

REZUMATUL TEZEI DE DOCTORAT CU TITLUL

INDICI DE EVALUARE ORTODONTICĂ ÎN DIAGNOSTICUL ȘI TRATAMENTUL ANOMALIILOR DENTO-MAXILARE

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CUVINTE CHEIE: indice ortodontic, anomalie dento-maxilară, evaluare calitativă, evaluare cantitativă, cuantificarea necesității de tratament, cuantificarea rezultatului terapeutic

INTRODUCERE

Limitele metodelor calitative, descriptive de evaluare a anomaliilor dento-maxilare au impus necesitatea identificării unor metode de apreciere cantitative, obiective. Scopul l-a constituit îmbunătățirea criteriilor de diagnostic și conceperea unei abordări comune în evaluarea necesarului de tratament și a rezultatului tratamentului.

Literatura de specialitate semnalează preocupări în sensul conceperii unor instrumente obiective în două direcții, cea a evaluării necesarului de tratament ortodontic și cea a cuantificării rezultatelor obținute, ducând la apariția indicilor ortodontici, începând cu anii 1950 și continuând în prezent (Shaw W. C., Richmond S., Parker W. S., Thomas J. Cangialosi).

Cuantificarea necesarului de tratament prin indici de necesitate a tratamentului ortodontic (ex. IOTN) vine în întâmpinarea nevoii de ierarhizare a pacienților ortodontici în serviciile finanțate de casele de asigurări, având ca scop principal repartitia cât mai echitabilă a unor resurse financiare, materiale și umane limitate, acelor cazuri care ar beneficia cel mai mult de pe urma unui astfel de tratament. O analiză obiectivă completă trebuie să cuprindă o cuantificare a repercursiunilor unei anomalii dento-maxilare atât în ceea ce privește estetica facială, cât și a longevității dentației.

Cea de-a doua direcție de cercetare se referă la încercările de a concepe mijloace obiective de cuantificare a rezultatului terapeutic ortodontic. Dacă inițial părea suficientă o evaluare a situației de final de tratament strict din punctul de vedere al aspectului ocluzal (ex. indicele PAR), ulterior studiile au arătat preocuparea spre metode mai complexe de analiză a acesteia. Astfel anumiți indici au inclus pe lângă criteriile ocluzale o analiză a aspectului estetic facial (ex. ICON), sau elemente ale examenului ortopantomografic (ex. ABO-OGS).

Dificultățile de concepere a unei metode comprehensive de evaluare rezidă din multitudinea de elemente care ar trebui luate în considerare atunci când se evaluează rezultatul terapeutic și dificultatea cuantificării. O încercare în acest sens este indicele CCA al ABO care asociază criteriilor menționate mai sus și o evaluare a modului în care s-a realizat controlul vertical pe parcursul tratamentului, a cooperării pacientului, a aspectului suprafețelor dentare, a rezorbțiilor radiculare, a duratei tratamentului, etc.

În lucrarea de față ne-am propus, pe de o parte, studiul concordanței dintre metodele diagnostice utilizate în practica ortodontică curentă și indicii de necesitate a tratamentului ortodontic, și pe de altă parte evaluarea rezultatelor terapeutice prin indici concepuți în acest scop.

PARTEA GENERALĂ

CAPITOLUL 1: DIAGNOSTICUL ANOMALIILOR DENTO-MAXILARE ȘI INDICII DE EVALUARE A NECESARULUI DE TRATAMENT ORTODONTIC

Metodele de înregistrare și evaluare a unei malocluzii pot fi divizate, în linii mari, în două categorii: calitative și cantitative. Numărul mare de clasificări și indici care au fost concepuți este o dovadă a problemelor inerente ambelor abordări.

EVALUAREA CALITATIVĂ

Evaluarea ortodontică reprezintă bilanțul investigației clinice și complementare. Ea cuprinde înregistrarea, aprecierea și cuantificarea caracteristicilor faciale, ocluzale și funcționale ale unei anomalii.

Evaluarea calitativă este descriptivă și include clasificarea diagnostică a malocluziilor. De-a lungul timpului au fost propuse în literatură diverse variante de clasificare a anomaliilor dento-maxilare: metoda lui Angle de clasificare a malocluziilor, metoda de bază WHO/FDI de înregistrare a malocluziei, Clasificarea British Standards Institute, Clasificarea OMS (1997)

EVALUAREA CANTITATIVĂ ȘI INDICII ORTODONTICI

Încercările de a dezvolta metode cantitative de evaluare a malocluziilor s-au concretizat mai târziu decât cele calitative, având în vedere că metodele diagnostice tradiționale furnizau doar o evaluare calitativă descriptivă, nefiind adecvate cuantificării. Astfel s-au dezvoltat indicii ocluzali, sisteme de evaluare sau categorizare, care rezumă un set de date despre malocluzie și îi atribuie un scor numeric sau o etichetă alfanumerică. Scopul este acela de a cuantifica într-un mod cât mai obiectiv nivelul de severitate de la care o anomalie impune intervenția prin tratament ortodontic, astfel permițând determinarea accesului la serviciile ortodontice finanțate public (prin cuantificarea nevoii individuale de tratament ortodontic), a nivelului de coplată, precum și a alocării resurselor.

Dintre indicii dezvoltați recent enumerăm :Indicele de necesitate a tratamentului ortodontic IOTN, Indicele ICON (indicele de complexitate, rezultat și necesitate ortodontică), Indicele rezultatului tratamentului ortodontic PAR, Metoda de evaluare a ABO în ceea ce privește complexitatea tratamentului și a gradului de excelență în terminarea cazului (ABO-OGS, CCA, DI)

Acești indici au fost cei aplicați în studiul nostru și metodologia lor de aplicare este detaliată în capitolul corespunzător.

