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Featured Original Research

"Spontaneous" correction capacity of skeletal Class II malocclusions in growing patients after upper and lower arch coordination using fixed appliances: A prospective controlled clinical study

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ABSTRACT

Objective: To determine the effect of arch coordination on the dentoskeletal jaw base relationship and the mandibular growth pattern in growing skeletal Class II patients.
Materials and Methods: Leveling, aligning, and upper/lower arch coordination were done in 30 Class II/1 growing patients with preadjusted edgewise fixed appliances. After arch coordination was achieved without transverse discrepancy and occlusal interferences, the 6-month experimental passive observation period was started. The records were compared with 30 untreated patients who served as controls. The initial (T_0) and post-coordination+observation (T_1) cephalograms of two groups were analyzed and compared using standard cephalometric parameters, Pancherz analysis, and cranial base superimposition.
Results: Sagittal maxillary growth in the treated group was slightly restricted, in turn resulting in a decrease in profile convexity. Mandibular sagittal growth did not differ between groups, but the mandible rotated posteriorly in the treated and anteriorly in the control group. The upper incisors were retroclined and retruded in the treated group, resulting in overjet reduction. The lower incisors were intruded in the treated group, leading to overbite reduction. The cephalometric superimposition over the stable structures of the anterior cranial base showed higher prevalence for the forward rotation with forward pogonion position and increased vertical dimension in the control group.
Conclusions: Upper and lower arch coordination alone does not seem to affect mandibular growth; however, because of a posterior rotation of the mandible, it does affect the direction of mandibular growth in some patients, although not in the desired therapeutic direction. (ClinicalTrials.in.th: TCTR20170706003).

1. Introduction

Typical Class II malocclusion characteristics include protrusive upper incisors, retrusive chin, and convex facial profile [1], which often present with mandibular retrusion [2]. It is generally accepted that self-correction of Class II malocclusion to a clinically significant degree cannot be expected and it persists from childhood to adulthood [3].

Several appliances are available for comprehensive Class II treatment, and their treatment efficacy has been widely analyzed. In contrast, the effect of interceptive orthodontic measures on Class II correction remains poorly understood. It has been proposed that a mechanical unlocking of occlusion by means of occlusal interference removal could promote a physiologic development of jaws [4]; however, the effect of such an approach remains controversial.

It is well established that Class II division 1 patients have smaller maxillary skeletal base and dental arch widths [5]. Comprehensive Class II treatment usually includes transverse maxillary expansion [6,7]. It has been reported that already a transverse maxillary expansion alone, by unlocking the occlusion, may lead to a spontaneous improvement of Class II malocclusions [7–13]. Being able

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