Removable implant-prosthodontic rehabilitation of the edentulous mandible: five-year results of different prosthetic anchorage concepts.


Weinlander M, Piehslinger E, Krennmair G.

Abstract

Purpose: The present study evaluated implant and peri-implant outcomes as well as prosthodontic maintenance efforts for implant/bar-supported mandibular prostheses with different prosthesis anchorage systems.

Materials and Methods: Seventy-six patients who received two or four interforaminal implants were assigned to one of three different bar designs and subsequently to different prosthesis supporting systems. Forty-nine patients received implants and a mucosa-supported implant-retained overdenture (OD) with an ovoid bar (two implants; design 1) or multiple ovoid bars (four implants; design 2). Twenty-seven patients received four implants and a rigid implant-supported prosthesis (ISP) with a milled bar (design 3). Implant survival, peri-implant parameters (marginal bone resorption, pocket depth, and plaque, bleeding, gingival, and calculus indices), and postinsertion prosthodontic maintenance were followed over a 5-year period and compared among the different retention modalities. At the most recent follow-up examination, subjective patient satisfaction was additionally evaluated using a simplified scoring system (ranging from 1 = not satisfactory to 5 = excellent).

Results: Implant survival rates (100%) and all peri-implant parameters evaluated showed no differences among the three designs used for implant prosthesis anchorage. Prosthodontic maintenance did not differ between the different ODs (OD design 1: average of 1.04 maintenance visits/year/patient; OD design 2: 1.2 maintenance visits/year/patient), but it was significantly lower for the dentures that were rigidly stabilized with milled bars (ISP: 0.37 maintenance visits/year/patient). A high subjective satisfaction rate (range: 4.5 to 5.0) was registered at the final examination, without any differences among the designs used.

Conclusions: Rigid anchorage with milled bars on four-implant prostheses combined with a metal-reinforced framework showed a lower extent of prosthodontic maintenance issues than round bars on two- or four-implant overdentures with resilient denture stabilization. Nevertheless, implants and peri-implant structures were not negatively affected by either resilient or rigid anchorage mechanisms.
A 5-year randomized clinical trial on the influence of splinted and unsplinted oral implants in the mandibular overdenture therapy. Part I: Peri-implant outcome.

Naert I, Gizani S, Vuylsteke M, van Steenberghe D.


Department of Prosthetic Dentistry, School of Dentistry, Oral Pathology and Maxillofacial Surgery, Catholic University Leuven, Belgium. ignace.naert@med.kuleuven.ac.be

Abstract

Thirty-six completely edentulous patients were enrolled for a 5-year prospective study testing the treatment outcome between splinted and unsplinted implants retaining a mandibular hinging overdenture. The patients were randomized into 3 groups of equal size depending on the attachment system used such as: magnets, ball attachments or bars (reference group). Only 1 implant out of the 72 had failed at the abutment stage. Not a single implant failed during the 5-year loading period. The accumulation of plaque was significantly higher for the Magnet than for the Ball group. Bleeding on probing, as well as marginal bone level, attachment level and Periotest values did not statistically differ among the groups, neither at year 1 nor at year 5. However, the Periotest values were significantly lower at year 5 compared to year 1 for all groups, which indicates a higher rigidity at the bone-implant interface. No correlation was found between bleeding on probing and marginal bone loss. We conclude that the connection state of 2 implants retaining a hinging overdenture did not influence the peri-implant outcome.

A 10-year randomized clinical trial on the influence of splinted and unsplinted oral implants retaining mandibular overdentures: peri-implant outcome.

Naert I, Alsaadi G, van Steenberghe D, Quirynen M.


Department of Prosthetic Dentistry/Biomat Research Group, School of Dentistry, Oral Pathology and Maxillofacial Surgery, Faculty of Medicine, Catholic University of Leuven, Leuven, Belgium. Ignace.Naert@med.kuleuven.ac.be

Abstract

PURPOSE: This randomized controlled clinical trial aimed to evaluate the efficacy of splinted implants versus unsplinted implants in overdenture therapy over a 10-year period.