CAPITOLUL 2: OBIECTIVE FINALE ALE TRATAMENTULUI ORTODONTIC

Acest capitol descrie succint obiectivele de natură ocluzală statică (după Angle, Andrews, ABO-American Board of Orthodontics) și dinamică, continuând cu cele de natură funcțională și estetică pe care trebuie să le atingă orice tratament ortodontic. Se observă, o modificare a obiectivelor de tratament ortodontic, marcând o schimbare de paradigmă, accentul nemaipunându-se pe rapoartele scheletice și dentare, ci pe o mai mare considerare a părților moi faciale și orale. În prezent, părțile moi sunt apreciate atât ca un important element limitativ al tratamentului ortodontic, dar și un important factor de confirmare sau infirmare a succesului tratamentului. Astfel se constată o evoluție de la paradigma lui Angle, care a dominat ortodonția secolului 20 la cea a părților moi care o înlocuiește.

CAPITOLUL 3: INDICII DE EVALUARE A REZULTATULUI TERAPEUTIC ORTODONTIC

O evaluare a rezultatelor tratamentului ortodontic contribuie la identificarea obiectivelor, la stabilirea standardelor și la obținerea unui final măsurabil pentru pacienții finalizați. Mai mult, poate să îndeplinească și un scop educațional în cadrul programelor ortodontice postuniversitare și în practica curentă. Acest lucru a condus la dezvoltarea indicilor de cuantificare a rezultatului terapeutic descriși în acest capitol.

Indicii de complexitate a tratamentului contribuie la înțelegerea complexității cazului evaluând prezența, numărul și gravitatea aspectelor care contribuie la apariția malocluziei.

II. CERCETĂRI PERSONALE

CAPITOLUL 4: EVALUAREA NECESITĂȚII DE TRATAMENT A ANOMALIILOR DENTO-MAXILARE PRIN INDICI ORTODONTICI, LA UN LOT DE 111 PACIENȚI DIN EVIDENȚA CLINICII DE ORTODONȚIE CLUJ-NAPOCA

OBIECTIVE: Anomaliile dento-maxilare, prin tulburările fizionomice și funcționale pe care le produc, prin afectarea sănătății oro-dentare, au multiple implicații psiho-sociale. Frecvența lor ridicată (se estimează că ocluzia ideală se regăsește doar la 1-2% din populație), precum și costurile mari ale tratamentelor ortodontice, impun o selectare riguroasă a cazurilor care pot beneficia de anumite compensații financiare din partea caselor de asigurări.

Ne-am propus să evaluăm beneficiul adus de utilizarea indicilor ortodontici, cu referire la Indicele de necesitate a tratamentului ortodontic, stabilind măsura în care pacienți tratați în Clinica de Ortodonție Cluj- Napoca în perioada 2004- 2006, corespund acestei cuantificări.

De asemenea, am urmărit dacă există sau nu o corelație direct proporțională a celor două componente ale indicelui și anume: Componenta estetică-AC

(Aesthetic Component) și cea de Sănătate Dentară- DHC (Dental Health Component), în ceea ce privește necesitatea de tratament.

MATERIAL ȘI METODĂ: Eșantionul a cuprins 111 pacienți, cu vârste între 5 și 24 ani, media de vârstă fiind de 10,8ani (SD \pm 3,32), prezentând o gamă largă a patologiei ortodontice. În funcție de vârstă am stabilit patru grupe: 5-8 ani, 9-12 ani, 13-17 ani and 18-24 ani.

Metoda de evaluare a fost IOTN (Index of Orthodontic Treatment Need), iar pentru interpretarea datelor culese, am folosit metodele de statistică descriptivă (programul de prelucrare SPSS for Windows) care oferă informații legate de ponderea, distribuția, frecvența și valorile medii ale parametrilor urmăriți.

REZULTATE ȘI DISCUȚII: Studiind necesitatea de tratament globală la nivelul lotului observăm că predomină o necesitate de tratament moderată din punct de vedere estetic (36,04%), urmată de o necesitate ușoară (27,03%), pentru ca o necesitate evidentă de tratament să se regăsească doar în (22,52%) .

Studiul necesității de tratament globale din punct de vedere al sănătății dentare, evidențiază că la lotul luat în studiu predomină subiecții cu necesitate mare (54,05%) și foarte mare (24,32%) din punct de vedere al sănătății dentare.

Remarcăm o lipsă de concordanță între cele două componente AC și DHC ale IOTN în ceea ce privește necesitatea de tratament pentru ultimele trei grupe de vârstă (necesitate ușoară de tratament din punct de vedere estetic se asociază cu o necesitate mare de tratament din punct de vedere al sănătății dentare). Aceasta poate fi justificată prin gradul de subiectivitate pe care îl presupune determinarea componentei estetice, precum și de imposibilitatea surprinderii anumitor caracteristici ale malocluziei, cu potențiale implicații estetice, exclusiv prin examinarea ocluziei din normă frontală. Lipsa deficitului estetic nu semnifică întotdeauna absența necesității de tratament, iar examenul clinic este esențial pentru depistarea acelor aspecte ale sănătății dentare care impun tratamentul. În ceea ce privește stabilirea diagnosticului și a indicației de tratament evaluarea cu IOTN furnizează date similare cu metodele

convenționale, însă devine indispensabilă pentru ierarhizarea și stabilirea priorității de tratament în cadrul unei populații.

CAPITOLUL 5 : EVALUAREA REZULTATELOR TERAPEUTICE CU AJUTORUL INDICELUI PAR LA PACIENȚI TRATAȚI ÎN CLINICA DE ORTODONȚIE CLUJ-NAPOCA

SCOPUL STUDIULUI: a fost acela de a evalua impactul utilizării unei metode de cuantificare a rezultatelor tratamentului ortodontic (indicele PAR) în practica ortodontică curentă și valoarea variației punctajelor PAR ca rezultat al intervenției terapeutice. am urmărit de asemenea dacă există o corelație între necesitatea de tratament inițială a malocluziei (exprimată prin componenta DHC a IOTN) și variația postterapeutică a punctajelor PAR.

