

Predictable Fabrication and Delivery Technique for Full-Coverage Hard Acrylic Non–Sleep–Apnea Dental Orthotics

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“Clinical Showcase” is a series of pictorial essays that focus on the technical art of clinical dentistry. The section features step-by-step case demonstrations of clinical problems encountered in dental practice. If you would like to propose a case or recommend a clinician who could contribute to this section, contact editor-in-chief Dr. John O’Keefe at jokeefe@cda-adc.ca.

Dental orthotics for the treatment of conditions other than sleep apnea, also known as non–sleep–apnea dental orthotics (NADOs), are removable occlusal appliances that completely or partially cover either dental arch. NADOs are widely used by most general and rehabilitative dental practitioners, as well as those who treat orofacial pain, for the treatment of temporomandibular disorders. This article describes a predictable fabrication and delivery technique for full-coverage hard acrylic NADOs. A full-coverage maxillary hard acrylic NADO of minimal thickness (about 1 mm in the posterior) has the potential to maximize all the possible mechanisms of action for NADO therapeutic usage (Fig. 1).^{1,2,3}

Fabrication, Delivery and Maintenance of Full-Coverage Hard Acrylic NADOs

In fitting restorations and prostheses, including NADOs, dental practitioners work to exacting tolerances. The fabrica-

tion process for a full-coverage hard acrylic NADO begins with a precise impression of the dental arches. To assure correct fit, crown and bridge impression materials such as reversible hydrocolloid (Fig. 2) must be employed; irreversible hydrocolloid (alginate) is not acceptable. An interocclusal record (i.e., the bite) is then obtained. Before the interocclusal record is taken, it is recommended that some form of anterior muscle deprogrammer be applied for at least 10 to 20 minutes.^{4–6} Leaf gauges, which allow for minimal posterior disclusion, are commonly used for this purpose (Fig. 3). This type of device is believed to facilitate muscle relaxation, thus allowing for greater accuracy in record-taking, regardless of the technique used.⁶

Once the interocclusal record has been obtained, the casts are mounted on an articulator of choice, at the vertical dimension and with the anteroposterior relationship that will be used in fabrication of the NADO (Figs. 4 and 5). For



Figure 1: Flat-plane full-coverage hard acrylic maxillary non–sleep–apnea dental orthotic (NADO).



Figure 2: Reversible hydrocolloid impressions.



Figure 3: Intraoral application of leaf gauge deprogrammer.

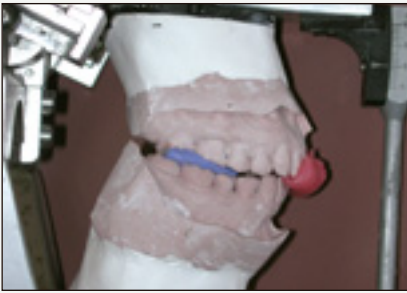


Figure 4: Casts mounted on a semiadjustable articulator with interocclusal record.



Figure 5: Casts mounted on a semiadjustable articulator showing adequate posterior clearance (at least 1 mm) for NADO fabrication.



Figure 6: The articulator pin set at "0". This vertical dimension must not be changed during NADO fabrication.

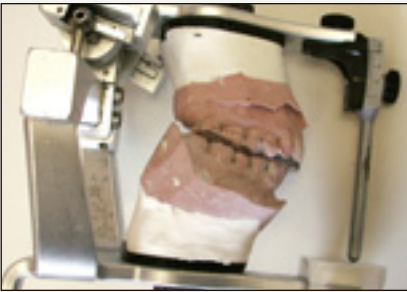


Figure 7: NADO fitted on mounted study casts. The pin setting has not been changed.



Figure 8: Posterior contacts and minimal anterior contacts are verified with the NADO positioned on mounted casts with the pin set at "0."



Figure 9: This NADO has uneven posterior contacts and heavy anterior contacts. It was returned to the laboratory for correction.



