Efficacy and Clinical Utilization of UV Activated Implant

II. Theoretical base for ISQ measurement for determination of the early stage implant load and the effects of UV Activation on the time of loading

1. Theoretical grounds for ISQ measurement for determination of early stage implant load and the effects of UV Activation on the time of loading

Until now, opinion that activation of UV onto the implant surface in appropriate method will be beneficial for early stage osteogenesis has been presented and was verified through the thesis by Professor T. Ogasawara of UCLA in 2014, including claims from animal experiments. Benefits of UV Activated implant surface including increased protein absorption, increased contact of osteoblast cells, increased retention of cells, promoted proliferation of cells, promotion of osteoblast differentiation, increase in the speed of synostosis, marked increase in bone-implant binding, prevention of the loss of Stability Dip that occurs in the 3rd ~ 4th week after placement, and removal of surface hydrocarbon, etc. were reported in laboratory research along with the disclosure that these phenomenon do not occur independently but through close interaction with each other. Such theoretical advantages of UV surface treatment were being verified scientifically.

According to Ueno et al., if the embedded implant is healed without the support of cortical bone, strength of synostosis was reduced by 60% in the ordinary implant while the UV treated implant displayed the extent of improvement. UV surface treatment is being verified through clinical experiments.

UV Activation Surface treatment enables shortening of the implant fixation time through quicker loading without decreasing the success rate of implant. This has also been proven in cases on the basis of extensive clinical results. (Fig. 1-5)

Measurement of Implant Stability Quotient (ISQ) value based on Resonance Frequency Analysis (RFA) among various methods of measuring the implant stability has been reported as a non-destructive method with high reliability and efficiency. Although electronic device (Ostell®) was used for RFA in the initial stage, Ostell Mentor® (Integration Diagnostics AB) or Ostell ISQ® (Integration Diagnostics AB) with contact-type probe using magnetic receptor, SmartPat® (Integration Diagnostics AB), is used at the moment. Although there are different opinions in various theses on the correlation between the measured ISQ value and synostosis, follow-up observation by measuring the ISQ values prescribed several times after the implant placement will provide highly useful ground for estimation and determination of UV surface treatment. This method was, therefore, recommended for each implant. Currently, Ostell ISQR, which is capable of accumulating data by storing dental formulas, supports color screen and has the function for graphic with electronic chart in comparison to Ostell Mentor, is commercially available. (Fig. 1-6)

2. Effect of photoactivation (UV Activation) on the time of loading

In 2013, Professors A. Facundo and T. Ogasawara confirmed in 2013 that UV surface treatment enables shortening of the implant treatment time through quicker loading without decreasing the success rate of implant. This has also been proven in cases on the basis of extensive clinical results. (Fig. 1-5)

As illustrated above, it can be seen that UV Activated implant enables early stage loading with display of quick osteosynthesis in areas such as the area of bone graft, area of maxillary sinus lifting with inadequate residual bone and area of tooth extraction, and determination of such time can obtain good results by utilizing ISQ values properly.

In the next issue, I will introduce the effects of UV Activated implant in clinical application difficult cases on the basis of potential cases and cases that verified such effects by using ISQ values (continued in the next issue).