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UNIDAD ACADÉMICA DE SALUD Y BIENESTAR

CARRERA DE ODONTOLOGÍA

THE EFFECTS OF BRUXISM ON PATIENTS WITH DENTAL IMPLANTS.

A LITERATURE REVIEW

TRABAJO DE TITULACIÓN PREVIO A LA OBTENCIÓN DEL TÍTULO DE ODONTÓLOGA

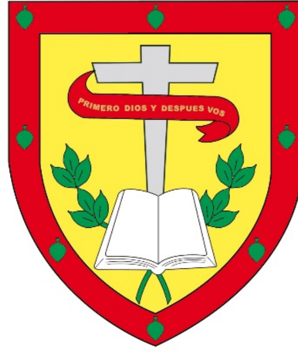
AUTOR: NICOLE GABRIELA CORDERO ASTUDILLO

DIRECTOR: DR. ERICA DAYANA QUITO VALLEJO, DMD

CUENCA - ECUADOR

2021

DIOS, PATRIA, CULTURA Y DESARROLLO



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THE EFFECTS OF BRUXISM ON PATIENTS WITH DENTAL IMPLANTS.

A LITERATURE REVIEW

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ABSTRACT

Bruxism is a parafunctional activity with involuntary nonfunctional rotation, grinding, or clenching of teeth, awake or asleep. In current literature, its association with dental implants has remained controversial. **Objective**: This article aims to analyze literature, identify the effects of bruxism on dental implants and how it could lead to complications or failure. **Data**: An electronic search of studies of the previous five years, related to bruxism and dental implants, was performed on April 2021. **Sources**: It was conducted in the following databases: Google Scholar, PubMed, Scopus, Wiley, Elsevier, and ResearchGate. **Study selection**: *Inclusion criteria* are clinical studies, meta-analysis, systematic reviews, randomized or not, that involved people with bruxism and dental implants, and published within five years of the search date. *Exclusion criteria* are duplicated, poorly designed studies, published before the search date, and people without bruxism and dental implants. **Conclusion**: Dental professionals have a generally open mental outlook on performing dental implant treatments in patients with bruxism. Literature shows consistent data on bruxism causing complications with porcelain fractures, an increase in implant failure, and mechanical complications. Research analyzed recommend the placement of as many implants, in a proper position, to reduce overload, and longer implants with a larger diameter for more implant-bone surface area. Bruxism is considered to have statistically significant effects on dental implants, but it is not a contraindication. Although, there is no specific treatment due to the diversity of existing criteria, it is suggested to follow the mentioned recommendations to prolong longevity.

KEYWORDS:

Bruxism; dental implant; complications; effects of bruxism; implant failure.

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RESUMEN

El bruxismo es una actividad parafuncional de rotacion involuntaria no funcional, rechinar o apretar los dientes, despierto o dormido. En la literatura actual, su asociación con implantes dentales sigue siendo controversial. **Objetivo**: Este articulo tiene como objetivo analizar la literatura, identificar los efectos del bruxismo sobre implantes dentales y cómo puede conducir a complicaciones o fallas. **Datos**: En abril del 2021, se realizó una búsqueda electrónica de estudios de los últimos cinco años, relacionados con bruxismo e implantes dentales. **Fuentes**: Se realizó en las siguientes bases de datos: Google Scholar, PubMed, Scopus, Wiley, Elsevier e ResearchGate. **Selección de estudios:** *Criterios de inclusión* son estudios clínicos, metanálisis, revisiones sistemáticas, aleatorias o no, con personas con bruxismo e implantes dentales, y que se publicaron dentro de cinco años posteriores a la fecha de búsqueda. *Criterios de exclusión* son estudios duplicados, mal diseñados, publicados antes de la fecha de búsqueda y personas sin bruxismo e implantes dentales. **Conclusión**: Los profesionales dentales tienen una perspectiva mental generalmente abierta sobre la realización de tratamientos con implantes dentales en pacientes con bruxismo. La literatura muestra datos consistentes sobre el bruxismo, que causa fracturas de porcelana, aumento en el fracaso de implantes y complicaciones mecánicas. Las investigaciones analizadas recomiendan la colocación de la mayor cantidad de implantes, en una posición adecuada, para reducir sobrecarga, e implantes más largos con mayor diámetro para mayor superficie implante-hueso. El bruxismo tiene efectos estadísticamente significativos sobre implantes dentales, pero no es una contraindicación. No existe un tratamiento específico debido a la diversidad de criterios existentes, pero se sugiere seguir las recomendaciones mencionadas para prolongar la longevidad.

