

Cementing of loosed abutment screw in dental implants

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Received 30 November 2016; Accepted 03 January 2017

doi: 10.15713/ins.ijcdmr.110

How to cite this article:

Hamzah Abbas, Khaled Bulad, "Cementing of loosed abutment screw in dental implants," Int J Contemp Dent Med Rev, vol.2017, Article ID: 010117, 2017. doi: 10.15713/ins.ijcdmr.110

Dental abutment screw loosening and fracture have been reported as a high incidence complication associated with the two-stage implant systems for both fully edentulous,^[1-3] partially edentulous patients,^[4] and single-tooth implant replacements.^[5] The aim of this viewpoint is to focus on cementing abutment screw and connection hex between the implant body and the abutment as a final solution for screw loosening.

Through the use of advanced materials and basic engineering design principles, the new dental implant designs have been made relatively fail-safe.^[6] In a retrospective analysis of the ITI implant used for single-tooth components, there was an 8.7% incidence of occlusal screw loosening, but no repeated loosening and solid conical abutment loosening had a 3.6% occurrence rate.^[7] Lee *et al.* reported that more than 10 Ncm of tightening torque is recommended for the gold screws in this external hexagon implant system, to reduce loosening of the abutment screw.^[8] However, some studies showed that abutment screw loosening is a rare event in single implant restorations regardless of the geometry of implant-abutment connection, provided that proper antirotational features and torque be employed.^[9] Another study showed that the external hex type-joint model had greater movement than the taper type-joint model. The external hex joint-type model showed rotation movement, whereas the movement of the taper joint-type model showed no rotation.^[10] To minimize joint separating forces, it is advised to use a surgical template designed from a restoratively driven treatment plan. An ideal implant occlusion for full-arch prostheses should aim to have light lateral forces by keeping low cuspal angles, light anterior forces on protrusion by minimizing the overbite, and centralized contacts for molar teeth. Occlusion becomes less relevant to screw loosening when fixed implant prostheses oppose conventional dentures. Wennerberg *et al.* repeated that screw loosening may be diagnostic of an underlying occlusal issue, a poorly fitting framework, or parafunction.

Unfortunately, there is a dearth of literature that confirms the ideal implant occlusal scheme using randomized controlled trials or even longitudinal studies.^[11] Subsequently, many of the recommendations for occlusal schemes and their effect on screw longevity and joint maintenance are based on longitudinal, empirical, or *in vitro* research.^[12] When tightening a screw, a significant part of the clamping force (90%) is lost due to friction between the contact points of the threads of the screw contacting the internal thread of the implant or abutment. Without lubricant, approximately 10% of the force is transmitted to the preload.^[13]

Loosed abutment screw reduces the prostheses stability and could increase peri-implantitis around the abutment. Several techniques were reported to manage loosed abutment screws, using screw systems that have a dry lubricant (coating) of either gold or Teflon (3i Gold-Tite, Nobel Biocare TorqTite, Neoss Crystaloc) will help to reduce friction between the components and the screw, thus increasing preload and clamping force from a given torque.^[13] The use of dental cement to adhesive the connection area (internal or external hex) and the screw can manage the loosening problem. However, the cementing would increase the ability of peri-implantitis due to residual cement impaction so that it can be cemented and checked first; then, the prostheses can be cemented. After cementing of the abutment to the implant body, the implant will be similar to one-piece implant. Future research should focus on the suitability of using dental cement to fix the loosed abutments screw shortly.

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