

# # 3971227532 : MAJOR PROSTHODONTICS

KEY WORD: PASSIVE FIT / INTERFACE FIT / PRELOAD / SCREW TIGHTENING / IMPLANT COMPONENT COMPATIBILITY

PIRIYA YAVIRACH : THE RELATIONSHIP OF THE NUMBER OF REPEATED TIME IN TIGHTENING THE ABUTMENT SCREW TO THE FITNESS AND ROTATION OF THE ABUTMENT ON THE IMPLANT ANALOG AND IMPLANT. THESIS ADVISOR : ASSO. PROF. PANUPONG WONGTHAI, 166 pp. ISBN 974-639-525-4.

The main purpose of this study is to find the relationship of the number of repeated times in tightening the abutment screws to the fitness and rotation of the abutments on the 3 Spline implant analogs and implants (Calcitek, Carlbud, CA) which are embedded in type IV dental stone models. Another purpose of this study is to find out the number of repeated tightening times which enhance no gaps and consistence rotational distances of the abutments on the implant analogs and implants.

The first step of this research methodology is to construct six dental stone models which engage each implant analog and implant at upper center part. Then the abutment screw is repeatedly tightened, so that the abutment is attached to the implant analog. The attachment is performed 20 times using torque wrench with torque value of 28.2 N/c.m.. For each tightening, the gaps between the abutment and the implant analog at the marker areas on 4 sides of the implant analog are measured with the scanning electron microscope at magnification of 2000 times. At the same time, the horizontal distances which the abutment is rotated on the implant analog are measured too. The torque wrench, the abutment and abutment screw are then sterilized and the abutment is attached to the implant. The same experimental procedures as described above is conducted with repeated tightening of 25 times. Collected data from the experiment are analyzed using scattering diagrams and regression analysis techniques. It is found that the relationship between the number of repeated tightenings of the abutment screws to the fitness of the 3 abutments and the 3 implant analogs is exponential regression equation at the significant level of  $\alpha = 0.05$ . The number of repeated tightenings which enhance no gaps between assembling components is 28 times. The relationship between the repeated tightenings of the abutment screws to the fitness of the 3 abutments and the 3 implants is linear regression equation at the significant level of  $\alpha = 0.05$ . The number of repeated tightenings which enhance no gaps between assembling components are 90, 31 and 67 times in the 1<sup>st</sup>, 2<sup>nd</sup> and the 3<sup>rd</sup> implants, respectively. The relationship between the repeated tightenings of the abutment screws to the rotation of the abutments on the implant analogs and implants is polynomial regression equation at the level of 3 degree in some sides at the significant level of  $\alpha = 0.05$ . According to these relations, the number of repeated tightenings which enhance consistence rotational distance of abutments on the implant analogs and implants are not found.

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