Palabras claves:

Bruxismo; implante dental; complicaciones; efectos del bruxismo; fallo del implante.

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INTRODUCTION

Today, dental professionals strive to give patients the best possible treatment option and outcome. Science keeps advancing and we keep updating our knowledge, to understand, diagnose, and treat a patient in the best manner. Literature has been giving bruxism and dental implant failures great attention but it still is controversial. Long-term research has displayed that dental implants' survival rate exceeds 95%, with evidence that they maintain in great conditions for 8 to 10 years.[1] Despite dental implants' high success rates, complications still happen. For example, mechanical issues associated with occlusal overload and stress, such as bruxism.[2]

Meta-analysis reviews have concluded that bruxism may notably elevate dental implant failure and mechanical complication rates.[3] Bruxism is a parafunctional activity that has become more common in adults, and the consequences it has on patients with dental implants are still controversial.[4] Based on the Glossary of Prosthodontic Terms, bruxism is defined as "1) the parafunctional activity of teeth grinding and 2) a buccal tendency that involves uncontrolled rhythmical or sporadic movements of rotation, clenching, or grinding, aside from chewing movements, which could cause occlusal trauma".[4] A recent International Consensus described it as a constant masticatory muscular activity that can arise during wakefulness and/or sleep, also denominated awake or diurnal bruxism and sleep or nocturnal bruxism.[3,5] These parafunctional activities can be unconscious, involuntary, or unintended, with biomechanical overload. The general adult population has a prevalence of bruxism of approximately 10%.[6] It is considered a potential factor for attrition, mandibular joint pain, attrition, and implant loss. These probable effects emphasize their clinical relevance. Fundamentally, there is still a lack of consensus on bruxism as a concept and the association it has with dental implants, which could make it difficult to interpret the available literature.[6]

During recent years, bruxism has become a growing concern, due to its common occurrence. With a growing prevalence, it can lead to harmful health conditions like complications in dental implant treatments.[7] Per-Ingvar Branemark first introduced dental implants in the mid 1960s, and it has developed into a frequent alternative used to rehabilitate and replace dental absence.[8] They are also denominated endosseous or oral implants and are one of the best alternatives in dentistry today. Osseointegration occurs when the implant material merges with the neighboring tissue. Such integration has

various determinants, like the osseous quantity and quality, the implant material and the loading protocol and status.[9] A crucial factor in dental implant longevity and its success is osseointegration; the development of a direct and effective union of the implant and bone, without soft tissue interference, determining the implant's survival rate.[10] Although, in a successful implant integration, failure can still occur if there is an overload on the definitive restoration.[11] Therefore, occlusal forces are an influential factor in determining the complete integration of dental implants and their overall success.

Throughout time, dental implants have developed into a cutting-edge advanced method in modern dentistry for patients that are partially or completely edentulous.[11] Although, once bruxism is associated with these patients, the main concern is if this parafunctional activity will affect the favorable outcome of the dental implants and their rehabilitation. Various authors have debated and agreed that it is possible to treat bruxers with dental implants, but there are a series of consequences that can be acquired.

The aim of this article is to analyze literature and identify the effects of bruxism on patients with dental implants. Furthermore, analyze how this parafunctional activity could lead to dental implant complications or failure, as well as in its rehabilitation. Thus, this study will further advance dental research by helping people discover more data on bruxism and better understand how it can impact dental implants. Dentists and dental students should be equipped with basic knowledge in this field. Further understanding, its association will aid to improve the success rate of patients with this affectivity and treatment.

MATERIALS AND METHODS

An electronic search of studies related to bruxism and dental implants was performed on April 2021 to collect scientific articles published throughout the previous five years.

