
Treatment Options in Pseudo-Third Class Malocclusions: a Systematic Review

Peer review status:

No

Corresponding Author:

Dr. Elisa Lombardelli,
DMD, Attender, Oral and Maxillo Facial Sciences Department, Orthognatodontics Unit, La Sapienza, - Italy - Italy

Submitting Author:

Dr. Elisa Lombardelli,
DMD, Attender, Oral and Maxillo Facial Sciences Department, Orthognatodontics Unit, La Sapienza, - Italy - Italy

Other Authors:

Dr. Giuseppe Rodi,
DMD, Attender, Oral and Maxillo Facial Sciences Department, Orthognatodontics Unit, La Sapienza, - Italy - Italy
Dr. Gabriella Padalino,
DMD, Attender, Oral and Maxillo Facial Sciences Department, Orthognatodontics Unit, La Sapienza, - Italy - Italy
Dr. Martina Maria D'Emidio,
DMD, Attender, Oral and Maxillo Facial Sciences Department, Orthognatodontics Unit, La Sapienza, - Italy - Italy
Dr. Emanuele Fantasia,
DMD, Attender, Oral and Maxillo Facial Sciences Department, Orthognatodontics Unit, La Sapienza, - Italy - Italy

Article ID: WMC005217

Article Type: Systematic Review

Submitted on: 13-Nov-2016, 02:43:52 PM GMT **Published on:** 15-Nov-2016, 10:04:47 AM GMT

Article URL: http://www.webmedcentral.com/article_view/5217

Subject Categories: ORTHODONTICS

Keywords: Pseudo-Third Class Malocclusions, Orthodontics, Functional Appliances

How to cite the article: Lombardelli E, Rodi G, Padalino G, D'Emidio M, Fantasia E. Treatment Options in Pseudo-Third Class Malocclusions: a Systematic Review. WebmedCentral ORTHODONTICS 2016;7(11):WMC005217

Copyright: This is an open-access article distributed under the terms of the [Creative Commons Attribution License \(CC-BY\)](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Source(s) of Funding:

No found has been taken.

Treatment Options in Pseudo-Third Class Malocclusions: a Systematic Review

Author(s): Lombardelli E, Rodi G, Padalino G, D'Emidio M, Fantasia E

Abstract

The third Class malocclusion¹ is fortunately a non frequent skeletal malocclusion, infant in Europe is reported with an occurrence of 1-4% in Caucasian population², meanwhile there is an highest percentage in Italian's population³. However, we need to distinguished the real third class from the so-called "pseudo-third class".

Skeletal third class are deformities that are link with a smaller and/or retrusion of maxilla, and with a lower frequency they are due to a mandibular protrusion that may also be associated with a larger jaw. These last types of problematics have a strong genetic component that usually required more complex therapy and often these are patients who must undergo an orthognathic surgery. Pseudo third class on the contrary are present in subjects with a normal skeletal structure and the type of dental problems. are not to be underestimated and should be treated in growing age to prevent their possible shifting towards a third true class. The scope of this works its to evaluate diagnosis and treatment options of the recent state of art.

Introduction

Pseudo third class are definite as a condition in which the patient that a have a normal skeletal structure have a dysgnathia limited to dental-alverolar district. The subject with this type of dental malocclusion during the movement of closure of the mouth make a circular arc up till to attive at the point of dental contact, where he meets a pre-contact that prevents him from properly closed, to avoid the wrong contact the patient tends to make a closing where the jaw is conditioned to slide forward thereby developing a cross bite dental front. The etiology of this condition could be usually linked to a trauma to the upper incisor that make an ankylosis and delayed eruption of correspondent permanent teeth who has misplaced (as a result of the failure root resorption of the deciduous); another reason could be linked to the lack of space in which a lateral incisor in his eruption failed to arrive correctly in the arch and remain locked orally near the location of

his gem that should move from the palatal to vestibular location.

Materials and Methods

In order to know how is the best method to correct an anterior cross bite, we have made a research in literature using pubmed, google scholar, scopus, about the current modality to obtain a successfully therapy in this type of dental malocclusion.

