

Class II Malocclusion Management of an Adult Patient Using PowerScope® 2 Class II Corrector - A Clinical Case Report

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Abstract

The role of functional jaw orthopedics plays a vital role in treating the skeletal malocclusion, timely planned and well-executed treatment results in attain an excellent functional occlusion and craniofacial harmony. This article presents a case report of an adult patient diagnosed with Angles Class II malocclusion with an increased overjet of 9 mm and overbite of 5 mm with incompetent lip relationship. Whereas the skeletal base was an Orthognathic maxilla and Retrognathic mandible. The patient was treated in two phases where the first phase consists of a leveling and alignment of the teeth and the second phase with PowerScope 2 Class II corrector device for mandibular advancement to achieve the skeletal discrepancy. The overall treatment duration took 18 months. The success in orthodontic treatment depends on patient compliance particularly in correcting skeletal malocclusions. There is always a constant search for a simple appliance in the treatment of these type of malocclusions. PowerScope 2 Class II corrector is a promising appliance that is relatively simple to install and easy to maintain by patients this directly helps the orthodontist in maintaining patient compliance to achieve the predicted treatment outcome.

Keywords: Class II Malocclusion; PowerScope 2 Class II Corrector; Class II Skeletal Correction; Mandibular Advancement

Introduction

Correction of Class II malocclusion has been a challenging task for an orthodontist in many ways beginning from the preparation of cases from banding the teeth for the future fixed functional appliance therapy or making the wax bite registration to fabricate myofunctional appliances like twin block or Frankel's appliances [1,2]. Even though it consumes a lot of chair-side time in fabricating and installing the devices, simplifying the appliances and meticulous planning in execution of treatment results in achieving complete patient cooperation, it is generally believed that if the orthodontist shows the results in a short term it is easy to achieve or maintain patients compliance [5].

In the recent past, various appliances and various techniques were executed to treat class II malocclusion. The most commonly used appliance during the pre-pubertal appliances are myofunctional appliance to advance the retarded mandibular growth, these

appliances redirected the growth of the mandible by forwardly positioning the mandible, the most commonly used appliances are Twin block, Activator, Bionator, and Frankel's regulator [1,2]. Similarly fixed functional appliances like Herbst, Jasper Jumper, Forsus, Powerscope, Carriere motion device were all used in the case of the post-pubertal or deceleration stage [9-11]. Due to its simplicity and less chair-side time consumption with faster results, since it cannot be removed by patients which provides the orthodontist a better control in treating the patients for which it is highly recommended in non-compliant patients.

Appliance design

PowerScope 2 Class II corrector is designed as a one size fits all appliances preassembled with locking nut attachment for quick and easy chair side application [6]. The device allows intermaxillary arch wire-to-arch wire fixing using a nut with a hexagonal screw. Whereas the ball and socket joint to maximize the lateral

movements improving patient comfort. The telescope system consisting of an inner shaft/push rod, middle and outer tubing, between middle tubing and the outer tubing there is a nickel-titanium (NiTi) spring constantly delivering 260 g of force [6]. Since the device is fitted on the arch wire directly it eliminates the need for headgear tubes or any other additional accessories.

Case Report

Diagnosis, treatment plan and sequence

A 21 years male patient was presented for treatment exhibiting an Angles Class II division 1 malocclusion with a orthognathic maxilla and retrognathic mandible (Figure 1). Considering the clinical condition a combination of orthodontic and orthognathic surgical treatment plans was discussed. The patient rejected the proposed treatment plan. The initial evaluation of VTO (visual treatment objective) was done, since the VTO was positive the recommended treatment plan was a non-extraction approach preadjusted MBT 0.022" prescription appliance for leveling and alignment followed by PowerScope 2 Class II corrector to advance the mandible.

and 0.019" × 0.025" stainless steel wire was placed in both the arches. This was followed by mandibular advancement using PowerScope 2 Class II corrector (Figure 2).

Figure 2: PowerScope 2 Class II corrector.

The objective of the treatment plan was achieved with a well-balanced class I molar occlusion and pleasing facial result. The outcome exhibits a tremendous repositioning of the mandible held in position by Class I occlusion. The mandibular repositioning was a result of the repositioning of the mandible in the temporomandibular joint space. The mandibular repositioning created a remarkable, positive change among his facial profile.

A well-established occlusion with class 1 molar relationship on both sides (Figure 3) with a significant improvement in facial profile, skeletal jaw relationship, overall esthetic appearance, and a competent lip relation of the patient was achieved. PowerScope-2 provides the best results for Class II management, thus enables us to treat such cases by a non-extraction approach rather than contemplating extractions.

Figure 1: Pre-treatment extraoral, intraoral photographs, lateral cephalogram and orthopantomogram.

Treatment progress

Treatment was commenced with initial records including oral prophylaxis. Fabrication of study and working models orthodontic metal braces were bonded for leveling and alignment of teeth. Treatment was commenced with 0.014" NiTi in both arches. Leveling and alignment were completed in eight months' time period

Figure 3: Post mandibular advancement.

Discussion

There are apparent advantages of treating Class II patients with the functional appliance before fixed appliance therapy [3]. The improvement in the facial changes encourages the patients to cooperate well till the completion of whole orthodontic treatment [4]. The ideal timing for orthopedic treatment for mandibular advancement is after the onset of the pubertal growth spurt [8]. The orthodontic and orthopedic treatment phase should be combined; as the studies have demonstrated that early management involving two separate phases of therapy does not have any benefits other than a positive effect on self-esteem [5]. Achievement with this treatment result depends upon slight over-correction of molars and canines, which builds anchorage into the system before placement of the fixed appliances and allows for the slight rebound. Class II correction is maintained with an inclined bite plate during the fixed appliance therapy phase. As in this case, excessive lower incisor proclination was maintained with the labial root torque. The One-piece concept prevents the disarticulation of the appliance with various jaw movements. Furthermore, since the appliance is available in one size the selection of appliance size selection and further clinical management issues can be well avoided. With the help of crimpable shims which is available along with PowerScope armamentarium makes the orthodontist easy to customise the appliance. The quick and easy wire-to-wire installation prevents bond failures of brackets and buccal tubes. The ball and socket joint at the two ends of the appliance allows exceptional jaw movements reducing patient's distress. This paper illustrates the skeletal, dental, and soft tissue changes after treatment with PowerScope fixed functional appliance. Moreover, it was an attempt to register the advantages of this appliance over the conventional ones built on our clinical knowledge.

Conclusion

The appropriate treatment planning and execution lead to desirable treatment outcome as the extraction of teeth in class II malocclusion with functional mandibular retrognathic cases should be avoided as it can lead to unfavorable soft tissue changes in the profile of the patient. PowerScope could be one of the best treatment options for Class II correction, especially among non-compliant patients with a radical improvement in the soft tissue profile and esthetic appearance of the patient by the sagittal displacement of mandible ensuring excellent long-term stable results.

Conflict of Interest

Nil.

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