A new methodology for the evaluation of the accuracy of digital implant impression for edentulous jaw

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Introduction

The passive fit is a primary factor for long-term clinical success and survival of an implant-supported fixed dental prosthesis (FPDP). However, the insufficient accuracy during the impression is a key point to the final success of the restoration. In this regard, different studies demonstrated that a virtual model of mandibular edentulous with six scan-abutment position was designed by using a computer aided design (CAD) software (Dassault Systèmes SolidWorks Corporation, Waltham, MA, USA).

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Material and Methods

A virtual model of mandibular edentulous with scan-abutment position was designed by using computer-aided design (CAD) software (Dassault Systèmes SolidWorks Corporation, Waltham, MA, USA).

Results

The virtual model was manufactured in a zirconia by a CNC machine tool (Dyamach Italia s.r.l., Mussolente, VI, Italy) to serve as a clinically relevant simulation model.

Analysis

The least-square fitting algorithm "optimizes" the position and orientation of the impression while considering the 3D distances between scan-above with the mesh and the virtual mesh.

Conclusion

Based on the results of this in vitro study, the Scan A and the Scan B demonstrated the highest accuracy. Three intraoral scanner did not achieve the necessary level of accuracy to be used for full-abutment-supported fixed dental prostheses.