Abstract

A Comparative Study of the Dimensional Accuracy of Intra-Oral and Extra-Oral Scanners with cartesian coordinates (x, y, and *z*)

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Abstract:

Introduction: In this study, we investigated and compared the inherent trueness and precision of intra-oral and extra-oral scanner systems in different dimensions, regardless of how scanners work and the conditions that can affect their accuracy.

Materials and Methods: In this experimental study, a mandible training dental model was used with two standard Dio implants that center distance implants were placed approximately 14 mm in parallel and in the first premolar area and first molar. Data from Planmeca Emerald, 3Shape Trios, CEREC Omnicam, 3shape D850, Cerec inEos X5, Amanngirrbach Ceramill Map+ and CMM scanners were transmitted to STL format to Geomagic Qualify software and superimposed data from scans (test groups) and data from the CMM (control group) was performed with the Best-Fit algorithm and the calculations were performed to determine precision and trueness.

Results: A significant difference was seen among the extra-oral scanners used in the estimation of displacement variables, the intervals between the implants (ΔD), posterior scan body ($\Delta\boxempty1$), anterior scan body ($\Delta\boxempty2$), and distance displacement ($\Delta Y2$) in terms of the amount of the trueness; in addition, there was a significant difference in estimates of variable distance displacement ($\Delta Y1$) in terms of precision (P <0.05). In the estimation of variables ΔD and $\Delta\boxempty1$, intra-oral scanners also had a significant difference in trueness level; furthermore, in the estimation of variables ΔD, there was a significant difference in terms of precision (p <0.05) and extra-oral scanners had better performance.

Conclusion: Extra-oral scanners have better trueness and precision than intra-oral scanners.

Publication of speakers:

1. Anurag ChoudharyUtility of Digital VolumeTomography in maxillofacialTrauma. Journal Oral andMaxillofacialSurgery, 2011;69: e135-e140

2. UTILITY OF CONE BEAM CTIN MAXILLO-FACIALRADIOLOGYInt J Dent CaseReports 2013;3(1): 134-145 ©IJDCR 2013. Allrights reserved www.ijdcr.com

3. Pleomorphic Adenoma of Palate-A Case Report with CT andCBCT Features.IOSR Journal ofDental and-Medical Sciences(IOSR-JDMS) e-ISSN: 2279-0853, p-ISSN:2279-0861.Volume 13,Issue 8 Ver. I(Aug. 2014), PP. 83-89

Citation: Iman Shafiei; A Comparative Study of the Dimensional Accuracy of Intra-Oral and Extra-Oral Scanners with cartesian coordinates (x, y, and z); Dentistry 2020; August 29, 2020; Paris, France