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e-MARA continued...

If a copier is being used, it should be set on the lightest setting in order to reduce the blackness when faxing later (Figures 3, 4). For greatest readability of occlusal details, a flat-bed scanner gives near-photo-quality results (Figure 5), but when the image is e-mailed there is more distortion (10-20% shrinkage) which is corrected by AOA using the embedded millimeter ruler in the template.

Whichever method of image capture is used, (copying or scanning), a hard copy is obtained and then the blanks are filled out, including doctor and patient name, which MARA options are desired, and what sizes of crowns are wanted. The mesial-distal dimensions of the first molars should be measured on the models with a divider and millimeter ruler, and the correct-sized crowns should be selected by circling them on the copied table. Additional inventory such as extra elbows and shims of varying sizes, as well as

additional MARA crowns of varying sizes, can be ordered.

If a lower lingual arch and upper TPA are desired, they can be made by AOA as Wilson 3-D modular appliances, or they can be soldered by AOA if adjustment loops are incorporated. For TPA fabrication the back of the study model can be copied or scanned as a second sheet, showing the approximate depth of the palate and width of the molars, and the adjustment loop will allow for fine-tuning at delivery.

The hard copy/copies, once filled out, is/are then either faxed or scanned and e-mailed to AOA. The order will be filled the same day and received by the doctor or lab tech within a week, depending on the distance.

When the lab work arrives, the contents can be fitted to the working model by the lab tech, or fitted directly onto the patient who has been previously separated.



FIGURE 3



FIGURE 4



FIGURE 5

Volume 7, Issue 1, 2003

AOA Appliances, etc.

In this Issue:

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The e-MARA - Quick and Convenient Crown Creation

Thinking Appliances

WHAT'S NEW



David Allesee
General Manager,
AOA Laboratory

With our ninth edition of the AOAppliance Newsletter we are freshening our publication image. We feel the new look will be more interesting to read and draw your attention

to the pearls our authors are sharing with you, our readers.

With this new look we are delighted to feature Dr. Jim Eckhart and Dr. Jay Bowman. Both are well known presenters at many Orthodontic seminars and continuing education courses as well as authoring papers in a number of Dental Journals.

We invite our readers to share with us their ideas as they relate to the use of Orthodontic appliances. Thanks to those of you that have shared pearls. Our format is designed to be friendly and open and the authors easily accessible to your inquiries. We also invite our readers to suggest changes and additions to our format. Just contact me at any of the various phone numbers in this publication.

Again thank you for your patronage, and I hope this issue has a pearl that will enhance your practice.

Contact:

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FEATURE ARTICLE

Fine-Tuning Case Completion with the New ProFlex Positioner



S. JAY BOWMAN, D.M.D., M.S.D.

Rationale for Finishing Treatment with a Positioner

Goals in orthodontics include the production of an ideal occlusion and beautiful smile in a timely manner for all patients. Unfortunately, these lofty aspirations are sometimes not met, often due to some lack of patient cooperation (e.g., lack of elastic wear, poor oral hygiene, broken appliances, etc.) or errors somewhere in the treatment process.

Sachdeva¹ has described the finishing process of orthodontic treatment as "reducing the errors that have accumulated during treatment." Such errors might include: radiographic and tracing errors, errors in diagnosis, in bracket/band placement, limits in manufacturing tolerances of wires and brackets, inappropriate selection of mechanics, errors in mechanics, etc. Consequently, a favorable orthodontic correction may be marred by a lack of detail in individual tooth positioning. The positioner is a removable device that can assist in the fine-tuning some orthodontic



FIGURE 1

Comparison of Completed Orthodontic Results with and without a Positioner			
Sample	N	Andrews Score	Range
Without Positioner	40	3.5	2.7 - 4
With Positioner	28	3.3	2.5 - 3.4

Table 1

results and may provide the means to produce a swifter completion of treatment.^{2,3,4,5,6,7} The Positioner is also a natural conclusion for cases treated with a series of clear aligners such as with Invisalign or Red, White & Blue appliances.⁸ In other words, take a good case and make it better.

My Patient Won't Wear a Positioner

There would probably be little argument that the Positioner is one of the finest retention devices ever invented. However, long-term compliance with this device is problematic as it is considered to be bulky and it interferes with function. The Positioner can, however, improve a patient's occlusion, producing small amounts of detailed tooth movement and conditioning the gingival tissues. It would be a distinct advantage if this benefit were harnessed while diminishing the compliance concern.