Inclusion criteria: is clinical studies, meta-analysis, systematic reviews, randomized or not, that involved people with bruxism and dental implants, and published within five years of the search date.

Exclusion criteria: is duplicated, poorly designed studies, published before the search date, and people without bruxism and dental implants.

Search strategies: the electronic search was conducted in 2021, without language restrictions, in the following databases: Google Scholar, PubMed, Scopus, Wiley, Elsevier, and ResearchGate. The terms included in the search strategy were as follows: "bruxism and dental implants", "bruxism and implant failure", "effects of bruxism on dental implants", "implications of bruxism on dental implants" and "bruxismo e implantes dentales". An initial scan of over 2000 articles was performed, based on the title and abstract. However, after a rigorous analysis, there was a total of 80 scientific articles evaluated, 50 excluded, and 30 high-quality studies included, from the year 2016 to 2021.

REVIEW OF LITERATURE

The literature published on bruxism today still has a persisting conflict on its etiology and diagnosis, but overall, it has been recognized to be a multifactorial disorder.[11] It is known as a neuromuscular disorder with unconscious muscular hyperactivity, which is caused by signals in the central nervous system and can produce overloads on dental and prosthetic structures. This makes it an essential component of clinical evaluation in the prognosis and long-term functionality.[12] Especially since it can involve neurological, psychological, and socio-environmental complications.

Since the use of dental implants has expanded, so has its treatment in bruxers. Therefore, occlusion forces, due to their intensity, duration, frequency, and direction, can influence the functional and structural durability of dental implants, their components, and the restorations they support. In this increasing implant use, it is necessary to know the risk factors for the damage or loss of implants, especially in patients with bruxism, since it is essential for prevention and control.[12] To date, the management and control recommended in bruxers with dental implants depend more on clinical experience than the scientific basis. A dental implant is acknowledged as a failure when it displays various signs and/or symptoms that lead to its extraction.[3]

SIGNS OF BRUXISM

There are a variety of signs that can indicate that individuals are suffering from bruxism, either awake or during sleep. As reported by the International Classification of Sleep Disorders, signs and symptoms of bruxism include: [13]

- Constant teeth grinding (asleep or awake).
- Abnormal teeth wear, compatible with tooth grinding.
- Transitory daylight muscular jaw pain or fatigue.
- Temporal arteritis.
- Jaw lock.
- Clenching and/or grinding of teeth.
- Awake energetic thrusting of the mandible.[3]
- Masseter muscle hypertrophy.

SEVERITY DEGREES OF BRUXISM

The severity of bruxism is diagnosed based on the sum of enamel and dentin that has been eliminated, as well as the level of teeth grinding that has occurred in each individual.[14]

Class I: Mild Bruxism

In mild bruxism, patients express that they are aware or have been told they clench or grind their teeth, and such noises, especially during sleep, validate this.

Clinical signs and symptoms: masseteric hypertrophy, trismus, headaches, migraines, cheek and/or lip biting, indentations and/or burning sensation on the tongue, hypersensitive teeth, muscular masticatory pain, temporomandibular joint (TMJ) tenderness, and clicking or locking of the TMJ.[14]

Class II: Moderate Bruxism

Clinical signs and symptoms: In addition to the mentioned signs and symptoms, patients present moderate tooth attrition with 1-2mm of enamel loss but no dentin exposure on the incisal edges or cusp tips, unjustifiable with normal tooth wear.[14]

Recommendation: A light hard-soft nightguard is recommended with 2-4mm of thickness.[14]

Class III: Severe/Advanced Bruxism

Clinical signs and symptoms: Additionally, there is the presence of severe tooth attrition with more than 2mm of enamel loss and dentin exposure on incisal edges or cusp tips, unjustifiable with normal tooth wear. Furthermore, exposed dentin and pulp shows a direct cause of untreated bruxism over a long period of time.[14]

Recommendation: A light hard-soft nightguard is recommended with 2-5mm of thickness or 100% acrylic appliance with 3-6mm of thickness.[14]

