Ten-year results of tapered implants supporting single-tooth or fixed partial dentures

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Figure 1.
Example of the clinical protocol followed for implant positioning and prosthetic rehabilitation

BACKGROUND AND AIM

Despite dental implants being widely used in clinical practice, there is a relative lack of information about medium- and long-term outcomes of implant-supported rehabilitations, particularly with respect to tapered implants and trends in bone resorption rates.

Among the parameters used to assess implant success, marginal bone resorption could be considered one of the most important, and also may influence implant survival¹.

Marginal bone resorption can be classified as:

- **early** if it occurs during the first year of loading, which can be due to a number of factors (both biological and mechanical); or
- **late**, which may or may not follow an infective process, such as peri-implantitis¹

The aim of this prospective single-center investigation was to evaluate the ten-year clinical outcomes, including marginal bone resorption, survival rate and prevalence of complications, of single-tooth and partial rehabilitations supported by tapered implants.

MATERIALS AND METHODS

To be included in this single-center study, all subjects had to fulfill the following criteria: aged 18 years or more; classification as ASA-1 or ASA-2, an absence of any systemic condition that could influence marginal bone resorption² (MBR); full-mouth plaque (FMPS) and bleeding (FMBS) scores less than 20%; sufficient bone volume to place an implant without a bone regeneration procedure³.

All patients fulfilling the criteria were treated between June 2005 to March 2006 with tapered implants (Replace Select Tapered, Nobel Biocare AB, Göteborg, Sweden), using either a one- or two-stage protocol.

Bone quality⁴ was assessed at implant insertion on implant level.

Patients were recalled every six months for the first 3 years and then annually.

Mean **MBR** (mean of mesial/distal measurements from periapical radiographs, with prosthetic delivery as baseline), and **occurrence of complications** were recorded.

Unpaired student t-test was used to assess the significance of differences in MBRs.

RESULTS

A total of 19 patients (6 male, 13 female, mean age 64.60 ± 8.59 years) received 53 conical implants supporting 30 prosthetic rehabilitations comprising 13 single crown restorations and 17 fixed partial dentures (FPDs) and were followed for 10 years.

Prosthetic rehabilitation was done at 4.2 ± 0.6 months (range 3.0-4.8 months) after surgery.

Three implants failed due to peri-implantitis (one each after 2, 6 and 8 years from loading) and were removed, giving a cumulative survival rate of 95.4% and a cumulative success rate of 88.9% at 10 years after prosthetic loading.

The mean MBRs were 0.44 ± 0.19 mm, 0.71 ± 0.35 mm, and 1.05 ± 1.06 mm after 1, 5 and 10 years of loading, respectively.

The mean MBR was statistically higher ($P=0.02$) for implants placed in type 3 bone ($n=26$) than for those placed in type 2 bone ($n=27$). Furthermore, the mean MBR for implants supporting FPDs was statistically higher than for single crowns ($P=0.03$).

CONCLUSION AND CLINICAL IMPLICATIONS

Tapered dental implants were characterized by a high cumulative survival and success rate, and low MBR changes at implant sites, up to 10 years after loading.

Given these medium-term outcomes, **this study supports the clinical use of tapered implants for long-term FPDs and single-crown restorations.**

Figure 2.
Marginal bone resorption over time

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