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Rocha-Herrera Beatriz

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DENTAL IMPLANTS IN BRUXOMANIAC PATIENT: CONSIDERATIONS FROM A CLINICAL CASE

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ABSTRACT

The placement of dental implants is a fundamental aspect of modern restorative dentistry, providing a functional solution for the replacement of missing teeth. However, its success faces challenges, particularly in the presence of conditions such as occlusal overloads induced by bruxism. Bruxism, a multifactorial condition characterized by involuntary abnormal activity involving the grinding or clenching of teeth, brings about various negative effects. Hence, during the planning phase, bruxism should be regarded as a significant risk factor that necessitates careful consideration. This article describes the outcomes achieved through the application of recommended indications for implant placement in patient exhibiting bruxism. A 63-year-old male patient presented with painful symptoms in the right

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posteroinferior sector. During the anamnesis, the patient reported a habitual teeth-clenching habit. Intraoral examination unveiled wear facets, particularly notable in the first and second lower right molars. Subsequently, a comprehensive approach was undertaken, involving dental extraction, decontamination, and adaptation of dental sockets using tetracycline. This was followed by guided bone regeneration with platelet-rich fibrin, bone grafting, and Sticky bone. Finally, dental implants were placed in a well-distributed manner. The success achieved through the utilization of platelet-rich fibrin and alveolar biomodification as adjuncts demonstrated highly favorable outcomes in the guided bone regeneration process. This, in turn, facilitated the creation of a conducive site for the accurate placement and distribution of implants.

KEYWORDS: Dental implants; Bruxism; Bone Regeneration; Tooth Extraction; Tetracycline.

IMPLANTES DENTALES EN PACIENTE BRUXÓMANO: CONSIDERACIONES A PARTIR DE UN CASO CLÍNICO

RESUMEN

Antecedentes: La colocación de implantes dentales representa un pilar esencial en la odontología restauradora moderna, ofreciendo una solución duradera y funcional para

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reemplazar dientes perdidos, sin embargo, su éxito es desafiado por diversas condiciones clínicas, entre esas la existencia de sobrecargas oclusales por bruxismo, siendo una afección de causa multifactorial, caracterizado por actividad anormal involuntaria donde se presenta el roce o apretamiento de los dientes, trayendo consigo un sin número de efectos negativos, por lo tanto, en la planificación se debe considerar el Bruxismo como un factor de riesgo. Objetivo: Describir los resultados obtenidos en la implementación de indicaciones descritas para la colocación de implantes en el paciente bruxomano. Descripción del caso: Paciente masculino de 63 años con sintomatología dolorosa a la masticación en el sector posteroinferior derecho e inconformidad estética dental. En la anamnesis, afirmo presenter el hábito de apretar los dientes. Al examen intraoral revela facetas de desgaste, resaltando entre ellos los órganos dentales 47 y 46 con un mal pronóstico, Por lo tanto, se implementó extracción de órganos dentales, descontaminación y adaptación de los alveolos con tetraciclina para la regeneración ósea guiada con fibrina rica en plaquetas, con hueso Ti oss, Sticky bone para colocación de implantes dentales distribuidos adecuadamente para disipación de fuerza. Resultados: El éxito obtenido con el uso de fibrina rica en plaquetas y la biomodificación alveolar como coadyuvante logró mostrar resultados altamente favorables en el proceso de regeneración ósea guiada dando así un sitio propicio para la colocación y distribución adecuada de implantes.

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PALABRAS CLAVE: Implante dental; Bruxismo; Regeneración osea; Extracción dental; tetraciclina.

INTRODUCTION

The placement of dental implants is a pivotal aspect of modern restorative dentistry, offering a durable and functional solution for replacing lost teeth. However, the success of this procedure can be compromised by various clinical conditions, one of which is the presence of occlusal overloads resulting from bruxism, especially in teeth with a reserved prognosis, particularly those with apical lesions.

Bruxism is a multifactorial condition characterized by abnormal involuntary activities such as grinding or clenching of the teeth, leading to numerous negative effects.[1] Its impact on the success rate of dental implants has sparked significant controversy, ranging from potential loss of bone surrounding the implant to causing no damage at all.[2] In their research, Yang H et al.[3] concluded that tissues can exhibit changes, either for the better or worse, due to bruxism. Therefore, bruxism should be considered a significant risk factor during the planning phase of dental implant procedures.

