

A Review on Occlusal Splint Therapy

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Abstract: *The aim of this topic is to provide an insight and detail information regarding the various types, their rational, functions and proper case selection for the occlusal splint therapy. An extra emphasis has been placed on the importance of recalling the patient after placing the occlusal splint so that the patients may be relieved of their symptoms within short period of time*

Keywords: splint, occlusal splint, directive splint, permissive splint

1. Introduction

Occlusal Splint/ Occlusal Device / Orthotics:

“Any removable artificial occlusal surface used for diagnosis or therapy affecting the relationship of the mandible to the maxillae. It may be used for occlusal stabilization, for treatment of TMJ disorders, or to prevent wear of the dentition.”¹

Purpose: The purpose of occlusal treatment is to make the teeth conform to a correct skeleton - related position of the condylar axis. The purpose of occlusal splints is to provide an indirect method for altering the occlusion until the correctness of the condylar axis position can be determined and confirmed.

Functions of Occlusal Splints

Guide Condyle - disc Assembly to More Stable Position

The basic function of the occlusal splint is to prevent the existing occlusion from controlling the maxillo - mandibular relationship at maximum inter - cuspal position. A properly balanced splint results in an occlusion associated with relaxed positioning elevator muscles, allowing the articular disc to obtain its antero - superior position over the condylar head.¹

Muscle Relaxation

The tooth interferences to the centric relation arc of closure activate the lateral pterygoid muscles⁴, posterior tooth interferences during excursive mandibular movements cause hyperactivity of the closing muscles. Occlusal splints promote muscle relaxation by providing a platform for the teeth that allows for equal distribution of tooth contacts, immediate posterior tooth disclusion in all movements (with anterior guidance), and reduced stress on the joint.

Provide Diagnostic Information

Occlusal splints provide diagnostic information in different ways. The dentist can determine parafunctional habits, anterior guidance requirements, as well as obtain information about vertical dimension from patients who wear a splint. Whether or not bruxing is continuing can be monitored by observing wear facets created on the splint surface.

Protect Teeth and Jaw

Patients who are prone to nocturnal bruxism (“the grinding or clenching of teeth at other times than for the mastication of food.”) should routinely wear occlusal splints at night

because the splints protect the teeth against wear as the wear occurs against the splint. Also, the splints reduce stresses on the individual tooth due to more teeth contacts of equal intensity.

TYPES:

According to Okeson

- 1) Muscle relaxation appliance/ stabilization appliance used to reduce muscle activity
- 2) Anterior repositioning appliances/ orthopedic repositioning appliance

Other types:

- a) Anterior bite plane
- b) Pivoting appliance
- c) Soft/ resilient appliance

According to Dawson:

- 1) Permissive splints/ muscle deprogrammer
- 2) Directive splints/ non - permissive splints
- 3) Pseudo permissive splints (e. g Soft splints, Hydrostatic splint)

MORA – mandibular orthopedic repositioning appliance

Permissive Splints: Are designed to unlock the occlusion to remove deviating tooth inclines from contact. The condyles are then allowed to return to their correct seated position in centric relation if the condition of the articular components permits.

Permissive splints are often referred to as muscle deprogrammers. A properly made centric relation occlusal splint is a permissive splint.

If a centric relation splint is made with deep fossae and inclines that are too steep, it can be turned into a directive splint that limit condylar access to centric relation only.

Examples of permissive splints are bite planes (anterior deprogrammer, Lucia jig, anterior jig) and stabilization splints (Tanner, centric relation, flat plane, and superior repositioning occlusal splints).

Directive splints: Are designed to position the mandible in a specific relationship to the maxilla. The sole purpose of a directive splint is to position or align the condyle - disk assemblies. Thus directive splints should be used only when a specifically directed position of the condyles is required. These are also called as the “directive splints” because these

appliances direct the mandible in a specific relationship to the maxilla. Examples include an anterior repositioning appliance and a mandibular orthotic repositioning appliance.

Contraindications for Directive Splints:

- 1) The condyle and the disk can be aligned correctly.
- 2) The correctly aligned condyle - disk assemblies can move to the most superior position against the eminentiae without derangement.
- 3) The disks can maintain their alignment with the condyles during function.

Selection of the Occlusal Splint: A careful medical and dental history along with a thorough examination is necessary for those patients with facial pain, TMD, or bruxism.

The type of splint utilized is dependent on the diagnosis.

- 1) If the patient reports bruxism and headaches but no TMD, the use of a full - coverage splint at night, in which acrylic covers an entire arch of teeth, is often adequate to protect the teeth. If the patient clenches isometrically, a full - coverage maxillary guard with all of the teeth in contact is appropriate. If the patient demonstrates parafunctional movement in lateral and protrusive directions, a splint for the mandibular teeth will be effective. With parafunctional movement laterally, a mandibular splint that does not touch all of the anterior teeth is acceptable (it must touch the cuspids for guidance). A minimum of a 4 - mm increase in vertical dimension is necessary to protect bruxing patients. If the patient is wearing a splint 4 mm in thickness and still experiences muscular soreness, headache, and/or facial muscle tightness immediately after waking, splint thickness should be increased incrementally until symptoms disappear⁸.
- 2) When a muscle disorder is suspected in TMD patients, bite plane therapy may be used. Muscle disorders are initiated by hyperocclusion; bite planes separate the teeth, allowing the muscles to relax. Full - coverage stabilization splints, which are flat plane splints covering the entire dental arch, can also be used, and may be the treatment of choice for unreliable patients. In general, muscle disorders are effectively treated with appropriate splint therapy (bite planes and stabilization appliances).
- 3) If combination of muscle and disc disorders are identified (i. e. clicking of TMJ with muscle pain), stabilization splints are the treatment of choice. They provide long - term wear that is usually needed. They also cover the entire dental arch, ensuring that the covered teeth do not move. They must be worn continually for 24 hours for as long as required to eliminate muscle, disc, ligament, and tooth symptoms. Three to 6 months of wear is often required.
- 4) If advanced disc and muscle disorders are identified (jaw locking and/or noises, painful joints), stabilization splints are the treatment of choice which must be balanced to accommodate the specific needs of the patient. Splints may need to be worn for 6 months to 2 years depending on the patient.
- 5) In acute trauma anterior repositioning appliance for 7 to 10 days is required to keep the condyle away from the retrodiscal tissues so that the inflammation can subside.

RECALL: If an occlusal splint is being used only as a night guard to protect teeth or restorations it is advisable to review the patient after 7 days to check whether their occlusion has remained stable and to readjust if necessary. The patient must be reviewed and the splint re - adjusted at weekly intervals for as long as is necessary to achieve a stable retruded position if the splint is being used to treat mandibular dysfunction. The time necessary for this to occur may vary from a couple of weeks to several months. The splint must be continually monitored and adjusted to ensure equal contacts on all teeth, with immediate disclusion of the posterior teeth in all movements. If splint therapy was initiated to treat mandibular dysfunction no irreversible alteration to the patient's occlusion (equilibration) is generally needed. The patient may be gradually weaned off the splint but told to wear it if their discomfort returns which is often at times of stress.

Conclusion For a successful occlusal appliance therapy through examination of the patient and exact diagnosis is quiet mandatory. Also, the complete knowledge of the appliances is essential.



Figure 1: Stabilization splint



Figure 2: Anterior repositioning splint



Figure 3: Anterior bite plane



Figure 4: Posterior bite plane

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