BRUXISM AND DENTAL IMPLANTS

Endosseous implants are considered a promising treatment option to restore missing teeth in partial or completely edentulous patients. Numerous studies evaluated approximately 66.4% of patients to be free from complications and ensured the restoration of an implant-supported fixed prosthesis, while the others faced complications connected to risk factors like bruxism.[15,16,17] Three major factors can lead to the loss of an implant and dental prosthesis: "1) the implant design (size, design and material), 2) the biomechanical pr physical occlusal overload, and 3) an inaccurate operative and prosthetic planning".[18] Bruxism is a parafunctional activity that can generate an overload and numerous professionals consider dental implants to not be an ideal treatment for these patients because of their greater possibility of failure.[18] Some indications of an excessive occlusal load include the loosening of screws and other connecting devices, peri-implant tissue inflammation and bleeding, peri-implant bags with exudate, and vertical bone loss around the implant. Excessive occlusal loads in an axial or lateral direction can damage the implant structure and substructures by exceeding the vertical force of 50 to 100 Nw.[12] Moreover, prosthesis or suprastructure fractures can arise.

Chewing overload due to bruxism can affect biomechanical and biological aspects. Biological changes can occur in early and late stages. An early change reveals an altered osseointegration process and loss of the implant before its prosthetic loading. While late biological complications develop when there is a yearly bone loss of more than 0.2 mm

around the implant neck. Biomechanically, some implant systems fail due to misalignment, fracture or loss, and possible prosthetic fracture. Mechanical complications are mainly a result of periodontal ligament sensory loss, and the incapability to compensate for the excessive compression and displacement forces. Implants have a physical limit of 3-5 μm in the apico-coronal direction and 10-50 μm in the vestibule-lingual direction. However, the degree of risk regarding the strength in bruxism for restorations through implants is not clarified in medical or dental literature.[12,19]

Lobbezoo et al. consider bruxism a clinical issue that can possess harmful effects on periodontal, dental, and muscular skeletal tissues. It produces occlusion overload on implants and their suprastructures, which can cause bone loss around the implants and possible failure, but there are no consistent outcomes yet. Consequently, a conscientious approach is suggested, as well as a reduction or elimination of bruxism and protection with a nightguard of the final treatment.[6,20] Moreover, sleep bruxism is considered to be a higher risk for implant restorations, as oppose to awake bruxism, since the oblique and horizontal force applied in teeth grinding is more prone to cause osseointegration failure than with compressive axial loads in teeth clenching.[21]

BRUXISM AND PROSTHODONTICS

Bruxing can affect the prosthesis or rehabilitation process because it is more often related to mechanical complications, than biological ones. Some mechanical complications are ceramic chipping or fracture, screw loosening, and fixture or abutment fracture. Whereas, the biological complications involve a compromised marginal bone junction and biological failure. Therefore, in prosthodontic treatment planning, all risk factors that can be magnified by bruxism should be examined.[19] Research shows that bruxers have greater failure in prostheses than those that do not suffer from bruxism.[16,22]

EFFECTS OF BRUXISM ON DENTAL IMPLANTS

Professionals from the analyzed studies have examined the effects that bruxism can have on dental implants, and investigators' views vary on what can occur in such individuals. Parafunctional habits are frequent occlusal alterations, especially bruxism. Such heavy

occlusal forces create a risk in dental implant loosening.[23] A retrospective clinical analysis showed that implant fracture can occur throughout the first years after a functional load is placed, when there is an overload due to bruxism or an incorrect occlusion.[18] Metal fatigue and implant fractures are more frequent in bruxers than in individuals that do not present bruxism. Gulati et al. have reported that more than 77% of all implant fractures occur in patients with a history and signs of chronic bruxism. This para-functional habit is linked to greater peri-implant bone loss.[23]

Furthermore, dental implants complications are split into early and late failures. Early failures are associated with osseointegration, and late failures to occlusion overload. Therefore, bruxism is linked to late failures, particularly with screw loosening, screw fracture, ceramic or porcelain prosthesis fracture, decementation, severe marginal bone loss, and implant fracture. Authors believe failure increases with the frequency and intensity of bruxism or excessive occlusal stress inflicted in areas of dental implants. Parafunctional force directions also affect dental implants and their prosthesis survival rates.[24,25,26]

The analyzed studies have expressed that the implant-suprastructure complex can obtain biological or mechanical complications of approximately four times more in bruxers than non-bruxers.[22,24,27]

Biological complications:

These complications may include early and late biological failures.

