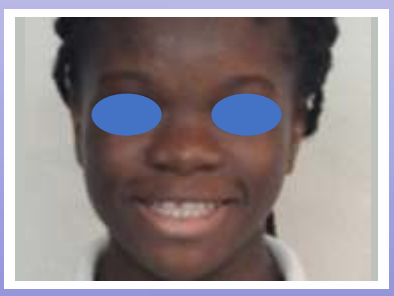
WEST AFRICAN JOURNAL OF ORTHODONTICS

ISSN 2315-9502

VOLUME 12, NUMBER 1

JUNE 2023

Artificial Intelligence in Orthodontics



Knowledge and Practice of Oral Habits in Children

Orthodontic Bond Failure Rate using Light Cure Adhesive

Multidisciplinary Management of a Class III Malocclusion

The Spontaneous Correction of Anterior Crossbite

OFFICIAL PUBLICATION OF ORTHODONTIC ASSOCIATIONS IN THE WEST AFRICAN SUB-REGION

"DENTISTRY'S FIRST SPECIALTY JOURNAL IN SUB SAHARAN AFRICA"

The Spontaneous Correction of Anterior Cross Bite in an Eleven-Year-Old Boy

Babalola A[a], Shubhita S[a] , Agrawal N[a] , Nwadiani A[a], Traore-Shumbusho A[a]

Abstract

Anterior cross-bite, a malocclusion affecting the alignment of upper and lower incisors, poses significant challenges necessitating early diagnosis and intervention to mitigate potential complications. This case study presents an eleven-year-old Nigerian boy exhibiting anterior cross-bite involving teeth 11, 12, 21, and 22, diagnosed as Angle's Class III malocclusion on skeletal pattern 1. Of particular interest was the spontaneous correction observed within six months. This unexpected self-correction stands in contrast to conventional orthodontic patterns recommended in numerous studies, including removable appliances, fixed bracket systems, and clear aligners. In conclusion, this case study underscores the significance of early diagnosis and intervention in anterior cross-bite cases while shedding light on the rare occurrence of spontaneous correction, potentially attributable to distinct physiological factors in individual cases.

Keywords: Anterior Cross-Bite, Malocclusion, Spontaneous, Correction.

Authors' Affiliations:
[a]Smile 360 Dental Specialists, Lagos, Nigeria.

Correspondence:
Adetola Emmanuel Babalola
Mail: adetolababalola5@gmail.com
ORCID: 0000-0002-5660-4917
Smile 360 Dental Specialists, Lagos, Nigeria.

ORIGINAL ARTICLE

Introduction

Early diagnosis and treatment planning of children with orthodontic needs require skilled efforts of dental practitioners, most especially orthodontic specialists.[1] Anterior cross-bite is a type of malocclusion involving the reverse relationship of the upper and lower jaws.[2] Anterior cross-bite is seen when one or all maxillary (upper) incisors bite on the lingual side of the mandibular (lower) teeth, causing a functional shift of the jaws.[3]

Numerous factors have been linked to causing anterior crossbite; which include a lingual eruption path of the maxillary anterior incisors; trauma to the primary incisor resulting in lingual displacement of the permanent tooth germ; supernumerary anterior teeth causing crowding, retained deciduous teeth and oral habits such as tongue thrusting. [4–6]

Onyeaso et al found out that the prevalence of reverse bite was 11.9% in the Lagos and Ibadan Nigerian communities.[7] The prevalence of anterior cross-bite is 5.5% in the Calabar Nigeria sample population of 10–15-year-olds.[8] It is important to diagnose and create a management plan early due to the complications that can arise when left untreated. Complications in aesthetic appearance, mastication, speech, and possible soft/hard tissue trauma to oral tissues are consequences of leaving this type of malocclusion uncorrected. This relationship can be seen in deciduous teeth or permanent teeth, and they require orthodontic correction.[9]

