

Design Improvement of Dental Implant-Based on Bone Remodelling

Authors : Solehuddin Shuib, Koay Boon Aik, Zainul Ahmad Rajion

Abstract : There are many types of mechanical failure on the dental implant. In this project, the failure that needs to take into consideration is the bone resorption on the dental implant. Human bone has its ability to remodel after the implantation. As the dental implant is installed into the bone, the bone will detect and change the bone structure to achieve new biomechanical environment. This phenomenon is known as bone remodeling. The objective of the project is to improve the performance of dental implant by using different types of design. These designs are used to analyze and predict the failure of the dental implant by using finite element analysis (FEA) namely ANSYS. The bone is assumed to be fully attached to the implant or cement. Hence, results are then compared with other researchers. The results were presented in the form of Von Mises stress, normal stress, shear stress analysis, and displacement. The selected design will be analyzed further based on a theoretical calculation of bone remodeling on the dental implant. The results have shown that the design constructed passed the failure analysis. Therefore, the selected design is proven to have a stable performance at the recovery stage.

Keywords : dental implant, FEA, bone remodeling, design

Conference Title : ICMBE 2015 : International Conference on Medical and Biological Engineering

Conference Location : Boston, United States

Conference Dates : April 20-21, 2015