



## OCCLUSAL SPLINTS USED IN TREATMENT OF TEMPOROMANDIBULAR JOINT DISORDERS-REVIEW

### Prosthodontics

**Dr. Kalpana D.** MDS, Professor and Head of Department.

**Dr. Brunda K** Senior Lecture

**Dr. Sanjana J Rao** MDS, Reader

**Dr. S Kumara Raju Kurapati\*** Post Graduate Student \*Corresponding Author

**Dr. Joel Koshy Joseph** Post Graduate Student

**Dr. Naila Perween** Post Graduate Student

### ABSTRACT

Splint therapy may be defined as the art and science of establishing neuromuscular harmony in the masticatory system and creating a mechanical disadvantage for Para-functional forces with removable appliances<sup>1</sup>. This paper is a systematic review of the splint occlusal therapy, characteristics, and types of occlusal splints and applications of occlusal splints in temporomandibular joint disorders treatment.

### KEYWORDS

occlusal splint, splint therapy, temporomandibular joint disorders.

#### Introduction:-

An occlusal appliance (often called a splint) is a removable device, usually made of hard acrylic, which fits over the occlusal and incisal surfaces of teeth in one arch, creating precise occlusal contact with the teeth of opposing arch.

It is commonly referred to as a bite guard, night guard; inter occlusal appliances, intra-oral arthrotic, or even orthopedic device.

These are extensively used in management of TMJ disorders. They have shown considerable control in myofascial pain, however no clear hypothesis about the mechanism of action has been proved.

It has more of diagnostic value, for example, if a patient responds favorable to an occlusal device then the response to the same restorative permanent treatment should be positive. So it serves as an important diagnostic value before going to a fixed Prosthodontic therapy. Creating a stable balanced occlusion<sup>2</sup>.

#### 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 TMDS, or to prevent wear of the dentition<sup>3</sup>.

#### General considerations

Several favorable qualities of splint therapy render it extremely helpful for the treatment of many tm disorders. When splint is specifically designed to alter an etiologic factor of tm disorders even temporarily, the symptoms are also altered. In this sense, the splint becomes diagnostic. It is extremely important with a splint reduced symptoms to identify the precise cause and effect relationship before irreversible therapy is begun.

Splints can be equally helpful in ruling out certain etiologic factors. When a malocclusion is suspected to be contributing to a tm disorder, occlusal splint therapy can quickly and reversibly introduce optimum occlusal condition, if this does not affect the symptoms, malocclusion cannot be verified as an etiologic factor. The success of occlusal splint therapy depends on the selection, fabrication, and adjustment of the splint and patient co-operation.

#### Characteristic of occlusal splint

The characteristics of a successful splint should includes stability, balance in centric relation, equal intensity stops on all teeth, immediate posterior disocclusion, smooth transitions in lateral, protrusive and extended lateral excursions, comfort during eating, reasonable esthetics and patient compliance<sup>2</sup>.

#### Splints can be broadly classified as

- I) permissive
- ii) Non permissive
- iii) Hydrostatic and
- Iv) Rubber (silicon) splints.

**Permissive splints** are designed so as to allow the teeth to move or glide unimpeded over the contacting or biting surfaces<sup>4</sup>. Examples of permissive splints are1:-

#### A. Stabilizing splints:

This is the most commonly used type of intraoral appliance, and when properly fabricated it has the least potential for adverse effects to the oral structures<sup>6,7</sup>.

- a. Centric relation
- b. Superior repositioning

#### B. Bite plane

- a) Anterior deprogrammer
- b) Lucia jig
- c) Anterior jig

**non-permissive** also called as directive splints are designed with the ramps and indentations by which the movement of mandible is restricted<sup>1,7</sup>. They are:

E.g.

- 1) Anterior or repositioning appliances (ara).
- 2) Mandibular orthotic repositioning appliances (mora).

#### Rubber splints and hydrostatic splints include<sup>8</sup>.

These splints can exacerbate bruxism, possibly due to premature posterior contacts related to the fact that these splints cannot be balanced<sup>8</sup>. They are:

- A) Aqualizer
- B) Jumar cor

#### Uses and functions of occlusal splints<sup>1,2,5</sup>

The main functions of splints are:

- A) Relaxation of muscles
- B) Seating the condyle in centric relation
- C) For providing diagnostic information
- D) It protects teeth and other structures from bruxism.
- E) To mitigate periodontal ligament proprioception
- F) Reduces cellular hypoxic levels.

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### Applications of oral (occlusal) splints <sup>1,2,10</sup>.

#### Treatment for temporomandibular disorders include

Myofascial pain, disc displacement disorders arthritides of the temporomandibular joints.

**Other pain disorders like** :- headaches/migraine, motor and sleep disorders, sleep bruxism, sleep apnea, parkinson's disease, oral tardive dyskinesia

#### Others application (prevention of tissue trauma, habits) include:

Diurnal bruxism, as a sports gourd, for prevent cheek or fingernail biting, for electroconvulsive therapy, for treatment of lip commissure burn, esophageal reflux and sinusitis

**Theories of splint action:**-there are five theories concerning the mode of splint action. They overlap and are not mutually exclusive. The theories are <sup>11</sup>.

- 1) **Occlusal disengagement theory.**
- 2) **Restored vertical dimension theory.**
- 3) **maxillo-mandibular alignment theory.**
- 4) **TMJ repositioning theory.**
- 5) **Cognitive awareness theory.**

#### There are a number of clinical points that are critical for successful splint therapy. These include:

- The patient must eat with the splint in place.
- The patient must not bite their teeth together when the splint is removed for hygiene.
- The patient should eat relatively soft food placed on the posterior teeth.
- The patient should not incise with the front teeth.
- The patient must not open their mouth excessively wide.
- The general health of the patient is a critical element in the success or failure of tmd therapy.
- Basic nutrition must include a daily multiple vitamin as well as 1,000 mgs. Of vitamin c twice a day, 1,000 mgs. Of vitamin e once a day and chelated magnesium.
- In addition, the patient must eliminate all caffeine from their diet, limit their consumption of alcohol, and refrain from using any tobacco products. It is very important that the clinician assists the patient in making these changes in lifestyle.

#### Conclusion:

The type of splint utilized is dependent on the diagnosis. A careful medical/dental history along with a comprehensive examination is necessary for all patients, but especially those with facial pain, TMD, or bruxism <sup>12</sup>.

Familiarity with application of splint therapy for patients with occlusal-related disorders can be one approach to treatment of affected individuals. Proper diagnosis and fabrication of the appropriate device can often result in relief <sup>13</sup>.

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