

Maxillary Anterior Crossbite Correction with Modified Anterior Bite Plane: A Case Report

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Abstract

Anterior crossbite refers to an occlusal issue where the maxillary anterior teeth are positioned palatally to the mandibular anterior teeth. These crossbites can be classified as either dental or skeletal in origin. This article documents a case in which anterior dental crossbite was successfully corrected using two consecutive removable acrylic appliances.

Keywords: Anterior bite plane, Crossbite, Hawley's appliance, Modified anterior bite plane.

INTRODUCTION

Dental anterior crossbites arise from an abnormal axial inclination of the maxillary anterior teeth, whereas skeletal anterior crossbites are typically linked to underlying skeletal issues, such as mandibular prognathism and midface deficiency.^[1] Differential diagnosis between dental and skeletal anterior crossbite is crucial for determining the appropriate clinical treatment. This can be accomplished by guiding the mandible into centric relation and assessing the relationships of the molars and incisors. If the molars are in a Class I relationship and the incisors are in an edge-to-edge relationship, a dental correction can be performed.^[2] Anterior dental crossbite has an incidence of 4–5% and typically occurs due to the palatal malposition of the maxillary incisors, which arises from a lingual eruption path.^[3] Other contributing factors include trauma to the primary maxillary incisors, which may cause lingual displacement of the permanent tooth buds; the presence of supernumerary anterior teeth; crowding in the incisor region; a habit of biting the upper lip; an over-retained, necrotic or pulpless deciduous tooth or root; delayed exfoliation of primary incisors; and odontomas.^[2-5] The primary objective in treating anterior dental crossbite is to reposition the affected maxillary tooth or teeth by tipping them labially until a stable overbite relationship is achieved, which helps prevent relapse. Treatment may include moving a mandibular tooth lingually, moving a maxillary tooth labially, or utilizing a combination of both approaches.^[2] Various techniques have been employed to achieve this goal, including tongue blades, composite inclined planes, reversed stainless steel crowns,

removable acrylic appliances with lingual springs and fixed appliances^[6,7] In addition to being cost-effective and gentle on surrounding soft tissue, removable appliances for young patients should be easy to place and remove, as well as comfortable and well-tolerated.^[2,8]

CASE REPORT

Clinical presentation and intervention

An 11-year-old girl was referred to the Department of Pediatric Dentistry with the chief complaint of an unesthetic appearance of the maxillary central incisors, which were located behind the lower anterior teeth. Her medical and dental history was non-contributory, and the patient did not have a family history of Class III malocclusion. The permanent maxillary right central incisor was in crossbite. The patient had a complete set of permanent teeth and exhibited a Class I molar relationship on both sides. The maxillary midline was deviated approximately 2 mm to the left, whereas the mandibular dental midline coincided with the facial midline. Mild spacing was noted in the mandibular arch and there was adequate mesiodistal space to allow for labial movement of the

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maxillary central incisors [Figure 1]. There was no evidence of bone or dental pathology, nor any indication of a basal problem between the mandibular and maxillary arches. The treatment objectives for the patient included correcting the anterior crossbite, establishing normal overbite and overjet, aligning the anterior teeth for ideal inclination and enhancing the patient's facial and dental esthetics. The child was motivated to maintain good oral hygiene. To align the maxillary anterior teeth and correct the crossbite, a removable acrylic appliance with a modified anterior bite plane was fabricated, along with a Hawley's appliance to further align the maxillary anterior teeth [Figure 2]. The patient was recalled for follow-up every 2 weeks. After 4 weeks of active treatment, the crossbite of the maxillary incisor was successfully corrected and no issues were observed during the subsequent 2 months of clinical follow-up [Figure 3].

DISCUSSION

Anterior dental crossbite is a rare condition that poses significant esthetic and functional challenges for both children and their parents. It rarely resolves on its own.^[2] The ideal age to treat an anterior crossbite is between 8 and 11 years old, which is when the tooth roots are forming and the teeth are actively erupting.^[7] Anterior dental crossbite is a habitual crossbite of the anterior teeth that occurs without any skeletal discrepancy, resulting from a functional forward shift of the mandible during closure. When the mandible is properly guided into a normal centric relation, a normal overjet or an edge-to-edge position of the incisors can be achieved. Delaying correction until later stages of maturity may lead to a skeletal malocclusion, which could require more complex treatment. Various techniques have been employed to correct anterior dental crossbite, including tongue blades, composite inclined planes, reversed stainless steel crowns, removable acrylic appliances with lingual springs and fixed appliances.^[2,6,8] In addition to the child's age, treatment decisions should consider the number of teeth needing repositioning, the degree of overbite, the total number of teeth involved, and the motivation of both the child and the parents for pursuing treatment.^[7,9] The simplest treatment for anterior crossbite involves using a tongue blade. The patient is instructed to bite down on the blade during their leisure hours. This biting force is directed at the lingual side of the affected maxillary tooth, helping to move it forward. Meanwhile, the incisal edges of the mandibular teeth serve as a fulcrum, absorbing the opposing lingual forces.^[10] Crossbite can also be corrected using a reversed, prefabricated stainless steel crown. However, the main disadvantage of this treatment is the challenge of adapting a preformed crown to fit the tooth in crossbite. In addition, its unesthetic appearance often leads to rejection by children and their families.^[11] A composite inclined bite plane is an effective, simple and non-invasive treatment option, making it the preferred choice in certain situations. However, it is



