IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 20, Issue 4 Ser.15 (April. 2021), PP 43-47
www.iosrjournals.org

Interceptive Treatment protocol for Orthodontic patientsin mixed dentition period: Case Series

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Abstract:
***Background**: Early orthodontic treatment in mixed dentition period is important to develop dentitions in such a way that they should have functional and morphological occlusion. Anterior crossbite and thumb sucking habits are two conditions which are required immediate attention and correction irrespective of other associated contraindications. These conditions can be treated by interceptive orthodontic treatment modalities. This will help to guide the dentition from malocclusion to a normal occlusion.*
***Case Presentations**: All thecases have range from 7-9 years age presenting in mixed dentition development period. In This study total eight cases, five cases of anterior crossbite corrected by using removal acrylic appliances with Z spring and three cases of thumb sucking habits corrected by using palatal crib. Recall examination after 3 and 6 months displayed clinically normal occlusal relationship without any reversal of previous condition.*
***Conclusion:** orthodontist have important role to diagnose malocclusions early and interceptive orthodontic treatment can predominantly eliminate the need for future correction of complicated, expensive and time consuming orthodontic treatments.*
***Keywords**: mixed dentition, Interceptive orthodontics, anterior crossbite, thumb sucking, Z spring, palatal crib.*

I. Introduction:

Early detection of developing malocclusions and the use of interceptive orthodontic treatment procedures can help to avoid the need for more sophisticated and expensive treatment in the future [(1)]. When a malocclusion has begun, interceptive orthodontic procedures are used to re-establish a normal occlusion [(2)]. The capital concern in the progression of normal occlusion is normal growth and ideal dentition development.

Early orthodontic therapy has the goal of guiding dentitions as they form a functional and morphologic al occlusion. Interceptive orthodontic treatments are used to identify and correct any discrepancies and malpositi ons that occur during the development of the dentoskeletal complex [(1)].

Serial extraction, correction of developing crossbite, control of abnormal habits, spacerecovery, and ext raction of supernumerary andretained primary teeth are all examples of interceptive orthodontics applications [(3)].

The condition of anterior crossbite is described as improper labiolingual connection between one and more maxillary and mandibular anterior incisor teeth[(4)].Dental is characterised by the tipping of one or moreteeth, which is localised but unrelated to the basalbo ne . Patients with abnormalities presenting one or moremaxillary incisors in crossbite shouldhave a normal skele tal pattern. To avoid aberrant enamel abrasion, anteriortooth mobility and breakage, periodontal disorders, and t emporomandibular joint dysfunction, an anterior dental crossbite should be treated right away [(5)].

Bonded resincomposite slopes, tongue blades, fixed acrylic inclined planes, reversed stainless steel cro wns, removable acrylic appliances with Z springs, and the Bruckl appliance are all options for treating anterior c rossbite . A habit is a habitual action that is carried out on a regular basis.Repetitive behaviours are widespread

during the infancy period, and the majority of them begin and end spontaneously[6].If the habit persists or becomes more frequent, negative dentoskeletal consequences will occurs .

Proclined maxillary or mandibular incisors, anterior open bite, greater overjet, lingual inclination lower incisor, unilateral crossbite, deep palate, speech defect, and finger defect are examples of these outcomes [7]. Direct counselling by a dentist, reminder therapy, the incentives concept, and orthodontic appliance treatmentare all possibilities for treating these behaviours [8]. This article discusses a case study in whi ch a crossbite was rectified with the help of interceptive orthodontic therapy.

II. Report on Cases:

Case 1:

A 7 -year old male patient came with chief complaint of crooked upper front teeth . The permanent maxillary left and right central incisors were found to be in crossbite after a through clinical intraoral examination. Upper removable acrylic appliances with Z springs were placed to maxillary left and right central teeth.
In three months, the crossbite was rectified. After 6 months, a recall examination revealed a normal occlusal rela tionship with no signs of recurrence (Figure1,2 and 3).

Figure 1: A 7 years old male patient with anterior dental crossbite

Figure 2: intraoral clinical photograph with removable acrylic appliances with Z spring

Figure 3: Intraoral photograph Post treatment - 3 months after treatment.

Case 2:
A 7-year old male patient was sent to our clinic because he was concerned about an unsightly anterior tooth. Anterior crossbite was discovered in connection to the maxillary right central incisor during a clinicalexaminatio n. Upper detachable acrylic appliances with Z springs were used to treat the crossbite.With in three months , the crossbite was treated with top detachable acrylic appliance with Z spring.Every month, Z springwas triggered. After 6 months, a recall examination revealed a normal occlusal rela tionship with no signs of recurrence.

