A Modified Pontic Appliance for Missing Maxillary Incisors

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A modified pontic technique is presented that simplifies the management of patients with missing anterior teeth during the course of comprehensive orthodontic care. This technique demonstrates a lingual arch attached to lingual sheaths with the pontic placed on the lingual arch. Information presented includes appliance design, improved bond strength of the bracket on the pontic tooth, preparing the appliance for use as anchorage, and the incorporation of an anterior biteplate in the appliance. A modified pontic appliance improves esthetics and function when treating patients with missing maxillary anterior teeth.

Keywords: Missing maxillary incisors; a modified pontic appliance, lingual arch, lingual sheaths

When patients are missing maxillary incisors, initial leveling is typically started on a round wire which results in the prosthetic tooth spinning on the archwire. The common way to prevent this is to place a continuous tie from the two adjacent teeth. However, as the patient continues to bite on this tooth, the ligature tie will eventually fatigue and break, and the problem will reoccur (Fig. 1).

Figure 1. A patient missing maxillary left lateral incisor. A conventional pontic is not stable and the common tie from adjacent teeth is not strong enough to hold it steady.

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There have been different materials and bonding techniques used for temporary aesthetic replacement of missing teeth. However, there are challenges in bonding these types of materials due to their differences in composition, resistance, and surface tension. The poor response of these provisional materials to the traditional acid etching has led to many attempts to improve the bond strength of the adhesives to these various materials. Some techniques involve mechanically or chemically altering the surface of the provisional with sandblasting, acid etching, or using a fine diamond bur to grind the surface.[1,2] There is a lack of data regarding the technique and materials to best retain a temporary aesthetic pontic in orthodontics. Therefore, the information in this article would be useful in clinical practice to optimally retain an acrylic pontic and bracket.

Laboratory Procedure and Clinical Applications

Clinicians might consider the fabrication of a modified pontic appliance on .036-in wire with bendbacks inserted into .036 x .072-in lingual sheaths on first molar bands (Fig. 2). This would eliminate the rotation of the prosthetic tooth around the archwire. To increase the stability and retention of the acrylic resin tooth, we can utilize a bracket with a vertical slot. Start by drilling two holes through the acrylic tooth incisal and gingival to the vertical slots. Then, cut out a trough on the lingual side of the acrylic pontic. Next, insert a ligature tie through the vertical slot of the bracket and pull through the holes drilled in the pontic. Next, tighten the ligature tie with a needle holder. Cut the ligature tie, tuck it into the cut-out area, and flow composite into the defect in the prosthetic tooth for improved esthetics and patient comfort. The acrylic resin tooth should be properly bonded to the denture base resin to increase the durability and strength of the appliance (Fig. 3).

Figure 2 shows the inserted prosthesis. Clinicians can also add U-loops in the wire to adjust it efficiently. The inserted prosthesis functions as an anchorage device for the canine retraction (Fig. 4). After canine retraction, the appliance can be modified when retracting incisors.

After canine retraction, the inserted prosthesis can prevent anterior retraction. In the presented case, the patient is missing the maxillary right central incisor. To retract the maxillary anterior teeth after canine retraction, remove half of the bendback and slenderize the .036-in wire so it can slide through the .036 x .072-in lingual sheath. If retraction is to occur, it is critical the legs of the appliance are straight and slenderized so it will slide freely through the sheaths. Confirm the legs of the appliance will slide freely prior to fully tying in (Fig. 5).

In the case of a missing maxillary lateral incisor with a deep bite, an anterior biteplate can be added to increase the vertical dimension (Fig 6). The anterior teeth can be retracted in the same way mentioned above to close the space.

Figure 2. A fixed esthetic pontic appliance on .036-in wire with bendbacks inserted into .036 x .072-in lingual sheaths on first molar bands for missing maxillary left lateral incisor.