Figure 10: Armamentarium for delivery of NADO: thick blue paper (Mynol, ADA Products, Milwaukee, Wis.), thin green and red silk ribbon (Madame Butterfly, Almore International, Portland, Ore.), cotton rolls (Richmond Dental, Charlotte, N.C.), acrylic bur (H79SGA, Brasseler, Savannah, Ga.), and 7404 bur (Midwest, Dentsply International, Des Plaines, Ill.).



Figure 11: Adjustment with thick blue paper is done first.



Figure 12: Posterior adjustments with thin red silk ribbon are done second.



Figure 13: Fremitus adjustments with thin red silk ribbon are done third.



Figure 14: Excursive adjustments with thin green silk ribbon are done last.



Figure 15: NADO before adjustments.



Figure 16: NADO during adjustment. The acrylic bur is held in place to provide a flat surface.



Figure 17: NADO after adjustments. Even posterior contacts, with shallow anterior excursive guidance, are present.



Figure 18: Maxillary NADO in place intraorally. Even contacts are present on the posterior mandibular teeth.

most patients, casts of the dental arches will be mounted, preferably with a facebow, and a true hinge axis technique will not be used; therefore, there must be no changes in the cast relationship. In other words, the pin must stay at “0” or remain unchanged, since any changes in vertical dimension will change the arc of closure of the articulator relative to that of the patient (Fig. 6). If this rule is not followed, the bite will be off when the NADO is delivered, a most frustrating situation that necessitates unnecessary chair time.

After the fabricated device has been received from the laboratory, the interocclusal record is fitted between the mounted casts, and accuracy of mounting and pin position (“0”) is verified (Fig. 6). The dental casts and the NADO are soaked in water for about 10 minutes, and the NADO is then placed on the articulator (Fig. 7). Contacts are studied with the dentition in centric occlusion.⁴ The practitioner should observe even bilateral posterior contacts that hold a shim, with minimal ante-

rior contact (Fig. 8). Any discrepancy necessitates return to the laboratory for correction (Fig. 9). If the accuracy of fabrication is verified in advance, delivery to the patient will flow smoothly.

At chairside, the NADO is placed on the dental arch intraorally and is checked for rocking, with adjustments made as indicated. Next, the patient is asked to evaluate comfort without interarch contact. If the NADO is uncomfortable and the patient feels that it is too tight, for example, then compliance might be an issue. Appropriate adjustments are made if necessary. The mandible is then guided into contact with the NADO in place. Adjustments to gain even bilateral posterior contact and anterior fremitus relief are made if required (Figs. 10–14).⁴ The NADO should have no dimples around the contact points; it should be completely flat, with shallow anterior guidance in lateral and protrusive excursions (Figs. 15–17). Delivery time if all the technical steps are meticulously followed should be

about 15 minutes and should not exceed 30 minutes (Fig. 18).

For a full-coverage hard acrylic NADO, nighttime wear only is advocated. As teeth are ideally apart and only contact during chewing and swallowing, daytime appliance usage is discouraged.⁷ Nighttime wear can be routine, or the patient can use the device as needed.⁸ Patients usually know when they will benefit from use of the orthotic. In some cases, changing the pattern of nighttime wear can beneficially alter proprioceptive input.⁹

Maintenance of NADOs is simple. They should be kept moist when not in use, either by soaking in water or wrapping a moist paper towel around the orthotic is sufficient. Weekly immersion in undiluted white table vinegar for about 10 minutes will help to sanitize the device and remove deposits. Daily cleansing with a soft toothbrush and nonabrasive emulsifier such as facial soap or toothpaste is mandatory.

Conclusions

Full-coverage hard acrylic NADOs are commonly employed as an aid for diagnosis, treatment and maintenance. Used effectively, they can lead to positive outcomes. For all types of practitioners (restorative dentists, prosthodontists, periodontists, orthodontists and orofacial pain specialists), they are an important part of dental practice. ➤

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Read Dr. Racich's complementary debate article, titled "A Case for Full-Coverage Hard Acrylic Non-Sleep-Apnea Dental Orthotics," on page 239.