In the past, the success of an implant was primarily focused on the availability of bone, neglecting other periodontal characteristics and occlusal traumas. This often led to unfavorable results due to inadequate preparation of hard and soft tissues before implantation. It is important to note that the aesthetic

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outcome of implants is one of the factors that patients are most interested in. However, it can also be one of the biggest challenges that arise after implant placement, especially in the anterior sector.[4]

The literature indicates an association between occlusal overloads and peri-implant bone loss, particularly when pathological loads are exerted before.[5] It emphasizes the importance of proper force distribution, carrying out dental replacement in accordance with the number of missing teeth and the edentulous region. This is because the distribution and number of implants are crucial for force dissipation, considering that the bone behaves the same during osseointegration, whether the patient is a bruxer or not.[6]

This paper details the outcomes derived from implementing diverse alternatives for implant placement in a patient exhibiting bruxomania. These alternatives encompassed alveolar biomodification and bone regeneration utilizing Tioss bone, Sticky bone, and platelet-rich fibrin, followed by the placement of an appropriate number of implants to ensure proper force dissipation. The success attained through this alternative approach is thoroughly discussed.

CASE REPORT

A 63-year-old male patient sought dental care due to painful symptoms in the lower right area during chewing, coupled with aesthetic discomfort. In the course of the anamnesis, the patient disclosed a habit of

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teeth clenching, with no other significant medical history identified. The intraoral examination showed wear facets, abfractive lesions, and fractured resins. Particularly noteworthy were the lower right first and second molars, both displaying considerable damage. The first molar exhibited a worn crown with furcation involvement and an active fistula, while the second molar displayed a fractured resin accompanied by adjacent caries and furcation damage. **Figure 1**.

Figure 1. A) Buccal view and fistula in the lower right first molar. **B)** Occlusal view of the teeth, showing worn crown and fractured resin.

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A tomography was performed, which showed radiolucent areas in the teeth involved.

Figure 2. Tomography of the teeth involved, presence of radiolucent lesions adjacent to apical areas.

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Given the clinical and radiographic findings, periapical lesions were diagnosed, indicating the presence of a chronic abscess and extensive furcation involvement. These conditions led to a poor prognosis for preserving the affected teeth. Consequently, dental extraction with odontosection was performed to maximize alveolar preservation. Subsequently, alveolar biomodification with diluted tetracycline was carried out. **Figure 3.**

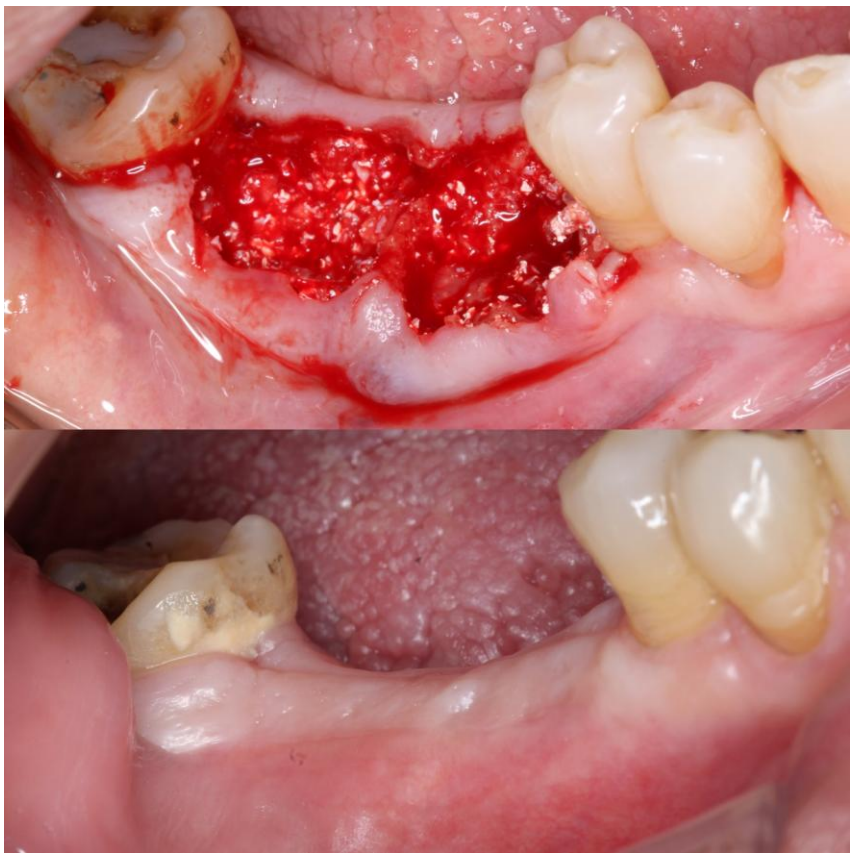

Figure 3. Surgical procedure. **A)** Odontosection **B)** Biological Modification with tetracycline **C)** Clinical view after biological modification.