MATERIAL ȘI METODĂ: Lotul studiat a cuprins 19 subiecți tratați în Clinica de Ortodonție Cluj-Napoca, cu vârsta cuprinsă între 5,5 ani și 13 ani (media vârstei lotului 8,8 ani). Toți subiecții prezentau documentația standardizată completă, inclusiv un set de două modele, unul inițial (t1) și cel de-al doilea la finalul tratamentului (t2) care au fost măsurate cu ajutorul indicelui PAR după metodologia propusă de Victoria University of Manchester (1992).

Subiecții au fost clasificați în funcție de clasa Angle și necesitatea de tratament, utilizând componenta de sănătate dentară (DHC) a Indicelui de Necesitate a Tratamentului Ortodontic (IOTN).

REZULTATE ȘI DISCUȚII: În cazul subgrupurilor anomaliilor de clasa I și a celor cu necesitate ușoară și moderată de tratament inițială reducerea medie a indexului PAR a fost mai mare decât media eșantionului. La lotul studiat overjet-ul, respectiv ocluzia inversă reprezintă caracteristicile ocluzale cel mai frecvent implicate în ameliorarea malocluziilor.

Pe baza clasificării lui Richmond și colab. subiecții la care s-a observat o **îmbunătățire semnificativă** (reducerea punctajului PAR între examinarea inițială și cea finală cu mai mult de 22 puncte) au fost în număr de 4 cazuri

(21,05%). La un număr de 15 subiecți (78,94%) s-a obținut **îmbunătățire**. Nu s-a înregistrat nici un subiect **fără îmbunătățire/ agravare**.

CAPITOLUL 6: STUDIU COMPARATIV A CINCI METODE DE EVALUARE A REZULTATULUI ȘI COMPLEXITĂȚII TERAPIEI ORTODONTICE LA PACIENȚI TRATAȚI ÎN CADRUL DEPARTAMENTULUI DE ORTODONȚIE AL CHU BORDEAUX

SCOPUL STUDIULUI

A fost acela de a evalua cantitativ rezultatele tratamentului ortodontic la un lot de pacienți tratați în serviciul Clinicii de Ortodonție al Universității „Victor Segalen” Bordeaux 2. Pentru aceasta am făcut un studiu comparativ a patru indici ai rezultatului tratamentului.

De asemenea am comparat 2 metode de evaluare a complexității inițiale a anomaliilor pentru a vedea dacă, includerea datelor cefalometrice furnizează o imagine mai exactă asupra dificultății tratamentului decât elementele strict ocluzale. Ne-a interesat, de asemenea și potențiala corelație dintre complexitatea inițială a cazului și rezultatele terapeutice obținute.

MATERIAL ȘI METODĂ

Eșantionul a cuprins 52 de pacienți tratați (cu vârste între 8-42 ani, cu o medie de 15 ani). Criteriile principale de includere în lot au fost următoarele: tratamentul ortodontic să fie finalizat și documentația de început și de final (fotografii, ortopantomografii, teleradiografii și modele de studiu) să fie completă.

Am folosit pentru evaluarea documentației pacienților instrumente cu o complexitate progresivă din punct de vedere al parametrilor studiați, și anume următorii indici ai rezultatului tratamentului: PAR (acesta limitându-se la aspectul ocluzal), ICON (care cuprinde și o analiză suplimentară a parametrului estetic), ABO-OGS (ocluzal și radiologic) completat de o analiză clinică comprehensivă realizată prin CCA.

Pentru ierarhizarea subiecților din punct de vedere a complexității anomaliilor am utilizat indicele atât indicele ICON cât și DI (Discrepancy Index) propus de ABO.

REZULTATE ȘI DISCUȚII: Pe baza rezultatelor cantitative obținute, reprezentate de punctajele acordate prin aplicarea metodologiei precise concepute pentru fiecare indice în parte, s-a efectuat un studiu retrospectiv descriptiv și analitic cu ajutorul aplicațiilor Excell (Microsoft Office), Statistica sub Windows și Spss. Prin compararea mediilor punctajelor totale finale ale PAR, ICON și ABO-OGS am obținut o diferență cu semnificație statistică ($p < 0,05$). Astfel, metoda ABO-OGS furnizează practicianului cea mai precisă cuantificare a calității terapiei pe care a condus-o la un anumit pacient.

Aplicând testul t pentru variabile independente, am găsit diferențe cu semnificație statistică foarte bună ($p < 0,001$) între mediile punctajelor totale preterapeutice ale ICON și DI. Considerăm că factorul responsabil de aceste rezultate este includerea unui element suplimentar în evaluarea inițială a cazului de către indicele DI, și anume valorile cefalometrice.

Apreciem că DI realizează o cuantificare preterapeutică mult mai exactă a anomaliilor inițiale.

CAPITOLUL 7: BENEFICII ȘI INCONVENENTE ALE UTILIZĂRII INDICILOR ÎN PRACTICA CURENTĂ - CAZURI CLINICE

CONCLUZII GENERALE

1. Evaluarea calitativă este descriptivă și principalul dezavantaj al acestor metode este acela că, malocluzia este o variabilă continuă, astfel încât nu există întotdeauna puncte limită (cutt-off) bine definite între diferitele categorii și nu furnizează nici o informație asupra dificultății tratamentului
2. În literatura de specialitate s-a descris o varietate de indici de evaluare ortodontică denumiți indici profesionali sau indici ocluzali, cu scopul de a cuantifica într-un mod cât mai obiectiv nivelul de severitate de la care o anomalie impune intervenția prin tratament ortodontic.

