

Fabrication and test for Automated Dental Implant Drilling System

Presenter: sayedali Mousavi

Co- authors: Vida kargar:, Mansour Rismanchian

Department of mechanical engineering, Najafabad branch, Islamic Azad University, Isfahan, Iran

Dental Implant Research Center, Isfahan University of Medical Sciences, Isfahan .Iran

Abstract:

Introduction: In dental implant surgery, drilling is first step to make hole for insertion of fixture. Different implant system has their sequence and drilling system for making the implant site preparation. To determine drilling system performance in vitro examination under constant condition need accurate experimental apparatus to determine drilling system performances.

Materials and Methods: The use of a novel test system for drilling the implant site in preparation for the insertion of the implant was developed in this research. Experimental condition of drilling test such as feed rate, vertical force, RPM, drill forward and backward and temperature should monitor in designed system. The system's software, which consists of robot calibration module, drill plan module, load plan module, drill execution module, and acquisition data module, is programmed based C# software GUI system for test monitoring.

Results: The experimental result shows that all implants are precisely placed at the right location and Positioning accuracy was improved by 90% ($p < 0.01$) in comparison by hand drilling and resolution of drilling was improved by 80% ($p < 0.001$) in comparison by human hand implantation .

Conclusion: By usage of this instrument the experimental drilling would be accurate and the results could be acceptable. Future research could be conducted to integrate this device and different drilling handpice

