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Oral Splint Therapy by Using a Cutting-Edge Fluid System

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Abstract

The term "jaw joint and disorders" refers to a complicated and poorly understood group of problems that cause pain in the jaw and nearby muscles as well as difficulty speaking, expressing oneself facially, eating, chewing, and swallowing normally. In contrast to surgical therapy for jaw joint diseases, the traditional soft occlusal splint therapy is a safer and more successful form of conservative treatment. The Aqualizer, a hydrostatic oral splint, will be discussed in this article as an accurate, efficient therapy and differential diagnostic tool in TMD that enables addressing the patient's pain fast and accurately while saving significant treatment time.

Keywords: Jaw joint and disorders; Occlusal splint therapy; Diagnostic tool; Conservative treatment

Introduction

The articular surfaces of the temporal bone and the mandibular condyle combine to produce the compound articulation known as the jaw joint. A thick layer of articular fibrocartilage covers both surfaces. Each condyle articulates with a sizable portion of the preglenoid plane, articular eminence, and articular fossa of the temporal bone. Because the condyle moves anteriorly along the articular eminence and rotates within the fossa, the TMJ functions differently from other joints [1]. The mandible can have substantially higher maximal incisal openness than would be feasible with rotation alone because of the condyle's capacity to translate. Thus, the joint is called "ginglymodiarthrodial." The words ginglymoid (rotation) and arthroidial combined (translation).

Procedure

On the day of the appointment, tell the patient not to take any painkillers for their jaw or face. Make sure there is no organic disease and that the posterior occlusal support is sufficient. Take the Aqualizer out of the packaging and place it in the mouth. The biting splint does not require any prior preparation. Tell the patient to maintain the fluid pads in the spaces behind the back teeth [2]. As the patient swallows, they should unwind and put their teeth against the fluid pads. Clenching is not a good idea. Ask the patient to notice any changes in their head, neck, shoulders, or upper back sensations. Check the patient's symptoms every 5 to 10 minutes for 30 to 40 minutes. A reduction in pain validates the diagnosis. Most patients who experience episodic pain experience relief within 5 to 10 minutes of the Aqualizer being inserted. Specify that the patient wear the Aqualizer constantly for the following 48 hours, excluding just for meals and tooth cleaning [3]. Check on the patient again after this time has passed. After using the bite splint, occlusal therapy is suggested if the patient's bruxism gets better. If the patient's symptoms do not dramatically improve, it is quite likely that the cause of them is not occlusal, and occlusal treatment on its own is not likely to be effective. Patients shouldn't use the Aqualizer for longer than 8 hours in a day.

Discussion

The phrase "jaw disorders" refers to all issues involving the TMJ and associated musculoskeletal systems. For the treatment of TMD, many methods have been recommended. Occlusal orthotics, also known as dental or occlusal appliances or splints, are a frequent kind of therapy [4]. Any removable artificial occlusal surface used for diagnosis or therapy affecting the relationship between the mandible and the maxillae is referred to as an occlusal splint, occlusal device, or orthotics. It may be used to treat TMJ disorders, stabilise the occlusal joint, or prevent tooth wear. The occlusal surfaces of maxillary or mandibular teeth can be covered by the appliance, which can be made from a variety of materials and have a hard, soft, or intermediate feel. Occlusal orthotics are helpful for TMJ dislocation, masticatory muscle pain, TMJ noises, and restricted jaw movement.

When nocturnal Para functional activities can be recognized, splint therapy is most appropriate and is thought of as an adjunct to pharmaceutical treatment. A flat-plane maxillary occlusal splint typically created for bilateral contact of all teeth is made. These splints are believed to relieve joint pressure by disarticulating the dentition and lengthening the vertical dimension of occlusion [5]. Both synovitis and the activity of the masticatory muscles will decrease as a result of joint unloading. As a consequence, symptoms are lessened. Additionally, these devices might alter the occlusal relationship and condylar position, which would lessen abnormal muscle activity and spasm. The main purpose of the majority of occlusal splints is to change an occlusion so that it does not prevent the condyles from fully seating in centric relation. Here are a few ideas that describe how occlusal splints can be beneficial:

By using an occlusal splint, the patient is forced to position his mandible in a new position, creating a new muscle and articular balance [6]. This prevents the patient from closing in the maximum intercuspal position. The patient, whose habits have been altered, will no longer clench his teeth to protect his TMJ and teeth as he once did.

Force distribution: Bruxism can produce forces that are up to six times greater than those produced by chewing normally. The masticatory system receives a distribution of these forces from the splints. These devices can lessen bruxing episodes' frequency but not their intensity.

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Periodontal ligament proprioception normalisation: Each tooth's periodontal ligament contains proprioceptive fibres that communicate with the brain, causing the central nervous system to send signals to the muscles that protect them from overload. By using a greater surface area that covers all of the teeth in the arch, an occlusal splint works to disperse the stresses applied to individual teeth. Splints allow for muscular symmetry and load balancing.