3. În condițiile unor resurse publice limitate, un indice de necesitate a tratamentului, poate fi utilizat pentru a direcționa resursele pentru cazurile care cel mai probabil vor obține beneficii de pe urma tratamentului.
4. Aplicarea indicelui IOTN la lotul de 111 cazuri a dovedit că procentul cel mai mare de subiecți (24,32%) s-au încadrat în grupa cu o necesitate moderată (la limită) din punct de vedere estetic, dar asociată cu o necesitate mare din punct de vedere al sănătății dentare.
5. Acest tip de asociere a celor două componente s-a regăsit într-un procent de 16,22% la grupa de vârstă 9-12 ani.
6. Necesitatea mică din punct de vedere al sănătății dentare s-a asociat cu o necesitate scăzută sau nici o necesitate estetică.
7. Componenta AC nu surprinde întotdeauna necesarul real de tratament impus de anomalia dento-maxilară, aspectul estetic neputând să constituie singurul criteriu în stabilirea indicației pentru tratament ortodontic.
8. Apreciem pe baza rezultatelor obținute că IOTN constituie o metodă obiectivă, validă și sigură în cuantificare și ierarhizarea necesarului real de tratament în cadrul unei populații, putând fi un instrument util pentru Casa Națională de Asigurări de Sănătate pentru selecția pacienților care vor beneficia cel mai mult de pe urma tratamentului ortodontic și acordarea în consecință a fondurilor pentru asistența ortodontică.
9. Un dezavantaj major al indicilor de necesitate a tratamentului este riscul de insensibilitate și apreciere greșită a nevoilor individuale.
10. Variația punctajelor PAR datorată tratamentului este mai mare în cazul eșantionului din Bordeaux comparativ cu cea găsită în urma aplicării PAR la lotul de pacienți tratați în clinica de Ortodonție din Cluj-Napoca.
11. Apreciem că DI realizează o cuantificare preterapeutică mult mai exactă a anomaliilor la momentul preterapeutic decât ICON.
12. Pe baza corelațiilor efectuate între valorile obținute pentru PAR, ICON, ABO-OGS, apreciem că indicele OGS asigură cea mai fidelă evaluare a finalului terapeutic din punct de vedere al aspectelor ocluzale ale unei malocluzii,

dezavantajul său este că nu permite estimarea elementelor funcționale, de estetică facială, controlul sensului vertical, eventuale consecințe parodontale sau asupra structurii dentare și radiculare consecutive tratamentului ortodontic.

13. Completarea evaluării ocluzale și ortopantomografice realizate prin ABO-OGS, cu cea CCA rezolvă aceste inconveniente și constituie metoda ideală de cuantificare a rezultatului obținut prin terapia ortodontică.
14. Concepută inițial ca metoda obiectivă de evaluare în cadrul programelor postuniversitare, această metodă își poate găsi o deosebită utilitate în practica curentă a oricărui specialist ortodont care dorește să afle dacă rezultatele sale terapeutice corespund calității impuse de ABO.
15. Se speră că utilizarea acestei metode de auto-evaluare de către specialiștii ortodonți va contribui la ridicarea calității asistenței ortodontice în viitor.

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- 22.12.2007 am urmat un stagiul de studii postuniversitare la Universitatea „Victor Segalen” Bordeaux 2, Franța (conform OMEC nr. 2128/19.09.2007), urmat de o bursă de studii Erasmus până la data de 05.06.2008, sub conducerea D-nei Prof. Marie-Jose BOILEAU, Șeful Catedrei de Ortodonție și Ortopedie Dento-Facială. Titlul proiectului de cercetare fiind: „Evaluarea necesității de tratament ortodontic a anomaliilor dento-maxilare și monitorizarea rezultatelor terapeutice cu ajutorul indicilor profesionali”.
- Trei lucrări comunicate ca prim autor.
 - Pe parcursul anului 2006 am susținut trei referate în cadrul stagiului de doctorat cu titlurile:
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 2. Evaluarea necesității de tratament a anomaliilor prin indici ortodontici;
 3. Monitorizarea rezultatelor terapeutice cu ajutorul indicilor.
 - Pe parcursul anului 2005 am susținut cele trei examene din cadrul stagiului de doctorat de ortodonție, radiologie stomatologică și metodologia cercetării științifice;
 - 2005- am început stagiul de specializare în ortodonție și ortopedie dentofacială, la Catedra de Ortodonție în cadrul Facultății de Medicină Dentară, UMF „Iuliu Hațieganu”, sub îndrumarea Prof.Dr. Elvira Cocârlă și Conf.Dr.Șerbănescu Alin;
 - Am promovat examenul de rezidențiat în decembrie 2004;
 - 1 noiembrie 2004 am început stagiul de doctorat la forma cu frecvență, având lucrarea cu titlul „Indici de evaluare ortodontică în diagnosticul și tratamentul anomaliilor dento-maxilare”, sub îndrumarea Prof.Dr. Elvira Cocârlă;
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Am participat la următoarele manifestări științifice:

- 4-7 iunie 2010 am participat la Congresul CEO cu tema “L` orthodontie de l`adulte: des choix multiples”, Bordeaux. În urma evaluării de către comisia de afiliere a documentației a trei cazuri prezentate am obținut calitatea de membru afiliat al Colegiului European de Ortodonție.
- 7-9 noiembrie 2009 am participat la Journées de l’Orthodontie de la Fédération (Paris)-ediția a XII-a.
- 29 mai-1 iunie 2009 am participat la Congresul CEO cu tema “Innovations: Mirage ou Réalité: Analyse Critiques des résultats”, Rabat.
- 7 noiembrie 2008 am asistat la conferința “Traiter des problèmes asymétriques avec des mécaniques innovantes” prezentată de Dr Thomas MULLIGAN, Paris.

