentate; Metode clasice și moderne de reabilitare a edentațiilor si Biomateriale utilizate pentru confecționarea implanturilor dentare.

Sunt prezentate sintetic probleme anatomice, legate de osul maxilar si mandibular, inervația si vascularizația acestora, raporturile anatomice cu variantele lor, prezentate in literature de specialitate, aspecte importante pentru implantologia dentara.

In capitolul 2 al partii generale doctoranda prezinta aspecte legate de etiologia, complicaţiile şi clasificările breşelor edentate, cu referire la factorii favorizanti si determinanti ai pierderii dintilor, dar si cu corelatiile cu conditiile de implantare, dar si de protezare a zonelor edentate.

In capitolul 3 sunt amintite metodele de protezare conventionale fixe si mobile, dar si o prezentare mai ampla a metodelor moderne de reabilitare a edentațiilor, cu sprijin implantar.
Planul de reabilitare orală complexă cu alegerea tipului de restaurare protetică indicată pentru cazul clinic specific. In funcție de tipul de restaurare aleasă, medicul va aprecia dacă există sprijin dentar suficent sau dacă este necesară inserarea unui număr de implanturi dentare cu sau fără proceduri de augmentare a osului disponibil

Ultimul capitol al partii generale este dedicat biomaterialelor utilizate pentru confecționarea implanturilor dentare, cu descrierea proprietatilor acestora, care le indica in utilizarea lor pentru tratamente dentare, cu identificarea unor direcții și preocupări importante, prezente in literatura de specialitate.

Capitolul 5 cuprinde STUDIUL PRIVIND PREVALENȚA EDENTAȚIEI ȘI POSIBILITĂȚI TERAPEUTICE CLASICE ȘI MODERNE DE REABILITARE ORALĂ COMPLEXA, scopul studiului fiind acela de a determina prevalența edentației și frecvența utilizării modalităților de protezare clasice sau moderne în funcție de vârsta, sexul pacienților, nivelul de instruire și nivelul economic al acestora.

Studiul retrospectiv realizat pe 173 pacienți a aratat ca indiferent de grupa de vârstă și de sex, pacienții au preferat tratamentele modern, prin utilizarea implanturilor dentare.

Capitolul 6, intitulat STUDII PRIN METODA ELEMENTELOR FINITE ASUPRA TRANSMITERII FORȚELOR MASTICATORII CĂTRE SUBSTRATUL OSOS PRIN INTERMEDIUL IMPLANTURILOR DIN TITAN

VERSUS ZIRCONIA, a avut drept scop analiza comparativa prin metoda elementelor finite a modului de transmitere a forțelor masticatorii către substratul osos prin intermediul implanturilor din titan și zirconie. Datele obtinute au aratat ca implantul de zirconie prezintă un modul de elasticitate sensibil mai mare decat cel din titan, ceea ce face sa atenueaze semnificativ transferul de tensiuni între implant și os, anulând posibilitatea concentrării efortului masticator la interfața os-implant, cu menținerea osteointegrării.

Capitolul 7, cu titlul STUDIEREA REZISTENȚEI LA COROZIUNE A UNUI IMPLANT DENTAR DIN ALIAJ DE TITAN, a pornit de la analiza coroziunii electro-chimice produsă la interfața metal-soluție, atunci când metalele vin în contact cu soluții de electroliți, respectiv a efectului protectiv prin prezența stratului de oxid pasiv pe suprafața metalică.

Studiul a urmarit determinarea rezistenței la coroziune prin tehnica polarizării liniare, a unui implant dentar din aliaj de titan, urmarind variațiile potențialului de circuit deschis (Eoc) și curbele Tafel corespunzătoare implantului testat în salivă artificială. Toți parametrii analizați în urma efectuării testelor de coroziune a implantului dentar din aliaj de titan la pH 5.2 și temperatură de 37±0.5°C confirmă buna rezistență la coroziune a probei din aliaj de titan, prin formarea stratului de oxid de titan cu rol protector la suprafață.

Capitolul 8 EVALUAREA DEGRADĂRII ZIRCONIEI ÎN SALIVĂ ARTIFICIALĂ, analizeaza fenomenul de imbatranire al materialului, asociat cu o scădere importantă a rezistenței acestuia. In acest scop au fost utilizate testele de imersare a zirconiei în condiții care să simuleze mediul în care probele își exercită scopul și funcția pentru care au fost concepute, respectiv evaluarea degradării zirconiei în salivă artificială. S-a urmarit morfologia suprafeței și compoziția elementala cu ajutorul unui microscop electronic de baleiaj – SEM dotat cu un spectrometru cu dispersie după energie – EDS. Rezultatele expuse in imagini si tabele arata compoziția elementală a materialului si morfologia suprafetei probei imersate in saliva artificiala, care au demonstrat că materialul studiat nu a suferit procese de degradare în timp.

