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A bonded appliance to correct ectopically erupting permanent molars

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Abstract

A fully bonded multiloop wire appliance for the correction of ectopically erupting permanent molars is described. The appliance allows control in the anteroposterior, vertical, and transverse planes.

Ectopically erupting first permanent molars are seen in about 3% of the population.[1,2] Sixty-six per cent of ectopically erupting maxillary first permanent molars self-correct by jumping over the impaction on the distal surface of the second primary molar.[1] A variety of conservative methods have been suggested for the correction of ectopically erupting first permanent molars which remain impacted against the second primary molar.[3-8] These range from placing a brass separating wire between the second primary molar and the impacted first permanent molar[3] to banded appliances applying distal pressure to the impacted first permanent molar.[4-8] Most active appliances incorporate a band cemented to the second primary molar with wire soldered to the buccal surface allowing activation to the partially erupted first permanent molar.[4-7] The wire can be attached to the permanent molar by a Class I cavity preparation,[4] by pressure to the mesiobuccal surface[5] or to the mesiobuccal and mesiolingual surfaces,[6] or by bonding to the occlusal surface.[7] A combination of banding to the second primary molar and a bonded button to the maxillary first permanent molar together with orthodontic chain elastic also has been recommended.[8] This report describes the use of a totally bonded multiloop wire to correct an ectopically placed first permanent molar using commonly available materials.

Clinical Report

The materials needed for the technique are: .018 round stainless steel wire, bird-beak pliers, cotton forceps, cotton roll, cotton pellets, 37% phosphoric acid, Concise® composite resin using a sealant and paste combination[9] and three-pronged pliers.

Figures 1-3 identify the appliance used on a 9-year, one-month Caucasian female. Primary canines had been extracted for the relief of crowding and she presented with the maxillary left first permanent molar impacted beneath the retained maxillary left second primary molar. Despite the need for future orthodontic appliances relative to the serial extraction program, the decision was made to relieve the impaction in an effort to maintain molar symmetry anteroposteriorly.

A multiloop .018 wire was bent (Fig 2). The increased wire length between second primary and first permanent molar permits the use of light wire for a continuous force which remains active over a greater time period then shorter, heavier wires. It was retained by bonding composite resin to the buccal surfaces of the maxillary first and second primary molars and to the occlusal surface of the first permanent molar.

Following a thorough pumice prophylaxis of the tooth surfaces, the area was washed, dried, and isolated. The buccal surfaces of the primary teeth were etched for 90 sec. After thorough rinsing with air and water, these areas were dried and sealant was applied; moisture contamination must be avoided. The multiloop wire was attached to the buccal surfaces of the primary molars using a small mix of a sealant composite paste.[9] The wire was held by cotton forceps during initial polymerization. Additional composite paste then was applied in a step-wise fashion; a cotton swab moistened with alcohol can be used to provide a smooth surface which requires little or no finishing. The last area to be etched and bonded was the occlusal surface of the first permanent molar. The multiloop wire should be tested by attempting to pry it away from the three-surface contact to ensure that the bonding attachment is secure.

The horizontal arm of the multiloop wire then was

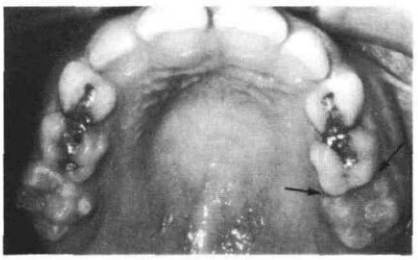


FIG 1. Pretreatment, permanent molar impaction demonstrated by arrows; A. buccal view (*left*), B. occlusal view (*right*).

activated in vivo using three-pronged pliers (Fig 2). Additional in vivo activation visits were made approximately every 4 weeks as necessary. In this patient, the impaction was relieved in 8 weeks. Follow-up photographs taken 2 months after appliance removal, demonstrated continued eruption of the permanent molar (Fig 3).

Discussion

This clinical report identifies a bonded appliance for the correction of ectopically erupting permanent molars. The technique is applicable only when the impaction is sufficiently severe, such that the use of elastic or brass separating measures is impossible. Unlike previously recommended appliances, this multiloop allows control of the impacted first permanent molar in the anteroposterior, vertical, and transverse planes. Activation of the horizontal arm of the multiloop between the second primary and first permanent molar controls the anteroposterior plane of space. The vertical arms allow control in the transverse and vertical planes of space.

The advantages of this technique are that the appliance is fabricated in 1 visit with no laboratory work required; furthermore, adjustment time is brief. The procedure does not require a band inventory and other material requirements are minimal, commonly available, and inexpensive. Seldom do frenal attachments preclude the use of this multiloop wire in this area of the mouth. Since the correction of the impacted first permanent molar requires reciprocal anchorage, the increased anchorage afforded by utilizing the first and second primary molars is most beneficial. Any retained resin in the occlusal surface of the first permanent molar following debonding can serve as a pit and fissure sealant.

The disadvantages of the technique lie in the requirement for accurate wire bending; the clinician may choose to use a working model to assist him in fabrication of the appliance. Removal of the bonding material is required with appropriate finishing of the enamel surfaces. Clinicians may be cautious with re-

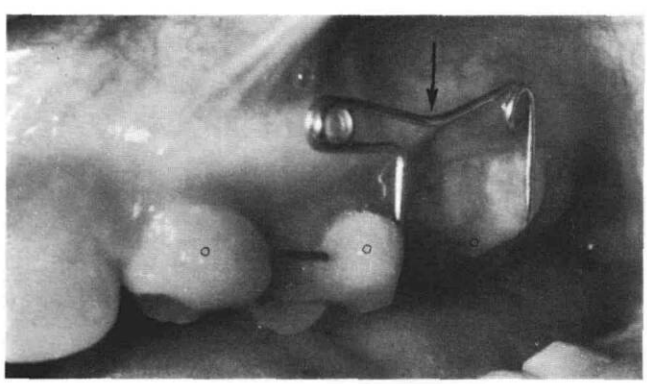
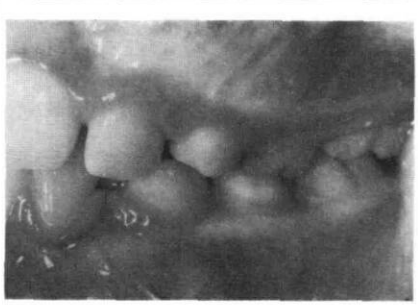


FIG 2. The bonded multiloop appliance; buccal view shows activation of horizontal arm with 3-prong pliers (arrow). Helical loops (marked o) in the wire help the resin adhere to the teeth.



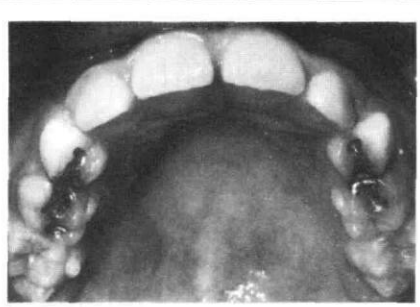


FIG 3. Two months posttreatment shows impaction relieved; (compare with Figs 1A & 1B; A. buccal view (*left*), B. occlusal view (*right*).

gard to the possibility of failure of the bonded attachments resulting in possible ingestion or inhalation of the appliance. The final disadvantage of the technique is that it requires the occlusal surface of the first permanent molar to be accessible for bonding. Surgical uncovering of the occlusal surface of the molar may be necessary.[8]

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