Shorter implants in clinical practice: rationale and treatment results.

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Abstract

INTRODUCTION: The use of shorter implants offers a number of potential advantages if such utilization yields the same level of treatment success as the use of longer implants. The purpose of this retrospective study was to assess the survival of short implants in various clinical situations in function over time.

MATERIALS AND METHODS: A retrospective study was conducted of all patients treated between May 2000 and May 2007 who received endosseous implants that were less than 10 mm in length. Patient age, gender, location of implants, type of prosthesis, time in function, and stability of peri-implant crestal bone were assessed.

RESULTS: The retrospective analysis identified 2,073 implants of 6 mm, 7 mm, 8 mm, or 9 mm in length placed in a variety of clinical situations in 1,774 patients. Cumulative implant survival rates for implants in function in various areas of the mouth supporting single crowns or short-span fixed prostheses ranged from 98.1% to 99.7%. Each indication was examined with regard to individual success and failure rates and mean time in function.

CONCLUSIONS: When utilized appropriately, implants of 6 to 9 mm in length demonstrate cumulative survival rates under function comparable to those reported for longer implants.

A 7-year life table analysis from a prospective study on ITI implants with special emphasis on the use of short implants. Results from a private practice.


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Abstract

This paper reports on a 7-year life table analysis on ITI titanium plasma-sprayed (TPS) and sandblasted and etched (SLA) implants placed in a private practice and loaded for at least 1 year. In 236 patients, 528 (264 TPS and 264 SLA) implants were placed, 351 (66.5%) implants rehabilitated the posterior region and 71.1% implants were < or =11 mm. In the posterior mandible and maxilla, the mean implant length was 9.90 and 9.74 mm respectively. Implant length was determined through standard radiographs only. Increase of the number of
implants or reduction of the width or length of the rehabilitations was no specifically sought for the shorter implants. One hundred and twenty-two SLA implants were loaded within 63 days. All early loaded SLA implants resisted the applied 35 N cm without rotation or pain. Three implants failed, one early and two late failures, all were SLA implants placed in the mandible. Shorter implants did not fail more than longer ones. The cumulative success rate was 99.40%. The predictable use of short implants supporting single crowns and small fixed partial dentures of 2-4 units supported by two to three implants permitted (1) restricting the need for sophisticated and expensive presurgical procedures aimed to determine precisely the available bone height by computerized radiographic methods, (2) the placement of prosthetically driven restoration instead os surgically driven ones, (3) reducing the indications span for complex invasive procedures like sinus lift and bon grafting procedures, (4) facilitating the surgery, without attempting to place the longest implant and (5) avoiding the occurrence of sensation disturbance. The safe use of short implants in a private practice should make implant therapy simpler and accessible to a higher number of patients and practitioners.

**The use of short, wide implants in posterior areas with reduced bone height: a retrospective investigation.**

Griffin TJ, Cheung WS.

J Prosthet Dent. 2004 Aug;92(2):139-44.

**Abstract**

STATEMENT OF PROBLEM: Reduced bone height frequently presents a challenge for implant-assisted tooth replacement in partially edentulous patients. PURPOSE: This retrospective study evaluated the success rate of short, wide hydroxyapatite (HA)-coated implants placed in mandibular and maxillary molar areas with reduced bone height.

MATERIAL AND METHODS: A total of 168 HA-coated implants (6-mm diameter x 8-mm length) were placed in 167 patients in a private-practice setting. A minimal 6-mm workable ridge height and 8-mm ridge width was available in all situations. Patients were referred back to 1 of 7 referring restorative dentists for restoration of the implants. No attempt was made to standardize the restoration of the implants except to avoid working and nonworking contacts in lateral excursions. Implant success was evaluated according to the following criteria: (1) absence of complaints, (2) absence of recurring peri-implant infection or suppuration, (3) absence of perceptible implant mobility, and (4) absence of radiolucencies at implant-bone junction. The data were analyzed with descriptive statistics.

RESULTS: Fifty-four (32.1%), 35 (20.8%), 36 (21.4%), and 42 (25.0%) implants replaced maxillary first and second and mandibular first and second molars, respectively. There were 128 implant-supported single crowns. Thirty-eight implants served as abutments for fixed partial dentures connected to other implants of various sizes. Two implants were involved in cantilevered fixed partial dentures. Patients were followed for up to 68 months (mean=34.9 months) after loading of implants. The overall cumulative success rate was found to be 100%.
CONCLUSIONS: For residual ridges with minimal height but adequate width, the use of short, wide HA-coated implants may offer a simple and predictable treatment alternative in posterior areas.

Outcomes of placing short dental implants in the posterior mandible: a retrospective study of 124 cases.

Grant BT, Pancko FX, Kraut RA.


Abstract

PURPOSE: The purpose of this retrospective study was to determine the overall success of short dental implants (8 mm in length) placed in the partially or completely edentulous posterior mandible restored with fixed and removable prostheses.

