Odovtos-International Journal of Dental Sciences (Odovtos-Int. J. Dent. Sc.), Online First, 2025. ISSN: 2215-3411
https://doi.org/10.15517/ijds.2025.575

ODOVTOS
International Journal of Dental Sciences

UNIVERSIDAD DE COSTA RICA FOd Facultad de Odontología

https://revistas.ucr.ac.cr/index.php/Odontos

NEW PERSPECTIVE ARTICLE:

Current View of the Clinical Management of Bruxism in Dentistry

Visión actual del manejo clínico del bruxismo en odontología

Cristian Camilo Morales-Lastre DDS[1] https://orcid.org/0000-0001-9837-6361
Ana Melissa Morales-Ramírez DDS[2] https://orcid.org/0009-0005-0466-1847
Jorge H. Wilches-Visbal Eng, MSc, PhD[3] https://orcid.org/0000-0003-3649-5079
Midian C. Castillo-Pedraza DDS, MSc PhD[4] https://orcid.org/0000-0003-3170-3959

[1]Dentist, Clínicas Prevenga Comfama Odontología. Sabaneta, Colombia.
[2]Dentist, Hospital Eduardo Arredondo, Valledupar, Colombia.
[3]Associate Professor. Dentistry Program, School of Health Sciences, University of Magdalena, Santa Marta, Colombia.
[4]Assistant Professor. Dentistry Program, School of Health Sciences, University of Magdalena, Santa Marta, Colombia.

Correspondence to: Jorge H. Wilches-Visbal - jwilches@unimagdalena.edu.co

Received: 4-IV-2025 Accepted: 4-VI-2025

ABSTRACT: Bruxism is a parafunctional activity involving repetitive movements of the masticatory muscles, often associated with stress, anxiety, and other psychosocial or physiological factors. This paper offers a comprehensive review of its clinical management, discussing diagnostic approaches and therapeutic strategies. Diagnostic methods include clinical examination, self-reported scales such as the CBA and PSS-14, electromyography, and polysomnography. Management requires an individualized, multidisciplinary approach. Occlusal splints remain the most widely used intervention for protecting dental structures. Botulinum toxin has shown efficacy in reducing muscle activity in severe cases, while physical therapies, acupuncture, and photobiomodulation (laser and LED) offer promising complementary options. LED therapy is emerging as a non-invasive alternative for pediatric patients. The findings suggest that early diagnosis and a personalized combination of conventional and alternative treatments can improve clinical outcomes. The integration of stress assessment tools and new technologies is essential for optimizing bruxism management in dental practice.

KEYWORDS: Bruxism; Diagnosis; Interdisciplinary communication; Phototherapy; Occlusal splints.

RESUMEN: El bruxismo es una actividad parafuncional que involucra movimientos repetitivos de los músculos masticatorios, comúnmente asociada con el estrés, la ansiedad y otros factores psicosociales o fisiológicos. Este manuscrito ofrece una revisión integral sobre su manejo clínico, abordando métodos diagnósticos y estrategias terapéuticas. Las herramientas diagnósticas incluyen el examen clínico, escalas de autoinforme como el CBA y la PSS-14, la electromiografía y la polisomnografía. El tratamiento requiere un enfoque individualizado y multidisciplinario. Las férulas oclusales siguen siendo la intervención más utilizada para proteger las estructuras dentales. La toxina botulínica ha demostrado ser eficaz en la reducción de la actividad muscular en casos severos, mientras que las terapias físicas, la acupuntura y la fotobiomodulación (láser y LED) se presentan como opciones complementarias prometedoras. La terapia con LED, en particular, surge como una alternativa no invasiva en pacientes pediátricos. Los hallazgos sugieren que el diagnóstico temprano y la combinación personalizada de tratamientos convencionales y alternativos mejoran los resultados clínicos.

PALABRAS CLAVE: Bruxismo; Diagnóstico; Comunicación interdisciplinaria; Fototerapia; Férulas oclusales.

