

A device for diagnosing role of occlusion in myofascial pain dysfunction syndrome

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Myofascial pain dysfunction syndrome is the most common temporomandibular joint disorder (TMD). It is a stress-related disorder and its incidence is on the rise in this present day stressful lifestyle. Temporomandibular joint kinematics requires strict harmony between the dentition and the muscle action for normal functioning of the masticatory apparatus to take place. An accurate diagnosis is the first step in the management of any TMDs and this process cannot be abridged. This paper highlights an easy method of designing and functioning of a device can be used for diagnosing the relationship of the noxious occlusion to tenderness in the lateral pterygoid muscle and other muscles of the mastication. Along with this it can be used to relieve the ischemic muscle tenderness, may be used as a positioning device for the registrations of physiologic interocclusal relations and to help eliminate the dysfunctional articular clicks.

Key words: Dysfunction, temporomandibular joint

INTRODUCTION

The temporomandibular disorders (TMD) are of multifactorial nature, designating the conditions that comprise complaints of the masticatory system involving the craniomandibular articulation and its musculature.^[1,2]

Currently the TMD is divided into three major categories.^[3]

1. Myofascial pain dysfunction syndrome (MPDS)!
2. Internal derangements (ID)!
3. Degenerative joint disorders (DJD) !

MPDS is considered the most common among them.^[4] They are characterized by myalgic pain, restricted mouth opening, acute malocclusion and the condition worsen towards the end of the day.^[5]

The complex symptomatology and frequent psychosocial factors make the disorders difficult to treat.^[6] Making an accurate diagnosis is the most important single step in the management of TMD of all types. This article describes the designing and functioning of a device which can be used for the recognition of occlusal disharmony as the causative factor for the tenderness and pain in the masticatory muscles especially the lateral pterygoid muscle. !

DESIGNING OF THE DEVICE

A diagnostic device is fabricated from two bars of self cure acrylic resin.^[7] Two shapes should be selected, !

one in 'I' shape and one in 'T' shape. Each bar is of 2' in length. The bottom of the T bar should fit on one side of the I bar. So that it can move back and forth in it freely. The top of the T bar is notched so that it fits well over the maxillary central incisors and the bottom of the I bar is notched so that it fits over the mandibular central incisors. The unnotched sides of both the bars should face toward each other. !

The parts of the assembled device should offer little resistance to movement over each other and should prevent the impingement of the oral mucosa ! [Figure 1].

Advantages of the device

1. The stress test is used to diagnose whether the tenderness in the lateral pterygoid muscles is related to the noxious occlusal contacts.^[8] The assembled device is placed between the maxillary and mandibular central incisors. The patient is asked to retrude and close firmly in these recorded relations for a minute [Figure 2]. If it causes tightness, pulling or discomfort, that is a positive test.

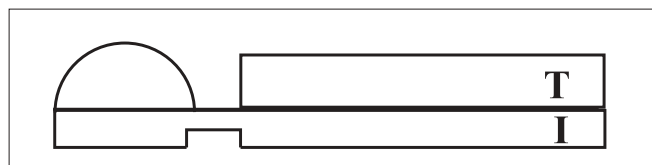


Figure 1: The device showing T- bar resting on one side of the 'I' bar

The stress test is actually an isometric muscle test as described by Friedman and Weisberg.^[9] It directs the condyles to their superior limit of movement along the posterior slope of the articular eminences and forward against the articular disks and eminences.

The entire neuromuscular system has been attempting to avoid the movement of the condyle in that direction because of the proprioceptive memory of noxious dental contacts previously encountered when the condyles approached that position.

The principal vehicle for avoiding such contacts is the lateral pterygoid muscles, the subconscious efforts expended in the attempt results in the hyperactivity of the muscle and a degree of oxygen poverty.^[8] The ischemia causes the discomfort, giving the stress test positive.

2. To relieve the ischemic muscular tenderness.^[7]

The patient is instructed to move the mandible forward slightly [Figure 3], immediately after the positive stress test. This will reduce the demands for oxygen by the lateral pterygoid muscle and immediately relieve the discomfort. In approximately 30 seconds, the tenderness and pain felt in the muscle starts fading. Within 5-10 minutes, the patients can retrude the mandible fully with little or no discomfort.

The finding that the painful tenderness in the lateral pterygoid muscle can be increased by the stress test and reduced with the device further confirms that occlusion is a major factor in causing the muscle pain.

3. To position the mandible for the registration of the most physiologic and stable interocclusal relationship.^[7] After the loss of proprioceptive memory of noxious occlusal contacts, the relaxation

and relief of tenderness in hypertonic and ischemic muscles of mastication and the reduction of displaced articular disks, the device can be used for positioning the mandible for the registrations of physiologic interocclusal relations.

When recorded on a 3D 'Buhnergraph' instrument, registrations made with the device before deprogramming described differ markedly from registrations made with same technique after deprogramming of the patient with the device.