MATERIALS AND METHODS: The study sample comprised 36 completely edentulous patients, 17 men and 19 women (mean age 63.7 years). In each patient, 2 implants (Brånemark System, Nobel Biocare, Göteborg, Sweden) were placed in the interforaminal area. Three to 5 months after placement, they were connected to standard abutments. The patients were then rehabilitated with ball-retained overdentures, magnet-retained overdentures, or bar-retained overdentures (the control group). Patients were followed for 4, 12, 60, and 120 months post-abutment connection. Group means as well as linear
regression models were fitted with attachment type and time as classification variables and corrected for simultaneous testing (Tukey).

RESULTS: After 10 years, 9 patients had died and 1 was severely ill. Over 10 years, no implants failed. Mean Plaque Index, Bleeding Index, change in attachment level, Periotest values, and marginal bone level at the end of the follow-up period were not significantly different among the groups.

DISCUSSION: The annual marginal bone loss, excluding the first months of remodeling, was comparable with that found around healthy natural teeth.

CONCLUSION: The fact that no implants failed and that overall marginal bone loss after the first year of bone remodeling was limited suggested that implants in a 2-implant mandibular overdenture concept have an excellent prognosis in this patient population, irrespective of the attachment system used.

---

Comparing bar and double-crown attachments in implant-retained prosthetic reconstruction: a follow-up investigation.


Department of Prosthodontics, Friedrich-Alexander-University Erlangen-Nuremberg, 91054 Erlangen, Germany. seitner@prothetik-erlangen.de

Abstract

OBJECTIVES: A removable implant-retained dental prosthesis in an edentulous mandible can use telescopic crowns or a bar superstructure as anchorage elements for an overdenture. The aim of this study was to compare the clinical results for bar-anchored and telescopic crown-retained overdentures in implant prosthetic treatment of the toothless lower jaw with two or more implants placed in the intraforaminal region.

MATERIAL AND METHODS: A clinical and radiographical comparison was made of the telescope vs. the bar method for removable prosthetic rehabilitation treatments in patients with an edentulous mandible. For evaluation of the clinical data, the sulcus fluid flow rate, Periotest values, and the peri-implant bone loss were recorded.

RESULTS: In the follow-up examinations, 19 implant losses were reported between insertion and review of 328 implants. The frequency distribution of the observed loss rates showed no treatment-specific trend. In the group with bar-treated implants, failure led to ‘group loss’ of the whole prosthetic superstructure. Failure of one of the double-crown-stabilized full dental prosthesis could usually be adapted so that the overdenture remained usable even without re-implantation.

CONCLUSIONS: After comparing all the clinical parameters evaluated, no significant difference between the stabilization of full dentures via conus and telescopic crowns and bar-anchored dentures could be found. The choice of one particular method remains the decision of the professional treating the patient.
Praxisbewährte implantatprothetische Versorgungsmöglichkeiten des zahnlosen Ober- und Unterkiefers 5 klinische Beispiele

Plöger M, Scheinert U.


Zusammenfassung:

Implant supported restorative treatment concepts for the edentulous upper and lower jaw.

Summary:
Several implant supported restorative treatment concepts for edentulous patients are presented. Naturally, the type of restoration depends on the number of implants placed. Five cases are described to provide a critical overview: a bar retained overdenture on four Frialoc implants with immediate loading; telescopic denture in the lower jaw, overdenture on six implants with a custom milled bar, fixed cemented bridge on implants; tooth by tooth restorative concept using 10 root shaped immediate implants and four temporary implants. A survey of the surgical procedures, the overlay denture concepts and some dental laboratory aspects are discussed.

Does the type of implant prosthesis affect outcomes in the partially edentulous patient?

Weber HP, Sukotjo C.


