

Geometric morphometric assessment of treatment effects of maxillary protraction combined with chin cup appliance on the maxillofacial complex.

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Abstract

The aim of this study was to investigate the treatment effects on the maxillofacial complex by maxillary protraction combined with chin cup therapy among growing children. An effective geometric morphometric assessment of cephalometric radiographs, using Procrustes analysis and thin-plate spline analysis, was applied to evaluate shape change in the craniofacial and midfacial configurations of a treated sample of 20 children with skeletal Class III malocclusion. This was compared with matched untreated skeletal Class III controls. Marked treatment induced change involved the maxilla and the mandible. Major deformation consisted of forward advancement of the maxillary complex with negligible rotation of the palatal plane and a forward direction of growth of the mandibular condyle associated with a restriction in sagittal advancement of the chin. Considerable dentoalveolar components contributed to the correction of anterior crossbite. Further detailed study of skeletofacial remodelling in response to maxillary protraction in other skeletal components, including the cranial base and the mandibular complex that contribute to Class III skeletal discrepancies, is warranted.