Abstracts of articles published in important Implantology, Prosthodontics and Periodontics journals from around the world

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Are short dental implants (< 10mm) effective? A meta-analysis on prospective clinical trials

Monje A, Chan HL, Fu JH, Suarez F, Galindo-Moreno P, Wang HL.
J Periodontol. 2012 Aug 23. [Epub ahead of print].

Background: This study aims to compare the survival rate of short (<10 mm) and standard (≥10 mm) rough-surface dental implants under functional loading. **Methods:** An electronic literature search using PubMed and Medline databases was conducted. Prospective clinical human trials, published in English from January 1997 to July 2011, that examined dental implants of <10 mm with a 12-month follow-up were included in this meta-analysis. The following data were retrieved from the included articles: the number of implants, implant dimensions, implant locations, types of prostheses, follow-up periods, and implant survival rates. Kaplan-Meier survival estimates and the hazard rates were analyzed and compared between short and standard implants. **Results:** Thirteen studies were selected, examining 1,955 dental implants, of which 914 were short implants. Short dental implants had an estimated survival rate of 88.1% at 168 months, when standard dental implants had a similar estimated survival rate of 86.7% (P = 0.254). The peak failure rate of short dental implants was found to occur between 4 and 6 years of function. This occurred at an earlier time point compared with standard dental implants, where the peak failure rate occurred between 6 and 8 years of function. **Conclusion:** This study shows that in the long term, implants of <10 mm are as predictable as longer implants. However, they fail at an earlier stage compared with standard implants.

How successful are small-diameter implants? A literature review

Sohrabi K, Mushantat A, Esfandiari S, Feine J.
Clin Oral Implants Res. 2012 May;23(5):515-25.

Background: Edentulism is an important issue and will remain so due to high numbers of edentate individuals worldwide. For many years, complete dentures have been the only treatment option for this population. Implant overdentures have been shown to have many advantages over conventional complete dentures. However, although dissatisfied with their mandibular dentures, some edentate elders are reluctant to undergo even simple implant treatment due to factors such as cost and fear of surgery. To address these obstacles, this paper reports on a review of small-diameter implant (SDI) studies that were performed in the last two decades.

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The aim of this study is to (i) determine the survival of narrow diameter implants, (ii) determine whether survival is dependent on whether these implants are placed using a flap or flapless approach, and (ii) determine whether there is a relationship between length and implant survival in SDIs. **Methods:** In this review, studies were included that (i) involve implants with 3.5 mm diameter or less, (ii) have a randomized clinical trial, retrospective or prospective cohort design with human subjects, (iii) provide a follow up duration of at least 5 months following implant placement, (iv) include data on the survival rate of the implants. **Results:** Forty one studies meeting the above criteria were published between 1993 and 2011 using SDIs from a variety of companies and surface characteristics with diameters of 1.8 mm to 3.5 mm and lengths of 8 mm to 18 mm. A total of 10,093 SDIs were inserted in approximately 2762 patients. Twenty-six studies involved flap reflection techniques for implant placement, six studies used a flapless technique and two studies used both techniques; in the remaining studies, the technique was not specified. Follow up duration varied from 5 months to over 9 years. The survival rate reported in all screened studies was over 90%, including eight studies in which a 100% survival rate was reported. In 22 studies, the reported survival rate ranged from 95% to 99.9%. Failure was reported most often in short SDIs (less than or equal 13 mm) (n = 88) compared to longer ones (more than 13 mm). **Conclusion:** Survival rates reported for SDI are similar to those reported for standard width implants. These survival rates did not appear to differ between studies that used flapless and flap reflection techniques. The failure rate appeared to be higher in shorter SDIs than in longer ones in the studies in which the length of the failed implants was reported. SDIs could be considered for use with fixed restorations and mandibular overdentures, since their success rate appears to be comparable to that of regular diameter implants. They might also be an efficient, low-cost solution for elders who wish to reduce problems with denture instability.

Peri-implant bone loss in cement- and screw-retained prostheses: systematic review and meta-analysis

de Brandão ML, Vettore MV, Vidigal Júnior GM.

J Clin Periodontol. 2013 Mar;40(3):287-95.

Aim: The aim of this systematic review and meta-analysis was to assess and compare peri-implant marginal bone loss in cement- and screw-retained prostheses. **Material and Methods:** Electronic database and manual searches were undertaken to identify trials, prospective or retrospective studies reporting on radiographic marginal bone loss around dental implants restored with cement- and/or screw-retained prostheses. Two reviewers independently conducted the article selection and data extraction. Random-effects models were used to obtain estimates of peri-implant marginal bone loss [mean, 95% confidence intervals (CI)]. **Results:** Of the 1217 identified studies, nine finally met the inclusion criteria. Only two studies included both cement- and screw-retained prostheses, three assessed only screw-retained prostheses, and four evaluated only cement-retained prostheses. Pooled mean marginal bone loss was 0.53 mm (CI 95%, 0.31-0.76 mm) for cement-retained prostheses and 0.89 mm (CI 95%, 0.45-1.33 mm) for screw-retained prostheses. **Conclusion:** There is no evidence to support differences in the marginal bone loss through indirect comparison between cement and screw-retained restorations.

