

Communicating facial plane information to the dental laboratory: Introducing the Facial Plane Relator device

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The ability of the restorative dentist to communicate the location and orientation of the patient's pertinent facial landmarks to the dental laboratory technician has great bearing on the esthetic success of final anterior dental restorations. This article describes a new device designed to facilitate this process. (J Prosthet Dent 2001;86:173-6.)

The importance of incorporating facial considerations into the diagnosis and treatment planning of successful esthetic restorative dentistry has been explained in the dental literature.¹⁻³ The inadequacies of using functionally oriented dental articulators and face-bows to record and transfer esthetic facial landmarks to the dental laboratory recently have been summarized by Chiche and Aoshima.⁴ Some articulator and face-bow systems can be very expensive, complicated, and difficult to understand, which leads to frustration and nonuse. An inexpensive alternative may not provide enough precision to properly restore the patient's dentition.

Effective records should be made at both the diagnostic and the restorative phases of dental treatment; the easier and more precisely this can be performed, the more frequently it will be performed.⁵ The Facial Plane Relator (Ho Dental Products, Santa Barbara, Calif.) was developed to supplement, not replace, dental articulators or other face-bow devices. The clinician is encouraged to use any and all methods that clarify and complete communication to the dental laboratory.

Three specific facial landmarks (the facial midline [FM], facial vertical axis [FV], and facial horizontal axis [FH]) and their dental counterparts (the dental midline [DM], dental vertical axis [DV], and dental horizontal axis [DH]) are the focus of this article and the new device described. We use these terms in dental esthetic examinations, diagnosis, and treatment planning. They are presented here to facilitate the descriptive use of the Facial Plane Relator. The purpose of the Facial Plane Relator is to give the dentist a relatively quick, simple method to transfer FM, FV, and FH locations to the dental laboratory technician before the fabrication of the dental restoration begins.



Fig. 1. Anterior view of patient's dentition at presentation.

The FM can be found by studying the patient's entire face in frontal view and bisecting that outline shape. The FV is an imaginary plumb line running through the facial midline and crossing the facial horizontal at a 90-degree angle. The FH is also derived from facial outline examination; it frequently coincides with the horizontal plane of the patient's eyes. In a symmetrical face, FH and the horizontal plane of the lower lip are parallel, but most faces are not so symmetrical. For example, assume that the 2 maxillary central incisors are located at FM but that their alignment is askew with FV. According to the previously defined terminology, DM and FM would be equal, but DV would deviate from FV.

The following clinical report demonstrates the use of the Facial Plane Relator.

CLINICAL REPORT

A 33-year-old white woman presented for esthetic restorative dentistry with the chief complaint of rough, discolored porcelain veneers on her 4 maxillary incisors (Fig. 1). She stated that the teeth had shifted in position and that she no longer felt comfortable or confident with her smile appearance (Fig. 2). Clinical

Dr Greenberg is the inventor of the prototype Facial Plane Relator and Dr Ho is the developer and producer of this device. They do have a financial interest in this product.

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Fig. 2. Patient's smile and lower half of face at presentation.



Fig. 4. Determination of FM and FV with tautly held dental floss.



Fig. 3. Face-bow transfer with Hanau springbow. Intercondylar axis and interpupillary line are divergent.



Fig. 5. Line (guided by previously determined floss position) marked on patient's nose.

examination revealed various facial bilateral asymmetries (especially eyes and lips) and DV and DH divergent from FV and FH, respectively. A diagnostic face-bow (Hanau Springbow, Teledyne, Ft. Collins, Colo.) showed a horizontal discrepancy between the patient's interpupillary line and her intercondylar axis (Fig. 3). Without supplemental information, a final restoration guided by this face-bow would have possessed an incisal plane unattractively canted to the patient's facial symmetry. A Facial Plane Relator was used to capture facial landmark positions and transfer them to the dental laboratory according to the following procedure.

PROCEDURE

1. Examine the patient's face, and locate the FM and FV. In Figure 4, dental floss is tautly held along the FM at FV. Mark this position on the patient's nose with erasable marker with at least a 10-mm-long line (Fig. 5).
2. Prepare for the desired occlusal registration. A syringe-loaded vinyl polysiloxane interocclusal

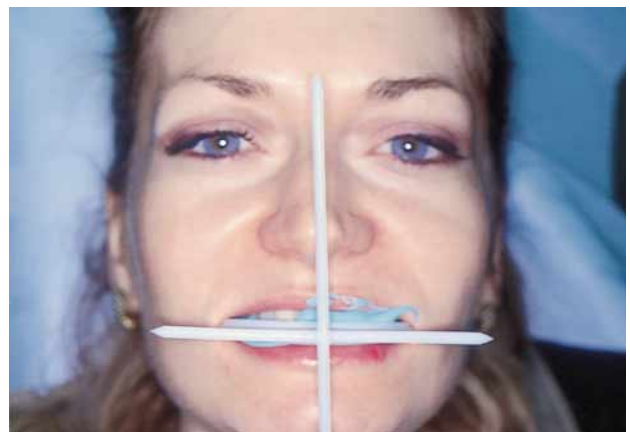


Fig. 6. Assembled Facial Plane Relator locked into position by occlusal registration material and superimposed over nasal marking line.

recording material is recommended for this technique.⁶

3. Assemble the plastic disposable Facial Plane Relator by snapping the vertical rod into the receptacle of the horizontal bite frame.
4. Syringe a generous portion of registration material onto the occluding surfaces of the teeth or preparations. Appropriate occlusal stops, if necessary, should already be in position at the desired vertical dimension of occlusion. Have the patient close or guide them to closure, as usual.
5. While the labially extruded excess recording material is still soft, inject some of the registration material onto the "spokes" of the bite fork. Quickly insert the bite fork of the Facial Plane Relator into this excess material, making sure to superimpose the vertical rod component over the previously recorded marking on the patient's nose (Fig. 6).
6. Hold the Facial Plane Relator in position until the occlusal recording material has set.
7. Step back and verify that the Facial Plane Relator accurately coincides with the patient's FM, FV, and FH. If it does not, repeat the process.
8. Remove the joined Facial Plane Relator and Bite Registration for transport to the dental laboratory. The following instructions for the dental technician accompany a clinical photograph and are enclosed with the Facial Plane Relator.

