Use Of A New Anterior Bite Splint For Management Of TMD Pain: A Case Report

Manoj Kumar[1], Pallavi Garg[2], Gaurav Issar[2], Ashish Kumar[2], Aashima Bhatnagar[2]

Abstract

Temporomandibular disorders often impair the quality of life of affected individuals. It is a group of diseases with overlapping similar signs and symptoms. Dentists have to rely on splint therapy for treatment of these disorders. Splints align the jaws to each other by providing an occluding surface, thus providing protection to teeth and also reducing strain and load on the TMJ while the patient is clenching on the splint. Pain from TMD has been related to depression or other emotional problems. Drugs are prescribed for stress which are of limited value and often have untoward side effects. Dentists are still searching for a nonaggressive preventative treatment for TMDs. The NTI-tss device is an FDA-approved anterior bite stop, which may be indicated for the prevention and treatment of TMDs, bruxism, tension-type headaches, and migraine. This paper will appraise the currently available evidence regarding the efficacy and safety of the NTI-tss splint.

Keywords : TMD, Bruxism, NTI-tss.

INTRODUCTION

The concept of Temporomandibular Disorder as a syndrome of unknown etiology is obsolete.[1] It is axiomatic that one cannot have a stable occlusion with unstable Temporomandibular Joints. Before any extensive occlusal changes are initiated, the condition of the TMJs must be known. For any treatment approach to be effective, it must identify each specific disorder and isolate the factor that either cause the disorder or contribute to its intensity or duration.

All Temporo-Mandibular Disorder pain may not always be related to Temporo-mandibular joint. It may be masticatory muscle pain triggered by deflective occlusal interferences. Occluso-musclar disorder is a discomfort or dysfunction resulting from hyperactive, incoordinated muscle function that is triggered by deflective occlusal interferences. Premature or overloaded tooth contact can cause severe pain in the teeth, intensify the pain of sinusitis, activate tension headaches (particularly in temporal muscle region), simulate ear pain because of the proximity to spastic lateral pterygoid muscles, affect the alignment of discs on the condyles or cause painful displacement of the TMJs.[1]

The NTI-tss (Nociceptive Trigeminal Inhibition- tension suppression system) is a small pre-fabricated anterior bite stop which can be placed over maxillary central incisors or mandibular incisors (Fig. 1 & 2). The fit along the teeth is accomplished at the chair side by filling a thermoplastic material into the base of the device, which is subsequently adapted along the central incisors, thereby increasing the vertical dimension between the

Correspondence: Dr. Manoj Kumar, Reader, Department of Prosthodontics, I.T.S-CDSR, Muradnagar, Ghaziabad
(M) 09873320714 **Email:** manojkumar51@yahoo.co.in

1 Reader, Department of Prosthodontics, I.T.S-CDSR, Muradnagar, Ghaziabad.
2 Post Graduate Student, Department of Prosthodontics, I.T.S-CDSR, Muradnagar, Ghaziabad

upper and lower jaw. Adjustments along the outer surface of the bite stop are made by the dentist to ensure that at jaw closure and during excursive movements tooth contacts are present only between the intraoral device and the incisal embrasures of the antagonistic anterior teeth. The therapeutic goal of NTI-tss is to exploit the efficacy of the anterior point stop in dynamic environment.

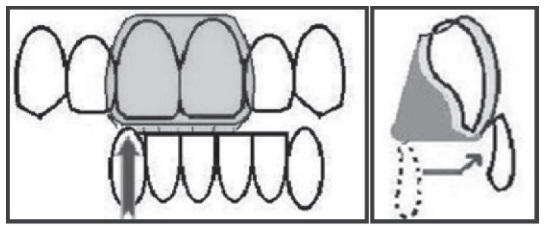


Fig 1: Conventional Anterior Bite Splint

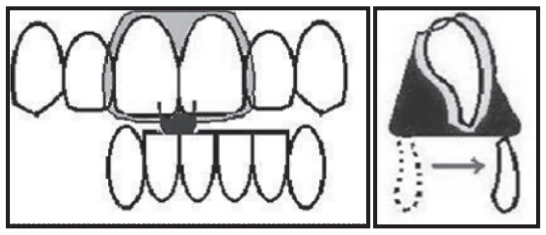


Fig 2: Schematic representation of the NTI-tss concept

CASE REPORT

A female patient, 25 years old, reported to the Departments of Prosthodontics, I. T. S. Center for Dental Studies and Research, Ghaziabad, for pain in the right half of the face since last 1 year. Symptoms of headaches, soreness of muscles in right half of the neck and pain on biting hard food were getting worse, since 3-4 months (Fig. 3). The patient had been taking regular medication (diclofenac potassium, serratiopeptidase, paracetamol, twice daily), but relief was short-lived and pain recurred. Patient pointed pain typically over the right joint and generally in the right half of the face, neck and head, with morning headaches being the most persistent complaint. Pain was also felt in the right eye and ear.

