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3 authors, including:

K. Nagashima
The Nippon Dental University

Akira Komori
The Nippon Dental University

Simple and Accurate Bonding of Lingual Retainers with KommonBase

YOKO YOSHIDA, DDS
KEIGO NAGASHIMA, DDS
AKIRA KOMORI, DDS, PHD, MOrth RCS

Bonded lingual retainers help prevent relapse of the lower anterior segments while requiring virtually no patient compliance.[1-3] Patients reportedly favor bonded retainers over removable retainers because of their effectiveness and comfort.[4] Although oral hygiene is more difficult to maintain than with removable retainers, a 20-year follow-up study of patients with bonded 3-3 lingual retainers found few long-term periodontal problems.[5]

Lingual retainer bonding is a detailed and technique-sensitive procedure.[6-9] The proximity of the lower incisors to the gingival tissue makes it difficult to maintain a dry field. Holding the wire in place while waiting for the adhesive to cure is also problematic due to the morphology of the lower incisors. If the retainer wire is not completely passive when bonded, it can cause unwanted minor tooth movements.

This article introduces a simple and accurate procedure for bonding lingual retainers with KommonBase.

Laboratory Procedure

1. Carefully fill an alginate impression with polyvinyl siloxane (PVS) die material,* using a syringe tip** to reach the deepest areas (Fig. 1A) and a vibrator to minimize air bubbles. Remove the working cast from the impression after it has set for two minutes.
2. Adapt a retainer wire with bonding pads at the canines to the lingual surfaces of the lower anterior teeth (Fig. 1B).
3. Apply a small amount of KommonBase Resin HV** to each bonding pad (Fig. 1C), and place the retainer back on the model.
4. Expose the bonding pads to visible light for temporary fixation (Fig. 1D).
5. Add KommonBase Resin LV** around the incisal, mesial, and distal edges of each pad; spread the material with an explorer to form the bonding bases (Fig. 1E).
6. Cure the resin with visible light.
7. Gently remove the appliance from the working cast with a tweezer (Fig. 1F).

Clinical Procedure

1. Clean the lingual canine surfaces with either a rotating brush and fluoride-free pumice or by air-powder polishing (Fig. 2A).
2. Try the retainer in the mouth.
3. Apply a 20% polyacrylic acid conditioner** to the lingual canine surfaces for 10 seconds (Fig. 2B), and rinse with a three-way syringe.
4. Apply a resin-reinforced glass ionomer cement to the interior surfaces of the KommonBases (Fig. 2C).
5. Place the retainer gently on the teeth, and use the explorer to press the bonding pads into the desired positions.
6. Remove excess cement with the explorer (Fig. 2D).
7. Cure the glass ionomer cement with visible light (Fig. 2E,F).

*Quick-Die, Bisco, Inc., Schaumburg, IL; www.bisco.com.
**GC Corporation, Tokyo, Japan; www.gcdental.co.jp.



Dr. Yoshida **Dr. Nagashima** **Dr. Komori**

Drs. Yoshida and Nagashima are Clinical Fellows and Dr. Komori is Professor and Director, Division of Orthodontics, Nippon Dental University Hospital, 2-3-16 Fujimi, Chiyoda-ku, Tokyo 102-8158, Japan. E-mail Dr. Komori at como@tky.ndu.ac.jp.

