Case study

Management of anterior single tooth crossbite using removable posterior teeth bite plane along with Z-spring: a case report

Abstract

Anterior crossbite is defined as a malocclusion characterized by the anterior maxillary teeth lingual position compared to mandibular anterior teeth. Anterior crossbite cases should be treated by emergency intervention in the early period to prevent the consequences of malaligned teeth and its effect on normal overall growth and development of the child. Children with untreated anterior crossbite could develop complications such as gingiva recession, TMJ dysfunction and worsening of mandibular displacement. As self-correction is rare in these alterations, early interception is recommended to allow normal occlusion and facial development.

Keywords: Single tooth crossbite, posterior bite plane, Z-spring, removable orthodontic appliance

Introduction

Anterior crossbite is defined as a malocclusion which is characterized by the anterior maxillary teeth lingual position compared to mandibular anterior teeth.[1] Anterior dental crossbite shows incidence of about 4-5%. It is basically observed in the early mixed dentition period and is caused by the abnormal eruption of permanent incisors.[2] Early orthodontic treatment in either primary or mixed dentition is advantageous to allow for normal occlusion and skeletal development before the establishment of the permanent dentition. Spontaneous correction of crossbites is extremely unusual, therefore, early interceptive interventions are required. Certain negative outcomes related to the anterior crossbite include gingival recession, loss of alveolar bone support, and mobility of the lower incisors, along with potential adverse growth influences on the anterior portion on the maxilla.[3]

Case report

A 7 year old boy visited with the chief complaint of malaligned front teeth in upper jaw. On extra-oral examination it was observed that child has proper facial symmetry and straight profile. On intra-oral examination child has single tooth anterior crossbite with upper right central incisor. It was in the stage of eruption. The upper right lateral incisor was yet to erupt. The child had mixed dentition. After complete examination of child upper and lower alginate impressions were recorded. After cast models were made, the treatment planned was fabrication of removable posterior teeth bite plane along with Z-spring. Components of the removable appliance consist of Labial bow, Adam's clasp and Z-spring. After stabilizing these components with the help of modeling wax and acrylic plate was fabricated using sprinkle on technique. Appliance was finished and polished with the help of polishing paste and burs. The appliance was delivered to the patient and Z-spring was activated by opening coil. Patient was recalled after every week. They were instructed to maintain adequate oral hygiene. It was only allowed to remove the appliance only during brushing and eating food. In a period of 2 weeks, the tooth came in edge to edge contact. After 4th week, labialization of the central incisor was observed and occlusion was achieved. Till this time duration the lateral incisor was also erupted. Patient was delighted with the results.

PRE-OPERATIVE IMAGES

Fig.1 Frontal view showing 11, 41 in crossbite Fig.2 Right lateral view showing occlusion

Fig.3 Left lateral view showing occlusion

Fig.4 Hawley's appliance incorporating Z spring and posterior bite plane

POST-OPERATIVE IMAGES

Fig.5 Frontal view after 1 month follow up

Fig.6 Right view in occlusion after 3 months follow up

Fig.7 Left view in occlusion after 3 months follow up

Discussion

Anterior dental crossbites are rare condition that possesses major esthetic and functional concern to children as well as parents which seldom corrects itself. The ideal age for treatment of anterior crossbite is between 8 years and 11 years, when the root is being formed and the tooth is in the active stage of eruption.[6] Many orthopaedic/orthodontic interceptive treatment modalities have been proposed for achieving the class III and the anterior crossbite correction, including the facemask associated with the rapid palatal expander, the chin cup, the Frankel appliance (FR-3), the bionator, the reverse Twin-block, the removable mandibular retractor, the double-piece corrector, and the bone anchorage appliances associated to class III elastics. Among these options, the reverse-pull headgear is proven effective for correcting a retrognathic maxilla by many authors.[7] The patient's motivation for treatment of anterior teeth crossbite depends on how they perceive the problem and determine the best course of action. Early intervention is recommended in such patients to prevent the condition from worsening and to achieve the best possible results for the patient's oral health and well-being.[8]

Conclusion

The above case represents the early diagnosis and treatment of anterior single tooth crossbite showing promising results. The compliance of the child in this case proved excellent. Patient maintained hygiene as well on his own. The advantages of doing early correction are less time duration, less follow up and reasonable expenses. As the age advances, the further growth and development takes place which might require more advanced treatment options and increased time duration. early orthodontic correction using removable appliance prove with better results when diagnosed and treatment option is chosen wisely.

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