



Restoring coronal contours of retained infraoccluded primary second molars using bonded resin-based composite

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Abstract

The purpose of this case report is to describe a step-by-step method of restoring function (and esthetics) to infraoccluded second primary molars using a crown-form crown, in a case of bilateral congenital missing premolars. This technique restores form and function, with a minimal reduction to the tooth. It also conserves tooth material and permits good bonding of the resin-based composite to the enamel.

The crown-form resin-based composite restoration is an easy and inexpensive solution in cases of infraoccluded teeth. Yet, patients must be warned about the possible failure of the crown and the need of periodic follow-up appointments. (*Pediatr Dent.* 2003;25:71-73)

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Infraoccluded primary molars may present a wide range of problems to a child's dentition. Tilting of the adjacent teeth and minimal space loss in the dental arch at the occlusal level, along with a separation of the root apices, midline shift, overeruption of the antagonist teeth and esthetic problems, have been described in association with infraocclusion.¹

It has been suggested that the etiology of infraoccluded teeth is ankylosis.² Infraoccluded primary molars with successors present generally exfoliate normally, although the premolars may erupt 6 months later than in a normal area.² In severe infraocclusion, however, where the primary molar is embedded in the gingiva, extraction is often suggested followed by space maintenance.

With aplasia of the successor, the infraoccluded tooth does not exfoliate within the normal time range, and the root resorption is very slow. The clinician then faces a dilemma whether to keep the infraoccluded primary tooth or to extract it. Some possibilities include removing the primary molars and closing the space orthodontically, or placing a space maintainer until final prosthodontics may be favorable.³ In other situations, however, keeping the tooth may be the preferred mode of treatment. In these cases, building up the crown to maintain function and es-

thetics may be required. Building up the crown may be achieved via stainless steel crowns, esthetic posterior crowns or resin-based composite restorations.

The present case report describes a step-by-step method of restoring function and esthetics of infraoccluded primary molars with a crown-form crown in a case of bilateral congenital missing premolars.

Case report

A 15-year-old boy was referred to the dental clinic of the Department of Pediatric Dentistry at the Hebrew University Hadassah School of Dental Medicine in Jerusalem, Israel, after completion of orthodontic treatment. He revealed infraoccluded retained mandibular second primary molars. The successor premolars were missing (Figure 1). Clinical and radiographic (Figure 2) examinations revealed no caries and no periapical pathosis in either of the teeth.

To prevent overeruption of the maxillary teeth due to the loss of occlusion and to prevent tilting of the adjacent teeth, it was decided to restore the primary teeth. The option of placing stainless steel crowns was presented, and, since neither the boy nor his parents accepted the option of the nonesthetic stainless steel crowns, it was decided to place composite crowns. The treatment was explained to



Figure 1a. Right infraoccluded retained mandibular second primary molars.



Figure 1b. Left infraoccluded retained mandibular second primary molars.

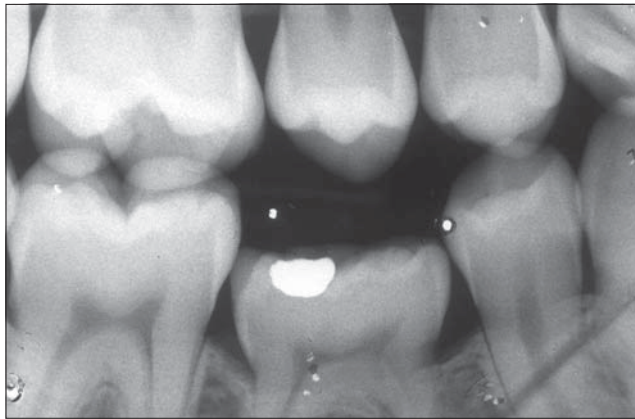


Figure 2. Preoperative radiographic examination. Note the loss of space and tilting of the first permanent molar.

the parents and the boy, and, after informed consent, the teeth were restored.

First, the occlusal height and the buccal and lingual surfaces of the primary molars were minimally reduced using a watercooled high-speed E1 diamond bur. Then the proximal preparation was done with the same bur. A proper crown-form matrix (Success Essentials, Space Maintainers Lab, Chatsworth, Calif) was selected for each tooth.