Erratum in:

Abstract
PURPOSE: Implant restoration of the partially edentulous patient has become highly predictable. The scientific information on the specifics of restorative designs and their influence on the long-term outcome is sparse. The main objective of this systematic review
was to determine what scientific evidence exists regarding the influence of prosthodontic design features on the long-term outcomes of implant therapy (implant success and survival, prosthesis success and survival) in the partially edentulous patient.

MATERIALS AND METHODS: Four questions of primary interest regarding implant prosthodontic design options were selected by the 2 reviewers: abutment type, retention type (cemented, screw-retained), support type (implant support alone versus combined implant-tooth support), and the type of restorative material. Inclusion and exclusion criteria were formulated and applied to a total of 1,720 titles. The list of titles was primarily based on a PubMed-type search provided by the State of the Science of Implant Dentistry workshop leadership. It was supplemented by a hand search of relevant journals at the Countway Library of the Harvard Medical School and of a personal collection of relevant publications of the 2 reviewers. Information on the survival and success of implants and prostheses as defined by the respective authors was retrieved from the included articles, entered into data extraction tables, and submitted for statistical analysis.

RESULTS: Seventy-four articles were selected for data extraction and analysis after critical appraisal and application of the exclusion criteria. The kappa value for reviewer agreement was 100% between the 2 reviewers. The majority of studies were in the “average” range and were published between 1995 and 2003. Only 2 “best” trials, ie, randomized controlled clinical trials, were identified. For the method of retention (screw-retained versus cemented), no differences were found in implant success or survival rates between screw-retained and cemented restorations. Prosthesis success rates showed greater variations between cemented and screw-retained restorations at the various evaluation times; however, the differences never reached statistical significance. The prosthesis success rate at the last reported examination (> 72 mo) was 93.2% for cemented and 83.4% for screw-retained restorations (P > .05). Regarding the type of support, implant success rates at the last reported evaluation were 97.1% for implant-supported fixed partial dentures (FPDs), 94.3% for single-implant restorations, and 89.2% for implant-tooth-supported FPDs. None of the differences reached statistical significance. Implant survival at the last examination (> 72 mo) was highest for implant-supported FPDs (97.7%), followed by single-implant restorations (95.6%) and implant-tooth-supported FPDs (91.1%). Differences were not statistically significant. Prosthesis success at the last examination (> 72 mo) resulted in overall lower percentage rates than implant success or survival (89.7% for implant-supported FPDs, 87.5% for implant-tooth-supported FPDs, and 85.4% for single-implant restorations; differences not statistically significant). Insufficient extractable information was available regarding the influence of abutment type or restorative material.

CONCLUSION: The scientific evidence obtained from this review is insufficient to establish unequivocal clinical guidelines for the design of implant-supported fixed prostheses in the partially edentulous patient.

Tooth-to-implant connection: a systematic review of the literature and a case report utilizing a new connection design.

Chee WW, Mordohai N.

Abstract

BACKGROUND: In the treatment of partially edentulous patients, implants have often been connected to natural teeth. Numerous studies have reported significant complications and problems, while others have demonstrated favorable outcomes.

PURPOSE: The purpose of this article was to systematically review the literature regarding the splinting of implants and teeth. The difference in the biomechanical behavior between osseointegrated implants and teeth and the efficacy of the different modes of connection that have been employed are explored.

MATERIALS AND METHODS: A MEDLINE search between 1966 and October 2006 was performed to retrieve relevant articles. A further manual search from the bibliographies of the former articles was performed to include as many references as possible. Prospective and retrospective clinical studies, as well as laboratory and computer-generated research, were included.

RESULTS: A pronounced difference in the biomechanics of teeth and implants has been revealed in theoretical models. This disparity has also been supported by the majority of the experimental work published. As a result, principal complications, such as intrusion of teeth and higher risk of overload and greater marginal bone loss around the implants have been reported. Among the several types of connections utilized, the rigid connection showed fewer complications but unfortunately did not eliminate them.