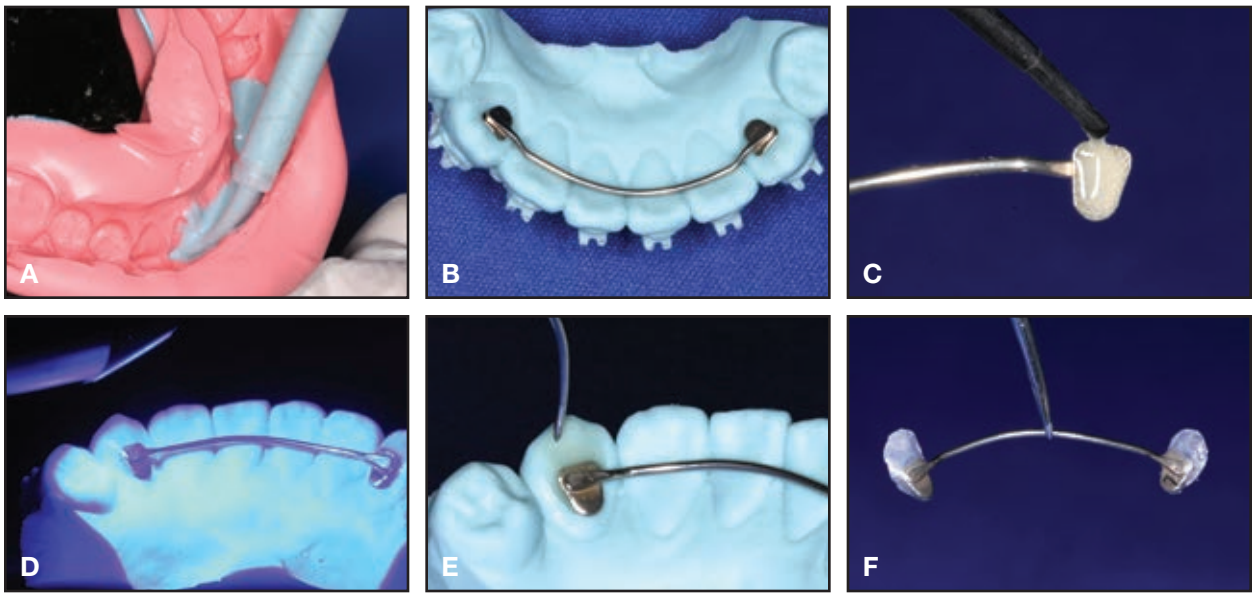

Fig. 1 A. Syringe tip used to fill alginate impression with polyvinyl siloxane die material* for fabrication of working cast. B. Retainer wire with bonding pads at canines formed to lingual surfaces of lower anterior teeth. C. Small amount of KommonBase Resin HV applied to bonding pad. D. Bonding pads exposed to visible light for temporary fixation. E. KommonBase Resin LV** applied and spread with explorer to form KommonBases. F. Retainer gently removed from working cast.**

Discussion

The KommonBase system was designed for precise placement of lingual brackets without the need for time-consuming, complicated transfer-tray procedures.[10] The KommonBase's large surface area, along with improved properties of the bonding materials, will reduce bond failures and allow the resin base to be seated accurately, even on teeth with poor morphological characteristics.

PVS was developed as a substitute for plaster die materials in the fabrication of prostheses and appliances such as esthetic dentures, composite resin bridges, bleaching trays, and mouthguards.[11,12] A previous study reported no significant differences in marginal discrepancies of PVS and plaster models.[13] Since PVS does not adhere to the resin, the KommonBases can easily be removed from the working cast without the need for a separating medium. Moreover, the elasticity of the model allows the finished appliance to be lifted off without weakening or breakage of the KommonBases. A bonded lingual retainer can generally be fabricated within 10 minutes after the impression is taken.

Although composite-resin adhesives have been shown to produce high bond strengths, saliva contamination can lead to failures. Moisture and saliva are difficult to control near the gingival margins, where lingual retainers are bonded. In

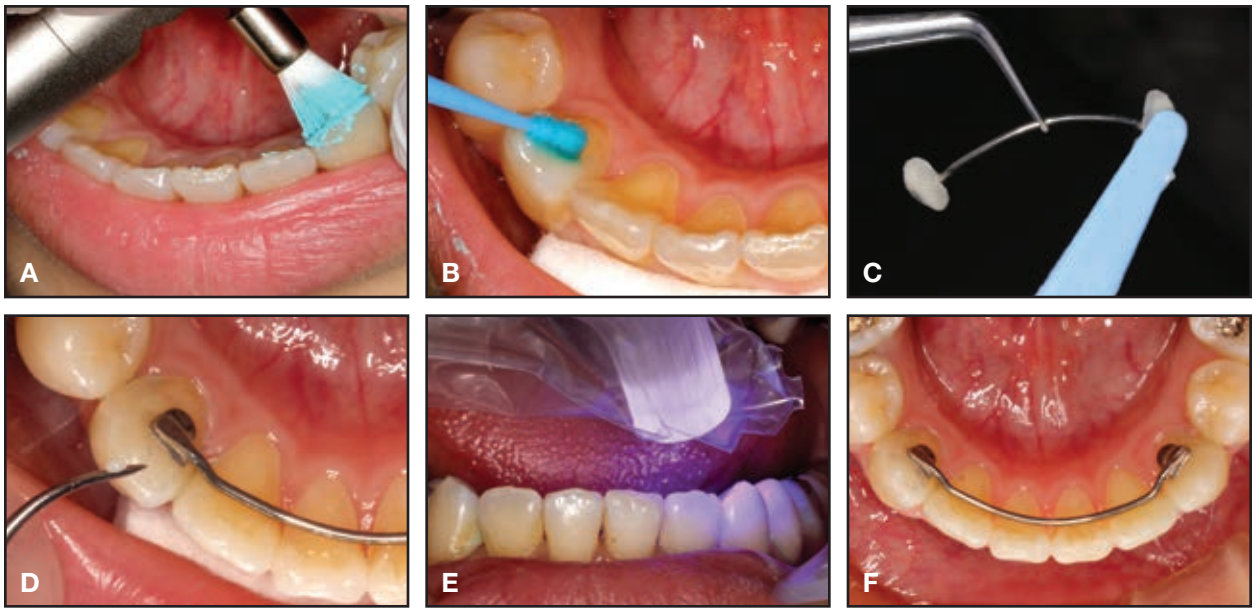

Fig. 2 A. Lingual canine surfaces cleaned with rotating brush and fluoride-free pumice. B. 20% polyacrylic acid conditioner applied for 10 seconds. C. Resin-reinforced glass ionomer cement applied to interior surfaces of KommonBases. D. Excess cement removed with explorer. E. Bonding pads cured with visible light. F. Finished retainer in place.**

addition, a conventional adhesive with a sticky texture and thick film, such as the widely used bisGMA, may promote improper seating of the bonding pads, further contributing to bond failures.[14] The hybrid resin-reinforced glass ionomer cement is not affected by saliva,[15] and the material polymerizes rapidly when visible light is applied. This cement not only releases fluoride, but has the ability to absorb fluoride from topical applications, which may help prevent decalcification around the bonding bases.[16]

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