Trimming of the crown-form matrix was performed to ensure proper placement and occlusion of the teeth. The adaptation of the crowns was checked on a model and on the teeth.

The restorations were made one at a time. Etching was performed with 37% phosphoric acid, followed by bonding (Single Bond, 3M Co, St. Paul, Minn), and curing with halogen light. Then, the crown-form matrix was filled with a resin-based composite resin (Filltek P60, 3M, Co, St. Paul, Minn) and was placed on the tooth.

Excess material was removed with a carver, and, after curing 20 seconds on each side of the tooth, the crown-form matrix was removed with the sharp edge of the carver. Minor polishing was required in the margins. Occlusion was checked. The crowns placed immediately after the treatment are observed in Figure 3. The patient was scheduled for follow-up visits every 6 months. A year after treatment, the crowns are still functioning and in occlusion (Figure 4).



Figure 3a. Right crowns immediately after the treatment.



Figure 3b. Left crowns immediately after the treatment.



Figure 4. One year after treatment, the crowns are still functioning and in occlusion.

Discussion

Current developments in esthetic dentistry are centered on new techniques and materials. These improve the ability of the clinician to provide esthetic services and to preserve, as much as possible, the remaining healthy structure of the teeth.⁴ Both the stainless steel crown and the esthetic posterior crown demand extensive reduction of tooth structure.⁵ The resin-bonded ceramic onlay suggested by Cavanaugh and Croll is another treatment option, but it demands extensive reduction of the tooth and is much more expensive than the resin-based composite technique.⁶

The crown-form resin-based composite technique restores form and function with a minimal reduction of the tooth and conserves tooth material and good bonding of the resin-based composite to the enamel.

The use of the crown-form posterior matrix enables the clinician to place a homogeneous resin-based composite material, which ensures good coverage of the margins and an easily obtained esthetic restoration.⁷

This method could be unsuitable in cases of a decayed infraoccluded primary molar with subgingival involvement since the margin areas may be contaminated with gingival fluid or blood.⁷ In the present case, the preparation was supragingival, with no contact with the gingival tissues.

The problems of restoring the posterior crown-form resin-based composites restorations closely resemble those of anterior strip-crown preparations for primary teeth.⁸

No longitudinal follow-up has yet been reported for the resin-based composite crown-form crowns. However, satisfactory clinical performance of posterior resin-based composite fillings after 2 years follow up in decayed primary molars⁴ are certainly encouraging the use of resin-based composite materials for a variety of clinical situations.

The crown-form resin-based composite restoration meets functional and esthetic needs and is an easy and inexpensive solution in the case of infraoccluded teeth. Yet, patients must be warned about possible failure of the crown and the need of periodic follow-up appointments.

References

1. Becker A, Karnei-R'em RM. The effects of infraocclusion: part 1. Tilting of the adjacent teeth and local space. *Am J Orthod Dentofacial Orthop.* 1992; 102:427-433.
2. Kuroi J, Magnusson BC. Infraocclusion of primary molars: a histologic study. *Scand J Dent Res.* 1984; 92:564-576.
3. Christensen JR, Fields HW. Treatment planning and treatment of orthodontic problems. In: Pinkham JR, Cassamasino PS, Fields H W, McTigue DJ, Nowak A, eds. *Pediatric Dentistry—Infancy Through Adolescence.* 2nd ed. Philadelphia, Pa: WB Saunders Co; 1994.
4. Fuks AB, Araujo FB, Osorio LB, Hadani PE, Pinto AS. Clinical and radiographic assessment of Class II esthetic restorations in primary molars. *Pediatr Dent.* 2000; 22:479-485.
5. Fuks AB, Ram D, Eidelman E. Clinical performance of esthetic posterior crowns in primary molars: a pilot study. *Pediatr Dent.* 1999;21:445-448.
6. Cavanaugh RR, Croll TP. Resin bonded ceramic onlays for retained primary molars with infraocclusion. *Quintessence Int.* 1994;25:459-463.
7. Ram D, Peretz B. Composite crown-form crowns for severely decayed primary molars: a technique for restoring function and esthetics. *J Clin Pediatr Dent.* 2000; 24:257-260.
8. Croll TP. Primary incisor restoration using resin-veneered stainless steel crowns. *ASDC J Dent Child.* 1998;65:89-95.