



Management of Crossbite in Anterior Region Due to Over-retained Deciduous Teeth in an Adolescent – a Case Report

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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Case Study

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ABSTRACT

The deciduous teeth which are retained beyond the age of exfoliation are termed as over-retained deciduous teeth. There are numerous reasons for such teeth which include congenital absence or impaction or translation or transmigration of successor teeth or maybe because of existence of some kind of pathology, such as cysts, tumours, and odontoma under the primary tooth that results in the impaction of successor teeth. It may also be due to partial or total microdontia of permanent dentition. This leads to malalignment in permanent dentition which indirectly hampers the normal growth of the jaws. This case report shows several after-effects of over retained teeth along with the concerned multiple treatment options.

Keywords: *Over-retained deciduous teeth; crossbite; fixed orthodontic therapy; malalignment; exfoliation.*

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1. INTRODUCTION

Mixed dentition is a very crucial stage in growth and development of the child. During this stage the deciduous teeth exfoliate and successor teeth attain the position in the jaw. Due to some dietary and oral habits including other reasons, the deciduous teeth may not exfoliate but permanent teeth erupt in the oral cavity. Thus, the deciduous teeth retaining beyond their age of exfoliation are called as overretained deciduous teeth [1]. This is resulting in malalignment of teeth thereby imposing restrictions on normal growth and development of the jaws. Therefore, it is important to treat such conditions in early age to allow for normal growth of oral structures.

Grabner defined crossbite as a condition where one or more teeth may be abnormally malposed either lingually or labially with reference to opposing teeth. Anterior crossbite is a situation in which one or more maxillary incisors occlude lingually to their 2 antagonists [2]. Different techniques have been used to correct anterior crossbite. The tongue blade is the most basic technique, but it is rarely sufficient when more than one tooth is involved. The use of reversed stainless steel crowns presents some difficulties in adapting of a preformed crown to fit the tooth in crossbite and it is unaesthetic [3]. The present article describes the case of overretained teeth treated by fixed orthodontic therapy.

2. CASE REPORT

A 14 year old boy visited to the department of Pedodontics and Preventive Dentistry in an institution situated in Nagpur City Maharashtra State, India with chief complaint of retention of milk teeth even after eruption of permanent teeth in front region of jaw. The patient and his parents were observing unaesthetic appearance of teeth. Except for these over-retained deciduous teeth in

anterior region rest all teeth were exfoliated on their own. There was no relevant history of any major illness, allergies, hospitalization and blood transfusion reported by parents. It was the first visit of the patient to the dental office. On examination it was observed that patient had several over-retained deciduous teeth in upper and lower jaw. In upper jaw there were deciduous lateral incisors and canine in both the quadrants and in lower jaw deciduous lateral incisors were observed. The patient also had crossbite in anterior region of jaw because of retention of deciduous teeth and lingually erupted permanent lateral incisors were observed in mandibular arch. Posterior segment of both upper and lower arch appeared normal. Patient had straight profile. Poor oral hygiene was also seen in anterior part of the jaw. The patient had Angle's class I molar relation on both sides. Dental treatment was advised to the patient which included extraction of deciduous teeth and fixed orthodontic therapy along with anterior crossbite correction.

Dental treatment was initiated with complete oral prophylaxis. Quadrantwise extractions of deciduous teeth were done. Separators were placed in upper and lower arch for 24-48 hours before initiation of fixed orthodontic therapy. Banding was done with permanent first molars followed by placement of blue bite raising composite. Metallic Brackets were bonded in upper and lower arch and 0.012 NiTi arch wire was placed and secured with modules. Arch wires were changed every month and modules were replaced after every 8 days. In the last phase of the treatment elastic chain was used to close the spaces. Treatment continued for about 16 months. Post bracket removal patient is kept on retention phase for about 6 months. He was also advised to maintain oral hygiene and periodic follow up after every 6 months.



