OMICS Group Conferences
Accelerating Scientific Discovery

International Conference on
Dental & Oral Health

August 19-21, 2013 Embassy Suites Las Vegas, NV, USA

Changes in 3D maxillary parameters after DNA appliancetm therapy in adults

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Controversy exists regarding the extent to which the maxilla can be changed in non-growing adults. However, previous studies have relied on 2D analyses, which may be unable to capture 3D phenomena. In this study, we investigated 2D and 3D changes in maxillary bone parameters, to test the null hypothesis that maxillary bone volume cannot be changed in adults. After obtaining informed consent, we undertook 3D cone-beam computerized axial tomographic scans of 11 consecutive patients (mean age approx. 38 years) prior to and after DNA appliance therapy. All cases had been diagnosed with midfacial hypoplasia without congenital malformation. The mean treatment time was 18.4 months ± 2.5. The minimum intramolar width was measured prior to and after the midfacial redevelopment protocol. Volumetric reconstruction of the maxilla was undertaken, excluding the frontal process of the maxilla and the dentition; and the 3D bony volume was calculated prior to and after the midfacial protocol in all cases. The findings were subjected to statistical analysis, using t-tests. The mean intramolar with was found to be 33.5mm ± 3.4 prior to treatment, but increased to 35.8mm ± 2.9 after DNA appliance therapy ($p = 0.0003$). Similarly, the midfacial bone volume was 17.4cm3 ± 3.9 prior to treatment, and increased to 19.1cm3 ± 2.6 after appliance therapy ($p = 0.0091$). These data support the notion that maxillary bone width and volume can be increased in adults. Therefore, midfacial redevelopment may provide a potentially-useful method of managing adults diagnosed with obstructive sleep apnea, by using DNA appliances.

Biography

Singh was born, educated and trained in England. He is currently President of BioModeling Solutions, LLC. Previously, he was a Visiting Professor in Orthodontics (Malaysia and Indonesia), and Associate Professor at the University of Puerto Rico, USA. He has been published extensively in the orthodontic and dental literature, and has co-authored several books. He is also Director of Continuing Education for the SMILE Foundation, USA; a Senior Instructor/Consultant/Fellow for the International Association for Orthodontics; Academic Fellow of the World Federation of Orthodontists; a Member of the American Academy of Craniofacial Pain, and the American Academy of Dental Sleep Medicine.

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