



**ORTHOPEDIC TREATMENT PLANNING IN PATIENTS WITH
BRUXISM: MATERIAL SELECTION, OCCLUSAL SPLINTS, AND LONG-
TERM MAINTENANCE OF RESTORATIONS**

YUSUBJONOVA.B.KH.

TASHIMBETOV.B.A.

TURAYEVA.R.SH.

Kimyo International University in Tashkent.

Annotation: *Bruxism is a parafunctional oral habit characterized by involuntary clenching and grinding of the teeth, which leads to excessive occlusal loading and accelerated wear or failure of dental restorations. It presents a significant challenge in prosthodontic and orthopedic treatment planning due to the increased risk of fracture, material fatigue, and occlusal instability.*

Successful management requires a comprehensive approach that focuses on controlling occlusal forces, selecting high-strength restorative materials, and ensuring long-term protection of both natural teeth and prosthetic constructions. In bruxism patients, durable materials such as monolithic zirconia and high-noble metal alloys are preferred, especially in posterior regions subjected to heavy functional stress, while glass-ceramic materials should be used cautiously and mainly in low-load aesthetic zones.

Occlusal splint therapy, particularly the hard acrylic stabilization splint (Michigan splint), plays a central role in reducing parafunctional activity, redistributing occlusal forces, and protecting restorations from overload. Proper occlusal adjustment and regular monitoring of splint wear are essential for maintaining therapeutic effectiveness. Long-term success also depends on well-designed occlusal schemes that minimize interferences, provide balanced contacts, and reduce horizontal stress. Regular follow-up examinations are necessary to evaluate restoration integrity, occlusal changes, and splint condition, allowing



timely adjustments or repairs. In conclusion, the long-term prognosis of orthopedic treatment in bruxism patients is determined not only by material selection but also by occlusal management, splint therapy, and continuous maintenance protocols.

Keywords: *Bruxism, parafunctional activity, occlusal overload, prosthodontic treatment, orthopedic planning, monolithic zirconia, metal alloys, glass-ceramics, occlusal splint, Michigan splint, stabilization splint, occlusal design, occlusal adjustment, restoration longevity, long-term maintenance.*

Materials and Methods: This study is based on a literature review and clinical principles of prosthodontic and orthopedic management of patients with bruxism. Relevant scientific articles, textbooks, and clinical guidelines were analyzed to evaluate treatment approaches, restorative material selection, occlusal splint therapy, and long-term maintenance strategies.

The materials considered for prosthetic rehabilitation in bruxism patients include high-strength restorative options such as monolithic zirconia, high-noble metal alloys, and glass-ceramic systems, selected according to functional load distribution and esthetic requirements. Occlusal splints, particularly hard acrylic stabilization (Michigan) splints, were evaluated as a protective and therapeutic intervention to reduce parafunctional forces and stabilize occlusion.

Methods of treatment planning involved assessment of occlusal relationships, identification of parafunctional habits, selection of appropriate restorative materials, and design of occlusal schemes that minimize interferences and horizontal stresses. Long-term management strategies included periodic clinical follow-up, occlusal adjustment, and monitoring of restoration integrity and splint wear.

Results and Discussion: The analysis of bruxism management strategies indicates that excessive occlusal forces significantly increase the risk of failure in prosthodontic restorations. Materials with high mechanical strength, such as monolithic zirconia and metal alloys, demonstrate superior clinical performance in high-stress posterior regions, whereas glass-ceramic materials are more suitable for low-load aesthetic areas due to their limited fracture resistance.



Occlusal splint therapy, particularly the hard acrylic stabilization (Michigan) splint, shows a significant protective effect by reducing parafunctional muscle activity and redistributing occlusal loads. Patients using splints demonstrate improved restoration longevity and reduced incidence of fractures and wear. Proper occlusal design, including elimination of interferences and establishment of balanced contacts, plays a critical role in minimizing horizontal forces and improving functional stability. Inadequate occlusal adjustment is associated with increased mechanical complications and premature failure of restorations. Long-term follow-up confirms that treatment success in bruxism patients depends not only on material selection but also on consistent occlusal management and regular maintenance. Periodic clinical evaluation allows early detection of wear, occlusal changes, and splint deterioration, ensuring timely intervention and improved prognosis.

Overall, a combined approach of high-strength materials, occlusal splint therapy, and meticulous occlusal control provides the most predictable outcomes in the orthopedic rehabilitation of bruxism patients.

Conclusion: Bruxism is a significant challenge in prosthodontic and orthopedic dentistry due to excessive occlusal forces that compromise the longevity and stability of restorations. Successful treatment requires a comprehensive and multidisciplinary approach that integrates appropriate material selection, occlusal splint therapy, and precise occlusal design.

High-strength materials such as monolithic zirconia and metal alloys provide improved resistance to functional overload, while occlusal splints, particularly stabilization (Michigan) splints, play a crucial role in protecting dental structures and reducing parafunctional activity. In addition, well-controlled occlusal schemes and regular maintenance significantly enhance treatment outcomes. Long-term prognosis in bruxism patients depends not only on restorative materials but also on continuous occlusal management and periodic clinical follow-up. Therefore, a combined strategy involving prevention, protection, and maintenance is essential for achieving durable and predictable clinical results.



REFERENCES:

1. Dawson PE. Functional Occlusion: From TMJ to Smile Design. Mosby; 2007.
2. Okeson JP. Management of Temporomandibular Disorders and Occlusion. 8th ed. Elsevier; 2020.
3. Lobbezoo F, Ahlberg J, Raphael KG, et al. International consensus on the assessment of bruxism. J Oral Rehabil. 2018.
4. Manfredini D, Winocur E, Guarda-Nardini L, Paesani D, Lobbezoo F. Epidemiology of bruxism in adults. J Orofac Pain. 2013.
5. Kohler AA, et al. Occlusal splints in bruxism management: a clinical review. Int J Prosthodont. 2010.
6. Stober T, Bermejo JL, Schmitter M. Clinical performance of zirconia restorations in high-load situations. Clin Oral Investig. 2014.
7. Silva NRFA, et al. Fatigue resistance of dental ceramics under functional loading. Dent Mater. 2012.
8. Koyano K, Tsukiyama Y. Sleep bruxism and its management. J Prosthodont Res. 2012.
9. Watanabe M, et al. Occlusal adjustment and restorative success in bruxism patients. J Prosthet Dent. 2015.
10. Beddis HP, Pemberton MN, Davies SJ. Sleep bruxism: an overview. Br Dent J. 2018.