Study underlined how anterior crossbite with functional shift in the mixed dentition can be successfully corrected by either fixed or removable appliance therapy in a short-term perspective and how there was shorter treatment time for correction significantly we used a fixed methods rather than a removable method.⁴

Review

Diagnosis

To do a correct diagnosis of pseudo-Class III malocclusion, we have to examined all the aspect of the malocclusion. At first we found a typical dental situation where the upper incisors are retroclined with normal or protruded lower incisors. Diagnosis is possible in a clinical way: clinicians should invite the patients into a centric relation by helping the movement of the mandible, in this situation if the incisors show an edge-to-edge relationship with posterior open bite and for the posterior teeth to occlude in centric occlusion, a forward functional mandibular shift is created causing incisors to occlude in anterior crossbite. However, this examination had to be supported also by radiographic analysis, in which usually subjects present a skeletal Class I relationship with normal maxilla and mandible sizes.⁵

So a retroinclination of maxillary incisors are the prevalent cause of pseudo-Class III malocclusion⁶. These subject often present a straight profile and an first molar occlusion relationships, the differential diagnosi it's possible as we have already mentioned because patients with skeletal III class malocclusion maintain a third class molar relationships also if they are guided in a centric relationships.⁷

Therapy

At the mixed dentition stage, is recommended an early correction, in order to avoid a development in a true Class III malocclusion and temporomandibular symptoms.

The options of treatment included the following:

- Quah Helix
- Third classes bite plane
- a removable appliance with a Z-spring to procline the maxillary incisors labially.
- 2 x 4 appliance with association of maxillary expansion.⁸
- Functional appliances, although the lack of cooperation of some patients and the inability of the appliances to promote correct alignment and leveling are the biggest disadvantages of these appliances. To achieve good alignment and leveling, a fixed appliance must be used [2, 5]. Using a facial mask was not considered because of the age of the patient and the fact that the harmonic basal bone relationship was within normal limits.

At the mixed dentition stage, is recommended an early correction, in order to avoid a development in a true Class III malocclusion and temporomandibular symptoms.

Quad Helix¹⁰⁻¹¹

Quad helix is an orthodontic appliance, in fact performs the predominantly dental movements, although studies shows how when it is applied to children aged 5-6 years where the palatal suture it has not yet been closed he can lead to an orthopedic transverse expansion of the maxilla.¹²

It is formed by a continued palatal arc formed by a single steel wire 0,9-1 mm (0.36 to 0.38 inch) with four helix which have the purpose of providing greater elasticity ; the arc is modeled with a frontal bridge, and two side bridges, at extremities there are four helix. It is connected to the molars, here can be constructed fixed, soldered to the molar bands, or removable tubes inserted in Palatine tube of the molars band. Finally two palatal arms that in the specific case of the third classes will be used to make a vestibular inclination of upper teeth, to do this it is essential that there is a modified design of the classical model which usually extends arms distal to the canine, in this case there is an extension that includes all the incisors groups.

According to the shape and type of activation nor the scope includes:¹³⁻¹⁴

- expansion and dental alveolar contraction of transverse arch (unilateral, bilateral) or selective against molars and / or premolars

- Front sagittal expansion make with a vestibular tipping of incisor
- decoupling of palatine suture
- movements of molars on which the bands are fixed (Rotation, torque and straightening root)
- stabilization

The activation is carried out every 4-6 weeks with caliper three spouts in two stages: first apply the clamp at the center getting the expansion of par- side walls, then the clamp acts on the two sides to make parallel the side arms. The control of the deformation induced by the activation is easier for the disconnected devices.

The first activation will be done extra-orally on the models, and you'll have to take into account how the first activation will be used for the rotation of the molars, that have the palatine root as centre of rotation; the anterior arms, which we had not previously attached to a palatal surface of anterior incisor, but at a certain distance from this, after the molar rotation will take contact with these teeth.

Usually we can get the first results in four months because the force is releasing slowing.

The third class bite plane with Bertoni screw.¹³

This is a bite plane with a resin body, equipped with a vestibular arc that goes to make contact with the mandibular incisors so as to create a block to the possible slip forward in the direction of the sagittal jaw.

At the level of palatal upper incisor the resin body takes anterior contact with the teeth and is equipped with a Bertoni type screw, this screw is a three-way, which allows to expand in a transverse and sagittal direction.

The Bertoni plaque is sectioned into three parts and shall present a three-dimensional screw that allows simultaneously and/or independently of both the expansion sagittal, for the correction of

retroalveolar or front retroinclination, both the transverse expansion of the crossbite unilateral or bilateral.

Removable appliance with a Z-spring to procline the maxillary incisors labially.

This type of appliance, is a removable appliance, in which there are springers that are useful to produce anterior teeth inclination if springs are activated about 1,5-2mm and produce 1mm of movement in one month. The major problem link of this method of treatment, is that if we want a success of the therapy the appliance had to do his action all day, so

exist the real risks of the lack of patients's cooperation.

