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 implants in the severely resorbed maxilla: a 2-year retrospective clinical study.**

Renouard F, Nisand D.


Department of Periodontology, Paris VII University, Paris, France. frenouard@aol.com

**Abstract**

BACKGROUND: Although the predictability of endosseous dental implants is well documented, the restoration of the posterior region of the maxilla remains a challenge. The placement of short implants is one therapeutic option that reduces the need for augmentation therapy.

PURPOSE: The purpose of this retrospective study was to assess the survival rates of 6 to 8.5 mm-long implants in the severely resorbed maxilla following a surgical protocol for optimized initial implant stability.

MATERIALS AND METHODS: The study included 85 patients with 96 short (6-8.5 mm) implants (Brånemark System, Nobel Biocare AB, Göteborg, Sweden) supporting single-tooth and partial reconstructions. The implants had a machined (54) or an oxidized (TiUnite, Nobel Biocare AB) (42) surface. A one-stage surgical protocol with delayed loading was used. The patients were followed for at least 2 years after loading (average follow-up period 37.6 months). The marginal bone resorption was assessed by radiographic readings.

RESULTS: Five implants were lost during the first 9 months, and four implants were lost to follow-up. The cumulative survival rate was 94.6%. Four of the failed implants had a machined surface, and one had an oxidized surface. The mean marginal bone resorption after 2 years in function was 0.44 +/- 0.52 mm.
CONCLUSION: This study demonstrates that the use of short implants may be considered for prosthetic rehabilitation of the severely resorbed maxilla as an alternative to more complicated surgical techniques.

The challenge of implant therapy in the posterior maxilla: providing a rationale for the use of short implants.

Morand M, Irinakis T.


University of British Columbia, Vancouver, British Columbia, Canada.

Abstract

Rehabilitating patients with a resorbed maxilla presents several challenges when the desired treatment plan involves the placement of endosseous implants. Correct diagnosis requires knowledge on jaw healing patterns, systemic effects, and the impact of bone quality changes on implant success rates. Appropriate treatment planning requires an in-depth understanding of the materials and methods available to the contemporary implant surgeon. The clinician must be able to persist on evidence-based techniques and adhere to those proven methods. Successful surgical placement requires correct use of the available armamentarium and acceptance of the limitations that implant dentistry still presents. Especially challenging is the implant treatment of maxillary molars due to the plethora of complicating factors such as limited bone availability, interarch space challenges, sinus problems, etc. These are just a few of the factors that may lead us to placement of short implants in these sites. An extensive review of the literature that is available for short implants (implants < 10 mm in length) indicates that although they are commonly used in areas of the mouth under increased stress (posterior region), their success rates mimic those of longer implants when careful case selection criteria have been used. The available studies and case-series offer a valid rationale for placement of short implants so long as one understands the limitations, indications, risk factors, and limited studies that actually follow-up success rates of short implants for over 5 years. This review of the literature will provide the reader an in-depth view of the evidence in using short implants as an alternative treatment modality for the maxillary molar region.
**Comparative clinical results after implant placement in the posterior maxilla with and without sinus augmentation.**

Schlegel A, Hamel J, Wichmann M, Eitner S.


Friedrich-Alexander-University Erlangen-Nuremberg, Department of Oral and Maxillofacial Surgery, Erlangen, Germany.

**Abstract**

PURPOSE: The objective was to compare implants in the posterior maxilla with or without sinus floor augmentation.

MATERIALS AND METHODS: A retrospective study was conducted of patients who received implants in the posterior maxilla. All patients received solitary, implant-retained fixed partial dentures or crowns. A standardized form for implant treatment was used to document the follow-up examination. The different parameters were initially analyzed descriptively by frequency distribution, measure of central tendency, and statistical spread. A 95% level of significance was set for all tests.

RESULTS: A total of 76 patients with 141 dental implants in the posterior region of the maxilla were evaluated. Fifty-one patients with 71 implants received prior no augmentation (sinus floor elevation) and composed the control group. Twenty-five patients with 70 implants received an additional bone transfer prior to implant placement. The mean age of the patients at time of the follow-up examination was 49.7 years in the overall group, 52.6 years for men and 46.7 years for women. The implants inserted in an augmented area had similar implant stability and implant loss results after a mean functional observation period of 1.6 years (range, 0.5 to 4.7 years) compared to those inserted without augmentation. Augmented implants exhibited less peri-implant bone resorption.

CONCLUSIONS: The outcomes for implants with augmentation were similar to those without augmentation.

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**Shorter implants in clinical practice: rationale and treatment results.**

Fugazzotto PA.


progressiveperio@aol.com

**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.

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**Ultrashort sintered porous-surfaced dental implants used to replace posterior teeth.**

Deporter D, Ogiso B, Sohn DS, Ruljancich K, Pharoah M.


Discipline of Periodontics, Faculty of Dentistry, University of Toronto, Toronto, ON, Canada. douglas.deporter@dentistry.utoronto.ca

**Abstract**

BACKGROUND: This retrospective multicenter report provides data from a case series of partially edentulous subjects treated with an ultrashort (5-mm-long) sintered porous-surfaced (SPS) dental implant.

METHODS: The implant used had a tapered truncated cone shape, was 5-mm long, and had a maximal coronal diameter of 5 mm. Twenty-six implants were placed in 20 subjects to replace primarily maxillary and mandibular molar teeth. Submerged primary healing was used. Nine implants were restored with single crowns, one carried a single cantilever, and the remaining 16 implants were part of fixed implant-supported bridges, generally as the most distal abutment.

RESULTS: After functional periods of 1 to 8 years, two maxillary implants failed, giving maxillary and mandibular failure rates of 14.3% and 0%, respectively.

CONCLUSION: The results of this case series suggest that an SPS, press-fit, tapered dental implant with a length of 5 mm and a maximal coronal diameter of 5 mm should be investigated further as a solution for the management of highly resorbed posterior sites in partial edentulism, particularly in the mandible.