Invisible Lower Cuspid to Cuspid Retainer

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INTRODUCTION

Bandless orthodontics is being practiced today by some and may soon be a common practice as new adhesive systems are developed. This paper describes a technique of making the lower cuspid to cuspid retainer without bands. The method of direct bonding used here was developed by the University of Kentucky Department of Orthodontics.

Retention of the lower arch takes many extremes. Some orthodontists routinely use maxillary Hawley retainers but no lower retainer. Others cement a lower soldered lingual retainer attached from cuspid to cuspid or from bicuspid to bicuspid. The lower cuspid to cuspid soldered linguals have the advantage of preventing incisor rotation relapse while still allowing the forces of occlusion to adjust the posterior occlusion. This retainer also preserves any alteration in cuspid widths. The chief disadvantage of the cuspid to cuspid soldered lingual is the necessity of having unsightly metal bands show on the lower cuspids. A patient who has endured two years of full mouth banding is often asked to wear the lower cuspid bands as long as possible to delay the relapse that often accompanies expansion of lower cuspid widths. Decalcification may occur to the gingival of bands kept in place such a long time.

The basis of the technique is to acid-etch the lingual surface of the lower cuspids. A self-curing resin is then applied to the lingual of the cuspids to hold a wire against the lingual of the lower incisors.

The procedure includes the following steps:

1. Take alginate impression of lower and pour in impression plaster.

2. While waiting for the model, pumice the linguals of the lower cuspids. The lower anteriors are now isolated by means of a rubber dam running from bicuspid to bicuspid. It is important that the punch holes be properly spaced to permit enough dam material to isolate the teeth from any moisture. The teeth are now well dried and ready to be etched.

3. The lingual surfaces of the cuspids are etched by fifty per cent phosphoric acid (which is basically the same as the liquid from a zinc-phosphate cement). This is accomplished by holding soaked cotton-tipped applicators to the teeth for four minutes. This etching time has been found to be ideal by recent research.[1] An etching time that is too short will not completely clean the crevices in the tooth's surface that the resin is intended to seep into. An etching time that is too long will crater out the crevices and not retain the bonding resin. The effects of etching the tooth surface have been found to be reversible after the resin has been removed and the enamel surface pumiced.[2] After etching, the teeth are rinsed extremely well to remove any trace of acid. The teeth are then well dried again.

4. The wire for the retainer is now formed to the model from .028 round stainless steel. Small discrepancies may be corrected by bending the wire to an ideal form. The ends of the wire are bent at ninety degrees to the occlusal and cut to leave a .5 mm barb to hold the wire in the resin. The wire extends from cuspid to cuspid, intimately contacting the linguals of the incisors. The ends of the wire may stand slightly away from the cuspids since this space will be filled with resin.

5. The wire is now held to the dried teeth in the proper location by means

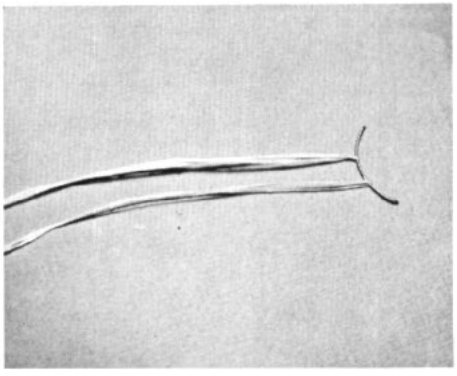

Fig. 1 Wire looped with dental tape.

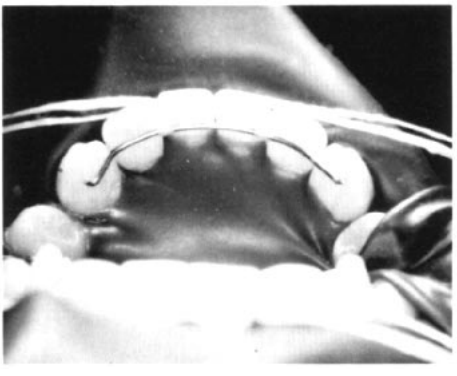

Fig. 2 Teeth isolated by rubber dam; tape holding wire in place.

Fig. 3 Finished retainer with resin on lingual of cuspids.

of two strands of dental tape (Figs. 1 and 2). The tape is looped over the wire and pulled through the embrasures tugging the wire against the incisors. Slight displacement of an incisor to the labial may now be made by pulling an ideal wire to place. The tape may now be knotted to hold the wire in place, or held if an incisor is moved.

6. The dried linguals of the cuspids are moistened with cavity primer from a sulfinic acid resin such as *Sevriton* or *Bonfil*. The application of primer improves the adhesion.[3] The resin is then applied by the Nealon technique. A brush is moistened with the liquid, used to pick up powder, and this wet mass applied to the tooth. The brush is cleaned and successive layers are applied until the wire is well covered on the cuspid. The final layer is covered with petrolatum for five minutes to allow the resin to set. After hardening, the excess resin is ground away with a #8 round steel (not carbide) bur. The resin is polished with a rubber cup and pumice. The rubber dam is then removed (Fig. 3).

Discussion

After application the patient is instructed to check retention of the wire every two weeks. Instructions are given to apply pressure with a tooth brush handle on the resin mass on the lingual of the cuspids to be sure it is not loose.

It has been suggested by others familiar with the soldered cuspid-to-cuspid that heavier .036 wire be used.[4] This wire would be less prone to distortion by occlusal forces on hard foods. Another modification is to extend the wire around the second bicuspid in extraction cases to keep the extraction site closed.

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The Angle Orthodontist

A magazine established by the co-workers of Edward H. Angle, in his memory . . .

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Vol. XLIII, No. 2 April 1973