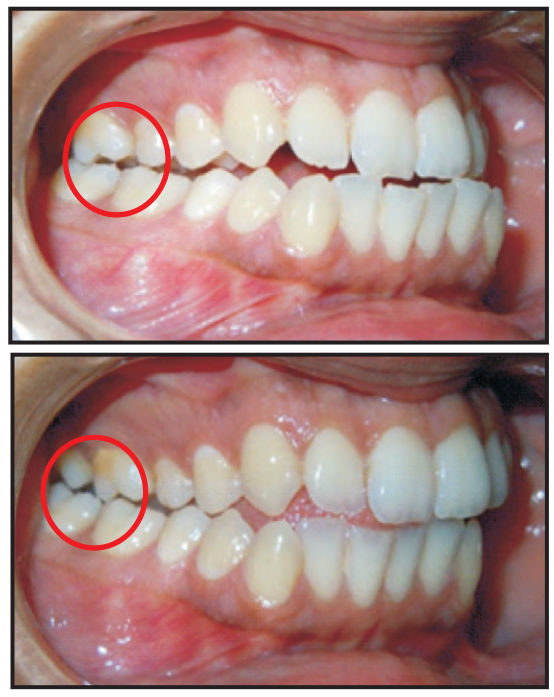


Fig 3: Interfering cusp in protrusive and right lateral positions

Screening history to evaluate TMD negated all concerns. There was no history of trauma to the joint, any noise during opening or closing or any incident of jaw locking. Dental examination revealed no attrition of teeth or wear facets. The pain in the TMJ region was felt during clenching. Palpation of masticatory muscles revealed tender medial pterygoid of the right side with hypertrophied masseters. Patient mentioned early morning tenderness over the region of masseter muscle.

The TMJs were load tested to verify centric relation by deprogramming the muscles and asking the patient to clench her teeth on cotton rolls placed in the premolar region which presented with absence of pain (Fig. 4 & 5). The presence of pain on clenching when the mouth was empty and absence of pain after deprogramming confirmed the diagnosis of occluso-muscular disorder as the primary source of pain. The patient had a comfortable

mouth opening of 38 mm, normal protrusion of 9 mm, and left and right excursions measuring 8 mm and 7 mm respectively. Diagnostic models were made and mounted on Hanau articulator using facebow transfer. The history and examination were suggestive of nocturnal parafunction.

Fig 4: Customization of NTI-tss anterior bite splint

MANAGEMENT

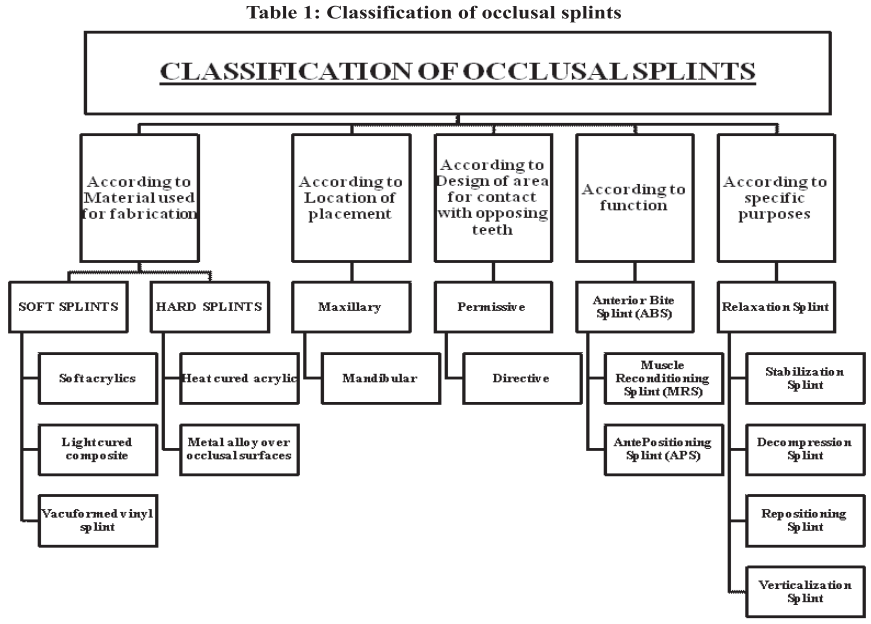
The patient was given muscle relaxants (chlorzoxazone + ibuprofen + paracetamol, twice daily) to provide symptomatic relief along with the NTI device (Fig. 6). The patient was instructed to wear the device only during the night for two weeks. It was observed that there was a gradual decline in pain symptoms over a span of one week. Complete release of discomfort with NTI-tss device confirmed the diagnosis of an OMD. Muscle deprogramming was done with the help of leaf gauge and centric relation was then recorded with the help of facebow transfer and "Jet bite" bite registration paste. Occlusal interferences were noticed in the left mandibular second molar in centric occlusion, which were removed first on cast by arbitrarily scraping and these changes were then replicated intraorally.

