

Management of Anterior Cross Bite in Mixed Dentition Using Catlan's Appliance

Nishidha Tiwari¹, Shilpi Tiwari^{2*}, Dipak Sharma³

¹Senior Lecturer, Department of Pedodontics and Preventive Dentistry, Malla Reddy Dental College for Women, Hyderabad, India

²Associate Professor, Department of Pedodontics and Preventive Dentistry, Peoples College of Dental Science and Research Center, Bhopal, MP

³Consultant Pediatric Dentist, India

***Corresponding Author:** Shilpi Tiwari MDS, Associate Professor, Department of Pedodontics and Preventive Dentistry, Peoples College of Dental Science and Research Center, Bhopal, MP

DOI: 10.31080/ASDS.2020.04.0768

Received: December 27, 2019

Published: January 28, 2020

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Abstract

Anterior crossbite in mixed dentition is commonly encountered malocclusion during occlusion development in children. Pediatric dentist plays crucial role in early diagnosis and providing early orthodontic intervention. It is key to guide the developing dentitions in proper functional and morphological occlusion. In present paper, three cases of anterior crossbite are discussed which are corrected using the Catlan's appliance in a short period without any damage to the tooth or the periodontium. Catlan's appliance is cost effective in correction of anterior crossbite, also don't require the patient cooperation like in removable appliance.

Keywords: Anterior Crossbite; Catlan's Appliance; Anterior Bite Plane

Introduction

Anterior crossbite is an abnormal labiolingual relationship between one or more maxillary and mandibular anterior incisor teeth. Clinically seen as a reverse overjet in which one or more maxillary teeth are positioned palatal to the mandibular incisor teeth when the patient closes his mouth into centric occlusion [1]. The anterior crossbite is usually an acquired malocclusion develops from local factors like Over retained deciduous incisors or its root; odontomas, crowding or inadequate arch, Abnormal tongue position may result in forward mandibular deviation affecting closure that locks that anterior teeth in crossbite posture, (Pseudo class III malocclusion), A repaired cleft lip, Trauma to the primary incisor resulting in lingual displacement of the permanent tooth germ and supernumerary anterior teeth, Habit of biting the upper lip [2,3].

Localized dentoalveolar anterior crossbite with or without mandibular displacement should be treated as soon as they are found [2]. Delay in treatment may result in complications like [1,2]:

- Loss of arch dimension
- Shift in midline

- Gingival stripping and loss of alveolar bone support to the lower incisors due to irregular position of teeth.
- Traumatic occlusion and temporomandibular dysfunction.
- Attrition in teeth involved in crossbite.
- Adverse growth influences on the mandible and the anterior portion on the maxilla, involving not just the teeth and alveolar processes, but skeletal structures of the mandible and maxilla.
- Dental compensation of lower incisors leading to thinning of labial alveolar plate [3] Anterior crossbite requires early and immediate treatment. The pediatric dentist plays crucial role [4]:

1. To prevent development of malocclusion.
2. To correct malocclusion associated with increased risk for tooth damage, eruption dysfunction.

The incidence of anterior dental crossbite is 4-5% and found mainly during the early mixed dentition phase [3,4]. Different treatment modalities have been suggested to correct the anterior crossbite. These modalities are tongue blades, reversed stainless

steel crowns, fixed acrylic inclined planes, bonded resin-composite slopes, removable acrylic appliances with finger springs, and Bruckl appliance. Here, the three case reports of anterior crossbite correction with Catlan's Appliance have been discussed. The Catlan's appliance is also known as Lower Inclined Bite Plane which is cemented onto lower incisors.

Case Reports

Case 1

A 8-year-old male patient reported to the Department of Pediatric Dentistry with a chief complaint of poor esthetics. The intra-oral examination showed that both maxillary permanent central incisors were linguallly placed to both lower mandibular incisors, (pseudo class III appearance). There was Class I molar relationship in the early mixed dentition, and there was adequate space pres-

ent for movement of the maxillary teeth. The treatment plan was explained to parents, and consent was taken. Alginate impressions of both upper and lower arches were made, cast was prepared. The undercuts were blocked with wax, and an acrylic inclined plane angled 45 degrees was fabricated to cover the mandibular incisors. The lower inclined plane was cemented to the mandibular incisors with luting glass ionomer cement, and the contact point was corrected only at the incisal edge of the cross bite. The post operative instructions were given to patient and parents regarding the appliance, diet during treatment and oral hygiene maintenance. Patient was recalled in 6 days for examination. The crossbite was repaired using Catlan's appliance within 1weeks. The appliance was removed, scaling was done, and topical fluoride was applied (Figure 1).

