



# Combined orthodontic and restorative care of early childhood caries and anterior crossbite: a case report

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## Abstract

*This case report describes management of a 3-year-old child with early childhood caries and anterior crossbite. Restorative care was postponed until after crossbite correction to eliminate occlusal interferences associated with premature contact and a functional shift of the mandible. Crossbite correction was performed with a fixed anterior bite plane appliance, and comprehensive restorative care was performed under general anesthesia. (Pediatr Dent 23:238-240, 2001)*

Early childhood caries presents a restorative challenge due to the age of the patient and the potential need for either sedation or general anesthesia to accomplish the necessary restorative work. In cases with anterior crossbite, the longevity of extensive Class IV restorations may be compromised by occlusal interferences associated with a functional shift of the mandible from centric relation to centric occlusion. In instances where caries is close to the pulp, it is prudent to establish a treatment plan which both corrects the anterior crossbite and restores the caries lesions.

## Case report

### A. History

A healthy 3-years, 2-month-old female was referred for management of early childhood caries and anterior crossbite correction. Caries was present in all four maxillary incisors (Figs 1 and 2) and on the occlusal surfaces of all first primary molars and the lower second primary molars. Radiographs identified early interproximal lesions on interproximal surfaces of first primary molars. Despite the fairly extensive caries, the



Fig 1. Occlusal view of the maxillary incisors with partial arrest of the decay after a 4-week course of topical fluoride varnish application.

child was free of pain. There was a previous history of at-will prolonged bottle feeding with both milk and juice placed in the bottle until age 2 years, 5 months, including nocturnal use.

The patient had a mesial-step occlusion, with lower anterior spacing and minimal maxillary incisor interproximal spacing. In centric occlusion, anterior crossbite was present with a negative overjet and positive overbite (Fig 3). She was able to attain an edge-to-edge relationship of the incisors in centric relation (Fig 4) from which she postured anteriorly and vertically into an anterior crossbite in centric occlusion where she was able to attain maximum occlusal interdigitation. There was no family history of a skeletal Class III malocclusion determined by parental interview.

### B. Treatment

Initial treatment involved appropriate preventive assessment and recommendations relative to diet, fluoride use and homecare instruction. Initial active treatment involved a one-month course of weekly fluoride varnish application on the lingual surfaces of the maxillary incisors in an attempt to arrest the caries and desensitize the patient to the dental operatory.

Following improvements in dietary habits and homecare, an upper and a lower impression with bite-registration in centric occlusion were attained, such that a fixed lower biteplane appliance could be fabricated. One week later, the bite plane



Fig 2. Periapical radiograph of maxillary incisors at the initial examination.

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Fig 3. Anterior dental crossbite in centric occlusion.



Fig 4. Edge to edge relationship in centric relation.



Fig 5. Anterior guide plane cemented in place with a resin-modified glass-ionomer cement (11-weeks post-insertion).



Fig 6. Completed anterior restorations following the correction of dental crossbite.



Fig 7. Eight-months post-operative view, indicating the stability of the occlusion.



Fig 8. Eight-months post-operative periapical radiograph indicating the continuation of root maturation and the presence of a maxillary mesiodens.

appliance was cemented with a resin-modified glass-ionomer cement (Fig 5). Definitive restorative care was provided under inhalation general anesthesia 11 weeks after the placement of the biteplane appliance. The biteplane appliance was removed, and the anterior crossbite was corrected. There was improved interproximal spacing in the maxillary incisor region secondary to biteplane treatment (Fig 5). Posterior lesions were restored with amalgam alloy and anterior restorations were restored with a microfill composite resin. Final photographs demonstrate appropriate restoration of caries lesions and correction of the anterior crossbite (Fig 6).

The patient presented to the office for recall examination 8-months postoperatively, at which time the occlusion appeared to be stable with no signs or symptoms of pathology (Fig 7). The periapical radiograph also demonstrated continuation of root maturation and the presence of a maxillary mesiodens (Fig 8).

## Discussion

While some anterior crossbites can self-correct,<sup>1</sup> the presence of active caries lesions precluded this waiting for self-correction as a viable treatment option. The decision to use fluoride

varnish to slow down the progression of caries was considered logical based on the need to correct the crossbite prior to restorative care. Failure to correct the crossbite would have likely resulted in more occlusal stress to the incisal edges of the restorations, predisposing them to failure.

The use of anterior fixed inclined planes has been described.<sup>2,3</sup> Fixed inclined planes have the advantage of elimination of patient compliance as well as rapid results.<sup>4</sup> This was advantageous given the young age of the patient and the need to attend to the restorative care before more rapid progression of caries. The two-month active treatment time was sufficient to accomplish the necessary tooth movement, and the positive overbite exhibited post-treatment is essential to a favorable long-term prognosis for correction.

## References

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## ABSTRACT OF THE SCIENTIFIC LITERATURE



### A STUDY OF REPEAT DENTAL GENERAL ANAESTHESIA FOR CHILDREN

The purpose of this retrospective study was to investigate the patterns of referral, disease and treatment for healthy children who had received two or more dental general anesthetics (GA) for dental extractions. Records from two hundred cases of repeat GA were analyzed. The mean age of children at their first referral for dental treatment under GA was five years and four months. The mean time interval until the next GA was just under two years. An interesting finding was that self-referrals rose from 14% at the first GA to 30% at the second GA. 75% of single tooth extractions required repeat GA for caries left at the first GA. The authors of the study conclude that it may be too optimistic to address only the most grossly diseased teeth when a child requires GA exodontia. A more radical treatment-planning approach, combining primary care secondary care and public health considerations, may be required to avoid the unnecessary use of dental general anesthesia.

**Comments:** A key finding in this timely study was the high proportion of children who had been left with untreated dental caries at the first GA returning for further GA. Proper treatment planing must be made before GA and a qualified pediatric dentist must be involved in the decision process. More and more children are being referred to GA due to the limited behavior management techniques allowed by modern parents. Parents of children undergoing GA must be made to understand that the GA treatment is only the first step in their child's oral rehabilitation. Proper home care, regular dental check ups and patient behavior modification are all needed to prevent future treatment under GA. **AK**

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