

Colonization of Candida Albicans on 3D Printed CAD/CAM Complete Denture Versus Conventional Complete Denture: Randomized Controlled Clinical Study

Authors : Eman Helal, Ahmed M. Esmat

Abstract : Statement of problem: The development of computer-aided design/computer-aided manufacturing (CAD/CAM) resin dentures has simplified complete denture production. Most of the studies evaluated the mechanical properties of the material, but the hygienic performance of the CAD /CAM denture and their ability to maintain clean surfaces and minimize bacterial accumulation is still lacking. Purpose evaluation of the antibacterial characteristics of the 3D printed CAD/CAM denture and to compare it with the conventional heat polymerized acrylic denture base material. Methodology a total of thirty completely edentulous patients grouped randomly into two groups (Group I: Control group) received conventional heat polymerized acrylic resin complete dentures, (Group II: Test group) received 3D printed (CAD/CAM) dentures (stereolithographic PMMA), Samples of Candida albicans culture swabs were taken after 1 month and 3 months of dentures` insertion. A culture swab was obtained by scrubbing the fitting surface of the upper denture. At each time interval, three swab samples were collected from each patient and were inoculated in three individual culture media. Results: there was a significant difference in the colonization of Candida albicans to the fitting surface of the dentures between both groups (Group I: Conventional denture cases) exhibited more adhesion of Candida Albicans to the fitting surface than did (Group II: CAD/CAM cases) ($P<0.05$). Conclusion: 3D printed CAD/CAM complete denture showed minimal Candida adherence upon upper denture fitting compared to conventional heat-polymerized acrylic resin, which contributes to decreasing the incidence of denture stomatitis which is considered one of the most common problems among complete denture wearers.

Keywords : CAD/CAM denture, completely edentulous, elderly patients,3D printing, antimicrobial efficiency, conventional denture, PMMA, Candida Albicans, denture stomatitis

Conference Title : ICDDMHC 2022 : International Conference on Dentistry, Dental Medicine and Health Care

Conference Location : Barcelona, Spain

Conference Dates : October 20-21, 2022