Figure 1

Case 2

A 8 year old girl reported with a chief complaint that her upper left front tooth was hurting the tongue on biting and lower front tooth was biting on front of the upper teeth. Profile examination showed an acceptable profile. Intra-orally class I occlusion was present. Parents gave the history of delayed shedding of upper left deciduous tooth, which explains the lingual eruption of permanent incisor causing anterior crossbite. The treatment plan was explained to parents, consent was taken. The impression with al-

ginate was made for both maxillary and mandibular arch, the catlan's appliance was fabricated on cast. The appliance was trialed in patient, suitable adjustment was then done. After few adjustment, the appliance was cemented on mandibular incisors. The instructions were given to patient and parents regarding the appliance, diet during treatment and oral hygiene maintenance. Patient was recalled after 1 week for examination. The crossbite was corrected within a week, the appliance was then removed. Oral prophylaxis and topical fluoride application was done post treatment (Figure 2).

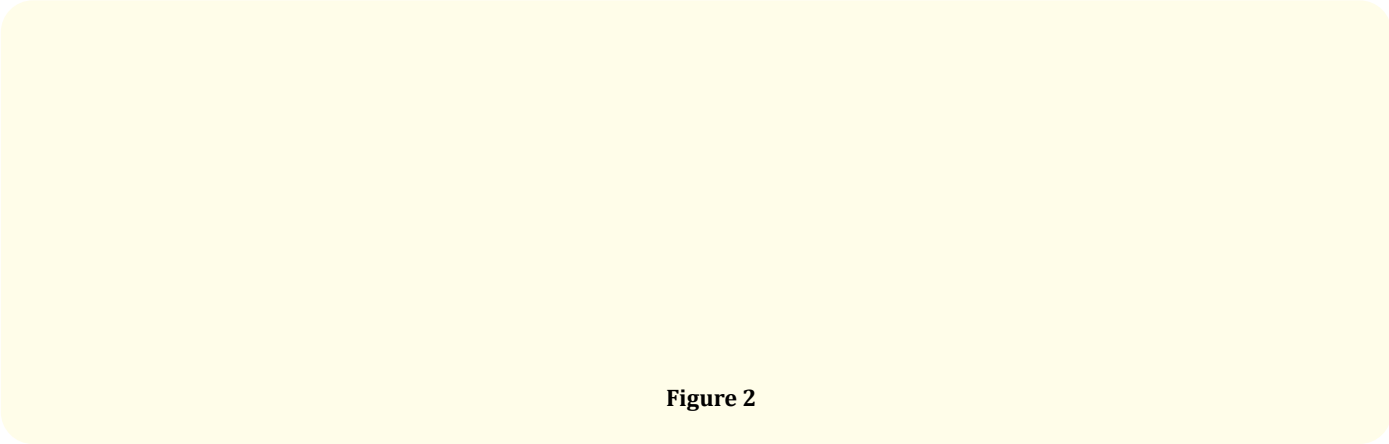


Figure 2

Case 3

Nine year old female patient was referred to the Pediatric Dentistry Department with a chief complaint of poor esthetics in teeth. On intra oral examination, anterior crossbite with respect to the maxillary left central incisors and left lower mandibular incisor was observed. There was shift in the midline, but Class I molar relationship was seen. The parents were informed of the treatment, and Catlan's appliance was prepared as described in Case 1 and 2.

The patient was instructed to have soft diet and to maintain oral hygiene during treatment period.

Patient was recalled for examination after a week. The crossbite was repaired using Catlan's appliance within a week. The appliance was removed, the oral prophylaxis was done and topical fluoride was applied (Figure 3).

