

Interceptive Management of Malocclusion: Case Series

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Abstract

Early recognition of developing malocclusions and the potential for uncomplicated orthodontic treatment procedures can minimize or eliminate future costly treatment. Interceptive orthodontics is a term that includes a range of interventions in the mixed dentition, which aim to prevent or reduce the severity of malocclusion in the permanent dentition. The following case series describes three different scenarios:- 1) Use of Twin Bloc appliance in a child to correct Class II malocclusion of skeletal origin, 2) Correction of mesio-palatal rotation of 21 due to presence of supernumerary tooth – mesiodens and 3) Interception of thumb sucking habit using fixed intra oral crib.

Keywords: Interceptive orthodontics; Twin-bloc; 2X4 appliance; Mesiodens; Thumb sucking; Palatal Crib.

Introduction

Ackerman and Proffit defines interceptive orthodontics as elimination of existing interferences with the key factors involved in the development of the dentition. Various procedures that can be undertaken under interceptive orthodontics are Serial extraction, Correction of cross bites, Control of abnormal habits, Space regaining procedures, interception of skeletal mal relations, removal of supernumerary teeth and utilization of orthodontic appliances to intercept any malocclusion as seen on examination (1,2,3). This case series describes three

different scenarios: 1) Use of Twin Bloc appliance in 8 year old child to correct Class II malocclusion of skeletal origin, 2) Correction of mesio-palatal rotation of 21 due to presence of supernumerary tooth – mesiodens in a 7 year old patient by dis impaction of mesiodens and correction of rotation using 2X4 appliance and 3) Interception of thumb sucking habit using fixed intra oral palatal crib in a 5 year old patient. The aim of this case series is to enlighten the miraculous and cost effective results, which can be achieved with minimal efforts when planned at an appropriate time and with precise technique.

Case Series

Case I : Twin Bloc Appliance for correction of skeletal discrepancy.

A male patient who was 8 year old reported to the department of Pediatric and Preventive Dentistry with a chief complaint of forwardly placed tooth in the upper front tooth region. On examination it was observed that patient had a convex profile and an Angle's Class II molar relation on right side and Angle's Class I relation on left side was seen. Impression were made for upper and lower arches and diagnostic casts were obtained. Lateral cephalogram was also obtained for cephalometric analysis. After diagnosis and analysis it was clear that patient had a skeletal discrepancy where in there was an excessive growth of maxilla in comparison to mandible. Hence it was decided to use a Twin Bloc Appliance for correction of this discrepancy. Acceptable results were obtained by the end of 6 months where there was a decent correction in profile of the patient was observed.



Fig. 1: represents the pre-op extra oral picture of the patient.



Fig. 2: represents intra oral view pre-op



Fig. 3: represents intra oral view with Twin Bloc Appliance



Fig. 4: represents correction of profile after 6 months

CASE II : Dis-impaction of Mesiodens and correction of Mesio-Palatal rotation of 21 using 2X4 appliance

A 7 year old male patient reported to the department of Pediatric and Preventive Dentistry with a chief complaint of ugly appearance of tooth in the upper front tooth region for the past 8 months. On intra oral examination it was observed that there was a mesio-palatal rotation of 21. On radiographic examination it was observed that there was presence of a mesiodens which was considered as the etiology for this rotation. Treatment plan was formulated which included surgical extraction of mesiodens followed by use of a 2X4 appliance for derotation of 21. Before surgical intervention blood investigations such as Bleeding Time, Clotting Time and Complete blood count were recorded and a Patch test for Local Anaesthesia was done.

After surgical dis-impaction of mesiodens, 2X4 appliance was used for correction of rotation irt 21. Bands with molar tubes buccally were luted on 16 and 26 and brackets were placed on 11,21, 53 and 63. Patient was recalled after every 2 weeks and proximal stripping was done irt 11 and 21 to provide space for movement of teeth to reach an optimal position. This was followed by application of fluoride varnish for enhancing rate of remineralisation of the stripped surfaces. Each time orthodontic wire was

removed and a new wire was placed to ensure optimal force orthodontic force. Within 3 months de rotation of 21 was done successfully and it was followed a fixed retention appliance.