- 8-10 noiembrie 2008 am participat la Journées de l'Orthodontie de la Fédération (Paris)-ediția a XI-a.
- 9 noiembrie 2007 am asistat la cursul "Systemul Damon: a 4-a generație" prezentat de Prof Dwight DAMON, Paris.
- 10-12 Noiembrie 2007 am participat la Journées de l'Orthodontie de la Fédération (Paris)-ediția a X-a.
- 20-24 Iunie 2007 am participat la Congresul European de Ortodontie cu posterul:
 - The contribution of IOTN in assessing orthodontic treatment need
- 7-9 iunie 2007 am participat la Al XII-lea Congres ANRO
- 2-15 decembrie 2006 am participat la Zilele Universității de Medicină și Farmacie „Iuliu Hațieganu”, Cluj-Napoca cu lucrarea comunicată:
 - Posibilități de evaluare clinică a rezultatelor tratamentului ortodontic
Autori: Mihaela Chiș, Amalia Chiș
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 - Evaluarea necesității de tratament ortodontic cu ajutorul IOTN
Autori: Amalia-Andreea Chiș, Mihaela Chiș, Elvira Cocârlă
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- Rolul indexului PAR în evaluarea tratamentului ortodontic. Autori: Amalia-Andreea CHIȘ, Mihaela CHIȘ, Elvira COCÂRLĂ Revista Medico-Chirurgicală a Societății de Medici și Naturaliști Iași -2007, vol.III, nr.1, supliment nr.I, pg.:315-320
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- „The Principles of the Alexander Discipline” coordonat de Prof. Alexander, 2-3 decembrie 2006, Cluj-Napoca;
- „Straight Wire Technique I”, caz de Cls. II Angle cu extracție de 4 PM, coordonat de Dr. Wolfgang Gruner și organizat de firma Dentaureum, 18-21 octombrie 2006, Sinaia;
- „Terapia interceptivă cu aparate scheletizate de tip Bimzat” susținut de Prof.Dr.Bruno Genone și Prof.Asic.Dr.Silvia Aurelia Dobrescu Massaro, din cadrul Congresului al Xi-lea ANRO, 3septembrie 2006, Constanța;
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APTITUDINI:

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Operare PC

SUMMARY OF PhD THESIS

INDEXES OF ORTHODONTIC ASSESMENT IN DIAGNOSIS AND TREATMENT OF MALOCCLUSIONS

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KEY WORDS: orthodontic index, malocclusion, qualitative assessment, quantitative assessment, quantification of orthodontic treatment need, quantification of treatment result

INTRODUCTION

The limitations of qualitative (descriptive) methods of malocclusion assessment imposed the development of quantitative ones, more objective .

The literature describes efforts made in the direction of developing objective instruments- orthodontic indexes, for two purposes : the assessment of treatment need and treatment result, beginning with 1950 till the present time (Shaw W. C., Richmond S., Parker W. S., Thomas J. Cangialosi).

The purpose of the quantification of treatment need with indexes of orthodontic treatment need (ex. IOTN) is to prioritise orthodontic patients which are to receive orthodontic care in public services financed by the assurance system. The aim is to distribute the financial, material and human resources which are limited, those cases which will benefit the most from the treatment. Any objective method must include a quantification of the consequences of malocclusion on aesthetics and dental health and longevity.

At the beginning seemed sufficient the assessment of treatment result strictly from the occlusal point of view (PAR Index), the recent studies showed concern developing more complex methods of assessment. Certain indexes include beside the occlusal criteria, an aesthetic analysis (ICON), or radiological criteria (ABO-OGS). The difficulties in developing a comprehensive assessment method consist in the great number of elements which should be taken into consideration when assessing the treatment result, and the difficulty of quantification. The CCA of ABO includes the assessment of vertical management, compliance, dental surfaces, radicular resorptions, treatment duration and efficiency during the treatment, and seems to be a good option

The purpose of this research is the study of the concordance between the diagnosis methods used in clinical practice and the use of indexes of orthodontic treatment need, and in the same time, the assessment of treatment result with indexes developed for this purpose.

REVIEW OF THE LITERATURE

CHAPTER 1: DIAGNOSIS OF MALOCCLUSIONS AND INDEXES OF ORTHODONTIC TREATMENT NEED

The assessment methods of the malocclusions can be divided in two categories: qualitative and quantitative methods. The great number of classifications and indexes is the proof for the inherent problems of both .

QUALITATIVE ASSESSMENT

Orthodontic assessment is the result of clinical and complementary investigations. It consists of the screening, assessment and quantification of facial, functional and occlusal traits of a malocclusion.

Qualitative assessment is descriptive and includes the diagnostic classification of malocclusions. The authors proposed different classifications of malocclusions: Angle method, WHO/FDI method, British Standards Institute Classification, OMS Classification (1997).

QUANTITATIVE ASSESSMENT AND ORTHODONTIC INDEXES

The quantitative methods were developed later, because the traditional diagnostic methods offer only a descriptive assessment, inadequate for quantification. For this reason, the occlusal indexes were developed, systems of evaluation and classification which resume a set of data about a malocclusion and assign a numerical score or an alphanumeric label. The purpose is to quantify in an objective manner, the level of severity of a malocclusion which indicates orthodontic treatment, in order to assign access in a public funded service, the level of copayment, and the resources assignment.

Indexes developed recently: IOTN(Index of Orthodontic Treatment Need), ICON (Index of Complexity Outcome and Need), which were also used in our study.

CHAPTER 2: FINAL OBJECTIVES OF ORTHODONTIC TREATMENT

This chapter describes the occlusal (after Angle, Andrews, ABO- American Board of Orthodontics), functional and aesthetic objectives of orthodontic treatment. It can be noticed a change of view concerning the aim of the orthodontic treatment.

