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Effects of a modified maxillary orthopaedic splint: a cephalometric evaluation

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ABSTRACT

Taking the presence of an interplay between the vertical and sagittal components of craniofacial development into consideration, the beneficial therapeutic potential impacts of controlling vertical development on the correction of Class II discrepancies has been previously investigated. In the present study, a modified maxillary orthopaedic splint combined with an anterior high-pull headgear was used for early correction of the vertical and consequently sagittal dentoskeletal discrepancy as the initial stage of treatment. The aim was to evaluate its effects on the maxillary and mandibular dentoskeletal development, as well as rotational growth pattern. In order to compare with and distinguish from the uninterrupted growth changes, a control group was formed by matching each one of the control subjects to a subject in the treatment group according to certain criteria. The initial and second standardized lateral cephalograms of each subject was evaluated by means of an adapted and biologically more substantial cephalometric analysis. Evaluation of the changes induced by the splint in comparison with the uninterrupted growth changes revealed that the splint had both orthopaedic and orthodontic effects on the growth pattern of the dentoskeletal structures. There seemed to exist a relationship between the direction of total mandibular and maxillary rotations. In addition, it was believed that in order to cause a forward mandibular rotation, i.e. to change the rotational mandibular growth pattern from a backward into a forward direction, the posterior vertical maxillary development should be restrained, but anterior vertical maxillary development should be relatively more restrained or reversed and, thereby, the rotational growth pattern of the maxilla should be changed from a backward into a forward direction. Moreover, the bite block effect of the splint seemed to cause a favourable change in the condylar growth direction from a backward to an upward direction.

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