Figure 5



Fig. 5 & 6: represents intra oral view of rotated 21



Fig. 7: represents radiographic view of impacted mesiodens



Fig. 8: represents intra oral, intra-operative view



Fig. 11: represents the use of 2X4 appliance



Figure 9



Fig. 12: represents 2 month follow up



Fig. 9 & 10: represents post operative view of disimpaction of mesiodens



Fig. 13: represents 3 month follow up. After this brackets and band were removed and a fixed retention appliance was given to the patient.

CASE III : Interception of thumb sucking habit using fixed intra oral palatal crib in a 5 year old patient.

A 5 year female old patient reported to the department of Pediatric and Preventive Dentistry. Parents had a chief complaint of Thumb sucking habit that was associated with the child for the past few years. On examination of the thumb a clean dishpan thumb was observed. Intra oral examination revealed mild constriction of arch. Treatment plan was formulated and it was decided to give a fixed palatal crib. Customised bands were adapted on 55 and 65 and an alginate impression of the upper arch was made. Palatal crib was prepared on the cast and were soldered to the bands. The appliance was polished and luted on 55 and 65. Within first 21 days there was a marked reduction in the habit and it disappeared with in 3 months.



Figure 14



Fig. 14 & 15: represents pre-op view



Fig. 16: represents post op view

Discussion

Twin bloc appliance was developed by William Clark in 1977. The basic concept is to create a protrusive bite so as to guide muscles to exert force in the direction of desired growth of mandible. This appliance consisted of maxillary and mandibular removable appliances retained with 0.7-mm Adams clasps on the first permanent molars and 0.9-mm ball clasps placed in the mandibular incisor embrasures. A passive maxillary labial bow was also used to aid anterior retention and control the incisors as they were proclined. The jaw registration was taken with approximately 7 to 8 mm of protrusion and the blocks 7 mm apart in the buccal segments. The steep inclined planes interlocked at about 70 degrees to the occlusal plane. Patient was advised to wear the appliance for 24 hours and after initial adaptation patient was advised to eat while wearing the appliance. Clark WJ (1995) and Mills CM et al (1998) showed favorable outcomes in correction of class II malocclusion using Twin bloc appliance in a cephalometric analysis based study (4,5,6,7,8).

The fixed appliance 2 x 4 comprises four brackets bonded onto the erupted maxillary permanent incisors, two bands cemented or two tubes bonded on the first permanent molars and a continuous arch wire to provide/maintain

good arch form. This appliance allows rapid correction of many incipient malocclusions in a single short phase of fixed appliance therapy in the early mixed dentition stage [Mckeown and Sandler, 2001]. The versatility of this appliance permits to resolve various problems affecting the upper incisors in a simple manner and in a relatively short period (about 6 months). It can be used for rapid correction of crossbites in the anterior sector, to reduce overjet and to align ectopic incisors. A 2 x 4 sectional fixed appliance offers more effective and efficient tooth positioning as it allows three-dimensional control of the involved teeth during correction of anterior crossbites or aligning ectopic incisors. Rotations, diastemas and incorrect tooth inclinations and angulations may therefore be treated very quickly using this versatile appliance (9,10).

Literature suggests that prolonged thumb sucking can result in anterior open bite, proclination of upper anteriors, narrowing of upper arch, which can all lead to malocclusion. This is why interception of such habit is necessary at its first sight. For this purpose various removable and fixed appliances have been suggested. In this case series we have shown use of palatal crib for cessation of the habit. It is easy to fabricate and is cost effective. Additional benefit is that it does not require patient's compliance which is an important factor in patients who are not willing to stop the habit. Reddy D and Dawjee SM (2019) suggested that with through careful motivation, good patient compliance and a fixed tongue crib, a thumb-sucking habit can be successfully treated with spontaneous correction of the anterior open bite (11).

Conclusion

It is disturbing to note that knowledge and awareness regarding the early interception of malocclusion is very low in India. Parents of young children are not aware of

such treatment options and general dentist fail to impart such awareness among them. The prime focus is towards the orthodontic correction of profound malocclusion which is a time taking process and is expensive. Certain cultural beliefs and myths such as presence of midline diastema brings good luck or presence of a peg lateral incisor as an ancestral blessing have further complicated the use of interceptive procedures. In the present era, multimedia have emerged as a free, easily available and a trusted source of information for people of all age groups. We request all the fellow dental surgeons to create awareness about oral health and preventive and interceptive procedures available to everyone through multimedia platforms such as WhatsApp, Instagram, Facebook and YouTube. It is not only our duty but also a moral responsibility towards the society.

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