Fine-Tuning Orthodontics with a Positioner

Completion of orthodontic treatment and refining occlusion often require the repositioning of brackets, placing detailing bends in arch wires, and the wear of intermaxillary (up-and-down or "triangle") elastics to "sock-in" the occlusion to proper interdigitation. These procedures occasionally produce adverse responses; for instance, the placement of bends to extrude one tooth may act to intrude the adjacent teeth, thereby, yielding another new problem. If a patient's occlusion is nearly ideal and additional changes in wires or brackets may introduce other dilemmas or if a patient's interest and cooperation has run out, it might be beneficial to consider the Positioner to assist in finishing treatment.

New ProFlex Silicone Positioners AOA/Pro Laboratories have recently developed a new type of silicone positioner; a more resilient and flexible material that will not distort from its original shape and continues to deliver the same force for an extended period of time. Silicone devices are more durable, more resistant to heat, and hypo-allergenic compared to appliances made with vinyl

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CASE 01



A. Patient in the detailing stage of orthodontic treatment.

Unfortunately, the patient has been non-compliant with intermaxillary elastics and oral hygiene. Impressions for a Positioner were made. Two weeks later, fixed appliances were removed and the Positioner was delivered with instructions for full-time wear.



B. After one week of full-time (24 hours/day) wear of the Positioner. Note: improvement in intercuspal contact and gingival tissues.

CASE 02



A. Patient with initial stages of demineralization stains and poor oral hygiene. Note the inflamed gingiva immediately upon removal of orthodontic appliances.



B. After 8 days of full-time Positioner wear. Significant improvement in the occlusion and gingiva.

ProFlex continued...

materials. In the past, however, silicone positioners were plagued by some degree of inaccuracy arising from the fabrication process. Today, the new ProFlex Positioner can be processed directly onto diagnostic wax set-up models that are mounted in a plasterless articulator to permit the technician to observe that there is proper compression and curing of the material. This improved and faster processing technique concludes with a special coating to create an even more translucent device than in the past. As a result, the new ProFlex Positioners are now lighter, slimmer, clearer and more resilient than past silicone appliances; making them more acceptable to patients.

Clinical Procedures

Impressions for a Positioner can be made with fixed appliances in place after arch wires are removed. Any additional artistic positioning bends are added to the arch wires after the impressions. The laboratory will sculpt away the brackets from the models, create a wax set-up, and produce the positioner per the doctor's prescription. The patient is informed that their braces will be removed at the next appointment and they will then receive a special appliance to help complete their treatment to a high standard of excellence.

Delivery of the Positioner

Upon removal of the fixed appliances the positioner is delivered. The patient is informed that the Positioner will be used to complete their treatment by refining their smile, gingival tissues, and the fit of their teeth. They are instructed to wear the positioner twenty-four hours a day—but only for one week.^{4,5}

Detailed instructions and a review of the benefits of using the Positioner is provided to the patient to reinforce their compliance. They are also encouraged to share this information with their teachers or employers to inform them of the need for their cooperation, especially since speech will be compromised. During the week of full-time wear, the patient is to "exercise" or chew into the appliance throughout the day (i.e., clench into the device and hold for 10-20 seconds and then release) and to also wear it during sleeping hours. At the end of one week,

they are to return to have new impressions made for the fabrication of traditional retainers. While these retainers are being fabricated, the patient is asked to wear the Positioner at night and to exercise with it 2-3 hours/day to maintain the now improved results.

Compliance in this arrangement is exceptionally good, as the patients are pleased to have had their braces removed and they can readily see that inflamed gingival tissue. Most importantly, the patients also see "the light at the end of the tunnel" with the Positioner. They understand that this is a short-term (1-2 week) commitment to this device and that they will be "free" of active orthodontic treatment in short order. They also realize that if results are not achieved with the Positioner, then additional treatment with "braces" may be required. As the dentition is typically mobile immediately after the removal of fixed appliances, the teeth readily move with the Positioner during the week of full-time wear.

After "retainers" are delivered, the patient is instructed to keep the Positioner as a "back-up retainer" in the event that the traditional retainers are misplaced or broken. If small dental changes are noted during retention, the Positioner may be used to correct them by returning to full-time wear for a short period of time. In addition, the patient is encouraged to use the Positioner for sports as it is an excellent athletic mouthguard. Most importantly, we remind our patients that retention is a lifetime commitment to periodic wear of retention devices.

Our Positioner Conclusion

Finishing with the Positioner is not selected for every patient, but rather is selected for specific cases to enhance and accelerate the finishing aspects of traditional orthodontic treatment. We have found that the investment in the Positioner as part of the "braces" process to be an exceptional benefit for many patients and consequently, for our practice.

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Orthodontists, a Fellow of the American College of Dentists, an Adjunct Associate Professor at Saint Louis University, and the Straightwire Instructor at the University of Michigan.