Case Presentation

The patient was an eleven-year-old Nigerian boy who presented at our facility with his parents. In his words, he said, "I want braces to arrange my teeth." His parents were concerned with his wrongly positioned front teeth. His medical and dental histories were non-contributory. The patient and parents also reported no oral habits. On extraoral examination, his face was symmetrical with competent and full lips as seen in Figure 1. Intraoral examination revealed teeth 11, 12, 21, and 22 in

anterior cross-bite as illustrated in Figure 2. The teeth present in the oral cavity were 11, 12, erupting 13, 14, 55, 16, 21, 22, 63, 24, 65, 26, 31, 32, 33, 74, 75, 36, 41, 42, 43, 84, 85 and 46 as shown in Figure 3.

The patient was in mixed dentition and all other teeth appeared to be in regular positions. Panoramic radiographic examination also showed all permanent teeth erupting normally, as seen in Figure 4. A diagnosis angle's class III malocclusion on skeletal pattern 1 complicated by anterior cross-bite was made. The patient also had a reverse overjet of 3mm, and the overbite was normal.

Teeth 11 and 21 still had open apices and early orthodontic treatment may result in short roots[10]. Also, teeth 34 and 44 were erupting, and the orthodontic team decided to review the patient after six months before orthodontic treatment. The patient was also asked to do a routine prophylaxis cleaning (scaling and polishing). After six months, the patient returned for review, and it was found that the cross-bite was completely corrected without intervention, as seen in Figure 5. At this presentation, the teeth present in the oral cavity were, 11, 12, 21, and 22 in anterior cross-bite as illustrated in Figure 2. The teeth present in the oral cavity were 11, 12, 13, 14, erupting 15, 16, 21, 22, 63, 24, 25, 26, 31, 32, 33, 34, 75, 36, 41, 42, 43, erupting 44, 85 and 46 as shown in Figure 6. The patient also appeared to smile more enthusiastically as seen in the facial profile photos shown in Figure 7.

Since we had no further plan to intervene, the team decided not to do any intraoral digital scans or study models. We asked the patient's parents to present for follow-up after an additional 6 months to monitor his occlusion.

Figure 1 Showing Facial Profile of the patient (L-R Lateral, Frontal Smile and Frontal views)

Figure 2. Intraoral Images at Presentation

Figure 2.1 Enlarged Intraoral Centre Image.

Figure 3 Intraoral Occlusal Photos at Initial Presentation

Figure 4. Orthopantomogram taken at initial presentation

Figure 5. Facial Profile on follow-up after 6 months

Figure 6. Six months Update Intraoral photographs.

Figure 6.1 Enlarged 6 months Update Intraoral Centre Photograph

Figure 7. Intraoral Occlusal Photos 6 months after Follow-up

Discussion

Multiple studies have shown various ways in which anterior cross-bites can be corrected. Removable appliances fixed or, more recently, clear aligners are all viable methods of correction[11–16]. Also, few studies have reported spontaneous or self-correction of the condition after months of follow-up[3,17].

The condition can be skeletal or dental in origin. The lateral cephalometric radiograph as shown in Figure 8**,** shows that it was more of a dental-related condition which also corroborates the self-correcting nature. The cephalometric radiograph was taken at the second presentation to properly assess the relationship of the incisors to the jaws which was now deemed satisfactory. This sagittal problem did not accompany a traverse or vertical component. It was, however, important to closely monitor or possibly intercept in phases to prevent occlusal wear or gingival damage[18].

The tongue could have propelled the maxillary incisors into normal occlusion as also reported by Mok et al[3]. In this case, the erupting canines and premolars could have given the needed clearance/space for this to occur.

Figure 8. Lateral Cephalometric Radiograph showing a Class 1 skeletal Pattern after 6 months.

Conclusion

This case study not only emphasized the importance of early diagnosis and intervention in anterior crossbite but also shed light on the rare occurrence of spontaneous correction, possibly attributed to physiologic tongue push on the maxillary incisors. We have also shown the importance of proper records and follow-up so as to compare orthodontic visits at intervals.