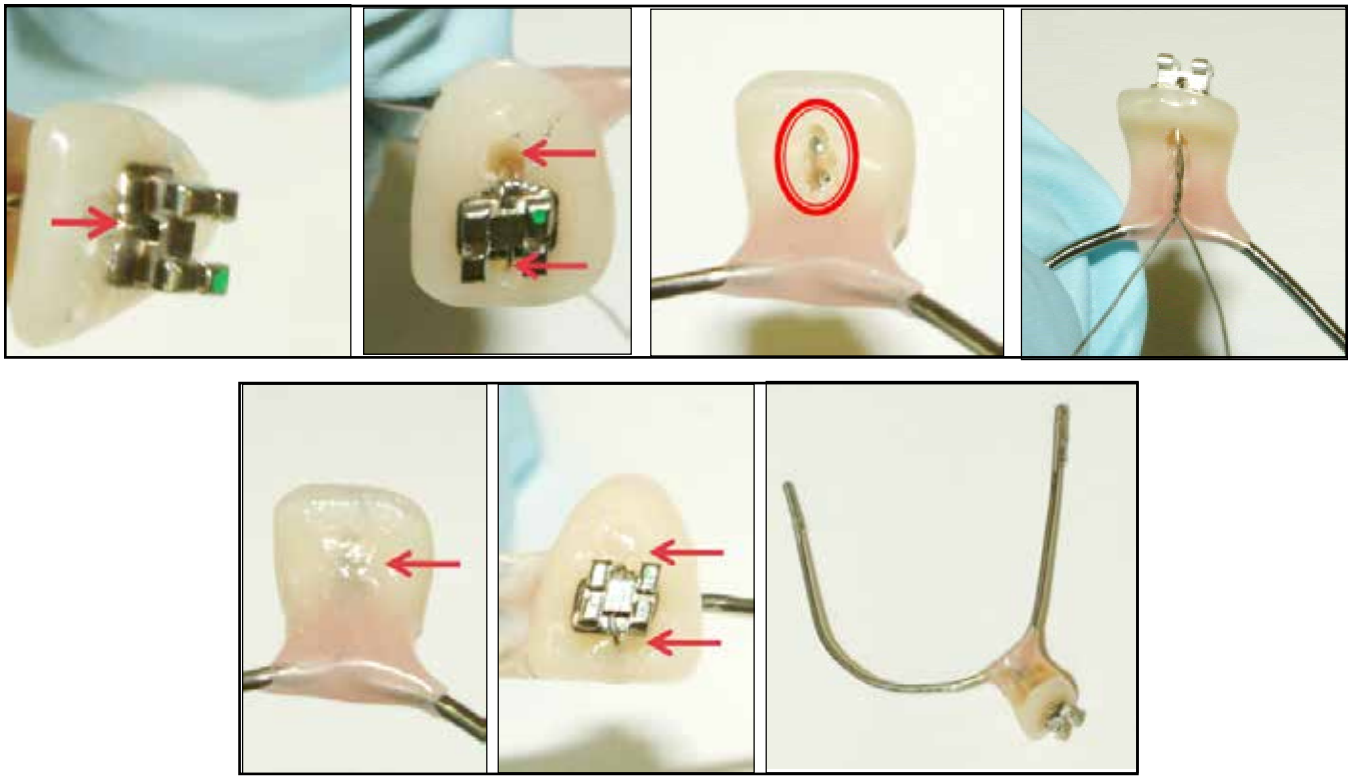

Figure 3. Two holes are made on the labial side of the acrylic tooth and connected to the lingual side of the tooth through a channel using a stainless steel ligature for increased stability between the acrylic resin tooth and bracket. The holes are filled with flowable composite. Ensure the durability and strength of the appliance by properly bonding the acrylic resin tooth to the denture resin base.

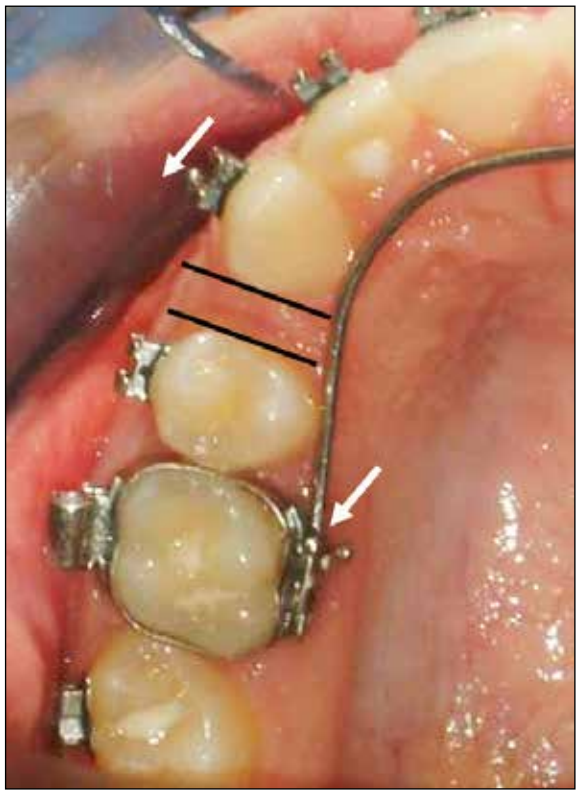

Figure 4. The modified pontic appliance can be used as an anchorage device for retraction of canines.

