

Evaluation of Condyle Alterations after Orthognathic Surgery with a Digital Image Processing Technique

Authors : Livia Eisler, Cristiane C. B. Alves, Cristina L. F. Ortolani, Kurt Faltin Jr.

Abstract : Purpose: This paper proposes a technically simple diagnosis method among orthodontists and maxillofacial surgeons in order to evaluate discrete bone alterations. The methodology consists of a protocol to optimize the diagnosis and minimize the possibility for orthodontic and ortho-surgical retreatment. Materials and Methods: A protocol of image processing and analysis, through ImageJ software and its plugins, was applied to 20 pairs of lateral cephalometric images obtained from cone beam computerized tomographies, before and 1 year after undergoing orthognathic surgery. The optical density of the images was analyzed in the condylar region to determine possible bone alteration after surgical correction. Results: Image density was shown to be altered in all image pairs, especially regarding the condyle contours. According to measures, condyle had a gender-related density reduction for $p=0.05$ and condylar contours had their alterations registered in mm. Conclusion: A simple, viable and cost-effective technique can be applied to achieve the more detailed image-based diagnosis, not depending on the human eye and therefore, offering more reliable, quantitative results.

Keywords : bone resorption, computer-assisted image processing, orthodontics, orthognathic surgery

Conference Title : ICO 2019 : International Conference on Orthodontics

Conference Location : Bangkok, Thailand

Conference Dates : February 04-05, 2019