Early failures involve inadequate osseointegration, where implants are lost prior to the first prosthetic loading.

Late failures include pathological bone loss posterior to achieving complete osseointegration at an earlier stage.[16,28] It is related to occlusal overload, which can cause a greater risk of implant failure and peri-implant marginal bone loss.[28,29]

Biological complications have an influence on bone and surrounding soft tissues. These are determined by the bleeding and/or suppuration on probing, the depth of pocket probing, and the amount of marginal bone loss throughout time.[27]

Mechanical complications:

Technical or mechanical complications include implant fracture, connecting or abutment screw loosening or fracture, excessive wear or loosening of mesostructure in implant-supported dentures, and excessive wear or fracture of acrylic teeth or porcelain in the suprastructure.[16,28] They can also affect prosthesis loss, veneer fractures, prosthesis retention loss, screw-hole sealing loss, and veneer material chipping.[27]

Bruxism creates extreme occlusal forces that have a higher probability of leading to implant failure, which is why its diagnosis and specific protocols, like a nightguard and/or botulinum toxin injections before implant placement, are very important to avoid such risks from incrementing.[25]

OPINIONS OF ACCREDITED ORAL IMPLANTOLOGISTS IN A QUALITATIVE STUDY (Thymi et al.)

Dental implants in patients with bruxism:

There are two mental outlooks regarding implant dentistry in individuals with bruxism. One advocates a positive approach, where bruxism is not a contradiction for dental implants, and they are possible treatment options but precautions need to be taken, such as not having orofacial pain before starting the implant treatment. Implants can help distribute forces over the dentition. While others express a negative attitude towards implants on bruxers, especially with patients that clench.[24]

Dental implant complications with bruxism:

Some interviewees have never experienced implant complications related to bruxism, while others have. The types of complications mentioned are wear or fracture of mesostructure, wear or fracture of overdentures, porcelain chipping, antagonistic wears, screw loosening fractures, and implant fractures. There were divergent views regarding bone loss and loss of osseointegration; some interviewees believed it was an effect of bruxism but others argued it was just an implant that was "never well-integrated".[24]

The mechanism of implant complications with bruxism:

Interviewees discussed some factors they found related to bruxism; for example, an excessive load, which is a mechanical component, can lead to bone loss, then bacterial invasion and peri-implantitis. Therefore, a load can generate micro movements of the implant in the bone and cause a loss of osseointegration, especially if it was already poor. Uncertainty remains with the relation between peri-implant bone loss and bruxism. While, other complications mentioned were inattentiveness of the dental professional with the tightening of screws, occlusion, etc.[24]

Treatment aspects on bruxers:

It is extremely important to assess bruxing patients and observe their occlusion, their articulation during mandibular movements, the materials to use, protection against bruxism, and technical issues. Implantologists agree that when the mandible produces lateral movements, the superstructures should not be contacting their antagonists. On FDPs (fixed dental prostheses), occlusion should be approached with the superstructure: "entirely out of contact, occluding with the antagonists only in maximal occlusion, or when authorized to remain in regular occlusion". Therefore, these should be supervised during preventive check-ups to control wear and slight movement during the years, and to avoid undesirable contacts with antagonists.[24]

Protection on the final restorations is essential for treatment maintenance. Occlusal splints are advised, especially for sleep bruxers. As for the material, interviewees argued that the type of material placed on patients does not change the treatment prognosis, regardless of the patient being a bruxer or not. Some specialists prefer hard material, while others a soft one, due to the patient's comfort. Less attention is given to awake bruxism, but specialists believe in making such patients more aware of it and for them to learn to control it so it can be avoided. Wide implants are preferred, if necessary, with bone augmentation to create room for a wider implant, and an extended waiting period before implant loading. It is believed that there should be the placement of as many implants as possible, to distribute the chewing forces. The dental technician's skills are very important for the longevity of the treatment.[24]