After delivery, like other pontics, clinicians should check that the pontics are not jeopardizing oral hygiene, causing premature contacts, interfering with tooth movements or affecting the healing of the extraction spaces.[3]

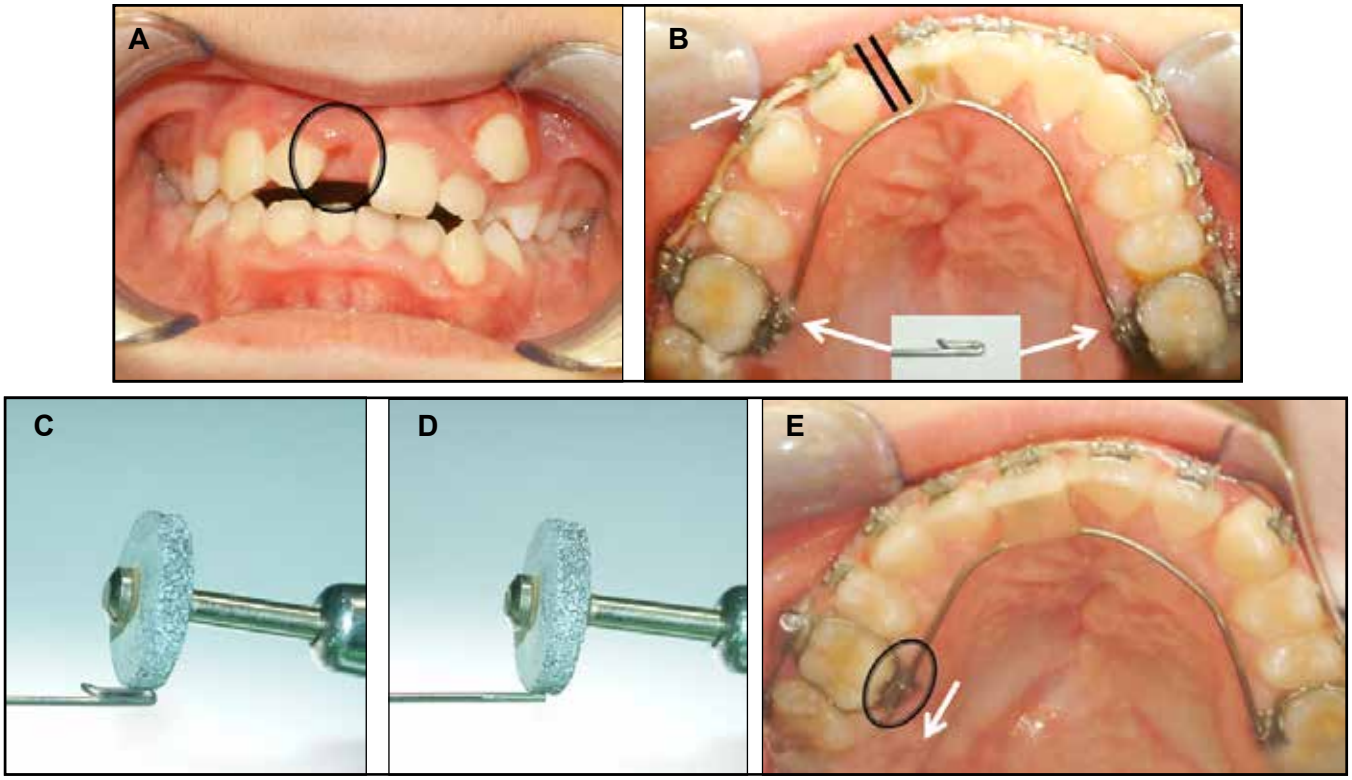

Figure 5. After canine retraction (A and B), the fixed pontic appliance is now being used for retraction of the incisors by slenderizing the .036-in wire so that it can slide through the .036 x .072-in lingual sheaths on first molar bands (C-E).

Figure 6. In order to open the bite in deep bite cases, the modified pontic appliance can be used in combination with an anterior bite plate.

REFERENCES

1. Soon HI, Gill DS, Jones SP. A study to investigate the bond strengths of orthodontic brackets bonded to prosthetic acrylic teeth. J Orthod, 42:192–199, 2015.
2. Viwattanatipa N, Jermwiwatkul W, Chintavalakorn R, Nanthavanich N. The effect of different surface preparation techniques on the survival probabilities of orthodontic brackets bonded to nanofill composite resin. J. Orthod, 37:162–173, 2010.
3. Matins RP, Magno AF, Martins IP, Martins LP, White LW. Composite pontics for orthodontic patients with extraction spaces. World J Orthod, 11:180-184, 2010.