Case 3:
An 8-
yearold girl patient was sent to our clinic with gingival recession. On clinical examination, gingivalrecessionwas seen due to occlusal stress to the lower right central incisor, and anterior crossbite was seen in relation to the ma xillary right centralincisor. Within three months, the crossbite was treated with top detachable acrylicappliances with Z spring. Every month, Z spring was triggered.

Case 4:
A 7-year-
old female patient was referred to our clinic for aesthetic concerns. The permanent maxillary implant was discov ered during an intraoral examination. The permanent maxillary right central incisor was found to be in crossbite duringintraoralexamination.Within three months, the crossbite was treated with top detachable acrylicappliances with Z spring.

Case 5:
A 8-year-
old female patient was admitted to our clinic due to a tendency of thumb sucking. Anterior open bite,deep palate , and compensatory tongue thrust were discovered during an intraoral examination. The palatal crib was cemente d to the upper permanent first molars with glass ionomer cement. After a month, her mother notified her that she had stoppedthe habit. However, the patient was advised to continue using the appliance in order to prevent the h abit from reversing. Every month, the patient was recalled for a checkup, and after 6 months,
the device was removed and the condition of the patient was assessed tongue position and swallowing pattern(Figure 4,5,and 6).

Figure 4: A 8 years old male patient's intraoral clinical photographs with thumb sucking

Figure 5: intraoral clinical photograph with removable acrylic appliances with palatalcrib.

Figure 6: Intraoral photograph Post treatment - 3 months after treatment.

Case 6:

A 7 year old male patient with a thumb sucking tendency was sent to our clinic.An anterior open bite anda deep palate were discovered during an intraoral examination. For six months, a palatal crib was used. Every month, the patient was called back for a checkup.

III. Discussion:

One of paediatric dentistry's main goals is to aid in the normal development of the dentitionand occlusi on . The development of mixed dentition provides the finest opportunity for occlusal management and malocclu sion prevention. Complexity may become an issue during therapy if it is not addressed [(9)]. Interception of habit a nd correction of anterior crossbite frequently necessitate the use of appliances, which can lengthen treatment tim e and cost [(10)]. Interceptive therapy techniques are used to correct malocclusion. Anterior dental crossbite occurs when the axis of one or more lingually positioned maxillary incisors incline unnaturally.

When primary teeth or roots are retained or pulp
less, odontomas are present, the arch length is insufficient, the incisor region is crowded, the permanent tooth ge rm is displaced lingually as the primaryincisor is traumatised, a repaired cleft lip is present, the maxillaryanterio r incisors' path is lingually erupted,supernumerary anterior teeth are present, and
biting the upper lip has become a habit, anterior dental cross.
Periodontal disease, temporomandibular joint dysfunction, anterior tooth movement andbreakage, and abnormal enamel abrasion can all be prevented by treating anterior crossbite as soon as it is discovered.
There are several approaches to dealing with anterior dental issues.Tongue blade therapy, reverse stainless steel crowns, removable acrylic appliance with anterior Z springs, bonded resin composite slopes, and fixed orthodontic appliance are some of the options for treating anterior dental crossbite.According to Skeggs and Sandler, the proper use of permanent appliances for the treatment of anterior dental crossbite was faster than the detachable approach . According to Wiedel et al., anterior crossbite in one or

moreincisors in the mixed dentition can be successfully treated with both fixed and removable prostheses that h ave similar long-term stability.

Oral habits can obstruct jaw growth and development, contributing to the development of malocclusion and abnormalities in normal swallowing and speech patterns and depending on duration, frequency, intensity of habit, and facial pattern [(11)].If the habit persists during mixed dentition, it may cause dentoalveolar changes, such as the procline of the maxillary or mandibular incisors, the development of an anterior open bite , the growth of overjet, the development of unilateral crossbite , and the occurrence of class II malocclusion[(12)].
Advice, reminder therapy, incentives concept, fitting a fixed or removable appliance to interfere with the habit, or behaviour modification strategies are some of the treatment options.
The use of palatal crib appliance to break behaviour is particularly helpful.It not only retains the tongue in a more retruded posture, preventing its interposition between the incisors during swallowing and speech, but it also keeps the finger or pacifier from
sucking. According to Abraham et al., it can be used to retrain theassociated musculature, and acts as mechanicalrestrainer and a reminder to discontinue the habit [(13)].
Theability of cribs to change tongue posture, allowing incisors to retract and extrude, may
have contributed to this result.The majority of research have sown that palatal crib appliance treatment effectively stopped the thumb- sucking habit.

IV. Conclusion

The early detection and correction of malocclusions is beneficial to skeletal and dentoalveolar development. Early orthodontic therapy may be able to eliminate the need for more sophisticated and expensive orthodontic tr eatment in the future. Pediatric dentists play a critical role in detecting malocclusions early on.

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