PATIENTS AND METHODS: A total of 124 patients had 335 8-mm-long implants placed from May 2005 until June 2007. Of the 124 total patients, 35 were men and 89 were women, with a median age of 56 years and an age range of 18 to 80 years at the time of implant surgery. There were 112 patients who were partially edentulous and 12 who were completely edentulous. Of the patients, 32 had a single implant placed whereas the other 92 had multiple implants placed. One patient had the implants immediately provisionally loaded. All of the implants were restored by use of fixed prostheses. Of these fixed prostheses, 245 were splinted together whereas 75 were restored individually.

RESULTS: A total of 335 short dental implants were placed in 124 patients. Of the 335 implants placed, 331 integrated successfully. In the 2 cases that failed, the sites were grafted with porous hydroxyapatite and platelet-rich plasma. The implants were replaced at 5 months after the initial failure in the first patient and at 7 months in the second patient. These replacement implants integrated and have been restored and in function for more than 16 months. There was 1 fracture of an implant with a restoration. The implant had been restored with an individually fabricated fixed restoration, with the fracture occurring at the head of the implant, requiring removal. The implant and restoration had been in function for 10 months before fracture. There were no other fractures of implants or restorative hardware noted in this study. The survival rate for 8-mm implants placed in the mandible was 99% from stage I surgery to a functional prosthesis for up to 2 years.

CONCLUSIONS: Placement of short dental implants is a predictable treatment method for patients with decreased posterior mandibular bone height.
Short implants in maxillae and mandibles: a retrospective study with 1 to 8 years of follow-up.

Anitua E, Orive G.

Abstract

BACKGROUND: The aims of this study are to evaluate the long-term survival rates of short dental implants in posterior areas in both jaws and analyze the influence of different factors on implant survival.

METHODS: A retrospective cohort study design was used. Six hundred and sixty-one patients received 1,287 short implants (<8.5 mm) between 2001 to 2008 in Vitoria, Spain. All implant installations were performed by two experienced surgeons and rehabilitations were done by three prosthodontists. Each implant failure was carefully analyzed. The potential influence of demographic factors, clinical factors, surgery-depending factors, and prosthetic variables on implant survival was studied. Implant survival was analyzed using a life table analysis (Wilcoxon [Gehan] test).

RESULTS: The overall survival rates of short implants were 99.3% and 98.8% for the implant and subject-based analysis, respectively. The mean follow-up period for the implants was 47.9 +/- 24.46 months. A total of 9 out of 1,287 implants were lost during the observation period. None of the variables studied resulted in statistical association with implant failure because of the low number of failures.

CONCLUSION: Results of the present retrospective study show that treatment with short implants can be considered safe and predictable if used under strict clinical protocols.

Short implants placed one-stage in maxillae and mandibles: a retrospective clinical study with 1 to 9 years of follow-up.

Maló P, de Araújo Nobre M, Rangert B.

Abstract

BACKGROUND: The use of short implants (7-8.5 mm) has historically been associated with lower survival rates than for longer implants. However, recent clinical studies indicate that short implants may support most prosthetic restorations quite adequately, but still clinical documentation is sparse.

PURPOSE: The purpose of this study was to report on the placement of short Brånemark implants, testing the hypothesis that short implants in atrophied jaws might give similar long-term implant survival rates as longer implants used in larger bone volumes.

MATERIALS AND METHODS: This retrospective clinical study included 237 consecutively treated patients with 408 short Brånemark implants supporting 151 fixed prostheses. One hundred thirty-one of the implants were 7-mm long, and 277 were 8.5-mm long. Final
abutments were delivered at the time of surgery, and final prostheses were delivered 4 to 6 months later.

RESULTS: One hundred and twenty six of the 7-mm implants (96%) have passed the 1-year follow-up; 110 (84%), the 2-year follow-up; and 88 (67%), the 5-year follow-up. Five implants failed in four patients before the 6-month follow-up, giving a cumulative survival rate of 96.2% at 5 years. The average bone resorption was 1 mm (SD=0.6 mm) after the first year and 1.8 mm (SD=0.8 mm) after the fifth year of function. Two hundred sixty nine of the 8.5-mm implants (97%) have passed the 1-year follow-up; 220 (79%), the 2-year follow-up; and 142 (51%), the 5-year follow-up. Eight implants failed in seven patients before the 6-month follow-up, giving a cumulative survival rate of 97.1% at 5 years. The average bone resorption was 1.3 mm (SD=0.8 mm) after the first year and 2.2 mm (SD=0.9 mm) after the fifth year of function.

CONCLUSIONS: The cumulative survival rates of 96.2 and 97.1% at 5 years for implants of 7.0- and 8.5-mm length, respectively, indicate that one-stage short Brånemark implants used in both jaws is a viable concept.

Five-year clinical evaluation of short dental implants placed in posterior areas: a retrospective study.

Anitua E, Orive G, Aguirre JJ, Andía I.


Abstract

BACKGROUND: The aims of this study were to evaluate the long-term survival rates of short dental implants in posterior areas and to analyze the influence of different factors on implant survival.