Currently, bruxism is recognized as a common condition encountered in dental practice. It is associated with repetitive activity of the masticatory muscles, characterized by clenching and/or grinding of the teeth and mandibular thrusting (1). Its etiology is multifactorial and involves pathophysiological factors such as genetics, parafunctional habits (lip or object biting, onychophagia), gastroesophageal reflux, airway obstruction, mouth breathing, alcohol and added sugar consumption, medication use, and smoking (1, 2). Other psychological factors include stress, anger, frustration, and anxiety (3).

Bruxism can be classified according to circadian manifestation (sleep or awake), medical causes (primary or secondary), and the harmful effects on the stomatognathic system (physiological or pathological) (3-5). To establish an accurate diagnosis, three fundamental aspects must be considered: anamnesis, clinical examination, and diagnostic aids (5, 6). The anamnesis aims to evaluate sleep quality, diet, medication, parental/caregiver reports (in children) of dental grinding, complaints of muscle pain, headaches, sleep routines, and airway characteristics (2). The clinical examination involves an intraoral assessment to identify non-functional wear facets, fractures in teeth and restorations, dental hypersensitivity, pulpal changes, audible occlusal sounds, morning tooth mobility, and occlusal interferences (dental component); as well as traumatic ulcers, linea alba on the buccal mucosa, tongue indentations, and gingival recessions. An extraoral examination is also conducted to evaluate the presence of muscle pain in the head or neck, muscle hypertrophy, muscle fatigue (muscle component), and joint-related signs such as joint noises, pain, or restricted mouth opening (joint component) (7).

Electromyography to detect bruxism during wakefulness and sleep, and polysomnography including electroencephalogram, electrocardiogram, airflow monitoring, and video/audio recordings during sleep are useful diagnostic tools (1). Additionally, self-assessment questionnaires have been used to evaluate significant associations between bruxism and psychological conditions such as stress and anxiety or parafunctional habits (1).

Cruz Fierro *et al.* (8) conducted a study using the Perceived Stress Scale (PSS-14) alongside a self-reported bruxism questionnaire (CBA) in two groups of 50 individuals, one with clinical

and self-reported bruxism and one without. Internal consistency reliability, factorial structure, and convergent validity between the PSS-14 and CBA were evaluated. Results showed internal consistency across the 11 items (α=.88). Confirmatory factor analysis for a single factor showed acceptable fit indices (χ2/df=1.461; GFI=.916; AGFI=.857, CFI=.967, RMSEA=.068). A positive correlation was found between the PSS-14 and CBA scales (r=.27; p=.001). The findings from the CBA showed strong reliability, consistent internal structure, and adequate correlation between items, confirming the questionnaire's convergent validity.

Clinical management of bruxism involves identifying and controlling its underlying factors and mechanisms (2). Due to its multifactorial nature, an interdisciplinary approach is required, including psychological care for self-care and emotional self-regulation techniques, physiotherapeutic care through myofascial manual therapy promoting muscle relaxation, and specialized dental care using occlusal splints to prevent dental wear or fractures and soft tissue injuries, as well as the use of neuromodulators like botulinum toxin (1,5,7). Additionally, low-level laser therapy and LED photobiomodulation therapy have been reported as alternative treatments to alleviate symptoms and signs (9). LED light emission generates a biostimulation process in the masticatory muscles, promoting blood circulation and producing analgesic and anti-inflammatory effects (10).

Kobayashi *et al*. (10) compared the effects of infrared LED photobiomodulation therapy with occlusal splint therapy in children with electromyographically diagnosed sleep bruxism in masseter and anterior temporal muscles. An increase in resting activity of the right masseter muscle was observed following photobiomodulation, whereas elevated electromyographic activity of the right and left temporalis muscles, as well as the left masseter, was noted only in children who used occlusal splints.

