ROLE OF OCCLUSAL SPLINTS IN PROSTHETIC MANAGEMENT OF TMJ DISORDERS

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ABSTRACT

Treatment of temporomandibular disorders (TMD) is a challenge for dentist due to varied range of signs and symptoms of tmds. Various treatment modalities like psychosocial and behavioural intervention, acupuncture, diathermy laser, occlusal splint therapy, medication and surgery are used nowadays. Different kind of occlusal splints are also employed in treating temporomandibular disorders as a non invasive and reversible form of treatment. An accurately fabricated occlusal splint helps to maintain a harmonious relation between TMJ, teeth, muscles and ligaments. Present article reviews role of occlusal splints in treating temporomandibular disorders.

KEYWORDS: Temporomandibular Disorder, Occlusal Splint, Temporomandibular Joint, Occlusal Contacts.

INTRODUCTION

The temporomandibular joints (TMJ) are the two joints connecting the mandible to the skull. It is a bilateral synovial articulation between the temporal bone of the skull above and the mandible below. Temporomandibular joint dysfunction consists of pain and dysfunction of the muscles of mastication and the temporomandibular joints. The most important feature is pain, followed by restricted mandibular movement, and noises from the temporomandibular joints (TMJ) during jaw movement. These disorder are not lethal immediately but they immensely effect the quality of life,¹ because they gradually become chronic in nature and their treatment becomes a challenge. Mcneill described the following TMD diagnostic criteria²: Pain in muscles of mastication, the TMJ, or the periauricular area (around the ear), which is usually made worse by manipulation or function; asymmetric mandibular movement with or without clicking; limitation of mandibular movements; pain present for a minimum of 3 months. Various treatment options for TMD includes patient reassurance, psychosocial and behavioural intervention, acupuncture, diathermy laser, heat exercise, occlusal splint therapy, medication and surgery. Present paper will review literature related to occlusal splint therapy in management of temporomandibular disorders.

DEFINITION OF OCCLUSAL SPLINT

According to glossary of prosthodontic terms (8th edition) occlusal splint (occlusal device/occlusal appliance/orthotics) is any removable artificial occlusal surface that fits over the incisal and/or occlusal surfaces of teeth in one arch, creating precise occlusal contact with the teeth of opposite arch and 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.

**TYPES OF OCCLUSAL SPLINTS**

Classification of occlusal appliances according to Okeson:

1. Muscle relaxation appliance/stabilization appliance used to reduce muscle activity
2. Anterior repositioning appliances/orthopedic repositioning appliance
3. Anterior bite plane
4. Pivoting appliance
5. Soft/resilient appliance.

Classification of occlusal appliances according to Dawson:

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

Occlusal splints serve three primary purposes in altering masticatory system:

1. Alteration of the dental occlusion
2. Decreased muscle contraction
3. Repositioning of the condyle

Splints provide diagnostic information, allow muscles in spasm to relax, protect the teeth and jaws from the adverse effects of bruxism, and normalize periodontal ligament proprioception. Parafunctional habits and vertical dimension can be determined on careful examination of splints, which patient is already wearing. Most of the TMD patient complain of headache. Role of occlusal splint in effectively reducing headache is well established. Occlusal splint permits equal distribution of tooth contacts, posterior discclusion and therefore the load on the joint is decreased. The grinding and clenching of teeth, other than mastication is called as bruxism. This is a kind of parafunctional activity which can be corrected with CR-balanced splint. Literature shows prevalence of bruxism in a range of 6.5% to 88%. Role of splints in bruxism is to distribute the forces in the masticatory apparatus and decrease the frequency of bruxism as well.

Tooth is attached to alveolus with the help of periodontal ligament (PDL), which is the fibrous connective tissue structure with neural and vascular components that joins the cementum covering the root to the alveolar bone. Sensory receptors in PDL protects the teeth from excessive loading. Occlusal splint dissipates forces on single tooth over a large area including all the teeth present. Occlusal splint needs adjustment at certain intervals to maintain equal occlusal contact. Deviant placement of articular disk with respect to mandibular fossa as well as condyle leads to TMJ disk displacement. There are eight abnormal disc positions; however, the anterior and the anterior-lateral displacements are the most common one. An occlusal splint allows the articular disc to regain its antero superior position over the condylar head.

**PERMISSIVE SPLINTS**

Permissive splints are fabricated to prevent noxious occlusal contacts and let temporomandibular joint work with harmony and comfort. It basically allows teeth to glide over occlusal surface without any hindrance, hence complete seating of condyles is accomplished. It can be either anterior midpoint contact splint or full contact splints. Examples of permissive splints are bite planes (anterior deprogrammer, Lucia jig, etc.)
anterior jig) and stabilization splints (Tanner, centric relation, flat plane, and superior repositioning occlusal splints. Anterior midpoint contact permissive splints disengage all teeth except the incisors. They work through following ways; 1) removes occlusal interferences, 2) allows freedom for full seating of the mandibular condyles, 3) encourages release of the lateral pterygoid and anterior neck positioning muscles on closure. Full contact permissive splints create an ideal occlusion by establishing uniform contact on all teeth. Dawson’s bimanual manipulation technique is used to seat the joints when adjusting the splint occlusion in centric relation. Joints should be fully seated to harmonize the occlusion accurately in this border position of mandibular function. A canine to canine ramp is designed to provide anterior guidance, to allow horizontal freedom of movement and immediate disclusion of posterior teeth. These splints can be adapted on either mandible or maxilla.

**NON PERMISSIVE SPLINTS**

These splints consist of indentation on occluding surfaces to limit mandibular movement instead of allowing free movements of the mandible. These are also called as the “directive splints” because they guide the mandible in a specific relationship to the maxilla. Basically the condylar disk assembly is aligned in a more stable position. Examples are anterior repositioning appliance and

A mandibular orthotic repositioning appliance.

The anterior repositioning appliance (also known as an orthopaedic repositioning appliance) changes the maxillomandibular relationship so that the mandible assumes a more anterior position. Repositioning appliances should not be used to recover the position of articular disc enduringly rather it should basically be used to restrict painful internal derangement. This type of appliance should be used only for short periods of time.

Posterior bite plane appliance alters the vertical dimension and effects horizontal maxillomandibular relationship. Disadvantage of this appliance is overeruption of unopposed anterior teeth because occlusion is present only in posterior teeth. This may lead to posterior open bite.

Soft rubber splints are made up of resilient material and it acts by separating the teeth. Soft rubber splints are easy to fabricate and less time consuming. The Equalizer consist of water system, which balances the biomechanics instantly by supporting the mandible in a stable position and supports the jaw in a comfortable position.

**CONCLUSION**

Occlusal splints are very effective means of not only managing but also diagnosing the temporomandibular disorders. Proper understanding of dynamics of masticatory apparatus is essential for exact diagnosis. Examination of occlusion, muscles, and joints helps in differential diagnosis of tmds. Occlusal splints are successful in managing effects of Para function and defective occlusion within its limits. So occlusal appliances can serve an effective means of treating TMD disorder only after appropriate diagnosis and and effective treatment plan.
REFERENCES