METHODS: A retrospective cohort study design was used. A total of 293 subjects received 532 short implants between 2001 and 2004. All implants were placed by two experienced surgeons, and rehabilitations were done by three prosthodontists. Each implant failure was analyzed carefully. The potential influence of demographic factors, clinical factors, surgery-dependent factors, and prosthetic variables on implant survival was studied. Implant survival was analyzed using a life-table analysis (Wilcoxon [Gehan] test).

RESULTS: The overall survival rates of short implants were 99.2% and 98.7% for the implant- and subject-based analyses, respectively. The mean follow-up period was 31 +/- 12.3 months. Two of 532 implants were lost during the observation period. None of the variables studied were statistically associated with implant failure.

CONCLUSION: Treatment with short implants can be considered safe and predictable if used under strict clinical protocols.
Short (8-mm) dental implants in the rehabilitation of partial and complete edentulism: a 3- to 14-year longitudinal study.


Romeo E, Ghisolfi M, Rozza R, Chiapasco M, Lops D.

Abstract

PURPOSE: This study aimed to evaluate the clinical effectiveness of different implant sizes (8- and 10-mm lengths with 3.75-, 4.1-, and 4.8-mm diameters) in diverse host bone sites in a selected sample of partially and completely edentulous patients.

MATERIALS AND METHODS: Over a 14-year period, 129 patients (68 women and 61 men) were consecutively treated with a fixed prosthesis (single or multiunit, screw or cement retained) supported by 265 different-sized implants (154 standard 10-mm; 111 shorter 8-mm). Two types of implants were used (141 titanium plasma-sprayed and 124 Sand-blasted, large-grit, acid-etched).

RESULTS: Dropouts were recorded for 23 patients with 23 prostheses supported by 42 implants. In the remaining 106 patients (223 implants), 8 implants failed (4 standard and 4 shorter), in type 3 or 4 bone. Mean marginal bone loss and gingival crevice probing depth associated with either implant length were statistically comparable (P > .05). The 14-year cumulative survival rates for all short and standard implants were 97.9% and 97.1%, respectively. Survival rates were 92.3% and 95.9% for titanium plasma-sprayed short and standard implants, respectively, and 100% and 98.5% for the Sand-blasted, large-grit, acid-etched short and standard implants, respectively. Six of the 8 lost implants required implant replacement after the host sites' healing period. The remaining 2 lost implants were managed by converting the distal unit of the fixed partial prosthesis to a cantilever.

CONCLUSION: Within the limits of the study design and observation period, a mix of implant sizes did not appear to compromise the effectiveness of implant therapy in this particular population group.

Short (6-mm) nonsubmerged dental implants: results of a Multicenter clinical trial of 1 to 7 years.

ten Bruggenkate CM, Asikainen P, Foitzik C, Krekeler G, Sutter F.


Abstract

Limited bone height restricts the use of long dental implants, so short implants may be selected in these situations. Recent reports on clinical results with short implants have been negative, however, and have suggested that indications for the use of these implants are limited. To verify these findings, a multicenter study of short ITI implants was carried out. In a 6-year period 253 short implants with a length of 6 mm were placed into 126 patients, who were followed up from 1 to 7 years. Altogether 7 implants were removed; 6 of these were located in the maxilla and 1 in the mandible. The quality of survival was comparable with the
clinical results of longer implants from the same implant system. Although the clinical results of these short implants were favorable, it is recommended that they be used in combination with longer implants, especially when used in the less dense bone that is often seen in the maxilla.

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**Short dental implants in posterior partial edentulism: a multicenter retrospective 6-year case series study.**

Misch CE, Steignga J, Barboza E, Misch-Dietsh F, Cianciola LJ, Kazor C.


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**Abstract**

**BACKGROUND:** Implants <10 mm long in the posterior regions of partial edentulous patients have a higher failure rate in many clinical reports. The purpose of this case series study was to evaluate implant survival when a biomechanical approach was used to decrease stress to the bone-implant interface.

**METHODS:** A retrospective evaluation of 273 consecutive posterior partially edentulous patients treated with 745 implants. 7 or 9 mm long, supporting 338 restorations over a 1- to 5-year period was reviewed from four private offices. Implant survival data were collected relative to stage I to stage II healing, stage II to prosthesis delivery, and prosthesis delivery to as long as 6 years follow-up. A biomechanical approach to decrease stress to the posterior implants included splinting implants together with no cantilever load, restoring the patient with a mutually protected or canine guidance occlusion, and selecting an implant designed to increase bone-implant contact surface area.

**RESULTS:** Of the 745 implants inserted, there were six surgical failures from stage I to stage II healing to prosthesis delivery. No implants failed after the 338 final implant prostheses were delivered. A 98.9% survival rate was obtained from stage I surgery to prosthetic follow-up.

**CONCLUSIONS:** Short-length implants may predictably be used to support fixed restorations in posterior partial edentulism. Methods to decrease biomechanical stress to the bone-implant interface appear appropriate for this treatment.