

A Modified Quad Block Appliance for Growth Modification

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Abstract

Introduction: There are various methods for managing skeletal discrepancy in Class II division 1 type of malocclusion. The treatment results for such malocclusions depend on age, growth status and patient cooperation. There are various appliances for growth modification. This article describes a new appliance, a modified Quad block appliance for correcting the sagittal discrepancy to make optimal use of pubertal growth spurt with maximum patient cooperation. This appliance would also achieve leveling and alignment at the same time.

Keywords: Modified Quad Block Appliance; Myofunctional Treatment; Skeletal Class II Malocclusion; Growth Modification

Abbreviations

MBT: McLaughlin Bennett Trevisi; TPA: Transpalatal Arch.

Introduction

Among the various forms of malocclusion, Class II Division 1 is most common. One of the most common features of Class II malocclusion is mandibular retrusion. This can be complicated by forwardly positioned maxilla where the condition is a combination of mandibular retrusion and maxillary prognathism. Compromised airway and failure of buccinator mechanism are the two outcomes of such Malocclusion [1].

To treat such discrepancy, measures should be taken early in the late mixed or early permanent dentition before the latent growth is completed. In individuals whose growth spurts are at the end or are uncooperative, Fixed functional appliance is the choice. In cases with no growth potential, Camouflage with extractions or Orthodontics combined with Orthognathic surgeries can provide best treatment results. Myofunctional therapy involves initial stage where mandible is advanced, followed by retention phase and phase II where Fixed Orthodontic treatment is carried out [2,3].

The Following method describes a Modified approach for growth modification which negates the undesirable effects seen in earlier Myofunctional appliances and at the same time achieve Leveling and Alignment with fixed appliance mechanotherapy.

Material and Methods

Appliance fabrication

Appliance fabrication is easy and cost effective, does not require any costly equipment. Materials required are-

1. An Articulator.
2. Acrylic material.
3. Wax sheets.
4. Beggs buccal tubes or MBT 0.022 molar tubes.
5. Impressions and working models are made.
6. After proper Diagnosis of the case and evaluating the growth status, a Construction bite is taken bringing molars and canines in Class I relationship. Incisal opening should not be more than 2mm.
7. The working models along with the construction bite are mounted (Figure 1).
8. Points are marked on the cast where brackets would be bonded according to MBT chart. This would guide us in proper positioning of the molar tubes (Figure 2. A to C).
9. Next, upper two blocks are prepared maintain an angle of 60-70 degrees.
10. Molar tubes can be directly attached to acrylic before it sets, or with additional acrylic material, it can be attached later (Figure 2. A to C).

7. After the upper blocks are ready, lower blocks are fabricated. Upper blocks have been fabricated maintaining an inclined plane of 60 - 70 degrees. This acts as a guide for fabrication of Lower Blocks.
8. The Quad blocks are retrieved and polished. Trial placement to be done before cementation.
9. After cementation, Initial archwires are placed for leveling and alignment.
10. The wire is Cinched back, if the appliance gets decemented, it stays in its position.

Case selection

1. Early mixed or late Permanent dentition.
2. Class II malocclusion due to Mandibular retrusion.
3. Mild to No crowding should be present.

Figure 1: Construction Bite with Class I molar and canine relationship.

Figure 2: The modified Quad block appliance.
A) Right view, B) Left view, C) Front view.

Figure 3: A) Maxillary view, B) Mandibular view.

Figure 4: Cementation of the Quad block appliance and placement of the initial Archwires.

Figure 5: Inter-incisal opening not to be more than 2mm.

Advantages

1. Easy to fabricate.
2. Cost effective.
3. Compliant as the blocks are cemented.
4. Less or no adjustments required.
5. Prevention of lower incisor proclination.
6. A TPA or Quad helix can be added in the palatal side, with a Lingual Sheath to hold the wire component.
7. The Blocks itself acts as a retentive appliance during retention phase.
8. Two phase treatment results achieved at the same time.

Discussion

The above method describes a modified approach for growth modification. The disadvantage removable myofunctional appliances like Twin block and Bionator have that, they require

patient compliance and are bulky. The modified quad block appliance is less bulky and is cemented which takes care of patient compliance. [4] This appliance also allows the clinician to place Brackets to achieve leveling and alignment at the same time, thus reducing time of the treatment as well as giving visible results. This modified approach is beneficial and an innovative approach to manage non-compliant Class II correction with ease and positive results.

Conclusion

Modified Quad block is an innovative approach to manage non-complaint Class II correction with reduced treatment time as well as better patient acceptance.

Conflict of Interest

No Conflict of Interest.

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