A 5-year clinical and radiographic follow-up of hydrophilic implants restored at implant level.

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Background and Aim

Dental implants should according to some authors be restored above the biologic width, i.e. the distance from the mucosal margin to the first bone contact, which has been suggested to be about 2.5 ± 0.5mm (1). This can be achieved by ideally using nonsubmerged implants with a long neck or to some extent by using prosthetic abutments, although a “microgap” will be present in the soft tissue. In this way, the soft tissue/implant interface is left intact during the prosthetic procedure and for the rest of the construction’s lifetime, which according to this theory will preserve the marginal bone level. The Neoss implant system (Harrogate, UK) was introduced without the use of prosthetic abutments. The implant has a 1.9 mm high collar, which can be fully submerged or left above the bone level. Impressions are taken at implant level, and a healing abutment is used between appointments. The final construction is screw-retained directly to the implant(s). Thus, depending on the level of submerging the prosthetic/implant gap is theoretically violating the biological width, which may result in extensive marginal bone loss.

The aims of the investigation were to study (i) implant survival and (ii) changes of marginal bone levels in a group of consecutive patients treated with hydrophilic implants and implant level screw-retained fixed constructions for 5 years.

Methods and Materials

A total of 49 consecutive patients treated with 102 hydrophilic dental implants (Neoss Proactive, Neoss Ltd, Harrogate, UK) were evaluated with regard to survival rate and marginal bone loss after one and five years of loading. Fiftyfour implants were installed in maxillae and 48 in mandibles to replace single teeth (n = 21), to support partial bridges (n = 26), total maxillary bridges (n = 2), or mandibular maxillary sinus floor augmentation. A submerged healing period of 3 months was observed (ISQ + SD) in the canine mandible. The stabiility was significantly higher in the mandible than in the maxilla after 1 year. After 5 years, the average bone loss was 0.8 ± 1.0 mm with 6.5% of implants showing more than 3 mm bone loss and 1.3% more than 3 mm bone loss. Two mandibular implants (2%) in two patients (4.1%) showed suppuration and extensive bone loss, where one was lost. There was no correlation between insertion depth and bone loss.

The marginal bone levels were situated 0.3 ± 0.4 mm,0.9 ± 0.7 mm and 1.2 ± 1.0 mm below the implant shoulder at baseline and after 1 and 5 years, respectively. The average marginal bone loss amounted to 0.7 ± 0.6 mm with 3.5% of the implants showing more than 2 mm and no implant more than 3 mm bone loss after 1 year. After 5 years, the average bone loss was 0.8 ± 1.0 mm with 6.5% of implants showing more than 2 mm bone loss and 1.3% more than 3 mm bone loss. Two mandibular implants (2%) in two patients (4.1%) showed suppuration and extensive bone loss, where one was lost. There was no correlation between insertion depth and bone loss.

Results

The marginal bone levels were situated 0.3 ± 0.4 mm,0.9 ± 0.7 mm and 1.2 ± 1.0 mm below the implant shoulder at baseline and after 1 and 5 years, respectively. The average marginal bone loss amounted to 0.7 ± 0.6 mm with 3.5% of the implants showing more than 2 mm and no implant more than 3 mm bone loss after 1 year. After 5 years, the average bone loss was 0.8 ± 1.0 mm with 6.5% of implants showing more than 2 mm bone loss and 1.3% more than 3 mm bone loss. Two mandibular implants (2%) in two patients (4.1%) showed suppuration and extensive bone loss, where one was lost. There was no correlation between insertion depth and bone loss.

The primary stability was found to be 72.7 ± 7.5 ISQ, which slightly increased to 73.6 ± 7.2 ISQ (NS) after 3 to 4 months of healing. The stability was significantly higher in the mandible than in the maxilla at placement and after healing.

Two implants were lost during 5 years of loading, giving a cumulative survival rate (CSR) of 98.0% after 5 years. Both failures occurred in the posterior mandible and all maxillary implants were successful.

Conclusions

• The present study showed that treatment with implant level screw-retained prosthetic constructions in an everyday patient cohort results in high implant survival rate after 5 years of function.
• Some marginal bone remodelling was observed during the first year of function followed by a minor further change up to the 5-year check-up.
• The amount of bone loss is similar to what has been reported for nonsubmerged longitudinal implants and other types when using prosthetic abutments (2).
• Implant level screw-retained prosthetic constructions placed near the marginal bone can be used without inducing abnormal bone loss.

References