

“Computer Assisted Design and Computer Assisted Manufacturing in Prosthetic Implant Dentistry”

Theodoros KAPOS, Linah M. ASHY, German GALLUCCI, Hans-Peter WEBER, Daniel WISMEIJER

ABSTRACT

Objective: The aim of this systematic review was to evaluate the existing scientific evidence on human clinical studies describing the application of Computer-Assisted Design / Computer-Assisted Manufacturing (CAD/CAM) technology in restorative implant dentistry. These applications include CAD/CAM fabricated abutments and/or frameworks.

Material / Methods: Electronic searches of clinical studies were performed using Pubmed search engine from 1966 through May 2008. The search terminologies used were controlled subject vocabulary terms which were identified after searching the MESH database. Concentrating on the restorative aspect of the CAD/CAM applicable to implant dentistry, pertinent literature was divided into articles related to implant abutments and implant frameworks. Clinical studies focusing on long-term follow up were considered for the assessment of CAD/CAM restoration survival outcomes.

Results: Of the initial 885 articles reviewed 5 articles satisfied the search criteria of the performed literature search. Three articles were included under the CAD/CAM framework fabrication category and two under the CAD/CAM abutment category. Combining the results from the framework clinical trial studies there were a total of 189 prostheses supported by 888 implants. The follow up varied in a range between 12 and 60 months. There were 4 implants lost prior to the insertion of the prosthesis and 46 lost after the insertion. There was 1 prosthesis failure reported. Similarly in the two abutment clinical trial studies there were a total of 53 ceramic abutments supported by 53 implants. The patients were followed between 12 and 44 months. No significant failures or complications were reported in association with the implants and their restorations.

Conclusion: Based upon a systematic review of literature concerning CAD/CAM used for fabrication of frameworks and abutments preliminary proof of concept was established. Clinical studies on the use of these techniques were too preliminary and underpowered to provide meaningful conclusions regarding the performance of these abutment/frameworks.