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CASE STUDY

TREATMENT OF ANTERIOR SINGLE TOOTH CROSSBITE WITH FIXED Z SPRING

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ABSTRACT

Anterior dental cross bites are one of the most prevalant orthodontic problems that we observe in growing children. Z spring has been used as the most conversant appliance as it is easy to fabricate and applies adequate magnitude of force to advance the teeth in cross bite. But most of the times a succesful outcomes becomes difficult due to compliance issues. So we decided to use fixed Z' Spring to obtain better patient cooperation and acceptance. Presented in the article is a case report in which anterior cross bite is corrected successfully with the fixed appliance and a positive result was obtained in 3 weeks time. An apt intervention at the right times proves to be of much help in these children with compliance issues.

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INTRODUCTION

Anterior crossbite is an anterior-posterior malocclusion that is highly prevalent during the mixed dentition and is etiologically associated with a deviation of the eruption axis, causing esthetic, functional, and periodontal abnormalities. [1]Graber has defined crossbite as a condition where one or more teeth may be abnormally malposed either lingually or labially with reference to opposing teeth. [2] Crossbite has a reported incidence of 4–5% and usually becomes evident during the early mixed dentition and if delayed to a later stage of maturity, treatment may become more complicated.[3] Numerous etiological factors are responsible for the condition such as palatal eruption of the maxillary incisors, trauma to the primary incisors resulting in lingual displacement of the permanent tooth germ, supernumerary anterior teeth, an over-retained necrotic or pulpless deciduous tooth or root, odontomas, crowding in the incisor region, and inadequate arch length, a repaired cleft lip , a habit of biting the upper lip. [4,5] The deleterious effects of anterior crossbites include abnormal enamel abrasion or proclination of the mandibular incisors, which, in turn, leads to thinning of the labial alveolar plate and/or gingival recession. Also it leads to interference with growth of the middle third of the face, abnormal speech patterns, loss of arch integrity, periodontal disease, undesirable esthetics, root resorption of central incisors.[4]

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According to Profitt, correction of anterior dental crossbite requires first opening of enough space, then bringing the displaced tooth or teeth across the occlusion into proper position. [5]The various treatment options which can be suggested in such a condition includes both removable applainces likebonded composite resin slopes, bruckels appliance, reversed stainless steel crowns, hawleys appliance with z spring or fixed appliances such as catlans appliance and 2*4 appliance. The disadvantages of removable appliances is that compliance is always an issue, tedious lab work, frequent patient appointments, The appliances can be left out, Only tilting movements are possible, They can affect speech, intermaxillary traction is more difficult, aside from the challenge a professional faces while delivering an appliance to a child in the primary dentition.[5,6]Z spring has been used as the most conversant appliance as it is easy to fabricate and applies adequate magnitude of force to advance the teeth in crossbite. To overcome the disadvantages of removable appliance and to incorporate the advantages of the most versatile z spring used for anterior single tooth crossbite we tried a fixed version of zspring for the correction of the malocclusion.

Case report

A 9-year-old male patient was referred to the pedodontics department with a chief complaint of backwardly placed upper front left tooth. On clinical examination, anterior single tooth crossbite was observed in relation to maxillary left central incisor (Figure 1).

Parents were informed about the treatment, and a written consent was documented. The crossbite was treated with a fixed z spring, and the bite was reversed (Figure 2).

The patient was examined after 7 months, and there was no relapse of the crossbite in relation to maxillary left incisor. (Figure 3)

Banding was done on both the maxillary molars and alginate impressions of both arches were taken. Z spring was fabricated and was attached to an anterior acrylic plate which was supported using a palatal bow passing through the anterior acrylic button. GIC bite blocks of 2mm height was given on mandibular molars for opening the bite. The patients were advised to maintain good oral hygiene and recalled every week to clinically evaluate the progress of the treatment. A softer diet than usual was suggested for the first few days after the cementation. The treatment continuedfor a period of 3 weeks. Following correction, the appliance was removed, the enamel surface was polished, and topical fluoride (APF gel) was applied.

DISCUSSION

Anterior crossbite is a condition which very rarely corrects by itself because the maxillary incisor is locked behind the mandibular incisors and selfcorrection of this condition is virtually impossible. The problems of anterior crossbite in permanent dentition shows progression in severity, so that early intervention aim at stimulating well balance growth and occlusal development is indicated. [6] There are different treatment approaches for the correction of anterior dental crossbite which can be used in early mixed dentition period. The tongue blade therapy is successful only with patient cooperation, and there is no precise control of the amount and direction of force applied. The reverse stainless steel crowns have been shown to be successful but the two main disadvantages of using reverse stainless steel crowns are the unaesthetic appearance of the crown form and the limitations of working with an inclined slope that is already formed. A removable appliance also requires patient cooperation and parental supervision. The Lower Inclined Bite Plane is the traditional method used for correcting anterior single tooth or multiple tooth dental crossbite. It can be used only if there is enough space in dental arch for labial movement of the upper incisors. The presence of crowding in mandibular incisors, temporomandibular joint problems, and maxillary deficiency has to be considered before suggesting this appliance.[5] Fixed z spring is a safe, cost effective, rapid and easy alternative for the treatment of crossbite. It is cost effective because it does not involve the use of fixed orthodontic tooth movement procedures. A disadvantage of the procedure was that it resulted in slight amount of palatal hyperplasia after the treatment which could have been reduced by reducing the size of the palatal button.

Conclusion

The case well describes that fixed z spring can be used as a favourable alternative for the trearment of anterior dental crossbite rather than depending on the feasibility of removable applainces. The correction was observed within three weeks, with no damage to teeth or marginal periodontal tissue and the child is benefited from the treatment at this early stage of development. Further studies are required to evaluate other treatment modalities in comparison with this traditional method of correcting anterior dental crossbite.

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