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Subsequently, bone regeneration was undertaken by introducing platelet-rich fibrin, along with Tioss bone and Sticky bone inside the alveoli. **Figure 4A.** Following this procedure, suturing was performed, and the sutures were removed after 7 days. The prescribed postoperative regimen included Amoxicillin plus clavulanic acid (1g), Dexketoprofen (25 mg), Benzidamine as a mouthwash, and hydrolyzed collagen (one sachet daily for 7 days).

Figure 4. A) Placement of platelet-rich fibrin, Tioss bone, and Sticky bone inside the alveoli.
Figure 4. B) Clinical appearance showcasing the evolution over 5 months.

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After 6 months of progress, there was clear evidence of complete healing, resulting in gums without any signs of inflammation or laceration and displaying a normal color. **Figure 4B**. In terms of the tomographic results, an improvement was noted 5 months post-surgery, leading to successful bone regeneration. **Figure 5.**

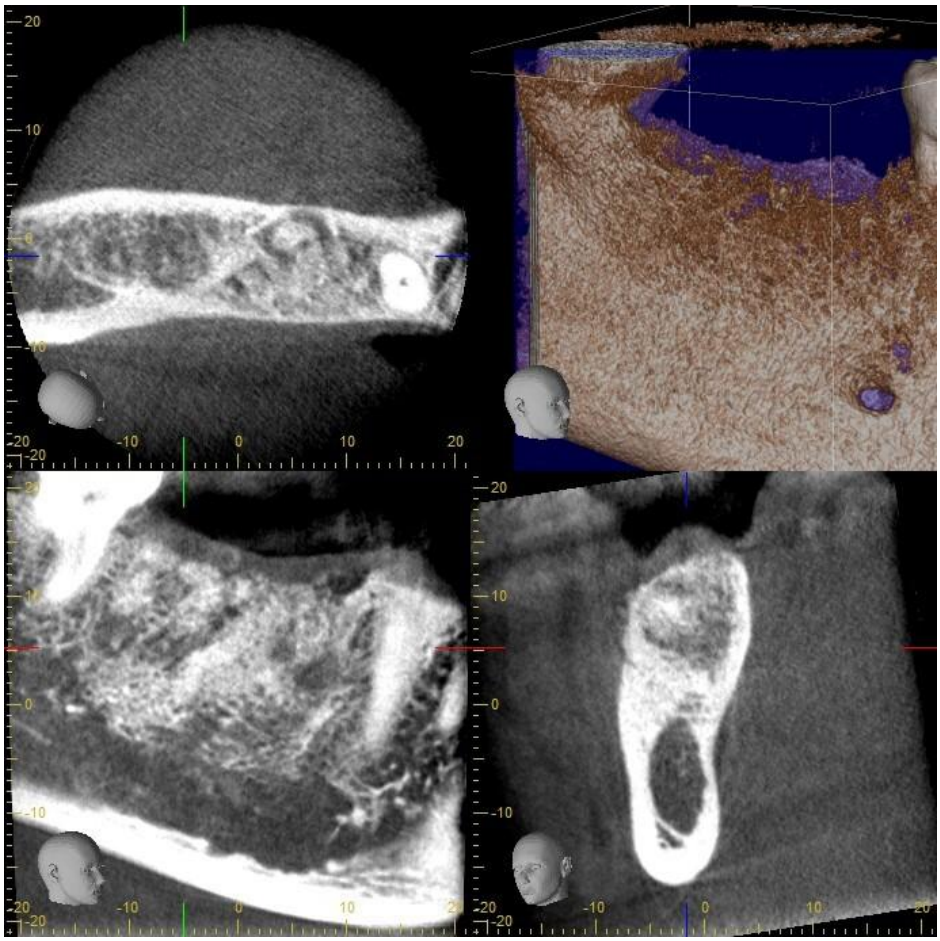

Figure 5. Tomography after 5 months of evolution.

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Adhering to the implant planning and placement protocol, three BioHorizons implants were strategically positioned to ensure optimal force dissipation in the first and second lower right molar areas. Two implants, measuring 3.8 mm in diameter and 10 mm in length, were placed with a 6 mm spacing between them. Additionally, one implant, measuring 3 mm in diameter and 10 mm in length, was positioned 3 mm away from the lower right third molar, considering the edentulous space. Subsequently, healing screws were affixed to all three implants. After 6 months, successful self-integration of the implants was achieved. **Figure 6.** As recommendations for the patient, the use of an occlusal splint or applications of botulinum toxin was suggested to ensure enhanced success following implant rehabilitation.