Figure 1: Maxillary central incisors

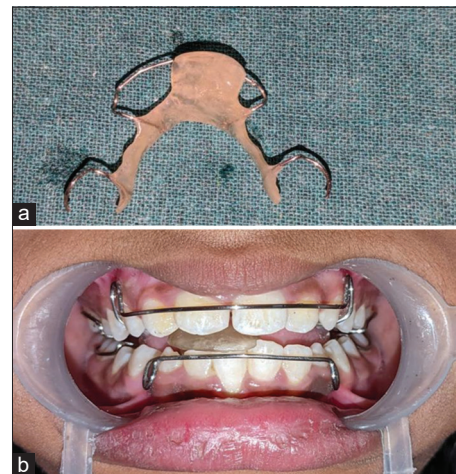


Figure 2: (a and b) Hawley's appliance



Figure 3: Two months of clinical follow-up

a safe, easy, and esthetically pleasing alternative for treating anterior crossbite.^[12] Removable orthodontic appliances offer three key advantages: (1) They are manufactured in a laboratory, which minimizes chair time for patients; (2) They can be taken out during socially sensitive events when visible wires on the front teeth may be undesirable; and (3) They are easy to clean, promoting good oral hygiene.^[13] In the present case as the patient was strongly against fixed appliances and treatments hence a novel approach was attempted using a modified removable anterior biteplane along with a maxillary Hawley's appliance to correct the single tooth crossbite. The

first appliance was equipped with a modified anterior biteplane to facilitate the labial movement of the incisor. The second appliance, a Hawley appliance, was used to align the maxillary central incisors. Throughout the treatment, the patient reported no discomfort. Ultimately, the treatment successfully corrected the malocclusion and resulted in an esthetically pleasing smile.

CONCLUSION

Based on the results presented here, this novel modified removable bite plane may be considered a viable choice of treatment to correct anterior dental crossbite of one or more incisors.

REFERENCES

1. Moyers RE. Handbook of Orthodontics. Chicago, IL: Yearbook Publishers Inc.; 1973. p. 564-77.
2. Park JH, Kim TW. Anterior crossbite correction with a series of clear removable appliances: A case report. *J Esthet Restor Dent* 2009;21:149-59; discussion 160.
3. Major PW, Glover K. Treatment of anterior cross-bites in the early mixed dentition. *J Can Dent Assoc* 1992;58:574-5, 578-9.
4. Bayrak S, Tunc ES. Treatment of anterior dental crossbite using bonded resin-composite slopes: Case reports. *Eur J Dent* 2008;2:303-6.
5. Heikinheimo K, Salmi K, Myllärniemi S. Long term evaluation of orthodontic diagnoses made at the ages of 7 and 10 years. *Eur J Orthod* 1987;9:151-9.
6. Vadiakas G, Viazis AD. Anterior crossbite correction in the early deciduous dentition. *Am J Orthod Dentofacial Orthop* 1992;102:160-2.
7. Kiyak HA. Patients' and parents' expectations from early treatment. *Am J Orthod Dentofacial Orthop* 2006;129:S50-4.
8. Sari S, Gokalp H, Aras S. Correction of anterior dental crossbite with composite as an inclined plane. *Int J Paediatr Dent* 2001;11:201-8.
9. Croll TP, Riesenberger RE. Anterior crossbite correction in the primary dentition using fixed inclined planes. II. Further examples and discussion. *Quintessence Int* 1988;19:45-51.
10. Graber TM. Orthodontics Principles and Practice. 3rd ed. Philadelphia, PA: W. B. Saunders Company; 1972. p. 673-5.
11. Croll TP. Correction of anterior tooth crossbite with bonded resin-composite slopes. *Quintessence Int* 1996;27:7-10.
12. Fields HW. Treatment of nonskeletal problems in preadolescent children. In: Proffit WR, editor. Contemporary Orthodontics. 4th ed. St. Louis, Missouri: Elsevier; 2007. p. 433-94.
13. Fields HW. Biomechanics, mechanics, and contemporary orthodontic appliances. In: Proffit WR, editor. Contemporary Orthodontics. 4th ed. St. Louis, Missouri: Elsevier; 2007. p. 397-402.