Facial alveolar bone wall width — a cone-beam computed tomography study in Asians

Zekry A, Wang R, Chau AC, Lang NP.

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Background: The width of the facial alveolar bone wall is crucial for long-term successful esthetic outcomes of implants immediately placed into extraction sockets. A threshold of 2 mm is recommended to minimize buccal vertical bone resorption. **Aim:** To assess the width of the facial alveolar bone wall using cone-beam computed tomography images (CBCT). **Material and Methods:** Retrospective CBCT images were acquired from a representative sample of Asians using the i-CAT(®) classic system with a 0.4-mm voxel size. At random, 200 CBCT images were selected according to predefined criteria. The DICOM file was imported into the i-CAT Vision(®) software. In the panoramic screen, the middle of each tooth was selected, and in the sagittal window, the middle cross section was selected for performing the measurements using a computer. The vertical distance from the alveolar crest (BC) - cemento-enamel junction (CEJ) was measured. The width of the facial alveolar bone wall was measured at three locations: 1, 3, and 5 mm apical to BC. Descriptive statistics, frequency analyses, and multi-level comparisons were performed. **Results:** The sample consisted of 74 men and 126 women (mean age of 37.2 years; range 17-82years). A total of 3618 teeth were assessed. There was no significant difference between the values of right and left sides, or between genders. However, statistically significant differences were observed between age groups at all levels. The distance from CEJ to BC varied from 0.4 to 4 mm, with an overall tendency to increase with age. The mean width of the facial alveolar bone wall at anterior teeth was 0.9 mm and increased toward posterior regions. Rarely, a width of 2 mm was yielded (0.6-1.8% for anterior teeth, 0.7-30.8% for posterior teeth). At a 5-mm distance from BC, minimal widths of facial alveolar bone were identified for the anterior teeth. The frequency of dehiscence ranged from 9.9% to 51.6% for anterior and 3.1% to 53.6% for posterior teeth, respectively. **Conclusion:** A thin facial alveolar bone wall was usually present in both jaws. Hence, for most patients, adjunctive bone augmentation may be needed when installing implants in areas of esthetic concern.

The impact of cantilevers on biological and technical success outcomes of implant-supported fixed partial dentures. A retrospective cohort study

Kim P, Ivanovski S, Latcham N, Mattheos N.

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Objective: To investigate the biological and technical success outcomes of implant-supported fixed dental prostheses with and without cantilevers, after a minimum of one year loading. **Material and Methods:** One hundred and seven subjects with 128 cantilever FDPs (cFDP) supported by 132 implants were compared with 99 individuals with 144 non-cantilever FPDs (ncFDPs) supported by 203 implants. Outcomes such as marginal bone loss from FDP insertion to final follow-up as well as frequency and extent of biological and technical complications were investigated and correlated with patient, site, implant and FDP design characteristics. **Results:** The cFDPs were followed for average

of 51 months (1551 days, SD ± 977), and ncFPDs for 49 months (1483 days, SD ± 809 days). Implant survival and success rates were 96.7% and 87.9% for implant supporting cFDPs, and 99.5% and 92.6% for ncFDPs. There was no significant difference in overall bone loss between cFDPs and ncFDPs (cantilever side: 0.58, SD ± 1.16 - non-cantilever side: 0.59, SD ± 0.99), but implants in the cantilever group lost significantly more bone in the posterior mandible (0.50 SD ± 1.3 mm for cFDPs and 0.24 SD ± 0.80 mm for ncFDPs). Within the cantilever group, cantilever arm length and implant location had an influence on bone loss. Regardless of the presence of cantilever, implants associated with technical complications had a higher rate of biological complications as well. Furthermore, the length of the cantilever arm was positively correlated with implant failure, technical complications and bone loss ≥ 1.5 mm (P = 0.011, <0.001, and 0.007). **Conclusion:** Overall implants can be successfully used to support cantilever FDPs. However, there are technical and biological implications which appear inter-related.

Immediate occlusal loading of extrasinus zygomatic implants: a prospective cohort study with a follow-up period of 8 years

Migliorança RM, Sotto-Maior BS, Senna PM, Francischone CE, Del Bel Cury AA.

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The aim of this study was to evaluate the long-term success rate of immediate occlusal loading of extrasinus zygomatic implants after an 8-year follow-up. From 62 patients who needed implant treatment in 2003, 25 patients who presented with maxillary atrophy met the inclusion criteria and agreed to participate in the study. All patients received fixed dentures under immediate occlusal loading supported by extrasinus zygomatic implants associated with anterior standard implants. No bone grafting procedures were performed. During the 8-year follow-up period, 21 patients underwent clinical evaluation and radiographic examinations every 6 months. This study conforms to the STROBE guidelines regarding prospective cohort studies. 40 extrasinus zygomatic and 74 anterior standard implants were evaluated. All patients were clinically free of signs and symptoms of sinus disturbance at all follow-up appointments. After 8 years, the success rates of extrasinus zygomatic implants, standard anterior implants and definitive prostheses were 97.5%, 95.9% and 95.2%, respectively. Within the limits of this study, immediate occlusal loading of extrasinus zygomatic implants presents a predictable treatment option for the atrophic maxilla.