

Neuromuscular Dentistry: Transcutaneous Electrical Nerve Stimulation and Orthotic Solutions in Full Mouth Reconstruction

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Introduction

Temporomandibular disorder (TMD) happen as a result of problems with the temporomandibular joint, and surrounding facial nerves and muscles that control jaw movement. The main cause of this is injury to the joint, or the nerves and muscles of the head and neck. This could also be due to the patient’s occlusion not being in the proper position.

Transcutaneous electrical nerve stimulation (TENS) currently is a form of electroanalgesia. Hundreds of clinical reports exist concerning the use of TENS for various types of conditions, including myofascial and arthritic pain. It uses electrical currents to stimulate muscle contractions that relieves pain and stiffness while improving jaw movement.

Orthoses is an externally applied device used to modify the structural and functional characteristics of the neuromuscular and skeletal system. They are used to control, guide, and limit joints or body segments for to otherwise correct the shape and/or function of the body, to provide easier movement capability or reduce pain. Orthoses are also used in dentistry to adjust the patient’s occlusion to a more optimum position, which allows the temporomandibular joint and the surrounding neuromusculatures to be relieved.

Procedures

1. Establish Occlusion using the golden vertical rule specified by Myotronics.

Golden Vertical	
Width of Central	Golden Vertical
7	14.6
7.5	15.7
8	16.7
8.5	17.7
9	18.8
9.5	19.8
10	20.9
10.5	21.9

Table 1: Golden vertical by Myotronics.

2. Fabricate fixed orthotics with the new vertical dimension using heat cured acrylic resin shade A2
3. Delivery of orthotics and low frequency TENS for 45-60 minutes using Myotronics J5 Myomonitor. Adjust occlusion with articulating paper.



Figure 1: Fixed orthotics appliance.

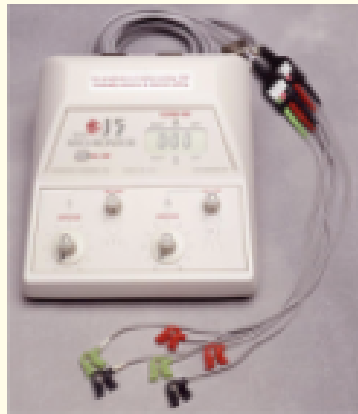


Figure 2: Myotronics J5 Myomonitor.

4. Patient recall after 24 hours to check occlusion and irregularities and polishing.
5. Recall after 1 week for occlusal equilibrium and TENS.
6. Repeat TENS as needed for another week.
7. Patient should recognize new occlusion, and symptom of TMD is relieved.
8. Prepare patient for full mouth reconstruction (psychologically and economically).
9. Start preparing upper arch for veneer and crowns. Temporize and check occlusion.
10. Install upper arch veneers and crowns.
11. Start preparing lower arch using the new vertical height based on the golden vertical rule and temporize.
12. Delivery of veneers and crowns and TENS.
13. Recall Patient after 24 hours and check occlusion and equilibrate.
14. Recall and TENS.

Case 1

A 56 years old male is presented with the deep bite. Patient history revealed that the patient is having headache, backache and tinnitus for 10 years. Clinical inspection revealed attrition of anterior teeth.



Figure 3-5: Pre-operative intra-oral pictures.



Figure 6: New vertical dimension with orthotic appliance.



Figure 7-9: Post-operative intra-oral pictures.

Case 2

A 37-year-old female is presented with posterior open bite. Patient history reveals that the patient was experiencing headache, backache and tinnitus for 15 years. Clinical inspection revealed ill-fitting anterior crowns.



Figure 10: Pre-operative pictures.



Figure 11: New vertical dimension with fixed orthotic appliance; repaired anterior teeth.



Figure 12-14: Low Frequency TENS for 60 minutes.



Figure 15: Post-operative pictures.

Conclusion

Overbite and openbite can be treated using transcutaneous electrical nerve stimulation (TENS) to stimulate muscle functions and orthoses to obtain a correct occlusion. It can also relieve some symptoms of temporomandibular dysfunction.

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