Accuracy of a manual torque application device for morse-taper implants: a technical note.


Cehreli MC, Akça K, Tönük E.

Abstract

PURPOSE: The objective of this study was to compare torques applied by new and used manual torque devices for Morse-taper implants.

MATERIAL AND METHODS: Fifteen ITI manual torque devices were tested. Those in group 1 (n = 5) were new (ie, never used), those in group 2 (n = 5) had been used 50 to 200 times, and those in group 3 (n = 5) had been used 500 to 1,000 times. The torques applied by each device were measured for 35 Ncm and 15 Ncm targets in an experimental setup by a custom-made wrench with strain gauges connected to a data acquisition system. The strain-gauge signals were simultaneously delivered to a computer at a sample rate of 10,000 Hz and converted to torque units.

RESULTS: New devices applied higher torques than used devices for the 35-Ncm torque target (P < .05). The torques applied by group 3 devices were approximately 1.5 Ncm lower than those of other groups for the 35-Ncm target and approximately 1 Ncm lower for the 15-Ncm target.

DISCUSSION AND CONCLUSION: ITI manual torque devices deliver consistent torque output, although a slight decrease occurs as a consequence of clinical use.

Torque generated by handheld screwdrivers and mechanical torquing devices for osseointegrated implants.


Goheen KL, Vermilyea SG, Vossoughi J, Agar JR.

Abstract

This study evaluated the ability of practitioners experienced in the use of Bränemark implant components to impart a desired torque using handheld screwdrivers. The torque output and variability of mechanical torque devices was also examined. For clinicians using handheld screwdrivers, values ranged from 0.7 to 18.1 Ncm, 1.4 to 33.7 Ncm, and 8.2 to 36.2 Ncm for the 10-Ncm, 20-Ncm, and 32-Ncm torques respectively. The manually operated mechanical torquing devices produced torque values within the tolerances specified by their respective manufacturers at all levels. Significant variation from the manufacturer's set values were noted as a function of tightening speed with the electronic torquing device. The data indicate
that there is wide variation in the ability of clinicians to perceive adequate torquing forces
applied to implant components. Calibrated torquing devices are mandatory if proper torquing
procedures are to be accomplished.

The change of rotational freedom following different insertion torques in three implant systems with implant driver.


Kwon JH, Han CH, Kim SJ, Chang JS.

Abstract

STATEMENT OF PROBLEM: Implant drivers are getting popular in clinical dentistry. Unlike
to implant systems with external hex connection, implant drivers directly engage the
implant/abutment interface. The deformation of the implant/abutment interface can be
introduced while placing an implant with its implant driver in clinical situations.

PURPOSE: This study evaluated the change of rotational freedom between an implant and
its abutment after application of different insertion torques.

MATERIAL AND METHODS: Three kinds of internal connection implants were utilized for the
current study (4.5 × 12 mm Xive, 4.3 × 11.5 mm Inplant Magicgrip, 4.3 × 12 mm Implantium
MF). An EstheticBase, a 2-piece top, a Dual abutment was used for its corresponding
implant system. The rotational freedom between an implant and its abutment were measured
before and after applying 45, 100 Ncm insertion torque. Repeated measures ANOVA was
used for statistical analysis.

RESULTS: Under 45 Ncm insertion torque, the rotational freedom between an implant and
its abutment was significantly increased in Xive (P = .003). However, no significant change
was noted in Inplant Magicgrip and Implantium MF. Under 100 Ncm torque, both in Xive (P =
.0005) and Implantium MF (P = .03) resulted in significantly increased rotational freedom
between the implant and its abutment.

DISCUSSION: The design of the implant/implant driver interface effectively prevented the
deforation of implant/abutment interface. Little change was noted in the rotational freedom
between an implant and its abutment, even though the insertion torque was far beyond
clinical application.

CONCLUSIONS: The implant/abutment joint of internally connecting implants were quite
stable under insertion torque in clinical situation
Comparison of torque measurements and clinical handling of various surgical motors.


Abstract

PURPOSE: Modern implant dentistry requires the application of torque during various treatment steps. This study investigated seven different surgical motors for the accuracy of the applied torque and their reliability.

MATERIALS AND METHODS: The following surgical motors were evaluated: Chiropro 980 (Bienair), INTRAsurg 300 and INTRAsurg 500 (KaVo), Osseocare (Nobel Biocare), Surgic XT (NSK), Elcomed SA-200 C (W and H), and Osseo System (XO Dentalcare). The torque was measured during typical surgical and prosthetic procedures using a special load transfer mechanism for a torque gauge. For each setting, 30 measurements were made and means were calculated.

RESULTS: The highest percentage shortfall was 20.5% at a set torque of 11.4 Ncm (absolute deviation of -2.4 Ncm). The highest percentage by which a torque was exceeded was 54.6% (absolute deviation of 5.5 Ncm). The lowest value for absolute shortfall was found to be -5.6 Ncm at a set torque of 45 Ncm. The highest absolute exceeded was 15 Ncm at a set torque of 40 Ncm. Potentially problematic torque values were identified in the low-torque-value setting, as the implant position may be changed if a machine driver applies excessive torque to the first-stage healing screw. In addition, in the indication of immediate loading in the high-set-torque group, torque values above the critical value of 50 Ncm may be unwittingly applied while working with a set torque of 40 Ncm.

CONCLUSION: For most of the clinically relevant torque settings, precise values were measured, although a few devices delivered potentially problematic torque values for some of the indications.