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Editorial

Implant Mobility Versus Implant Stability: A Clinical Decision Making Support

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Success criteria of implant osseointegration included: no clinical mobility; no peri-implant radiolucency or infection; no complaints of pain, neuropathy, or paresthesia; and crestal bone loss that does not exceed 1.5 mm at the end of the first year of function or 0.2 mm per year subsequently. Several clinical evaluation methods were utilized to assess the implant's mobility as Percussion, Bi-digital, Reverse torque, Cutting torque resistance analysis (CRA) and Periotest.

Periotest is a dynamic electronic device purposed to recognize objectively the measurement of tooth or implant mobility through evaluation the damping characteristics and stiffness of the natural tooth or implant. It quantifies the mobility of an implant by measuring the reaction of the peri-implant tissues to a specific impact load. Periotest scale varied from -8 (low mobility) to +50 (high mobility). PTV of -8 to -6 is believed good stability. It has limited clinical use as it cannot measure the mobility in mesiodistal direction, cannot discover the minimal changes at the implant bone surface and the impact percussing force can destroy the stability in poor primary implants stability.

Implant's mobility is a signal of lack of osseointegration. Although the peri-implant disease has been spread relatively far, implants may still seem immobile because of some remaining direct bone-to-implant contact. The recording of implant mobility may be a very specific but not at all sensitive clinical parameter in detecting loss of osseointegration. Furthermore, pain or discomfort may be associated with increased implant mobility and could be one of the first signs indicating a failing implant.

Implant's stability is necessary for osseointegration. Osseointegration is also a sign of implant stability which occurs at two different stages: Primary and secondary.

Primary stability is a consequence of mechanical interlocking with cortical bone whereas secondary stability (biological stability) comes through bone regeneration and remodeling.

Primary stability is influenced by bone quantity and quality, surgical technique and finally the implant. While biological stability is influenced by primary stability, bone modeling and remodeling, and finally implant surface conditions. Primary stability is a good indication of expected secondary stability.

Implant stability measuring using resonance frequency analysis (RFA) is a non-invasive and a relatively accurate technique, which provides both information on implant stability in the bone and a trustworthy clue to the further course of implant therapy.

Osstell® ISQ is the most recent commercial product representing the resonance frequency analyzer (RFA). The resonance frequency values were initially presented in hertz, but the values were later transformed to implant stability quotient (ISQ) units, which are presently used to describe implant stability with the RFA technique.

The ISQ values vary from 1 to 100. The lower the value, the lower the stability of the measured implant and vice versa. An ISQ greater than 65 is a typical display of successful (stable) implant.

Osstell® ISQ devices had been shown to be successful in identifying implant stability, distinguishing implants placed in different qualities of bone and assessing the prognosis of implants with different geometric or surface characteristics. So ISQ value can be considered an important indicator for observing the treatment state of the implant [1-3].

Discussion

While immobility of the implants indicates successful osseointegration, it cannot predict the possibility of their loading. As measuring of implants' stability is the only way to confirm loading decision, and as loading requires successful osseointegration, measuring of implants stability can subsequently measure implants mobility.

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