Muscle relaxation: Posterior tooth interferences during excursive mandibular movements cause hyperactivity of the closing muscles, while tooth interferences to the CR arc of closure cause hyperactivity of the lateral pterygoid muscles. A muscle that has been exhausted from persistent muscular hyperactivity may hurt. The pain brought on by hyperactivity typically goes away if the hyperactivity is halted [7]. The elevator and positioning muscles will relax when a splint is worn with equal intensity contacts on all of the teeth and immediate disclusion of the posterior teeth by the anterior guidance and condylar guidance in all motions.

Condyles seating properly: The superior belly of the lateral pterygoid should reach its full extension in order for the condyles to sit properly in centric relation under the disc in the anterosuperior position [8]. The disc is dragged anteriorly and medially in the direction of the muscle's origin when the lateral pterygoid is stimulated by occlusal stimuli to become hyperactive. TMJ issues are a result of condyle/disc overloading when they are not in their normal physiologic position. The articulator disc can achieve its antero-superior position over the condylar head thanks to an occlusion caused by relaxed placement and elevator muscles in a well-balanced splint.

Occlusal splints can be adjusted to have a vertical height greater than the normal interocclusal distance, increasing the vertical dimension of occlusion [9]. Occlusal splints worn temporarily and raised above the level of physiologic rest do not improve jaw muscular tone or hyperactivity. According to studies, using an occlusal splint to stretch the elevator muscles to the vertical dimension with the least electromyographic activity is an efficient way to induce neuromuscular relaxation.

Any or all of the appliances used can be analysed using the cognitive awareness hypothesis. The cognitive awareness theory is based on the idea that having an interocclusal appliance in the mouth constantly reminds the patient to change his or her typical behaviour so that the likelihood of damaging or aberrant muscle activity with every closure of the teeth is lowered [10]. The patient may learn which positions or activities are hazardous due to their enhanced cognitive awareness of how their jaw is used and positioned, changes in the oral tactile sensations, and decreased oral volume.

Okeson divided the occlusal splints into two categories: anterior repositioning appliances and stability appliances. Other categories of occlusal splints include soft/resilient appliances, pivoting appliances, anterior bite plane appliances, and posterior bite plane appliances [11]. Permissive splints/muscle deprogrammers and directive splints/non-permissive splints were Dawson's categories for the occlusal splints.

By enabling the muscles to move the jaw on their own, Aqualizer works. Restoring this balance is crucial for TMJ pain relief. The body can correct bite distortions and achieve ideal systemic function and balance with the help of the Aqualizer self-adjusting oral splint [12]. The Aqualizer eliminates treatment guesswork by allowing the body to naturally find TMJ pain relief and functional balance, unlike most dental mouth guards that simply disable the bite over time and assume that it is in the ideal occlusion position. The Aqualizer is a new application of Pascal's law, a fundamental physics principle that asserts that a closed fluid will exert equalised fluid pressure no matter where pressure is applied to the fluid. Or, to put it another way, biting down on the Aqualizer allows the fluid to distribute bite forces uniformly across the bite, lowering TMJ pressure and pain and providing relief.

By relieving pressure from sore muscles and joints by cushioning and floating the jaw, the Aqualizer fluid system may also provide migraine headache relief in addition to relieving chronic back, neck, and shoulder discomfort. A precise distribution of occlusal forces and bilateral balance are provided by the fluid-filled Aqualizer. Healing can start right away and muscle soreness can be significantly reduced. The teeth can easily slide across the Aqualizer's supple, smooth surface [13, 14]. All tooth-to-tooth contact is avoided thanks to the flexible fluid pads that are sandwiched between the upper and lower occlusal surfaces. The primary factor in the positioning of the mandible for functional purposes is neutralised. The mandible moves into its most comfortable, least accommodating position right away as a result of the muscles' instantaneous reaction. This occlusal-muscular harmony usually removes face jaw pain and muscle spasms that are caused by occlusal contact within the first few minutes. The Aqualize fluid system reacts dynamically, constantly re-equilibrating and balancing bilaterally as the mandible adjusts to the position where the muscles are most comfortable operating. Transcutaneous electrical neural stimulation (TENS), micro current electrical nerve stimulation (MENS), and the hydrostatic splint Aqualizer were all found to be more effective than TENS in treating patients with TMD in acute situations, according to Macedo and Mello's evaluation of the therapies. Patients with severe bruxism and those without a normal gag reflex should not use the Aqualizer [15]. The patient is a Para functional bruxer/clencher if Aqualizers are destroyed within hours or one or two nights. For them, the Aqualizer is not durable enough. The Aqualizer will gradually lose fluid as it is used. The symptoms could start to resurface if there is not enough fluid to produce the floating movement. When this happens, one should change to a new AqualizerTM. AqualizerTM is sold by Dental Depot and retails for US $ 24.86, or roughly Rs. 1200.

Conclusion

Like any other musculoskeletal ailment, TMD should be addressed. The jaw and mouth region may not be the only place affected by TMD symptoms if they are not treated. As the patient's first course of treatment, conservative therapy is preferred. Such patients may benefit from the use of soft oral splints as a therapeutic option. The patient is well-comforted by this, which is simple to make. Significant progress in pain management has been made with the Aqualizer device. Temporary splint that relaxes muscles and has a floating function does not alter the shape or placement of the jaw or teeth permanently or irreversibly. Compared to surgical treatment, it costs less and has higher patient compliance.

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