Data availability

Every data concerning this case is available upon request to the corresponding author of the manuscript.

Contribution to Authorship: All authors contributed equally to the manuscript.

Funding statement

We received no funding for this work.

Conflicts of interest

The authors declare no conflicts of interest.

Acknowledgements

All acknowledge the team members of the Orthodontic department including, the call centre, customers relations centre, nurses and treatment coordinators of Smile 360 Dental Specialists, Lagos Nigeria are all appreciated.

References

1. Dimond HDJ. Anterior crossbite correction. J Clin Orthod. 1983 May;17(5):326–7.
2. Lee BD. Correction of crossbite. Dent Clin North Am. 1978 Oct;22(4):647–68.
3. Mok CW, Wong RWK. Self-correction of anterior crossbite: A case report. Cases J. 2009;2(7):3–5.
4. Vadiakas G, Viazis AD. Anterior crossbite correction in the early deciduous dentition. American Journal of Orthodontics and Dentofacial Orthopedics.
5. Hannuksela A, Vaananen A. Predisposing factors for malocclusion in 7-year-old children with special reference to atopic diseases. American Journal of Dentofacial Orthopedics. 1987;92(4):299–303.
6. 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(2):151–9.
7. Onyeaso CO, Sote EO. A study of Malocclusion in the primary dentition in a population of Nigerian children. Niger J Clin Pract [Internet]. 2002 Jan 12];5(1):52–6.
8. Adekoya MN, Ayedun OS, Adeyemi TE. Prevalence of Malocclusion in Children between the Age of 10-15 Years in Calabar Metropolis, Cross River. West Afr J Med . 2021; Vol. 38(11):1095–100.
9. Estreia F, Almerich J, Gascon F. Interceptive correction of anterior crossbite. J Clin Pediatr Dent. 1991;15(3):157–9.
10. Hendrix I, Carels C, Kuijpers-Jagtman AM, Van 'T Hof M. A radiographic study of posterior apical root resorption in orthodontic patients. Am J Orthod Dentofacial Orthop. 1994 Apr;105(4):345–9.
11. De Brito GM, Simões D, Flores PS, Machado AW. An Effective Approach to Correcting Anterior Crossbite in a Class III Patient. J Clin Orthod. 2020 Nov;54(11):705–10.
12. Staderini E, Patini R, Meuli S, Camodeca A, Guglielmi F, Gallenzi P. Indication of clear aligners in the early treatment of anterior crossbite: a case series. Dental Press J Orthod. 2020;25(4):33–43.
13. Pellegrino M, Caruso S, Cantile T, Pellegrino G, Ferrazzano GF. Early Treatment of Anterior Crossbite with Eruption Guidance Appliance: A Case Report. Int J Environ Res Public Health. 2020 May;17(10).
14. Cheng H Chung, Shih M ju. ScienceDirect Dentofacial changes after anterior crossbite correction using a lingual arch with finger springs. J Dent Sci . 2017;12(1):70–7.
15. Zhang J, Yang Y, Han X, Lan T, Bi F, Qiao X, et al. The application of a new clear removable appliance with an occlusal splint in early anterior crossbite. BMC Oral Health. 2021 Jan;21(1):36.
16. Pereira da Silva HCF, de Paiva JB, Rino Neto J. Anterior crossbite treatment in the primary dentition: Three case reports. Int Orthod. 2018 Sep;16(3):514–29.

17. Rosa M, Lucchi P, Mariani L, Caprioglio A. Spontaneous correction of anterior crossbite by RPE anchored on deciduous teeth in the early mixed dentition. Eur J Paediatr Dent. 2012 Sep;13(3):176–80.

18. Wiedel AP, Bondemark L. Stability of anterior crossbite correction: a randomized controlled trial with a 2-year follow-up. Angle Orthod. 2015 Mar;85(2):189–95.