2x4 fixed appliance¹⁵

In most cases its possible to complete the correction of pseudo-Class III malocclusion, with the use of a 2 x 4 appliance, it consist in 2 molar bands, 4 bonded incisor brackets. To improve the correction it's possible in some case to The reachment of this target is due to the advancement of the maxillary point SNA¹⁶, however its important to understands how their tendency of the facial growth maintain the characteristic of their skeletal pattern at the start of the treatment¹⁷.

Conclusions

Based on these researches, it's important how exist the necessity to do a correct diagnostic process, able to distinguished the real third class malocclusion from the so called "Pseudo Third class". It's basic to diagnostic in an early age this condition because there is a valid opportunity that this functional condition shift to real skeletal third class. Once established the real nature of malocclusion, there are greater valid method at clinical disposition, and based on the skeletal and dentoalveolar condition, and not less important on accuracy anamnesi of the type of the patient based upon his oral hygiene, his oral habits and the potential compliance, it's possible to choose the better therapy.

References

- ¹ E. H. Angle, "Classification of malocclusion," *The Dental Cosmos*, vol. 41, pp. 248–264, 1899.
- ² Tschill, Pascal, William Bacon, and Abdul Sonko. "Malocclusion in the deciduous dentition of Caucasian children." *The European Journal of Orthodontics* 19.4 (1997): 361-367.
- ³ A. Giacotti, A. Maselli, G. Mampieri, and E. Spanò, "Pseudo-Class III malocclusion treatment with Balters' Bionator," *Journal of Orthodontics*, vol. 30, no. 3, pp. 203–215, 2003.
- ⁴ *Swed Dent J Suppl.* 2015;(238):10-72.
- ⁵ Major PW, Glover K. Treatment of anterior crossbite in early mixed dentition. *J Can Dent Assoc.* 1992;58:578–579
- ⁶ U. Hagg, A. Tse, M. Bendeus, and A. B. M. Rabie, "A follow-up study of early treatment of pseudo class III malocclusion," *Angle Orthodontist*, vol. 74, no. 4, pp. 465–472, 2004.
- ⁷ D. B. Raveli, P. C. R. Chiavini, R. F. Paulin, H. B.

Jacob, A. dos Santos-Pinto, and L. P. Sampaio, "Tratamento de um Caso de Pseudo-classe III por Meio de Aparelho Fixo," *Jornal Brasileiro de Ortodontia & Ortopedia Facial*, vol. 9, pp. 356–362, 2004.

⁸ Reyes, Ariel, et al. "Diagnosis and treatment of pseudo-Class III malocclusion." *Case reports in dentistry* 2014 (2014).

⁹ A. Giacotti, A. Maselli, G. Mampieri, and E. Spanò, "Pseudo-Class III malocclusion treatment with Balters' Bionator," *Journal of Orthodontics*, vol. 30, no. 3, pp. 203–215, 2003.

¹⁰ Ricketts RM, Provocations and perceptions in cranio-facial orthopedics, *RMO* 1989:695.

¹¹ McNally MR, Spary DJ, Rock WP, A randomized controlled trial comparing the quadhelix and the expansion arch for the correction of cross bite, *J Orthod* 2005; 32:29-35.

¹² Gandolfini M, L'espansore rapido palatino ed il quad-helix: Due presidi ortodontici per l'espansione mascellare, *Martina*, 1996:1-14, 26-48.

¹³ Kholoki MS, Quadhelix: approche orthodontique et clinique, *Rev Orthop Dentofac*, 1995; 29:251-258.

¹⁴ Montagna, Fabrizio. *L'ortodonzia e suoi dispositivi. Apparecchi mobili e fissi rimovibili nella pratica clinica.* Elsevier srl, 2007.

¹⁵ Proffit, William R., Henry W. Fields, and David M. Sarver. *Ortodonzia moderna.* Elsevier srl, 2008.

¹⁶ P. K. Turley, "Treatment of the class III malocclusion with maxillary expansion and protraction," *Seminars in Orthodontics*, vol. 13, no. 3, pp. 143–157, 2007.

¹⁷ U. Hagg, A. Tse, M. Bendeus, and A. B. M. Rabie, "A follow-up study of early treatment of pseudo class III malocclusion," *Angle Orthodontist*, vol. 74, no. 4, pp. 465–472, 2004.