Treating Angle’s Class III with anterior cross bite with Jaw Functional Orthopedics

Jaw Functional Orthopedics (JFO) is a branch of dentofacial orthopedics and, in Brazil a specialty. It works with the triad stimulus -central nervous system (CNS) integration – response. These stimuli are generated in the stomatognathic system (SS) by removable appliances that change the mandibular posture in a protocol which varies the type of malocclusion and the facial characteristics of the individual, among other factors as pain, pattern of edgy movements of the mandible (laterality and protrusion) and so on.

There are two types of anterior cross bite, the false anterior cross bite in which the mandible manipulated for centric relation retract, finds an occlusal interference and protrudes crossing the bite in the incisive region, and the true anterior cross bite in which manipulation for centric relation do not retract the mandible significantly, i.e. the mandible has an overgrowth.

The aim of this manuscript is to describe the treatment protocol used in JFO to treat false anterior cross bite through a case report.

Case Report

Brazilian afro descendant with anterior cross bite and posterior cross bite on the left side with observed mandibular deviation forward and left in the clinic through the manipulation for centric relation (CR) where the mandible retracts and corrects the almost completely the deviation of the inferior dental mid line. Lateral and frontal PA teleradiographs were used in the diagnostic and planning protocols in addition to Planas’ symptomatic and gnathostatic diagnosis protocol. Informed consent form to treat and use the data for didactic and publishing purpose were singed by the patient tutor.

In figure 1 can be observed the occlusion of the minor with the anterior and left side cross bite with mixed dentition. The mandibular therapeutic posture change (TMPC), in these cases of false class III or mesiocclusion is determined by the CR manipulation. With the casts in hand, the mandible is manipulated to CR and the casts are positioned the same as the mouth, that is the TMPC where the functional orthopedic appliance (FOA) is supposed to be built. Mark the casts with copy pencil or marker pen in the way is preconized by Simões (2010) and Santiago Jr & Santiago (2010) registering the patient’s vertical relation of incisors (horizontal line in the inferior incisor), mid line relation (vertical line in upper and lower incisor coincident), anteroposterior relationship in each side (vertical line in the upper and lower molar coincident); then make the same marks in the TMPC (Fig. 2)

The prescribed FOA is an Simões Network 3 (simões) with progeny arch and Equiplan, which construction can be see in Santiago Jr & Santiago or in the series of lectures about construction of FOA by Santiago Jr (colocar link).

It is crucial that all parts of the FOA are constructed with very specific and precise geometry touching in the exact location of the teeth. The progeny arch has four active parts (dash, ascending arm, loop and descending arm) on each side. The loop

stimulates receptors in the upper lip and push aside the muscle barrier. Its curve starts 6mm above the superior canine (deciduous or permanent) cervical region, the ascending arm cannot touch the superior lateral incisors. The dash positions the mandible and activates the temporal muscle, modulating mandibular growth when touches at the height of the cervical region of the inferior incisors. If the inferior incisors are protruded and retroclination (to verticalize them) is desired, the dash touches between the middle of the crown and high of the interproximal contact point as can be see is figure 3 extracted from Santiago Jr and Santiago 2010.

The Equiplan was idealized by Planas (x) and is used more frequently to increase vertical dimension to treat deep bite which efficiency is a been proved (JVE equiplan), but it can work as uncrossing plateau as in this case. The Equiplan has to be positioned horizontally without any anteroposterior or latero-lateral inclination.

The frontal springs developed by Bimler and redesigned by Simões has to have a distance between the two arms of the active portion around 2 mm distant, never less than 1,7 mm because the proprioceptive periodontal stimulation is compromised and it is not advisable to be more than 2,5 mm due to the possibility to interfere with another part of the FOA or opposite teeth. When it touches the closer possible to the cervical region of the superior incisors with light pressure it stimulates premaxillary growth. When buccal tipping of the superior incisors is desired the touch has to be at the height of the interproximal contact point of the incisors (figx).

On Figure XXA the FOA just after insertion in the mouth, observe how the stomatognathic system is still not responding to the appliance stimulation because muscles still remain with its postural and isotonic contraction memory. In figure XXB the anterior bite uncrossed and the appliance fully adapted to the mouth without the Equiplan, As soon as the anteiro bite is uncrossed, the Equiplan must be removed and the wave bar located under the acrylic must be exposed.

Later on, after overbite normalization a Simões Network 7 (SN7) (Simões 2010, Santiago Jr and Santiago 2010) to readapt the occlusal plane to the new stomatognathic system status. The progeny arch must be removed only after the individual during mandibular laterality movement keeps the mandible inside the maxilla in the anterior region as seen in figure XXXX

Results can be seen in figures xxxx

Must has been discussed about treatment in the deciduous or mixed dentition. There is a stream of thought the preconizes treatment only in permanent dentition, but, despite solid arguments we do not agree. If the individual with orthopedic problems in the stomatognathic system (anteroposterior, transversal of vertical malocclusions involving the mandible and/or maxilla bone bases) at 12/13 years old can have a situation where they are not treatable without orthognathic surgery or leaves significant functional and/or esthetic sequeleas that can compromise life quality either functionally or emotionally.

Conclusion

Jaw Functional Orthopedics has tools to treat false class III with anterior cross bite

Further studies are necessaire for o better understanding of these results and the treatment stability