Da Consolac *et al*. (11) conducted a study involving 76 children aged 6 to 12 years, divided into four groups: G1 (bruxism + laser therapy applied to acupuncture points; λ=786.94 nm, 20 seconds per point, fluence=33.5 J/cm², energy=1 J, 12 points); G2 (bruxism+occlusal splint therapy); G3 (bruxism+placebo laser therapy); and G4 (control group without bruxism). The laser treatment comprised 12 sessions, delivered twice a week, using the Therapy EC-DMC device. Clinical indicators-such as bite marks on the oral mucosa, headache reports, bite force (BF), and salivary cortisol levels (as a stress biomarker)-were evaluated before and after treatment. Statistical analyses included ANOVA and normality tests.

The results showed that children with bruxism responded favorably to photobiomodulation therapy, with reductions in both bite force and the frequency of headaches. Significant differences in headache occurrence were found pre- and post-treatment in both G1 and G2. Notably, G1 showed the lowest bite force bilaterally after treatment, indicating muscle relaxation and reduced tissue damage from intense muscle contractions.

Acupuncture has also been used for bruxism treatment, demonstrating decreased activity in the masseter and anterior temporalis muscles. Stimulating specific acupuncture points can modulate blood circulation and promote muscle relaxation, thereby alleviating spasms, inflammation, and pain. Stimulation methods include needles, infrared radiation, electrical currents, or lasers-the latter being especially suitable for pediatric patients due to its painless application and shorter exposure time per point (12).

Table 1. Summarizes the advantages and disadvantages of the most common bruxism treatments.

Treatment	Advantages	Disadvantages
Occlusal splints	Prevent wear and fracture of teeth; protect soft tissues	Do not eliminate the etiology; require long-term use
Botulinum toxin	Reduces muscle hyperactivity; effective in severe cases	Requires periodic application; potential side effects
Low-level laser therapy	Promotes analgesia and anti-inflammatory effects; improves muscle relaxation	Requires specialized equipment and training; multiple sessions
Photobiomodulation with LED	Non-invasive; effective in children; painless	Limited scientific evidence; requires multiple applications
Acupuncture	Reduces muscle activity; promotes relaxation; may decrease pain	Requires trained professionals; some patients may fear needles
Analgesics and muscle relaxants	Provide symptomatic relief in acute phases	Do not address underlying causes; prolonged use not recommended

In conclusion, bruxism is a multifactorial disorder encompassing various genetic, parafunctional, and psychological aspects. Dentists must be able to identify the most effective strategies for their management, considering the individual needs of each case and promoting an interdisciplinary approach. Patient education and prevention are essential to prevent the progression of this disorder. Occlusal splints remain one of the main strategies for bruxism treatment; however, analgesics and muscle relaxants can be useful for symptomatic relief in acute pain cases. A notable advancement is the use of botulinum toxin, which has proven effective in reducing prolonged muscle activity in severe bruxism, alongside acupuncture, low-level laser therapy, and photobiomodulation.

One future perspective of this work is to conduct new studies comparing available diagnostic methods, evaluating their accuracy and clinical utility to improve early detection and treatment of bruxism.

ACKNOWLEDGMENTS

Authors declare that they have utilized artificial intelligence software (ChatGPT Plus) to enhance the writing of certain sections of the manuscript.

CONFLICT OF INTEREST

None.

AUTHOR CONTRIBUTION STATEMENT

Conceptualization and design: C.C.M.L and A.M.M.R.
Literature review: C.C.M.L, A.M.M.R.
Writing-original draft preparation: C.C.M.L and A.M.M.R.
Writing-review & editing: M.C.C.P and J.H.W.V.
Supervision: M.C.C.P and J.H.W.V.