The change from Angle paradigm which dominated the 20th century, to the paradigm of the soft tissues consists in taking into account the soft tissues before skeletal and dental aspect. Today, the soft tissues represent an important element of restriction of orthodontic treatment but also a factor which confirms the success or failure of orthodontic treatment.

CHAPTER 3: INDEXES OF ORTHODONTIC TREATMENT ASSESSMENT

The assessment of orthodontic treatment identifies objectives and establishes standards and offers a quantifiable result for finished cases. It can be also used for educational purposes in a postgraduate orthodontic program, or in clinical practice. So appeared the indexes for orthodontic treatment assessment, which are described in this chapter. Another purpose of these indexes is the assessment of treatment difficulty.

PERSONAL RESEARCH

CHAPTER 4: ORTHODONTIC TREATMENT NEED ASSESSMENT WITH INDEXES IN A SAMPLE OF 111 SAMPLE OF SUBJECTS IN EVIDENCE OF THE ORTHODONTIC CLINIC OF CLUJ-NAPOCA

AIM OF THE STUDY

Malocclusions induce aesthetic and functional consequences, by affecting the oro-dental health, with multiple psycho-social implications. Their high frequency (1-2% of population present an ideal occlusion) and important costs of orthodontic treatment, impose an objective selection of cases which will benefit of copayment in public funded services.

Our purpose is to assess the contribution of orthodontic indexes, with reference to IOTN, establishing if the cases treated in the Clinic of Orthodontics Cluj- Napoca between 2004- 2006, subscribe to this quantification.

In the same time we studied if exists a correlation directly proportional between the components of IOTN: AC (Aesthetic Component) and DHC (Dental Health Component), in assigning treatment need.

MATERIAL AND METHOD

The sample consisted of 111 patients, with ages between 5 and 24 years (mean= 10,8 SD \pm 3,32), presenting the common orthodontic pathology. The age groups were 5-8 years, 9-12 years, 13-17 years and 18-24 years.

The method of assessing was IOTN and for the statistical analysis was used SPSS for Windows.

RESULTS AND DISCUSSION: The study of the global need of treatment in our sample shows that predominate the cases with moderate need of treatment from aesthetic point of view (36,04%), followed by a slight need (27,03%), and the need for orthodontic treatment need is found only in 22,52%.

From dental health point of view in our sample predominate the subjects with a great (54,05%) and very great (24,32%) need of treatment.

We notice a lack of correlation between the two components AC and DHC-IOTN in assigning the need for orthodontic treatment for the last 3 age groups (a slight need for orthodontic treatment from aesthetic point of view is correlated with a great need for orthodontic treatment from dental health point of view). This result can be explained by the degree of subjectivity which implies the scoring of AC, and the limitations in finding certain traits of malocclusions with potential aesthetic consequence strictly from anterior view. Minimal aesthetic disorders does not always implies lack of treatment need, and clinical examination is essential in finding those traits which indicate treatment. The diagnosis and the assigning indication for treatment with IOTN offers informations similar to the conventional method but it becomes indispensable in ranking and establishing the priority for treatment.

CHAPTER 5: ASSESSMENT OF TREATMENT RESULT WITH PAR IN A SAMPLE OF SUBJECTS TREATED IN THE ORTHODONTIC CLINIC OF CLUJ- NAPOCA

AIM OF THE STUDY

The aim was to assess the impact of a quantification method for the orthodontic treatment results (PAR) in clinical practice and the degree of variation of PAR scores as a result of therapeutical interventions.

We also studied if there is a correlation between the initial treatment need of malocclusion (assessed with DHC-IOTN) and the therapeutical variation of PAR scores.

MATERIAL AND METHOD: The sample consisted in 19 subjects treated in the Clinic of Orthodontics of Cluj-Napoca, with age between 5,5 years and 13 ani (mean= 8,8 ani). All subjects presented complete files, including a set of two dental cast (t1-at the beginning of treatment, t2-the end of treatment), which were measured using the PAR index according to the Victoria University of Manchester method (1992). The subjects were classified according to Angle method and the DHC- IOTN.

RESULTS AND DISCUSSION: in the case of classe I malocclusions and those with initial moderate and little need for treatment, the mean reduction of PAR scor was greater than the sample mean. The overjet and the crossbite are the traits most frequently responsible for the malocclusion correction.

Upon the Richmond și colab. method of interpretation we found significant improvement (the variation of PAR scor after treatment greater than 22 points) in 4 cases (21,05%). For 15 subjects (78,94%) we found improvement. In our sample there was no subject with no improvement/worse.

CHAPTER 6: COMPARATIVE RESEARCH OF FIVE ASSESSMENT METHODS OF ORTHODONTIC RESULT AND TREATMENT COMPLEXITY IN A SAMPLE OF SUBJECTS TREATED IN THE DEPARTEMENT OF ORTHODONTICS OF CHU BORDEAUX

AIM OF THE STUDY: was to quantitatively assess the orthodontic treatment results in a sample of patients treated in the Clinic of Orthodontics of "Victor Segalen" University Bordeaux 2. We conducted a comparative research of four

methods of treatment result. We also compared two methods for assessing malocclusion complexity for determining if the inclusion of cephalometric data offers a more precise estimation of the initial difficulty of the case than occlusal elements alone.

MATERIAL AND METHOD: The sample consisted in 52 patients (8-42 years, mean=15 years) treated. The major criteria of inclusion in the sample were: the orthodontic treatment had to be finished, and the patient file complet (photographs, radiographs and dental casts).

For assessing the patients files we used methods with a progressive complexity of the characteristics scored: PAR (occlusal aspect), ICON (also includes the aesthetic component), ABO-OGS (occlusal and radiological informations) completed with a clinical comprehensive assessment with CCA.

The ranking of subjects according to the complexity of malocclusion was made with ICON and DI (Discepancy Index) of ABO.