Fig. 1. Maxillary arch



Fig. 2. Mandibular arch



Fig. 3. Frontal view



Fig. 4. Lingually Erupting 32, 42



Fig. 5. Separators placed in maxillary arch



Fig. 6. Separators placed in mandibular arch

During treatment images Fig. 7 a) to Fig. 7 h)



Fig. 7. a) immediate brackets placement



Fig. 7. b) after 1 month



Fig. 7. c) after 3 months



Fig. 7. d) after 5 months



Fig. 7. e) after 7 months



Fig. 7. f) after 9 months



Fig. 7. g) after 12 months

Fig. 7. h) after 14 months



Fig. 8. After 16 months maxillary arch

Post operative images



Fig. 9. Maxillary arch

Fig. 10. Mandibular arch



Fig. 11. Frontal view

3. DISCUSSION

Over-retained primary teeth are a topic of concern for many Pedodontists, orthodontists and general dentist as well. Retention of primary teeth beyond their expected time of exfoliation is now a days encountered relatively frequently. There are lot of reasons involved with this such as congenital absence and impaction of successor teeth in individuals. Translation or transmigration of successor teeth is also one of the reason for retention of deciduous teeth. Existence of pathology, such as cysts, tumours, and odontoma under the primary tooth may also result in the impaction of successor teeth. Partial or total microdontia of permanent dentition also results in retention of primary teeth.

The common literature available regarding the persistence of primary teeth suggests that primary teeth may be retained for variety of reasons, the most common being developmental absence of the permanent successor (Robinson and Chan, 2009). Normally the primary tooth roots undergo gradual resorption concurrently with the initial eruption of the successors. The rate of the root resorption of primary teeth varied widely among individuals (Kuroi and Thilander, 1984). If the root and coronal structure are good, the tooth is functionally and aesthetically acceptable, and there is no compelling orthodontic need for extraction the primary tooth may be retained intact in its original condition in the arch.

Anterior crossbite correction in early mixed dentition is highly recommended as this type of malocclusion does not diminish with age. Anterior crossbite is an abnormal labiolingual relationship between one or more maxillary and mandibular incisor teeth. If it is kept uncorrected for longer period of time, it may lead to abnormal wear of the lower incisors, dental compensation of mandibular incisors leading to thinning of labial alveolar plate and/or gingival recession. It may also cause mandibular shift resulting in mandibular asymmetry and temporomandibular joint dysfunction syndrome. Therefore as soon as it is detected, it should be corrected early with desired methods. There are various treatment modalities available for correction of crossbite like Removable acrylic appliance with posterior bite plane, Anterior finger springs, GIC bite block, Coloured composite blocks, Guray bite raiser, 2 by 4 appliance, Catlan's appliance [4].

Fixed Appliances are those devices or equipments which are attached to the teeth, cannot be removed by the patient and are capable of causing tooth movement [5-8]. It is indicated for precise tooth movements, Correction of mild to moderate skeletal discrepancies, Intrusion and extrusion of teeth, Active closure of spaces: extraction spaces/hypodontia, Correction of rotation and crossbite, Overbite reduction by intrusion of incisors, multiple tooth movements in one arch [9-10].

Crossbites of dental origin must be distinguished from those of skeletal origin [11-12]. 3-7 In the simple anterior dental crossbite the patient should display a normal skeletal pattern, with abnormalities presenting in the axial inclination of the affected teeth only [13-14].

4. CONCLUSION

Over-retained deciduous teeth are of prime concern with respect to malocclusion. The treatment plan in such cases must be selected carefully when using this option of fixed orthodontic appliance. The crossbite must be a simple dental crossbite with no skeletal component involved. The facial profile should be staright and occlusion should have Class I molar relation. There should be adequate room in the arch for correction of the crossbite. The appliance used for this patient served as an alternative to the use of tongue blades, inclined planes, reverse stainless steel or composite crowns, and the Hawley retainer with auxiliary springs. This technique can be used in a variety of clinical situations with only minor changes in the appliance design.

CONSENT

Written & Oral informed consent was obtained from the parents of the patient included in the study.

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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