

Resonance frequency analysis of immediately loaded and delayed loaded ITI-sla implants. A clinical study

R. Nedir^{1*}, M. Bischof¹, S. Beyer¹, S. Szmukler-Moncler² & J. Samson²

¹CdR Clinique Dentaire SA, Vevey-CH, ²Univ. of Geneva-CH

Introduction: Radio Frequency Analysis (RFA) has been recently used to measure implant stability. It provides a 1-100 ISQ (Implant Stability Quotient) scale. The method has been suggested to be useful to monitor implant stability before delivering the definitive prosthesis. A clinical investigation was set-up to: 1) generate ISQ data with ITI implants, 2) measure implant stability after 3 months of healing at delayed (DL) and immediately (IL) loaded implants, 3) to monitor osseointegration of IL implants with multiunit bridges (2-6 units).

Materials and methods: The IL and DL groups involved respectively 11 patients/37 implants and 15 patients/42 implants, the mean age was respectively 57.1 y and 57.5 y. Implants of Ø 4.1 and Ø 4.8 mm, and 8-13 mm long were placed in the mandible (IL: 27.8 %, DL: 31.0 %) and in the maxilla (IL: 62.2 %, DL: 69.0%). Most of them supported short span bridges (DL: 83.8 %, IL: 64.8 %). The ISQ was recorded at implant placement (ISQi) and 12-14 weeks later (ISQf), before delivering the definitive prosthesis. The ISQi was recorded according to jaw, implant Ø, implant length and bone quality (cf. table). ISQ variation during healing (δ ISQ) was recorded at the DL and IL implants. The Kruskal-Wallis or the Mann-Whitney U test was applied accordingly to determine the factors affecting the ISQi and the δ ISQ.

Results: One IL implant became mobile after 4 weeks, its ISQ was 46 while it was 53 after placement. The ISQi was not influenced by location ($p=0.063$), bone type ($p=0.143$), implant Ø ($p=0.105$) but by implant length ($p=0.035$). The δ ISQ at the IL and DL groups was respectively 3.1 ± 5.5 and 3.5 ± 5.0 but was not different ($p=0.190$). The δ ISQ increased more in the mandible than in the maxilla, respectively 5.6 ± 4.2 and 2.2 ± 4.4 , the difference was significant ($p=0.002$).

Conclusion: These preliminary data show that IL short span bridges seem to be predictable with ITI SLA implants. Surprisingly, the δ ISQ was higher in the mandible than in the maxilla. The healing patterns of IL and DL implants appear to be similar since their δ ISQ did not differ after 3 months of healing, when osseointegration is achieved.

Location	Bone quality	Implant Ø (mm)	Implant length (mm)
Md 57.3 ± 5.0	Dense: 61.6 ± 8.4	4.1 mm: 56.3 ± 5.0	08: 56.3 ± 5.6
Mx 55.0 ± 6.0	Normal: 55.8 ± 4.9	4.8 mm: 53.5 ± 7.6	09: 53.7 ± 3.0
	Spongy: 54.5 ± 5.7	010: 54.9 ± 6.0	

ITI wide neck implants: a 4-year life-table analysis from a multi-center study with 186 implants

M. Bischof^{1*}, R. Pinho de Oliveira², R. Nedir¹, J.-M. Briaux & J. P. Bernard²

¹CdC Clinique Dentaire de Chauderon SA, Lausanne-CH, ²School of Dental Medicine, Geneva-CH

Introduction: Wide diameter implants were developed as rescue implants to the Ø 3.75-4.0 mm implants and for placement in soft bone. They were further used for molar replacement. Lower success rates have been reported for these wider Ø implants with failures mostly occurring during the first year. In 1999, a large Ø SLA implant of 4.8 mm with a wide neck (WN) of 6.5 mm allowing for a better emergence profile and aesthetics was added to the ITI assortment.

Materials and methods: Since February 1998, 186 WN implants were placed in 164 patients (43.9% males, 56.1% females, mean age = 49.1 y) in the posterior mandible (134 imp., 72.0%) and in the posterior maxilla (52 imp., 28.0%). 6.5% of them were placed in the premolar region. 14 implants were 12 mm long (7.5%); 122 (65.6%) were 10 mm; 1 (0.5%) was 9 mm; 48 (25.8%) were 8 mm; one was 6mm. Type IV bone sites represented 19.9% and dense bone sites were 11.8%. The residual vestibular and lingual lamellae around each implant was measured during implant placement. 161 implants (86.6%) had both lamellae > 1mm, 17 implants (9.1%) had one lamella > 1 mm, whereas 8 sites (4.3%) had both lamellae < 1mm. The mean follow-up was 19.1 months (min 2 mo-max 50 mo).

Survival criteria were lack of implant mobility, peri-implant radiolucency and recurrent peri-implantitis.

Results: Following surgery, no permanent sensory disorder was recorded. 7 (3.8%) implants were lost to follow-up. One early failure occurred after 6 weeks and one late failure after 17 months (14 mo of loading). In the latter case, the pathologist reported an unusually abundant presence of mast cells. No peri-implantitis was observed. Over the 4 years the cumulative survival rate was 98.61%, while 65.1% (121 imp.) passed the 1-year control.

Conclusion: In contrast to other studies that reported higher failure rates for wide implants during the 1st year, the present data did not show a higher failure propensity when compared to standard ITI implants. The Ø 4.2mm drill allowed 86.6% of the sites to have both residual cortical bone lamellae > 1mm. This WN implant design requires smaller bone volumes than other wide Ø implants, permitting satisfactory aesthetics for molar replacement, even under demanding biomechanical conditions, i.e. single molar replacement. The larger bone to implant contact with the textured SLA surface probably permitted a better interfacial stress distribution. These results, however satisfactory, warrant further research to be confirmed.