DISCUSSION

Occlusion, if harmonized to a misaligned joint, simply perpetuates the disharmony. Discomfort, dysfunction or deformation of any part or parts of the total masticatory system results in a masticatory system disorder. Pain is commonly triggered by loss of equilibrium or some form of structural disorder within the masticatory system, which simplifies the diagnosis. Deflective occlusal interferences activate muscle via the mechanoreceptor sensory system and are almost always a trigger for muscle hyperactiity. This damage is intensified by bruxing on deflective inclines of the teeth.[2] The most prevalent cause of Oro-facial pain is Occluso-Musclar Disorder (OMD). It is the most misunderstood and the most ignored of all the masticatory system disorders. It is imperative to relate occlusal contacts to completely seated condylar position because Occluso-muscular pain involves the relationship between the TM joints and occlusal contacts. Therefore, one should start determining if the TMJs are healthy and capable of completely seating into centric relation. 1 The role of OMD cannot be fully assessed without determining whether centric relation or adapted centric posture can be achieved. When a clinician who knows what to look for, the signs and symptoms of OMD are obvious. Even in the presence of multiple other causes for pain or dysfunction, OMD can be specifically diagnosed and its role can be ascertained in causing some, all or none of the pain.[1]

The masticatory muscles are supplied specifically by the trigeminal nerve. Occlusal interference triggers the mechanoreceptor complex which results in severe clenching. Across the distribution of the nerve, the resulting muscle activity manifests as a headache. Before the occlusion could be evaluated, the TMJs needed to be ensured to be acceptably healthy, with appropriate condyle-disk alignment and position.[3] An anterior bite plane can be used for muscle deprogramming

Table 1: Classification of occlusal splints



and to rule out any intra-capsular disorder as a source of pain. The role of NTI-tss becomes more important when compared to traditional splint therapy and other bite planes available. The aim of traditional splint therapy is to decrease the strain on TMJ and to protect the dentition. NTI-tss has an additional advantage over traditional splint therapy, Lucia jig and Pankey anterior bite stop. It provides for complete posterior disocclusion with no canine contact during excursive movement, an ideal condyle seating without translation and muscle relaxation. Canine disocclusion is important because canines cause >75% of the temporalis clenching intensity. The molar occlusion causes maximal temporalis clenching intensity which is only 30% in case of incisor contact.

CONCLUSION

- It was evidenced that the NTI-tss bite stop may be successfully used for the management of TMDs. However, to avoid potential side-effects, it must be ensured that the patient is willing to return regularly to the dentist's office for monitoring and, if needed, readjustments.

The NTI-tss splint may be particularly justified in the following clinical situations:

- Symptomatic treatment of para-functional hyperactivity of the masticatory musculature.
- Temporary use to decontract the masticatory musculature in order to prepare a bite registration in centric relation.

REFERENCES

1. Dawson PE. Functional Occlusion: From TMJ to Smile Design. 1st ed. St. Philadalphia. Louis: Mosby Elsevier; 2007.
2. Okeson JP. Management of temporomandibular disorders & functions. 6th ed. Missouri. Mosby Inc; 2003.
3. Stapelmann H, Türp JC. The NTI-tss device for the therapy of bruxism, temporomandibular disorders, and headache – Where do we stand? A qualitative systematic review of the literature. BMC Oral Health 2008; 8:22.