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[Image PDF (364K)] [References]

3D Morphological Measurements of Dental Casts with Occlusal Relationship using Microfocus X-ray CT

Masayuki KAMEGAWA[1)2)], Masayuki NAKAMURA[1)3)] and Sadami TSUTSUMI[1)]

1) Department of Medical Simulation Engineering, Research Center for Nano Medical Engineering, Institute for Frontier Medical Sciences, Kyoto University
2) Non-Destructive Inspection Business Unit, Analytical & Measuring Instruments Division, Shimadzu Corporation
3) Institute for Frontier Oral Science, Kanagawa Dental College

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Abstract:
In the diagnosis of dental occlusion, it is necessary to quantitatively measure interocclusal contacts and transfer them to a computer model. In this aspect, three-dimensional computer models of upper and lower dental casts play a significant role. In this study, we proposed a new method to measure occlusal interaction by using a microfocus X-ray CT technique. Measurement accuracy was determined as ±0.03 mm in comparison with a coordinate measuring machine. A superimposition procedure for two sets of three-dimensional dental cast models was also established. Using the same dental cast, the standard deviation between the two sets of models was ±0.015 mm—which was defined as measurement precision. Between an optical laser scanner and the microfocus X-ray CT system, the standard deviation measured between the two models was ±0.05 mm. Data were acquired when upper and lower dental casts mounted on the bite impression were scanned, and then occlusal interaction, contacts, and distance distribution between the casts were visualized by a colored map on the cast models. Within the limitations of the current study, it was successfully demonstrated that microfocus X-ray CT was well poised for quantitative measurement of occlusal interaction.

Key words:

Dental cast, Occlusion, Microfocus X-ray CT

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