Figure 6. A and **B)** Clinical view of implant distribution**. C)** Radiographic view of implant distribution.

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ETHICAL CONSIDERATIONS

It is important to highlight that all procedures were carried out with the explicit informed consent of the patient. Furthermore, this research is classified as minimal risk in accordance with Resolution 8430 of 1993 from the Ministry of Health and Social Protection of Colombia. The study adheres to the guidelines outlined in the Helsinki Declaration (2013) by the World Medical Association.

DISCUSSION

Due to the scarcity of studies and their inherent limitations in exploring the effects of bruxism on dental implants, the recommendations for their placement rely primarily on clinical experience supported by insufficient evidence. The extent of damage that bruxism can inflict on implant rehabilitation has been a subject of considerable controversy, and simultaneously, there are numerous variables to consider in its implementation.

While dental implants remain a widely sought-after treatment, they come with inherent limitations and considerations that cannot be overlooked. Early and late failures may occur, as emphasized by Thanh An Do et al.[7] Notably, late failures are particularly challenging to address and are more noticeable for the patient. Discussing factors that contribute to late failure, the authors highlight excessive occlusal loads, underscoring the importance of proper management in cases involving patients with bruxism.

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The study conducted by Birgitta Häggman H et al.[8] focused on examining disparities in implant failure rates and marginal bone loss between patients with and without bruxism. The findings indicated a heightened statistical risk among patients with bruxism, primarily due to the potential for micromovements surpassing the critical limit. Such micromovements could lead to fibrous encapsulation of the implant, jeopardizing its self-integration. Moreover, the diminished proprioceptive feedback resulting from the absence of periodontal ligaments increases the risk of exerting excessive force, consequently elevating the likelihood of implant failure.

In light of the aforementioned considerations, it becomes imperative to meticulously plan these cases, factoring in the number of missing teeth and the dimensions of the edentulous gap. This meticulous planning facilitates the implementation of an appropriate distribution and quantity of implants, ultimately achieving effective force dissipation.[9,10,11] The aim is to provide superior biomechanical stability, establishing a mutual support system, and promoting a more uniform distribution of chewing loads.

It is noteworthy that bone quality remains consistent, whether dealing with patients exhibiting bruxism or not. However, it is important to acknowledge that type II and III bones may present a more favorable prognosis in mitigating loads on implants in individuals with bruxism.[12,13] Additionally, in this particular case,

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adopting a delayed load protocol was essential to ensure adequate osseointegration and preserve initial stability.[14]

Supplementary measures to mitigate the impact of bruxism in the oral cavity are vital to enhance the likelihood of successful rehabilitation. While the utilization of occlusal splints is a prevalent approach in treating bruxism patients, the existing evidence is insufficient to assert its superiority over alternative treatments.[15] Conversely, the application of botulinum toxin has shown effectiveness in less than four weeks, leading to a reduction in bite forces and pain intensity, with effects lasting up to 24 weeks. Moreover, it offers greater comfort compared to occlusal splints. Nonetheless, drawbacks such as its duration, delayed onset of action, and cost must be considered in the decision-making process. [16]

Emphasizing the significance of effective guided bone regeneration is crucial in dental implant placement. This is particularly relevant due to dimensional changes in the bone, especially impacting the integrity of peri-implant bone. In certain cases, the formation of a very thin external bone wall can occur, favoring the emergence of biological and aesthetic complications.[17] Ensuring successful guided bone regeneration becomes pivotal in maintaining the structural integrity and overall health of the peri-implant bone, thereby mitigating potential

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complications and optimizing long-term outcomes.

CONCLUSION

The correlation between bruxism and dental implant failure lacks substantial evidence, and the limited studies in this domain have resulted in significant controversy. In the current case, success was achieved in eliminating apical lesions, placing implants, and ensuring their proper distribution. Consequently, bruxism should not be considered a decisive factor for rejecting implant placement. Instead, it should be thoughtfully managed within the treatment plan to ensure the viability and sustainability of dental implants. A personalized approach, coupled with appropriate follow-up, becomes essential in navigating the complexities associated with bruxism and optimizing the outcomes of implant procedures.

CONTRIBUTIONS OF AUTHORS:

All authors included in the study participated in the design, collection, analysis, and interpretation of the clinical case, as well as in the writing and final approval of the article.

CONFLICT OF INTEREST

The authors assert that they are independent concerning financing and support institutions. During the execution of the work and the manuscript's writing, no interests or values other than those inherent to typical research activities have

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influenced the process. Consequently, the authors declare no conflict of interest.

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