Implantologists have different preferences for fixed dental prostheses materials; monolithic zirconia, lithium disilicate, metal surfaces, or composite. With rapid prototyping (RP), which is a technique to construct a three-dimensional (3D) model using 3D printers, specialists believe in resilient mucosal supported prosthesis designs so that patients feel pain when they start bruxing and that will increase patient awareness. Likewise, they should be taken out during sleep.[24]

Once the treatment is complete, practitioners play an important role in its longevity by signaling changes in occlusion and articulation, and by proper handling implant components during check-ups.

Communication with bruxing patients:

Interviewees believe that it is important to discuss beforehand the concept of bruxism and its consequences in implant dentistry. Likewise, the risks, expectations, and protection should be discussed, and written informed consent should be signed. Dentists and patients should be aware of the problem and it should be discussed.[24]

DISCUSSION

Dental implants are an optimal rehabilitation method for teeth absence, although, bruxism in patients with such treatment can cause many of the previously mentioned complications. It is a cause-and-effect relationship, that when a greater uncontrolled implant loading occurs, it can contribute to micromotions superior to its limit and result in an implant with fibrous encapsulation instead of osseointegration.[29]

According to the literature reviewed, dental implants in individuals that suffer from parafunctional habits, such as bruxism, displayed 41% of significant defects, compared to 12% of error in patients without parafunctions.[1] Authors claim that force is determined by variables such as “magnitude, duration, direction, type, and frequency”. Therefore, when these variables increment, they are capable of activating force patterns that will delay dental implant failure.[1] The vast majority of bruxism incidents appear in the phase of light sleep and are followed by cardiac arrhythmia.[1] Biomechanical and parafunctional pressure on natural teeth or implants are identified by the repetitive and constant contacts

in occlusion, which are damaging to the stomatognathic system.[1] Studies have pointed out that dental implant fracture is nearly rare, with approximately 0.2-1.5%. However, clinical effects are important because it can lead to different issues, such as bruxism, which generate a higher load over implants and prosthesis, increasing fracture and marginal bone loss.[16,18] Likewise, Naert et al. concur that an overload generated from parafunctional habits is presumably the source of marginal bone tissue and dental implant loss.[1] Overload can also cause other effects on dental implants, such as screw or implant loosening or fracture, retention loss, and a disproportion in bone remodeling and absorption, which could contribute to marginal bone loss peri-implantitis.[15]

In addition, Stoichkov/Kirov et al. detected bruxism in patients representing 17 implants of a total of 218, and the result indicated that bruxism has 80% of statistical significance in cases of dental implant fracture. It is seen as an etiologic factor that leads to biologic and biomechanical complications in implant-supported prostheses. Similar to Pommer et al., which determined that 89.6% of fractures presented with a parafunctional activity.[18] Contrarily, Zupnik et al. analyzed 220 nonclenchers and 121 clenchers, with a total of 341 dental implants, and found there to be no interaction between bruxism and implant failure, causing controversial views on such matter.[10] Meanwhile, Chitumalla, et al. conducted a retrospective study of 450 patients (240 male; 210 female) with 640 dental implants, from which, 124 were bruxers. In such results, the survival of implants in male bruxers was 90% after 1 year, and 72% after 5 years, while in females, it was 92% after 1 year, and 70% after 5 years, presenting no statistical distinction among genders.[10] Although, Chrcanovic et al. compared the systemic conditions and other factors in their study and found the statistical significance of more men than women bruxers.[3]