RESULTS AND DISCUSSION

We obtained quantitative results, the indexes scores assigned, by usind the methodology describe for each index, so we were able to conduct a retrospective study descriptiv and analitic. The results were analysed with Excell (Microsoft Office), Statistics under Windows și Spss.

Comparing the final scoring means for PAR, ICON and ABO-OGS we found differences statistically significant ($p < 0,05$). ABO-OGS method assures the most precise quantification of the treatment result.

Using the t test for independent variables, we found differences with a very good statistical significance ($p < 0,001$) between the mean of ICON and DI pretreatment scores. The reason responsible for these results is the inclusion of a suplimentary element in the initial assessing by the DI index, which is the cephalometric values. DI assures a more precise pretreatment quantification of the malocclusion.

CHAPTER 7: BENEFITS AN INCONVENIENTS OF USE OF INDEXES IN ORTHODONTIC PRACTICE-CLINICAL CASES

GENERAL CONCLUSIONS

16. The qualitative assessment is descriptive and because the malocclusion is a continuous variable, there are not cut-off points between different categories and it does not offers informations about treatment difficulty.
17. There is a great variability of orthodontic indexes described in the literature, with the purpose of objective quantification of the level of severity wich indicates treatment.
18. In the situation of limited public resources, an index of orthodontic treatment need is useful in resources allocation for the cases which will benefit the most from the therapy.
19. The use of IOTN in the sample of 111 cases, showed a moderate(borderline) need of treatment from aesthetic point of view in a percentage of 24,32% , but associated with a great need of treatment from dental health point of view.
20. This kind of association of the two components was found in a percentage of 16,22% in the age group 9-12 years.
21. The little need for orthodontic treatment from dental health point of view was associated with a slight/no need from aesthetic point of view.
22. The Aesthetic Component does not always estimates the real need for orthodontic treatment imposed by the malocclusion, the aesthetic aspect
23. We estimate that IOTN represents an objective method of quantification and ranking the real need of treatment in a population, and therefore a useful instrument for the system of medical assurance in the process of selection those patients which will benefit the most consequently orthodontic therapy, and allocation of resources for orthodontic care.
24. A major inconvenient of indexes of orthodontic treatment need is the potential insensibility and error in assessind individual needs.

25. The variation of PAR scores in the Bordeaux sample, due to the treatment, is greater than that found in the Cluj Napoca treated sample.
26. DI assures a more precise quantification of the pretreatment difficulty than ICON.
27. We found a difference statistically significant ($p < 0,05$) between the mean scores of the four methods PAR, ICON, ABO-OGS and we estimate that OGS offers the most precise assesment of the final result from the point of view of occlusal and radiological aspect of a malocclusion, the inconvenient is that it does not includes the assesment of the functional elements, facial aesthetic, the vertical management, the potential parodontal consequences or the status of radicular and dental surfaces and compliance.
28. The association of the OGS assessment with CCA method eliminates these inconvenients and offers the most complete quantification of the treatment result.
29. Initially developed as an objective method in a postgraduate program, it can be very usefull for any orthodontist who want to know if his treatment results correspond with the ABO criteria of quality.
30. Applying this method in everyday practice will contribute to assure a high level of treatment quality on long term.

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Curriculum Vitae

1. STUDIES

- Sep 2003 I obtained my bachelor's degree in September with 9.85(nine85%)
- 2003 I graduated the Faculty of Dental Medicine within "Iuliu Hatieganu" University of Medicine and Pharmacy, Cluj-Napoca, year 2003 with 9.49(nine49%) average grade of all years of study
- 1997-2003 I followed the courses of the Faculty of Dentistry within " Iuliu Hatieganu" University of Medicine and Pharmacy, Cluj-Napoca
- June 1997 I passed the highschool graduation exam with 9.27
- 1994-1993 I went to "Lucian Blaga" theoretical highschool with Mathematics-Physics-English profile

2. PROFESSIONAL EXPERIENCE

- June 2010-I received the title of affiliate member of the European College of Orthodontics after having presented three orthodontic cases evaluated by the Congress of the European College of Orthodontics of Bordeaux
- October 2008-I received the title of doctor specialist in orthodontics and dental-facial orthopedics, confirmed by OMSP nr.2025, obtained through special examination which I passed with 9.53
- 2007- nominated for a postgraduate scholarship established by GD 697/1996 amended by GD 533/1998. During the period 9/22 to 12/22/2007 I took a postgraduate internship at the University "Victor Segalen" Bordeaux 2, France (according to OMER no. 2128/19.09.2007), followed by an Erasmus scholarship until 6/5/2008 under the leadership of Mrs.Prof. Marie-Jose BOILEAU, Head of Department of Orthodontics and Dental-Facial Orthopedics. Research project title is: "Assess the need for

orthodontic treatment of dento-maxillary anomalies and monitoring therapeutic outcomes with the help of professional indices”

- Three papers as first author communicated
- During 2006 we held three papers in the doctoral internship with the titles: 1.Orthodontic evaluation ratios, 2.Assess the need for treatment of orthodontic anomalies through orthodontic indices, 3.Monitoring therapeutic outcomes indices
- During 2005 we supported the three exams in the doctoral internship orthodontics, dental radiology and scientific research methodology
- 2005- I began specialist training in orthodontics and dental-facial orthopedics in the Department of Orthodontics within the Faculty of Dental Medicine, UMF “Iuliu Hatieganu”, under the guidance of Prof.Dr. Elvira Cocarla and Conf.Dr. Alin Serbanescu
- I passed the residency exam in December 2004
- November the 1st, 2004 I began doctoral internship at the frequency form, with the paper entitled “Indices for assessing orthodontic diagnosis and treatment of jaw anomalies” under the guidance of Prof.Elvira Cocarla
- After graduation in 2004 I made my internship in the Department of Orthodontics under the guidance of Prof.Elvira Cocarla

