NW PROSTHODONTICS
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Clinical Hints AND Usable Research

Know your Implant Procedures: Torque Drivers and implant screws

Implant abutments are commonly fixed to the implant using a screw. Screw mechanics take advantage of the metal structure that can be stretched as the tightening process occurs. Elongating the screw by using the recommended torque setting turns the screw into a "spring" that clamps the components together, improving the joint fixation more than if the screw is simply tightened.
This produces a robust joint, capable to withstanding the rigors of the oral environment during function. But certain rules must be obeyed in order to get the most out of this joint.

The Science:

A systemic review of abutment screw loosening in single-implant restorations found that abutment screw loosening is a rare event regardless of the geometry of the implant abutment connection, provided proper anti-rotation features and torque are employed.[1]

Rule No. 1.

Always use the ORIGINAL manufacturers' components and parts where possible. "Compatible Parts" may appear the same but they are not always guaranteed to work the same. Even the screws that are "compatible" have different thread pitch and patterns. The studies show they may LOOK the SAME, but DO NOT WORK in the SAME WAY[2]

Rule No. 2.

USE AS DIRECTED: If the manufacturer states a given torque, the screw has been designed and tested to that value. Using a lower or higher torque than prescribed will result in unpredictable joint behavior. Use of lubricants, ointments and medications affects the Implant: abutment joint especially under vibration. It is not advised and may lead to premature screw loosening.[3]

Rule No. 3.

CHECK that your torque wrench is delivering the correct force required. A recent study showed after repeated use some devices produce forces far in excess of that needed, some far less.[4] In general it is recommended you chose the beam-type (see below) as it delivers more consistent force, if you have the toggle type (not recommended) calibrate or change out your device yearly- ask your implant company for details.

Example of a beam-type (recommended) torque wrench.

Rule No. 4

Re-use of screws: Limit the number of times the screw is torqued and loosened. Each time it reduces the force needed to undo the screw. This affects both the screw and the implant, such that after 6 torque tightening/ loosening events even if a new screw is used, it does not improve the fastening properties of the joint. As a general rule, only torque tighten/ loosen the screw a maximum of 5 times.

Rule No. 5

If a screw breaks remove it carefully, not damaging the implant threads. If in doubt, seek help from the implant surgeon, or a specialist with a microscope (e.g. your friendly endodontist)

1 Theoharidou et al. Abutment screw loosening in single-implant restorations- a systemic review. Int Journal Oral Maxillo-Fac impl. 2008

2. Jaarda M et al. Comparison of "look-alike" implant retaining screws. Journal Prosthodont. 1995

3 Pai and Hess: Experimental study of loosening of threaded fasteners due to dynamic shear loads. Journal sound and vibration 2002

4 McCracken M. et Al. Variability of mechanical Torque-Limiting devices in clinical service at a US dental school. Int. Journal Prosthod. 2009

5.Weiss et al. Effect of repeated closures on opening torque values in seven abutment-implant systems. Journal Prosthetic Dent 2000

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