

DIGITAL IMPRESSIONS IN IMPLANT DENTISTRY

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Introduction

A gypsum cast poured from a physical impression taken with an elastomeric impression material has been the gold standard in the fabrication of implant restorations. However, shrinkage and distortion of the impression materials as well as unstable repositioning of the analogue during laboratory procedures may cause an inaccurate transfer of the implant position to the gypsum cast. ⁽¹⁾

With direct intraoral scanning of an implant it is possible to fabricate a milled model and to create a three-dimensional (3D) virtual model to design and mill the restoration. This may eliminate intermediate steps involved in conventional impression, which can have advantages in the clinical practice. ⁽²⁾

The aim of this literature review was to analyze the advantages and disadvantages of using digital impression systems in implant dentistry.

Materials and methods

Two Internet sources (MEDLINE-PubMed and LILACS) were used to search for eligible articles in English. The time period was from January 1, 1980, to May 1, 2016. The search strategy included the following keyword combinations (medical subject headings [MeSH] and free-text terms): “digital impression” AND “marginal fit”; “digital impression” AND “internal fit”; “digital impression” AND “dimensional accuracy”; “digital impression” AND “fixed dental prosthesis”; and “digital impression” AND “implant dentistry.”

Results

Advantages

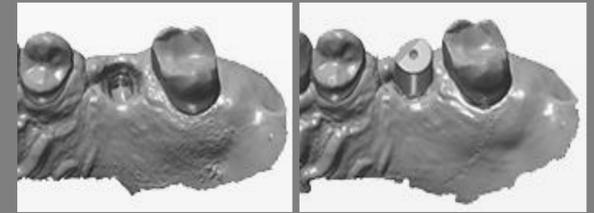
- Simplified implant impression technique ^(3,4)
- Virtual assessment of the implant prosthetic space ^(3,4)
- Evaluation of the depth of restorative interface ^(3,4)
- Improved workflow between laboratory and dentist ^(3,4,5)
- Emergency profile configuration before proceeding with laboratory steps ^(3,4)
- Reduced chair time ^(3,5,6)
- Less costly for the clinical and laboratory treatment process ⁽⁷⁾
- More comfortable for the patient ^(7,8)
- Can be stored electronically, which eliminates space management issues ⁽⁸⁾
- Elimination of distortion from impression and gypsum materials ⁽³⁾

Limitations

- Additional cost of purchasing an intraoral scanner ⁽⁹⁾
- Learning curve for adjusting to the new treatment modality ⁽⁹⁾
- Not enough scientific data about the accuracy of the digital impression-making technologies in comparison to the conventional ones, especially regarding multiple implant digitation



Image 1 – Initial case – healing abutment in implant 26



Images 2 e 3 – Digital impression with 3Shape TRIOS®



Image 4 – Simulation of the final restoration with 3Shape TRIOS® software



Images 5 e 6 – Final case – Metal-ceramic crown in implant 26

Conclusions

Despite the limited literature comparing digital versus conventional implant impression, the accuracy of digital impression making approach in implant dentistry seems to be clinically acceptable and can therefore be considered applicable for partial and multiple implant restorations. The complete digital workflow from planning to definitive rehabilitation should be assessed and compared with the conventional one in terms of time efficiency, learning curve, accuracy, and economical aspects.

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