IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

ROLE OF DISCLUSION TIME REDUCTION (DTR) IN THE MANAGEMENT OF BRUXISM – A NARRATIVE REVIEW

Dr. Siddiqua Ayesha[1], Dr. Nazish Baig[2], Dr. Babita Yeshwante[3], Dr. Namrata Baste[4], Siddiqui Anas[5]

Postgraduate Student[1], Professor & Pg Guide[2], Hod, Professor & Pg Guide[3], Postgraduate Student[4], Undergraduate Student[5]

Department Of Prosthodontics, Crown & Bridge

CSMSS Dental College & Hospital, Chhatrapati Sambhajinagar,Maharashtra,India

ABSTRACT

Repetitive clenching or grinding of teeth is the hallmark of bruxism, a parafunctional behaviour that causes tooth deterioration, muscular exhaustion, and temporomandibular disorders (TMD). Recent research emphasises the significance of occlusion in its pathogenesis, which has hitherto been thought to be complex with a significant psychological component. A quantifiable occlusal therapy for lowering bruxism activity is Disclusion Time Reduction (DTR), which is accomplished through Immediate Complete Anterior Guidance Development (ICAGD). The purpose of this review is to assess the effectiveness of DTR in treating bruxism, with a focus on the neurophysiological underpinnings, clinical results, and supporting data. Research shows that muscular hyperactivity, bruxism frequency, and related symptoms are considerably reduced when disclusion time is reduced to less than 0.5 seconds (4,5). Additionally, DTR enhances patient-reported results and occlusal force distribution (10). While encouraging, more randomised controlled trials are needed to determine its long-term effectiveness.

Index terms: ICAGD, Occlusion, TMD, Disclusion Time Reduction, Bruxism

I. INTRODUCTION

Repetitive jaw-muscle activity that involves clenching or grinding teeth while awake or asleep is known as bruxism (1). It is linked to temporomandibular disorders (TMD), headaches, muscle soreness, and tooth wear.

A biopsychosocial model has traditionally been used to explain the genesis of bruxism, with stress and central nervous system activity being the main causes. On the other hand, new research indicates that occlusal variables, especially extended disclusion time, are important in maintaining bruxism (2,3).

A digitally guided occlusal adjustment method called Disclusion Time Reduction aims to reduce neuromuscular stimulation by minimising posterior tooth contact during mandibular excursions (6).

II. CONCEPT OF DISCLUSION TIME

The amount of time needed for posterior teeth to separate during mandibular excursions is known as the "disclusion time" [6].

Less than 0.5 seconds is the ideal disclusion time [4,6].

Extended disclusion results in:

1. Greater contraction of the muscles
2. Occlusal friction
3. Prolonged bruxism

Long-term posterior tooth contact activates periodontal mechanoreceptors, which in turn causes excessive muscular contraction through central brain pathways [4,9].

III. MECHANISM OF BRUXISM RELATED TO OCCLUSION

Prior to DTR treatment:

- The posterior teeth do not immediately disclude.
- Constant occlusal contact leads to repetitive contractions of the muscles.
- The cycle keeps clenching and grinding [4].

Following DTR treatment:

- Neuromuscular stimulation is decreased by rapid disclusion.
- There is a decrease in muscle activation.
- The cycle of bruxism is broken [4,7].

Therefore, occlusion has a neurophysiological function rather than only a mechanical one.

IV. DISCLUSION TIME REDUCTION (DTR) TECHNIQUES

DTR is carried out with:

- Digital occlusal analysis using T-Scan
- BioEMG recording of muscle activity
- ICAGD, or selective enameloplasty [4,6]

Procedure:

1. Document occlusion at maximal intercuspation
2. Examine the excursive contacts
3. Determine the posterior frictional contacts
4. Modify enamel surfaces selectively
5. Obtain quick anterior guidance

Objective:

• Posterior disclusion in less than 0.5 seconds
• Equilibrium distribution of occlusal force [10]

V. EVIDENCE FROM CLINICAL STUDIES

1. Diminished Symptoms of Bruxism

A pilot study involving 36 patients demonstrated:
• A 69%–100% decrease in symptoms
• Complete disappearance of some symptoms at 12 months [5].

2. Reduction of Disclusion Time

• 2.5–3 seconds before treatment
• Approximately 0.3 seconds after treatment [5,6].

3. Modifications in Muscle Activity

• Enhanced intercuspation efficiency
• Less muscle activity during excursions [4].

4. Psychological Improvement

• Significantly lower depression scores
• Improved quality of life [5].

VI. COMPARISON WITH CONVENTIONAL THEORIES

Factor	Biopsychosocial Model	Occlusal (DTR) Model
Cause	CNS activity & stress	Occlusal contacts
Treatment	Splints, CBT	Occlusal adjustment
Evidence	Limited measurable outcomes	Objective digital data
Outcome	Symptom management	Etiological correction

VII. ADVANTAGES OF DTR

• Measurable and objective
• Quick outcomes
• Diminishes hyperactive muscles
• Enhances occlusal equilibrium
• Non-invasive compared to surgical alternatives [4,6]

VIII. LIMITATIONS

1. Needs sophisticated digital equipment
2. Technique-sensitive
3. Restricted randomised controlled studies
4. Limited sample sizes
5. Insufficient validation by sleep studies [5,8]

IX. CLINICAL IMPLICATIONS IN PROSTHODONTICS

1. Beneficial in treating TMD sufferers
2. Advantageous for complete oral rehabilitation
3. Extends the life of prostheses
4. Decreases occlusal overload
5. Crucial for occlusal equilibration [3,7,10]

X. FUTURE SCOPE

1. Extensive randomised controlled trials
2. Combining sleep studies with DTR evaluation
3. Extended follow-up studies
4. Comparative studies with splint therapy [8]

XI. CONCLUSION

A paradigm breakthrough in the understanding of bruxism is represented by Disclusion Time Reduction (DTR). Prolonged disclusion time appears to be a major etiological factor for bruxism [4,6]. DTR effectively reduces the frequency and severity of bruxism by lowering occlusal friction and neuromuscular stimulation [5,7]. Although encouraging, more high-quality research is needed to confirm its broad therapeutic application.

XII.REFERENCES

1. Lobbezoo F, Ahlberg J, Glaros AG, et al. Bruxism defined and graded: an international consensus. *J Oral Rehabil.* 2013;40(1):2-4.

2. Lobbezoo F, Ahlberg J, Raphael KG, et al. International consensus on bruxism. *J Oral Rehabil.* 2018;45(11):837-844.

3. Manfredini D, Lombardo L, Siciliani G. Temporomandibular disorders and dental occlusion. *J Oral Rehabil.* 2017;44(11):908-923.

4. Kerstein RB, Wright NR. Electromyographic analysis of occlusal therapy. *J Prosthet Dent.* 1991;66(5):677-686.

5. Thumati P, Thumati R, Kerstein RB, Radke J. Bruxism improvements after disclusion time reduction (DTR): A pilot study. *Adv Dent Tech.* 2021:54-64.

6. Kerstein RB. Disclusion time reduction therapy. *Quintessence Int.* 1992;23(11):735-747.

7. Thumati P, Manwani R. Effect of reduced disclusion time in TMD patients. *Cranio.* 2014;32(4):289-299.

8. Ommerborn MA, et al. Splint therapy vs CBT in bruxism. *Eur J Oral Sci.* 2007;115(1):7-14.

9. Haines DE. *Neuroanatomy: An Atlas of Structures.* 8th ed. Lippincott; 2012.

10. Kerstein RB, Radke J. Occlusal force distribution analysis. *Cranio.* 2012;30(4):243-254.