Short Communication

A 3-Year Prospective Clinical and Radiologic Analysis of Early Loaded Maxillary Dental Implants Supporting Single-Tooth Crowns

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In this study, 19 patients were treated with 36 Brånemark System MK III TiUnite implants in the maxilla. Definitive implant-supported single crowns were delivered to patients 6 weeks after implant placement. Clinical and radiographic parameters were recorded at baseline, and at 1, 2, and 3 years. Both implant and prosthesis success rates were 94% after 3 years. The average marginal bone loss was 0.97 mm after 3 years. The results of this study indicate that 6-week early loading of TiUnite surface implants in the maxilla was reliable and predictable for this patient population and may offer an alternative to the standard loading protocol. *Int J Prosthodont 2006;19:389–390.*

Over the past several decades, the use of dental implants in clinical practice for the treatment of total and partial edentulism has become a well-documented surgical and prosthetic procedure.[1,2] The replacement of single teeth using dental implants is a prosthodontic approach that allows greater preservation of adjacent teeth and solves esthetic problems.[3] Most standard protocols in implant dentistry recommend a healing period of 6 months for the maxilla.[4] However, the time required for treatment and the need for additional surgical procedures are obstacles that sometimes result in patients deciding against implant-related treatment. The objective of this study was to document standardized (Albrektsson and Zarb[5]) implant success outcomes over a short-term period among patients with single-tooth implant crowns according to an early loading (6 weeks) protocol with Brånemark MK III RP TiUnite implants (Nobel Biocare).

Materials and Methods

Nineteen patients (mean age 39 ± 10.5 years; 11 men, 8 women) were considered, according to the following criteria: age between 20 and 55 years, no systemic disease that would contraindicate oral surgery, any ridge width over 3.75 mm, natural teeth present both mesial and distal to the missing tooth, presence of opposing dentition, and willingness to give informed consent. Smokers were included in this trial. Patients were excluded if any of the following were evident: bone grafting in the area of the missing tooth, uncontrolled periodontal disease, or conditions (eg, diabetes, head and neck radiation) that might compromise healing or osseointegration.

Thirty-six Brånemark System MK III RP TiUnite implants were placed using a 1-stage surgical technique. Healing abutments (Nobel Biocare) were screwed to the implants after placement. The edentulous sites treated and the length and diameter of the implants used are given in Tables 1 and 2. Previously constructed removable acrylic resin partial prostheses replacing the missing teeth were temporarily relined and delivered to patients after implant surgery.

All patients were called back for impression procedures 1 month after implant placement. Preliminary impressions were taken with a stock tray using alginate (Cavex). Final impressions were taken with a custom-made resin tray (Heraeus Kulzer) using Impregum polyether impression material (3M ESPE), and the impression was poured with type IV stone (New Fujirock, GC Dental). Thirty-four CeraOne abutments (Nobel Biocare) were screwed on top of the implant replicas, (2 implants failed before abutment connection) and wax copings (Nobel Biocare) were placed. Regular porcelain-fused-to-metal definitive crowns with porcelain occlusal surfaces were fabricated. A high gold–containing alloy (Degudent U, Degudent) was used for the metal copings, and porcelain (Ceramco) was applied. All definitive restorations were cemented with temporary cement (Temp Bond NE, Kerr).

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Table 1 Distribution of Single-Tooth Edentulous Sites Treated with Implants

Location	No. of implants
Maxillary central incisor region	8
Maxillary lateral incisor region	6
Maxillary canine region	1
Maxillary premolar region	12
Maxillary molar region	9

Table 2 Dimensions of Implants Used

Dimensions (diameter × length)	No. of implants
3.75 × 15.0 mm	12
3.75 × 13.0 mm	5
3.75 × 11.5 mm	6
4.00 × 13.0 mm	3
4.00 × 11.5 mm	5
4.00 × 10.0 mm	5

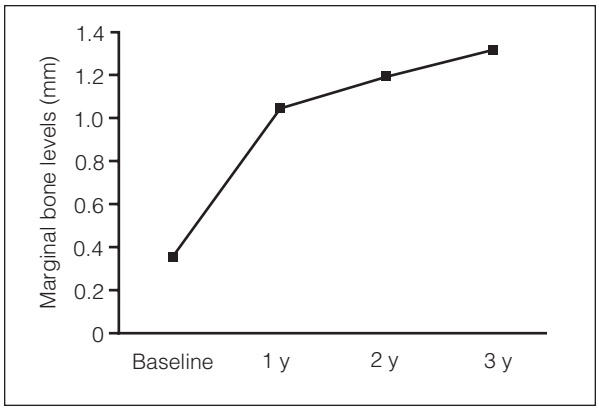

Fig 1 Average marginal bone levels during 3 years.

Implant survival was based on the following criteria, which were described by Albrektsson and Zarb[5]: absence of mobility, absence of painful symptoms, absence of peri-implant radiolucency during radiographic evaluation, and absence of progressive marginal bone loss.

Intraoral radiographic examinations were performed using the paralleling technique.[6] The radiographs were converted into digital files, and marginal bone changes were measured in a computer by 1 examiner using the implant-abutment junction as a reference. The average mesial and distal marginal bone changes were recorded for each implant. The distance between 2 threads of the implant (0.6 mm) was used for calibration of the measurements.

The prosthodontic results were recorded as successful at the final evaluation if the implant-supported single crown had remained in place, with no technical complications such as loosening of the abutment screw, decementation of the definitive crown, or porcelain fracture. Life table analysis was used to find the cumulative success rates of the implants and crowns.

Results

Of the 36 implants included in the study, 2 were lost during the follow-up period, resulting in an overall survival rate of 94.4%. One of the failed implants had been placed in a central incisor site and was lost 1 month after placement, while the other had been placed in a first molar site and was lost 6 weeks after placement. The mean marginal bone resorption was 0.97 mm for 34 implants at the 3-year evaluation (Fig 1). Two porcelain fractures (one was replaced and the other was slightly recontoured) in 1 patient were recorded during the 3 years. This resulted in an overall prosthetic success rate of 94.1% for the 34 restored implants.

Conclusion

Based on a total of 36 maxillary implants in 19 patients restored 6 weeks following implant placement, a 3-year success rate of 94% for Brånemark MK III RP TiUnite implants was observed.

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