REFERENCES

1. Cifuentes-Harris C.B., Véjar-Véjar N., Salvado-Robles B., Gómez-Pastene F., Azocar-Hemmerdinger A. Bruxismo: etiología, diagnóstico y sus repercusiones en adultos. Revisión de la literatura. Odontol Sanmarquina. 2022; 25 (4): e23839. Available from: https://revistasinvestigacion.unmsm.edu.pe/index.php/odont/article/view/23839
2. Pinos Robalino P.J., Gonzabay Bravo E.M., Cedeño Delgado M.J. El bruxismo conocimientos actuales. Una revisión de la literatura. RECIAMUC. 2020; 4 (1): 49-58. Available from: https://reciamuc.com/index.php/RECIAMUC/article/view/430
3. Inga Morocho H.A., Cárdenas Vidal F. de L. Bruxismo en niños panorama actual: revisión de la literatura. Res Soc Dev. 2022; 11 (10): e581111033109. Available from: https://rsdjournal.org/index.php/rsd/article/view/33109
4. Manfredini D., Ahlberg J., Aarab G., Bender S., Bracci A., Cistulli P.A., et al. Standardised Tool for the Assessment of Bruxism. J Oral Rehabil. 2024; 51 (1): 29-58. Available from: https://onlinelibrary.wiley.com/doi/10.1111/joor.13411
5. Revisión A DE, Wwwmedigraphicorgmx R, de Yucatán A. Conocimientos actuales para el entendimiento del bruxismo. Revisión de la literatura. Rev ADM. 2018; 75 (4): 180-8. Available from: https://www.medigraphic.com/cgi-bin/new/resumen.cgi?IDARTICULO=81744
6. Oyarzo J.F., Valdés C., Bravo R. Etiología, diagnóstico y manejo de bruxismo de sueño. Rev Médica Clínica Las Condes. 2021; 32 (5): 603-10. Available from: https://linkinghub.elsevier.com/retrieve/pii/S0716864021000882
7. Ponce-Rivera H.A., Suárez-Andrade N.C. Bruxismo y manifestaciones clínicas en el sistema estomatognático. Rev Arbitr Interdiscip Ciencias la Salud Salud y Vida. 2024; 8 (1): 68-74. Available from: https://fundacionkoinonia.com.ve/ojs/index.php/saludyvida/article/view/3696
8. Cruz Fierro N., González Ramírez M.T., Juno Vanegas Farfano M.T. Cuestionario de bruxismo autoinformado. Estudio piloto en el noreste de México. Interdiscip Rev Psicol y Ciencias Afines. 2019; 36 (2): 217-32.
9. Duarte A.V.M., Oliveira G.G.C., Santos M.S., Barbosa R.P., Santos S.K.D. dos. Terapias atuais utilizadas no tratamento do bruxismo. Brazilian J Implantol Heal Sci. 2023; 5 (5): 786-98. Available from: https://bjihs.emnuvens.com.br/bjihs/article/view/650
10. Kobayashi F.Y., Castelo P.M., Politti F., Rocha M.M., Beltramin R.Z., Salgueiro M.D.C.C., et al. Immediate Evaluation of the Effect of Infrared LED Photobiomodulation on Childhood Sleep Bruxism: A Randomized Clinical Trial. Life. 2022; 12 (7): 964. Available from: https://www.mdpi.com/2075-1729/12/7/964
11. Salgueiro M. da C.C., Kobayashi F.Y., Motta L.J., Gonçalves M.L.L., Horliana A.C.R.T., Mesquita-Ferrari R.A., et al. Effect of Photobiomodulation on Salivary Cortisol, Masticatory Muscle Strength, and Clinical Signs in Children with Sleep Bruxism: A Randomized Controlled Trial. Photobiomodulation, Photomedicine, Laser Surg. 2021; 39 (1): 23-9.
12. Salgueiro M. da C.C., Bortoletto C.C, Horliana A.C.R., Mota A.C.C., Motta L.J., Motta P. de B., et al. Evaluation of muscle activity, bite force and salivary cortisol in children with bruxism before and after low level laser applied to acupoints: study protocol for a randomised controlled trial. BMC Complement Altern Med. 2017; 17 (1): 391.