MEANS OF CROSS - INVESTIGATION IN THE CASE OF TEMPOROMANDIBULAR JOINT BIOMECHANICS. OVERDENTURE ON NATURAL TEETH VERSUS IMPLANTS

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Abstract: *The objective of this paper was to provide a comparative analysis of the biomechanics of the dento-maxillary device in the case of overdenture on natural teeth and dental implants. The results were collected from a total of 300 patients, using the following means of investigation: radiological examination method, the direct investigation method, the direct method for investigating and measuring the angle of inclination of the above determinant, along with statistic procedures. The results point to a picture where changes in the biomechanics of the temporomandibular joint can be found in very young ages (20-25 years old) and are directly linked to the outbreak toothless and especially its persistence for a long time, which distort the internal anatomy of the joint. Another aspect is represented by the inadequate or unfinished prosthetic restoration by occlusal equilibration. This problem occurs quite frequently and falls in the etiology of temporomandibular joint modifications.*

Cuvinte cheie: *biodinamică, supraprotezare, echilibrare ocluzală*

Rezumat: *Obiectivul acestei lucrări îl reprezintă analiza comparativă a biomecanicii aparatului dento-maxilar în cazul supraprotezării pe dinţi naturali şi pe implante dentare. Datele au fost colectate de la un eşantion de 300 de pacienţi, folosind ca mijloace de investigare: metoda chestionarului, metoda examenului radiologic, metoda directă de investigare şi măsurare a unghiului de înclinare a determinantului anterior, precum şi metode statistice. Rezultatele cercetării converg către o imagine unde: modificările biomecanicii articulaţiei temporomandibulare pot fi întâlnite la vârste foarte tinere (20-25 de ani) şi sunt în directă legătură cu apariţia edentaţiilor şi mai ales cu persistenţa lor pe o durată lungă de timp, fapt care dezechilibrează anatomia internă articulară. Un alt aspect de evidenţiat îl reprezintă restaurarea protetică necorespunzătoare sau nefinalizată prin echilibrare ocluzală. Această problemă apare destul de frecvent şi intră în etiologia modificării biodinamicii articulaţiei temporomandibulare.*

INTRODUCTION

Dentomaxillary device functions require various movements of the mandible. Arthromiologically speaking, they are the result of coordinated movements performed in the two temporomandibular joints, in mobilizing the mandible as a mandibulo-head reflex action.

Complex analysis of clinical dentistry jaw movements, especially in terms of functional occlusal relationships can organize and can be followed by studying the biomechanics of the jaw at the level of the temporomandibular joint movements and the movements of the mandibular jaw.

Although this is more a systematic teaching, we used it for ease of grouping and data collection for both the control group and the study group in our research.(1)

WORKING HYPOTHESIS

Changes occurring after the installation of the edentulous areas can lead over time to changes in the physiological biomechanics of the temporomandibular joint, which entails the craniomandibular dysfunction.(1)

Toothless implant restoration produces a change in temporomandibular joint biodynamics, which must be monitored quantitatively and qualitatively compared with the physiological joint biomechanics and with the biomechanics of the joint without implant overdenture.(2,3)

We started this research from a series of observations taken from clinical cases solved, in direct contact with patients within the practice of dentistry, patients who were complex clinical cases with simple and/or extended edentulous, whose prosthetic solution most often involved the application of dental implants.(4,5)

PURPOSE

The objective of this paper was to provide a comparative analysis of the biomechanics of the dento-maxillary device in the case of overdenture on natural teeth and dental implants.(6)

METHODS

The initial observations of a general nature have been subsequently made the object of a systematic investigation on a group of 300 patients.

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We used the following research methods: systematic observation method and experimental method in comparison with two groups: one study group and a witness group.

The research methods were selected according to:

1- type of edentation; we looked for the edentulous from lateral area, especially,
2- age,
3- solving the prosthetic implant superstructure,
4- specific methods of research:
   - questionnaire survey method (written) - indirect method with his own conceived questionnaire,
   - radiological examination method, direct method for measuring the angle of inclination of the condilian slope,
   - investigation method, direct method for investigating and measuring the angle of inclination of the above determinant-on his own conceived method,
   - bibliographic method - indirect method to study the works of the following areas: orthodontics, implant dentistry, radiology, equilibration, statistics, public health,
   - statistical method within Excel 200 computer program.

All applied research has been conducted on a sample of 304 subjects, aged 18 and over 60 years old, in this case the control group has a total of 136 edentulous subjects on side, but without the presence of any dental implant.

The study group included a total of 138 subjects aged 18 and over 60 years old, presenting lateral edentulous areas on which dental implants have been applied and afterwards overdenture. All the patients were clinically healthy.

RESULTS AND DISCUSSIONS

Summarizing the results obtained in the control group, we observed the existence of the following issues: changes in the biomechanics of the temporomandibular joint can be found in very young ages (20-25 years old) and are directly linked to the outbreak toothless and especially its persistence for a long time, which distorts the internal anatomy of the joint.

The patients complain of temporarily or permanently illness signs and joint noise when opening the mouth or during chewing. The alarm signal is the occurrence of pain in the joints, which sends the patients to the dental office.

Another important point of view is the inadequate or unfinished prosthetic restoration by occlusal equilibration. This problem occurs quite frequently and falls in the etiology of the temporomandibular joint modifications.

Regarding the study group, the following problems have been revealed, problems solved through implant overdenture: first of all, implantollogy is an effective method of solving long term prosthetic dysfunction.

Implantology provides optimal poles dispersed so that dentures can achieve good quality equilibration. This helps the joints biomechanics, maintaining the joint's health.

Just as in case of natural teeth overdenture, its implant is imperative in order to complete the prosthetic work with occlusal equilibration.

Because there is one major difference between the way dental implant acts vis-à-vis the bone, compared with natural teeth (dental implant has no mobility and proprioception), it is indicated that from the early prosthetic design plan, to pay special attention to joint biomechanics.

Recommendations and further directions

As we noted in our study, statistical results show important changes in the percentage of temporomandibular joint disorder. This leads us to the classification of symptoms in "craniomandibular dysfunction".

The patient bearing dental implants is treated as a periodontist patient, and it is important to consider all the consequences regarding treatment and placement.

A dental implant involves and requires different biological conditions and thus, requiring a different behaviour of implant dentures compared with that of natural tooth-supported dentures. It is also necessary that the medical attitude should be different in terms of dispensary the carrier patient of dental implant supported dentures.

Another goal is to check bacteria plaque control, a matter of great relevance for the life of the dental implant and also for overdenture. Also, it is required to observe any possible early inflammatory processes. It is also indicated to monitor and observe the possible unscrewing or de-cementing cases. The patient is called to regular check ups every 3-4 months. The patient is investigated radiologically every 12-18 months. If an overimplantation inflammatory process occurs, degranulation surgery is recommended, also detoxification and the possible augmentation of the bone defect.

The restoration of a "fixed" implant will take place over 10 to 12 weeks after surgery. It is recommended that interventions should be accompanied by the development of X-rays and photos.

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