3. SCIENTIFIC ACTIVITY

I attended to the following scientific events:

- 4th-7th of June 2010 I attended the Congress CEO on “L`orthodontie de l`adulte: des choix multiples”, Bordeaux. After the membership committee assessed the documentation of the three cases I had presented, I received the status of affiliate member of the European College of Orthodontics
- 7th-9th of November 2009 I attended the Journées de l`Orthodontie de la Fédération (Paris)-XII edition
- 29th of May-1st of June , 2009 I attended the CEO Congress on “Innovations: Mirage ou Réalité: Analyse Critiques des résultats”, Rabat
- 7th of November 2008 I attended the conference “Traiter des problèmes asymétriques avec des mécaniques innovantes” presented by Dr.Thomas MULLIGAN, Paris
- 8th-10th of November 2008 I attended the Journées de l`Orthodontie de la Fédération (Paris)-XI edition
- 9th of November 2007 I attended the “Damon System-the 4th generation” presented by Prof. Dwight DAMON, Paris
- 10th-12th of November 2007 I attended the Journées de l`Orthodontie de la Fédération (Paris)-X edition

- 20th-24th of June 2007 I attended the European Congress of Orthodontics with the poster:
 - The contribution of IOTN in assessing orthodontic treatment need
- 7th-9th of June 2007 I participated at the XII Congress ANRO
- 2nd-15th of December 2006 I attended the Days of the “Iuliu Hatieganu” University of Medicine and Pharmacy, Cluj-Napoca with the paper entitled:
 - Opportunities for clinical evaluation of orthodontic treatment results
Authors Mihaela Chis, Amalia Chis
- 8th-9th of September I participated to the XIth Congress ANRO, Constanta with the paper:
 - The assesement of orthodontic treatment need using IOTN
Authors: Amalia-Andreea Chis, Mihaela Chis, Elvira Cocarla
 - Decision-makers in the early treatment of Class III malocclusions
Authors: Mihaela Chis, Nestor Orolloga, Amalia Chis
- 5th-9th of December 2005 I attended to The Days of the “Iuliu Hatieganu” University of Medicine and Pharmacy, Cluj Napoca with the paper:
 - Opportunities for clinical evaluation of the effectiveness of early orthodontic treatment
Authors: Mihaela Chis, Amalia Chis
First prize to scientific poster session
- 10th-14th of September 2005 I attended to the 6th International Congress of Orthodontics, Paris
- 2nd-5th of December 2003 I attended to The Days of “Iuliu Hatieganu” University of Medicine and Pharmacy, Cluj Napoca with the paper:
 - Assesement indices in orthodontics
Authors: Mihaela Chis, Amalia Chis
- 29th of March-1st of April 2001 I attended the International Congress of Dentistry for Students and Young Dentists Dentis with the paper:
 - Investigation of the patient’s motivation for orthodontic treatment, awarded with a distinction to the scientific session of oral presentations

Publications:

- Assess the need for treatment of jaw anomalies through orthodontic indices

Authors: Amalia-Andreea Chis, Mihaela Chis, Elvira Cocarla, Clujul Medical-2009, nr.1, vol. 82, pg.: 118-122

- The role of PAR index in assessing orthodontic treatment
Authors: Amalia Andreea Chis, Mihaela Chis, Elvira Cocarla, Medical-Surgical Journal of Physicians and Naturalists, Iasi-2007, vol.III, no.I, Supplement no.I, pg.315-320
- Methods of quantifying the need for orthodontic treatment in dental-maxillary anomalies
Author: Amalia Andreea Chis, Dental Transylvania-2008, Year VIII, no.1, pg.91-102

Postgraduate courses:

- “Straight wire Technique II” first molars extraction case coordinated by Dr. Wolfgang Gruner and organized by Dentaurem Company, 29th of November-1st of December 2008, Sinaia
- Interuniversity Seminar of Orthodontics and Dental-Facial Orthopedics in technique Tweed, April 2008, University of Rennes
- “The principles of the Alexander Discipline” coordinated by Prof. Alexander, 2nd-3rd of December 2006, Cluj Napoca
- “Straight wire Technique I”, case of Cls. II Angle with extraction of 4PM coordinated by Dr.Wolfgang Gruner and organized by Dentaurem Company 18th-21st of October 2006, Sinaia
- “Interceptive therapy with type Bimzat devices ” supported by Prof.Bruno Genone and Prof.Asic.Silvia Aurelia Dobrescu Massaro within the XIth ANRO Congress, 3rd of September 2006, Constanta
- Course of Continuous Medical Training organized by The College of Dentists Cluj-Dental Medicine Assistance in contractual relationship with C.J.A.S, The risk of malpractice anesthesia in dental medical activity, 14th of March, 2006
- “Edgewise Modern” 3rd-5th of November 2005, coordinated by Prof.Univ.Dr.Andre Horn, Cluj Napoca
- “Getting Started in fixed orthodontics” 28th-30th of May 2004 organized by “Iuliu Hatieganu” UMF, coordinator Prof.Dr.Elvira Cocarla
- “Management of dental office” within The Days of “Iuliu Hatieganu” University of Medicine and Pharmacy, 3rd-4th of December 2003, Cluj Napoca
- Participation in professional conference cycle in the program of “Continuous vocational training in dentistry” organized by “Iuliu Hatieganu” University of Medicine and Pharmacy on 24th of October 2003

4. CURRENT POSITION

Specialist orthodontist in private practice

- 2004 Certificate of linguistic competence in English language, medical language obtained from the Department of Foreign Languages applied in Medicine, "Iuliu Hatieganu" UMF
- 2007 Certificate of linguistic competence in French language, medical language obtained from the Department of Foreign Languages applied in Medicine, "Iuliu Hatieganu" UMF

5. SKILLS

English and French advanced level

Computer skills