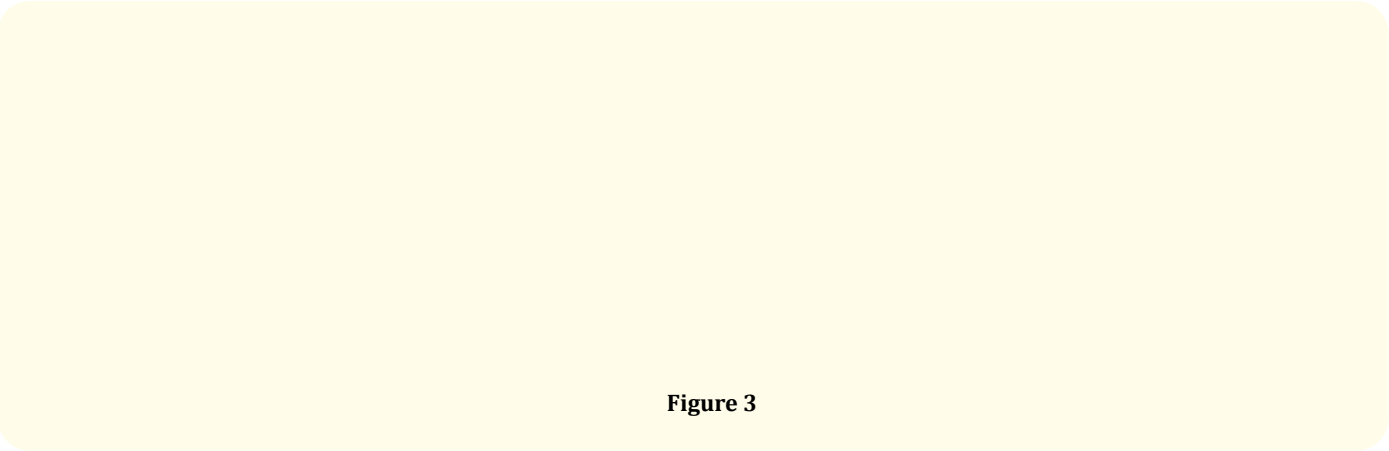


Figure 3

Discussion

Anterior crossbite should be treated as soon as it is diagnosed. According to Profitt, correction of anterior dental crossbite requires opening of space, then bringing the displaced tooth or teeth across the occlusion into proper position [5]. Catlan's appliance uses natural forces for rapid correction of anterior cross bites. It is a lower jaw inclined plane which is based on Newton's 3rd law of

motion [6,7]. The Catlan's appliance creates a slight lingual movement in the mandibular teeth, while generating labial movement in the maxillary teeth [7]. The ideal age for correction of anterior crossbite is 8 to 11 years. During this developing mixed dentition the roots is being formed, and the teeth are in the active stage of eruption provides the best chance for occlusal management and interception of malocclusion. The child's age not only plays a signifi-

cant role but also crucial for the patient's motivation for treatment and how child will perceives the problem [7,8]. The primary aim of this early treatment is to tip the affected upper tooth or teeth labially to a point where a stable overbite relationship occurs and relapse is then prevented by the normal overjet and overbite relationship that is accomplished by treatment [9]. The case selection for using catlan's appliance determines the success of the treatment. Lee in 1978 gave basic factors to consider before selecting a treatment method [9]:

1. Sufficient space in arch for repositioning the teeth.
2. Sufficient overbite to keep the teeth in position after correction
3. Apical position of the teeth in crossbite that is the same as it would be in the normal occlusion
4. Class I occlusion.

The kind of treatment selected should be comfortable to the child, should not damage surrounding tissues, should give rapid crossbite correction, and does not interfere with growth and development [7]. That's why in cases above catlan's appliance was given to patients as it require minimum patient cooperation and is economical, fast and easy to fabricate. While the use of removable acrylic appliances with posterior bite plane and anterior finger springs requires patient cooperation, whereas fixed orthodontic treatment may be costly for patient. The duration for correction was 1 week only, for all three cases. Once the "jump" was acquired (maxillary incisors teeth labial to mandibular incisors: overbite) the appliance was discontinued so as to avoid the open bite. Wiedel, *et al.* reported that a successful treatment of anterior crossbite in one or more incisors in the mixed dentition can be attained by any fixed or removable appliances which have long-term stability [10].

Conclusion

The cases discussed above, shows that Catlan's appliance is a satisfactory and cost effective alternative for correction of anterior teeth crossbite. In all the cases reported here, correction of anterior dental crossbite was observed within one weeks, with no damage to teeth or marginal periodontal tissue. Early interceptive orthodontic treatment can potentially eliminate the need for future complicated and costly orthodontic treatment.

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