In capitolul 9, intitulat PROTEZAREA EDENTAȚIILOR FOLOSIND IMPLANTURI DIN TITAN SAU DIN ZIRCONIE în funcție de pH-ul salivar al pacienților și densitatea osoasă, doctoranda a studiat selectarea biomaterialelor din care sunt realizate implanturile și din care sunt confecționate restaurările protetice în funcție de pH-ul salivar al pacienților și densitatea osoasă, pentru a reduce la minim incidența coroziunii şi a biodegradării materialelor dentare în mediul oral. Deoarece procesele de coroziune şi biodegradare a materialelor dentare sunt accelerate de un pH acid, doctoranda propune utilizarea implanturilor din zirconie şi a restaurărilor protetice integral ceramice sau din ceramică pe schelet de zirconie la pacienţii cu pH salivar mai scăzut, iar pentru pacienţii cu densitate osoasă scăzută utilizarea implanturilor din zirconie.

Capitolul ELEMENTE DE ORIGINALITATE ȘI PERSPECTIVE pe care le deschide aceasta teza de doctorat, subliniaza inca odata principalele contributii si directii de cercetare urmate, precum si limitele si posibilitatile de completare a informatiilor prin noi cercetari ce ar putea fi realizate. Lucrarea se incheie astfel prin propunerea unor viitoare directii si teme de cercetare ce pot decurge in continuarea studiilor initiate in cadrul tezei, oferind posibilitati pentru cercetari ulterioare. Conturarea concluziilor generale, desprinse din cercetarea proprie, contureaza cadrul celor mai bune conditii pentru un tratament protetic pe implanturi in raport cu caracteristicile generale si orale ale pacientului, starea de edentatie, particularitatile materiale ale implanturilor dar si a conditiilor structurilor orale, ca densitate osoasa si caracteristici ale salivei.

Ultima parte a tezei este reprezentata de “BIBLIOGRAFIE”, aceasta fiind foarte variata, atat din domeniul medicinei dentare, cat si din domenii conexe. De asemenea, au fost anexate documentele doveditoare publicării elementelor costitutive ale tezei în reviste de specialitate, cu cotatia CNCSIS corespunzatoare.

Concluzii generale

1) În urma investigării prevalenței edentației la un lot de pacienți și a posibilităților terapeutice clasice sau moderne de reabilitare orală am ajuns la următoarele concluzii:

- lotul studiat a cuprins majoritar pacienți:

a) de sex feminin

b) cu vârste cuprinse între 41-50 ani

c) din mediul urban

d) cu studii superioare

e) cu un nivel economic bun

f) cu 1-2 dinți absenți

g) cu edentații maxilare.

- tratamentele stomatologice moderne au fost preferate în detrimentul celor clasice indiferent de:

a) grupa de vârstă a pacienților

b) sexul pacienților

c) nivelul de instruire al pacienților.

2) Analizând cu ajutorul metodei elementelor finite modul de transmitere a forțelor masticatorii către substratul osos prin intermediul implanturilor din titan versus zirconie putem concluziona că la aplicarea experimentală a unei forțe de 200 N implantul din zirconie a avut un comportament biomecanic mai bun decât implantul din aliaj de titan.

3) Studiul rezistenței la coroziune a implantului din aliaj de titan la pH=5.2 și temperatură de 37±0.5°C la s-a soldat cu concluzia că respectivul aliaj din titan, prin formarea stratului de oxid de titan la exterior, prezintă o bună rezistență la coroziune.

4) Prin imersarea discurilor de zirconie în salivă artificială, materialul respectiv nu a suferit nicio degradare indiferent de perioada imersării (o zi, 3 zile, 7 zile, 14 zile sau 21 zile).

5) Apreciem că prin selectarea materialelor din care să fie confecționate implanturile și restaurările protetice, în funcție de pH-ului salivar și densitatea osoasă a pacienților, se poate îmbunătăți supraviețuirea pe termen lung a reabilitărilor efectuate și se poate reduce la minim posibilitatea de degradare a materialelor dentare în mediul oral.

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