

Craniofacial morphometric analysis of mandibular prognathism

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Abstract

The purpose of this study was to provide more information about the morphological characteristics of the craniofacial complex in mandibular prognathism. Forty young adult males having mandibular prognathism were compared with 40 having normal occlusion. This was conducted to carry out geometric morphometric assessments to localize alterations, using Procrustes analysis and thin-plate spline analysis, in addition to conventional cephalometric techniques. Procrustes analysis indicated that the mean craniofacial, midfacial and mandibular morphology was significantly different in prognathic subjects compared with normal controls. This finding was corroborated by the multivariate Hotelling T(2)-test of cephalometric variables. Mandibular prognathism demonstrated a shorter and slightly retropositioned maxilla, a greater total length and anterior positioning of the mandible. Thin-plate spline analysis revealed a developmental diminution of the palatomaxillary region anteroposteriorly and a developmental elongation of the mandible anteroposteriorly, leading to the appearance of a prognathic mandibular profile. In conclusion, thin-plate spline analysis seems to provide a valuable supplement for conventional cephalometric analysis because the complex patterns of craniofacial shape change are visualized suggestive by means of grid deformations.