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NEW APPLICATIONS

The e-MARA



Dr. James Eckhart

Theory of the e-MARA

The MARA is a fixed functional Class II corrector available from AOA which works in a similar manner to the Herbst in that it repositions the mandible forward and holds it there until growth and remodeling have permanently changed the occlusion to Class I, as verified by TMJ tomograms if the doctor wishes. Because the MARA, unlike the Herbst, has no connecting parts between the jaws, but relies instead on vertical abutment surfaces like the twinblock, it is possible to order the appliance without actually transporting models to AOA. Using the e-MARA concept, a doctor can proceed along either of two paths as follows:

1) Occlusal images of the original study models can be faxed or e-mailed to AOA, and appropriately-sized pre-soldered MARA crowns and elbows and shims will be fabricated and sent to the doctor the same day. Alternatively, electronic study models can be

transmitted to AOA, provided a millimeter ruler is embedded in the image to allow for size distortion correction. Upon receipt of the crowns and elbows from AOA, the doctor can fit the MARA in the mouth, particularly if the doctor and staff are already experienced in MARA deliveries and adjustments.

2) A working model in white plaster can be sent to the lab of the doctor's choice, and that lab can fax or e-mail the occlusal model images to AOA

and appropriately sized pre-soldered crowns and elbows will be fabricated and sent to the lab the same day. Upon receipt of the crowns and elbows, the lab can place the MARA on the working models and send it to the doctor for easy insertion.

The advantages of the e-MARA concept is that the time and cost of long distance shipping of models is eliminated, and the doctor can have the lab of his/her choice fit the appliance to working models if desired. This makes the MARA easily available for international doctors. The success of the e-MARA concept rests on the discovery by AOA that the mesial-distal widths of the first molars can reliably be used to predict the size of the Ormco crown that will fit the tooth. AOA has prepared a table of upper and lower first molar crown widths and the

corresponding Ormco crown sizes. (Figure 1)

It is possible, therefore, for the doctor or lab tech to measure the mesial-distal

dimensions of the first molars, to select the crown sizes from the table, and to order the necessary components via fax or e-mail, without particular regard to transmitting the occlusal images of the models. The measurements must be accurate to one-half millimeter. If the measurement is fractional (e.g. 10.3 mm),

it is best to err by ordering the next size larger, as the crown gingival margins can be crimped inward if the crown is slightly too large. If the crowns have unusual-shaped cusps or an extra-large cusp of Carabelli, the occlusal images will help AOA select the best fit. If the doctor foresees uncertainty in crown fit due to unusual shape, extra crowns one size larger and/or smaller can be ordered for a nominal price, and the extra crown can serve as inventory for another case later.

Using the Fax/ e-MARA Template (Figure 2)

The doctor or lab tech should mark the mesial and distal occlusal embrasures of the first molars on the model with a fine lead pencil, to make them more obvious when copied. The template (provided by AOA) is placed face-down on the copier or scanner, and the models are placed face-down with the backs abutting each other, in the cut-out of the template. The models should be covered with a white-lined box or with foam rubber which has been cut out to accept the models, and the foam rubber should be lined with a white cloth or towel, in order to reduce the black areas in the copy image.

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Occlusal Mesial - Distal Width of Molars					
Upper 1st Molar	9.5 mm =	Size 3	Upper 1st Molar	9.5 mm =	Size 3
	10.0 mm =	4		10.0 mm =	4
	10.5 mm =	5		10.5 mm =	5
	11.0 mm =	6		11.0 mm =	6
	11.5 mm =	7		11.5 mm =	7
	12.+ mm =	8		12.+ mm =	8

Figure 1

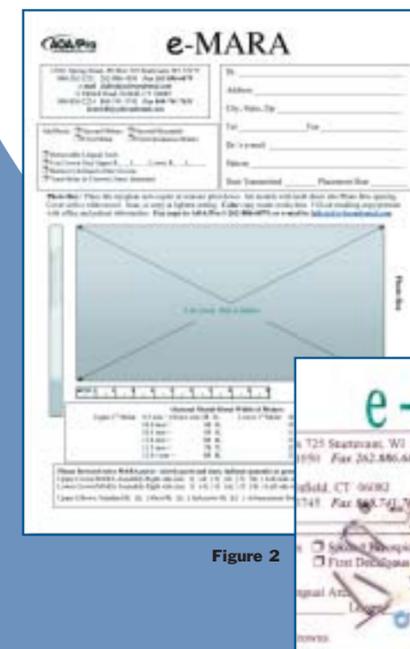


Figure 2