# Management of anterior dental crossbite in mixed dentition: case presentation


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## Abstract

Case presentation: Aim of this study is to describe the treatment of a patient with mixed dentition and anterior dental crossbite. The objectives of treatment were to correct the malocclusion, to align the incisor, to control the permanent teeth in a good eruption and improve aesthetical conditions.

Materials and Methods: This study presents an interceptive therapy which can use to treat the anterior crossbite. In this case, it shows that the use of the myofunctional appliance change the anterior dental crossbite.

Discussion: Various authors present solved clinical examples and recommend the use of removable appliances to treat de anterior dental crossbite.

Conclusions: Anterior crossbite is a malocclusion that must be diagnosed and treated early to establish well-balanced occlusal development.

**Keywords:** anterior crossbite, removable appliances, interceptive therapy

## INTRODUCTION

Cross bite in the anterior area represents deviations from the ideal occlusion that occurs in the sagittal direction at the level of the anterior segment. It is a malocclusion caused by the lingual location of the maxillary anterior teeth in relation to the mandibular anterior teeth [1,2] which involves one or more maxillary and mandibular teeth.[3] A correct diagnosis and early management may be beneficial in preventing the progression of this malocclusion in late adolescence.

Many orthodontic interceptive therapy approaches have been offered in order to repair the anterior crossbite, including tongue depressor or tongue blade or popsicle stick therapy, a removable inclined bite plane and eruption guidance appliance (EGA). [4,5]

Tongue depressor or tongue blade or popsicle stick therapy constitutes one of the most basic removable appliances. A force must be delivered in the proper direction and for a sufficient period to move a tooth. When using a tongue depressor, the patient should use it 20-30 times a day. Crossbite can be repaired in two weeks, but it can take up to three months.[5]

Removable inclined bite plane made of self – cure resin is made by thermoforming a plastic film over a mandible working cast. It is a specially designed resin that permits acrylic to be applied without the risk of the material coming away from the appliance. An inclined plane of orthodontic acrylic is constructed over the anterior teeth. Acrylic is used to engage only the upper tooth/teeth in a crossbite at a 45-degree angle to the long axis of the lower incisors and the posterior bite opening are not more than 2mm.[1]

Treating anterior crossbite has a considerable impact on the direction of condylar development and, as a result, mandibular size and form. The functional repair of this malocclusion is accomplished with the use of occlusal pressures, which can shift the occlusal plane angulation and so rectify the jaw relationship.[6,7]

### *Aim and objectives*

The purpose of this study is to describe the treatment of the anterior crossbite, minimize mandibular protruded development, enhance the profile, and adjust the occlusal plane inclination using the eruption guidance appliance.

## CASE PRESENTATION

The subject, K.A., a 8 year old man, was selected in our study. Nothing remarkable showed in his medical history, no temporomandibular problems, no oral habits, and good compliance. Clinical examination showed anterior crossbite at the level of the upper central incisors 1.1. and 2.1.

The present therapy technique is centered on collecting a variety of information with the goal of early detection of anomalies and the discovery of essential treatment techniques in minimizing clinical development. The approach of the contemporary notion of non-invasive or minimally invasive, resulting in the preservation of as healthy dental tissues as possible, is the key to success in correcting any structural defects.

An eruption guiding appliance (EGA) was chosen as the orthodontic instrument to treat this patient. For patients with mixed dentition and anterior crossbite, this appliance concentrates on nasal breathing and initial myofunctional correction. It is soft and flexible, providing excellent compliance while adapting to any arch form or malocclusion. This is focuses on arch growth and continuous habit correction.

The first stage of the treatment plan included the use of MYOBRACE i-3® appliance (size medium). (Figure 1)

Figure 1. MYOBRACE i-3® appliance

In the first month, the treatment is divided into four stages: the first week, the device is worn for 30 minutes during the day, after this week, 30 minutes will be added each week, so that at the end of the 4 weeks the device will have to be worn for 2 hours a day. The patient is instructed to bite into the appliance while keeping his lips closed firmly. The active phase of the treatment begins after the first month, with the patient maintaining the appliance for 1-2 hours each day and as much as possible at night (preferably for 8-10 h). During this time, the patient was monitored once a month. This phase is recommended for the first six months of usage.

After this period, we decided it was needed to continue the orthodontic treatment using the successive appliance (MYOBRACE i-3H®), for the arch expansion and to promote the position of the tongue and improve the lip seal for another 6 months. The patient was controlled regularly every month.

The major treatment was to correct the anterior crossbite while also improving the profile and changing the occlusal plane orientation. (Figure 2,3,4)

Figure 2. Extraoral before and after treatment pictures: frontal view at rest, frontal view with a smile, lateral view at rest, lateral view with smile

Figure 3. Intraoral before and after treatment pictures: frontal view, lateral view of the right side, lateral view of the left side

Figure 4. Intraoral before and after treatment pictures: overjet

The treatment length with MYOBRACE i-3® and MYOBRACE i-3H®appliance was of 12 months. (Figure 5)

The patient continues to utilize the EGA as a technique of retention during the night.

Figure 5. MYOBRACE i-3H® appliance

## DISCUSSIONS

Anterior crossbite may be quite dangerous in children. It causes significant aesthetic discord and functional damage by disrupting environmental factors in the mouth cavity.[5,8,9]

The current study looked at the importance of the early diagnostic and treatment of the anterior crossbite with an elastodontic appliance in participants who had symptoms of malocclusion in mixed dentition stage.

In 2020, Pellegrino M.[4] et al., in her study describe the importance of the functional device use in an eruption guidance appliance (EGA) in particular, an LM Activator High Short for 18 months. In our study use the MYOBRACE i-3® and MYOBRACE i-3H®appliance for months. In both studies the goal was achieved by correcting the anterior crossbite, improving the profile and adjusting the inclination of the occlusal plane. The fundamental feature of these devices, according to Keski-Nisula[11] et al., is that these devices do not use active pressures to adjust tooth position, but rather use erupting forces to guide the erupting teeth towards an appropriate occlusal position.

Another approach in treating anomalies of the crossbite in the frontal area can also be treated by using the removable inclined bite plane mentioned in the study. Also, Biradar[1] in his study used these devices which are very useful in treating this type of the anomalies.

An alternative treatment can be the use of the Aligners. In his study, Inchingolo[10] illustrates the orthodontic treatment of a 25-year-old patient with skeletal and dental class III malocclusion, anterior crossbite that created functional and aesthetic issues, occlusal trauma, and incisor wear.

In her study, Herawati[5] mentioned that there are numerous possible and suggested treatments for treating basic anterior dental crossbite, one of which is tongue blade therapy. A mild dental crossbite involving only one tooth is treatable. Her research was conducted during the Covid 19 coronavirus pandemic, which prompted her to make her call dentistry is an essential component of our healthcare system.

## CONCLUSIONS

Based on the results from this study, it is plausible to conclude that anterior crossbite malocclusion occurs and should be addressed as soon as possible. All of the procedures utilized to correct the abnormalities produce good outcomes, resulting in improvements in occlusion function and improved aesthetics.

The EGA appliance used was able to correct the occlusal plane inclination and harmonize the profile. Because of the little emotional and psychological influence, this therapy option is particularly considerate of the patient's daily life. All of these characteristics provide EGA another option for treating individuals with anterior crossbite at an early age, during incisor eruption.

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