Manor et al. reported that bruxism shows no significant effect in late failures, contrary to Chrcanovic et al., who revealed that it is actually a great significant risk factor for late failures.[8] In agreement with Chrcanovic et al, bruxism's association with extensive and unpredicted occlusal forces can endanger the implant's survival rate and cause biological and mechanical complications. Chrcanovic et al. studied 3549 implants installed in 994 individuals, with 185 implants placed in 56 bruxing patients. There was 13.0% (24/185) of implant failure in bruxers and 4.6% (155/3364) in nonbruxers, showing statistical significance in bruxers.[3] Kandasamy et al., evaluated 200 patients with 650 implants, of which 78 failed, resulting in a 14.55% failure rate due to bruxism, similar to Chrcanovic et al.[30] In addition, wider and shorter implants were more frequent in bruxers, and

enlarged-surface implants as well. Bruxing patients acquired more implants in the posterior area of the jaw and bone augmentation surgeries were performed more often as well, suggesting once more its association with an increased implant failure rate.[3] Glauser et al. determined that there is greater implant failure in bruxers (41%) than non-bruxers (12%).[1] Likewise, a meta-analysis analyzed the mean success rate and found 74.59% of success in patients having dental implants with bruxism, and 92.6% in patients having dental implants without bruxism, confirming that bruxers indeed have a higher failure rate.[16]

Kadu et. al.'s meta-analysis and systematic review assure that implant failure and bruxism have statistical significance and that the prosthesis failure rate is higher as well. According to literature, the chipping or fracture of porcelain on an implant with a reinforced crown is a usual complication in bruxers because there is a bite force of greater strength and density.[10,15,17,22] Likewise, various retrospective studies examined the prosthetic complications of implants associated with bruxism and included: access hole material loss, chip or wear of the veneering or prosthetic material, screw loosening, and framework fracture. Such complications involve a record of bruxism, especially without treatment, like using an occlusal stabilization splint.[31] To date, studies have found that implant-protected occlusion (IPO) can reduce overload and guarantee clinical longevity.[16,18] Van der Zaag et al. performed a study on 21 nocturnal bruxing patients and established that nightguards should be imperative in such patients, due to frequent issues like the screw loosening or fracturing, implant fractures, ceramic or porcelain fractures, and decementation. Overload induced by bruxism can also produce implant-supported prostheses failure, which is why an occlusal splint is considered highly important.[10]

On the contrary, results in literature have shown that bruxism is not always the main reason for implant complications, since low bone density, contrasting natural dentition, and male patients are risk factors in implant failures as well.[15] Thus, views are very controversial on the effects that bruxism can have on dental implants. Sánchez-Santamaría et al. performed a simulation with a mechanical behavior modeled structure in magnitudes of 800N with a dental implant in a maxillary central incisor, and it resulted without complications, since the parafunctional forces generated by bruxism are not higher than those presented in the modeled structure, so it will not create permanent bone deformations.[2]

CONCLUSION

Overall, implantologists have a generally open mental outlook on performing implant treatments in patients with bruxism. Some complications can arise in daily practice and research, but it does not have to be a contraindication. Considering that the prevalence of individuals with bruxism is growing and has become more common, implant treatment in such a population is inevitable. Literature shows controversy on bone loss and osseointegration loss as an aftereffect of bruxism, with some arguing against its relation. Although, bruxism has shown consistent data in complications with porcelain fractures and an increase in implant failure and mechanical complications. Therefore, bruxism must be diagnosed mainly by extra-oral and intra-oral clinical examination, and patient anamnesis. If practitioners, rather than just self-report, adopt more clinical signs to diagnose bruxism, the results would be furthermore accurate in daily practice and treatment planning. Clinicians should be able to conduct an appropriate diagnosis of bruxism, by determining the type and the degree of severity, for an adequate preoperative plan. Researchers have recommended the placement of as many implants possible, in an appropriate position, to reduce excessive forces. As well, longer implants with greater diameter are recommended, so there can be more implant-bone surface area; reducing stress surrounding the bone and implant. Prosthesis supported by dental implants should have proper maintenance to reduce its complications. As well, patients with awake bruxism should self-monitor and control the problem, while patients with sleep bruxism need a nightguard occlusal stabilization splint to reduce dental implant complications. Predominantly, bruxism is considered to have statistically significant effects on patients with dental implants, but since it is not precisely a contraindication and its prevalence is growing, professionals need to be reminded of such complications, to conduct an adequate treatment plan in such individuals and obtain favorable results. There is no specific treatment for these patients due to the diversity of existing criteria, so it is suggested to follow the mentioned recommendations to prolong the longevity of dental implant treatments in bruxers.

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