This device is designed to provide the dental technician with 3 important facial plane and facial symmetry orientations. The dentist has positioned this frame so that:

- a. The center ridge of the vertical plastic rod is at the patient's facial midline.
- b. The direction of the entire vertical plastic rod is coordinated with the patient's facial vertical axis.
- c. The horizontal plastic rod corresponds to the patient's facial horizontal axis.

Use the Facial Plane Relator when mounting the maxillary and mandibular casts, and mark the casts in any appropriate/convenient areas to transfer the orientations from the relator. Follow this facially derived orientation when fabricating the prescribed restorations.

9. The master cast is fabricated and the Facial Plane Relator positioned for transfer of orientation of the desired DM, DV, and DH (Fig. 7). The vertical rod of the Relator guides the marking of DM and DV on the cast (Fig. 8). The horizontal rod gives the desired perspective of DH. The diagnostic wax-up, provisional restorations, and final restorations are guided by these transfer relationships.

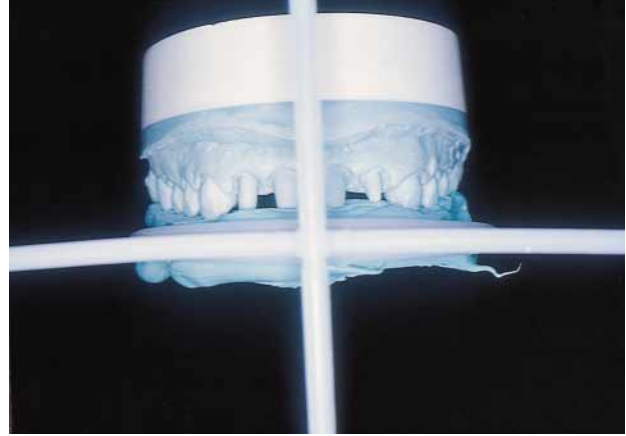


Fig. 7. Facial Plane Relator with master cast positioned in occluding relationship.

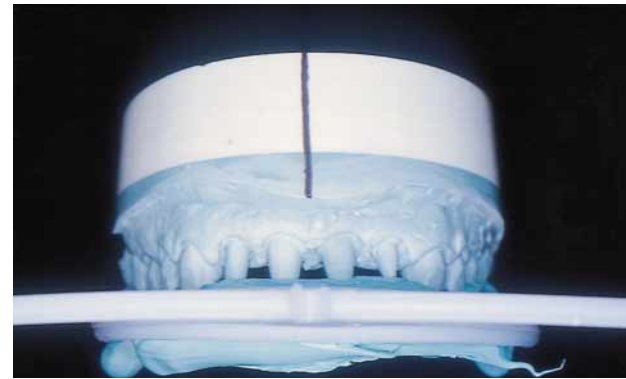


Fig. 8. Master cast scribed according to desired DM and DV dictated by Facial Plane Relator.

The final restorations for the patient described previously included porcelain veneers for the canines and first premolars bilaterally and splinted fixed porcelain-fused-to-metal crowns for the 4 incisors (Fig. 9). The patient's postoperative smile is shown in Figure 10.

SUMMARY

This article presented the Facial Plane Relator, a new, simplified, cost-effective, supplemental device for recording critical facial landmarks as viewed by the dentist and transferring that information to the dental laboratory technician.

We acknowledge Andrew A. Canterbury, MA, CDT, for the laboratory work and final dental ceramic restorations shown in this article.

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Fig. 9. Porcelain veneer restorations on maxillary canines and first premolars bilaterally. Splinted fixed porcelain-fused-to-metal dental restorations on 4 maxillary incisors.



Fig. 10. Patient's postoperative smile.

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Noteworthy Abstracts of the Current Literature

The symphyseal single-tooth implant for anchorage of a mandibular complete denture in geriatric patients: A clinical report

Krennmair G, Ulm C. *Int J Oral Maxillofac Implants* 2001;16:98-104.

Purpose. Mandibular overdentures have been successfully retained by 2 or more endosseous implants, but little information exists on the minimum number of implants required to retain such a prosthesis. This study was designed to evaluate the feasibility of retaining a mandibular denture with the use of a single endosseous implant for anchorage.

Material and methods. A group of 9 elderly patients (mean age 82 years) received a single implant in the mandibular symphyseal region. A ball attachment was connected to the implant 3 months after the surgical implant insertion and acted as a nonrigid retainer for a mandibular complete overdenture. Patients were evaluated at 3- and 6-month intervals for a period of 18 months. Subjective and objective evaluations of successful treatment were performed.

Results. During the course of this 18-month study, all implants maintained osseointegration. Bone loss and probing depth adjacent to implants increased during the early phase of treatment but stabilized after the sixth month. Patients reported significant improvements in satisfaction with their dentures supported and retained by 1 implant ($P < .01$).

Conclusion. On the basis of implant survival and subjective reports of increased prosthesis satisfaction, the treatment approach of using 1 implant in the mandible to retain an overdenture appears viable, particularly in elderly patients. 27 References. —SE Eckert