4. To eliminate the dysfunctional articulations.^[7]

The patient is asked to open the mouth wide and protrude the mandible [Figure 3] so that the joint clicks. With the device between the incisors, the mandible should not be retruded far enough. The emphasis in this situation is on retaining the articular disk between the condyles and the articular eminences while gaining a more intimate relationship of these articular elements as the patient protrudes and retrudes the mandible.

After approximately 5 minutes, with the device in the place, the movement in a retrusive direction should be gradually increased. If the joint clicks, the procedure should be repeated. Within 10 minutes, some individuals will be able to retrude fully without discomfort and without a click. The click will return shortly after the device is removed, so the interocclusal registrations should be made immediately.

Disadvantages of the device

1. For some individuals, it is possible that longer periods of exercising over the device may reduce the articular disk.
2. For some individuals, continued biting pressure over the device causes oxygen poverty and discomfort!

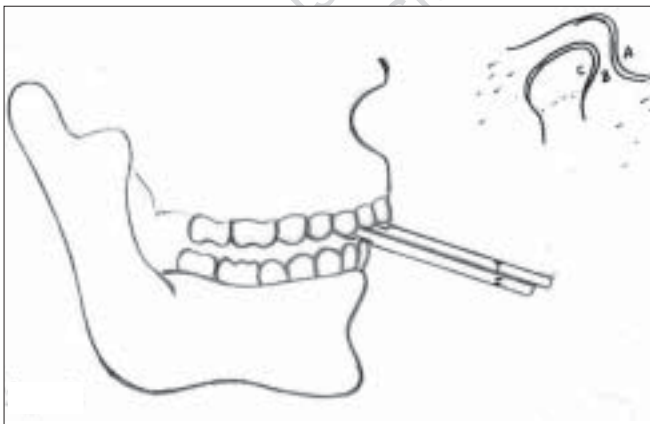


Figure 2: Stress test: mandible-retruded with the device. If this causes discomfort on either side in less than one minute, it is a positive stress test indicating a noxious occlusal factor. Articular disk (B), Condyle (C) and Articular eminence (A)

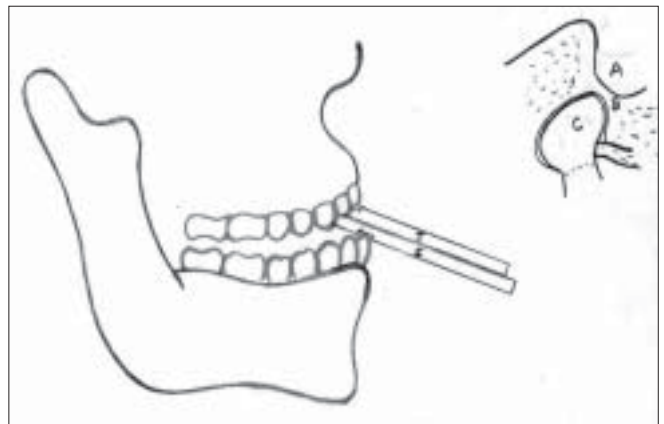


Figure 3: Protrusion with the device in place causing articular disk (B) to slip back between condyle (C) and articular eminence (A)

in elevator muscles, which can be relieved by massaging or opening the jaw and stretching the muscles.^[8] that there is no occlusal cause of the muscular pain.^[8] When the test is positive, the TMJ symptoms can be treated under one or all the categories described in this article.

OTHER TREATMENT MODALITIES

To reduce the muscular pain of occlusal origin following treatment modalities should be considered. The patient has the option of pursuing one or more of the four treatment modalities outlined.

1. **Psychotherapy:** MPDS is a stress-related disorder.^[10,11] Patient should be aware of these problems, the causes, the types of examination required, the anticipated therapeutic regimen and the results that should be expected. Proper counseling has a favorable modulating effect on pain and muscle relaxation, which is especially important in the management of acute muscle disorder.^[4]
2. **Physiotherapy:** This is intended to relax or soften the muscle and improve the circulation that will increase the blood supply. This includes the various exercises, 'Joint distraction' therapy,^[12] 'Spray and stretch'^[13] therapy, massage, heat application, ultrasound, and electrical stimulation.
3. **Drug therapy:** This is intended to break the cycle of pain and spasm by relaxing the muscles directly or allowing them to relax because of reduction of pain. This includes the non-steroidal anti-inflammatory drugs with or without muscle relaxant.
4. **Occlusal therapy:** Proprioceptive memory of the noxious contacts is eliminated by either reshaping the teeth or by placing a treatment splint that prevents the reinforcement of the noxious contacts, like the one described in this paper.

SUMMARY

The device described can be used to perform stress test, reduce the tenderness in the muscles of mastication by preventing the reinforcement of proprioceptive memory, eliminates the articular clicks, and helps in finding physiologic relationship for the registrations of the interocclusal records. If the lateral pterygoid muscles are not tender to palpation and the stress test is negative, no matter how much tenderness exists in the other muscles of mastication, one should conclude!

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