Study exploring accuracy of impression techniques finds partial vs. complete edentulism may be a factor

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Background
An accurate implant impression is necessary to generate an accurate cast, which is the milestone for the fabrication of a precisely fitting prosthesis. Several clinical and laboratory variables can affect the accuracy of an implant cast, with one of the most significant being the impression procedure. Although various implant impression techniques have been used to generate a definitive cast, the body of evidence shows controversy over which technique is most accurate. Furthermore, a previous review on accuracy did not account for partially vs. completely edentulous patients but reported on them collectively.

Key point
The splinted technique was more accurate than nonsplinted for both partially and completely edentulous patients, while the open-tray technique was more accurate than closed-tray for completely edentulous patients but not significantly more accurate for partially edentulous patients. Impression materials did not affect the accuracy of implant impressions. Implant angulation greater than 20 degrees affected accuracy of impressions for both partially and completely edentulous patients. The dental literature provides insufficient data for the effect of implant connection type on accuracy and on digital impression techniques.

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Purpose
Seeking to evaluate the accuracy outcomes of digital and conventional impression techniques for partially and completely edentulous patients separately, researchers conducted a systemic review. They also sought to assess the effect of different variables — materials, angulation and connection type — on the accuracy of implant impressions.

Materials and methods
A systemic review of the evidence was performed by searching publications indexed in the MEDLINE/PubMed, EMBASE and CENTRAL databases from Jan. 1, 1980 to Sept. 1, 2013, and supplemented with a hand search of the literature. Information extracted and assessed from the articles included: study design, edentulous jaw, implant number, impression technique, connection type, abutment angulations, accuracy method, implant brand, splint method, splint material, impression material and the results of impression accuracy.

Results
Of the 88 articles selected for full-text reading, 76 studies were ultimately selected for inclusion in the research — four clinical and 72 in vitro. Studies were grouped according to edentulism status. A total of 41 studies were investigations of impressions for completely edentulous patients. For partially edentulous patients, 35 studies were found. Of the research on completely edentulous patients, most in vitro studies and three clinical studies demonstrated better accuracy with the splinted (15) vs. the nonsplinted technique (1), and nine showed no difference. One clinical study and half of the in vitro studies reported better accuracy with the open-tray (10) vs. the
closed-tray technique (1), and 10 showed no difference. For partially edentulous patients, one clinical study and most in vitro studies showed better accuracy with the splinted (8) vs. the non-splinted technique (2), and three studies showed no difference. The majority of in vitro studies showed better accuracy with the open-tray (10) vs. the closed-tray technique (1) and seven studies showed no difference. The only clinical study reported no difference.

More information
For a complete copy of the study and the JOMI July/August “Table of Contents,” visit www.osseo.org/NEWJOMI.html. To join AO and begin receiving JOMI (bi-monthly) or obtain online access to JOMI, visit www.osseo.org/NEWJOMI.html.

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