CONCLUSION: Totally implant-supported prostheses should be the treatment of choice. However, there are cases where combining teeth and implants is inevitable. The authors propose a rationale design of connecting implants and teeth. This design minimizes the biologic and technical complications.

A systematic review of the survival and complication rates of fixed partial dentures (FPDs) after an observation period of at least 5 years. II. Combined tooth--implant-supported FPDs.

Lang NP, Pjetursson BE, Tan K, Brägger U, Egger M, Zwahlen M.


Comment in:

- Evid Based Dent. 2005;6(4):98.

Abstract

OBJECTIVES: The objective of this systematic review was to assess the 5- and 10-year survival of combined tooth-implant-supported fixed partial dentures (FPDs) and the incidence of biological and technical complications.

METHODS: An electronic MEDLINE search supplemented by manual searching was conducted to identify prospective and retrospective cohort studies on FPDs with a mean follow-up time of at least 5 years. Patients had to have been examined clinically at the follow-up visit. Assessment of the identified studies and data abstraction was performed.
independently by two reviewers. Failure and complication rates were analyzed using random-effects Poisson regression models to obtain summary estimates of 5- and 10-year survival proportions.

RESULTS: From a total of 3844 titles and 560 abstracts, 176 articles were selected for full-text analysis, and 13 studies met the inclusion criteria. Meta-analysis of these studies indicated an estimated survival of implants in combined tooth-implant-supported FPDs of 90.1% (95 percent confidence interval (95% CI): 82.4-94.5%) after 5 and 82.1% (95% CI: 55.8-93.6%) after 10 years. The survival rate of FPDs was 94.1% (95% CI: 90.2-96.5%) after 5 and 77.8% (95% CI: 66.4-85.7%) after 10 years of function. There was no significant difference in survival of tooth and implant abutments in combined tooth-implant FPDs. After an observation period of 5 years, 3.2% (95% CI: 1.5-7.2%) of the abutment teeth and 3.4% (95% CI: 2.2-5.3%) of the functionally loaded implants were lost. After 10 years, the corresponding proportions were 10.6% (95% CI: 3.5-23.1%) for the abutment teeth and 15.6% (95% CI: 6.5-29.5%) for the implants. After a 5 year observation period, intrusion was detected in 5.2% (95% CI: 2-13.3%) of the abutment teeth. Intrusion of abutment teeth were almost exclusively detected among non-rigid connections.

CONCLUSION: Survival rates of both implants and reconstructions in combined tooth-implant-supported FPDs were lower than those reported for solely implant-supported FPDs (Pjetursson et al. 2004). Hence, planning of prosthetic rehabilitation may preferentially include solely implant-supported FPDs. However, anatomical aspects, patient centered issues and risk assessments of the residual dentition may still justify combined tooth-implant-supported reconstructions. It was evident from the present search that tooth-implant-supported FPDs have not been studied to any great extent and hence, there is a definitive need for more longitudinal studies examining these reconstructions.

Survival and complication rates of fixed partial dentures supported by a combination of teeth and implants.

Weber HP, Zimering Y.


Abstract

Selection Criteria: The authors searched for all English-language articles in MEDLINE through 2004. The electronic search yielded 3844 titles, from which 151 studies were ultimately selected. The authors also conducted a manual search that included searching 8 specialty dental journals that published articles on implant-related research during 2001 to 2004. The manual search yielded 25 additional studies. Overall, no randomized controlled trials (RCTs) were found. Inclusion criteria required studies to have patients clinically examined at follow-up and to have reported on the characteristics of the fixed partial dentures (FPD) structure. The meta-analysis included 13 of 176 studies in which patients with 5 or 10 years of follow-up in a prospective or retrospective study design were evaluated clinically at the end of the follow-up period. KEY STUDY FACTOR: The primary exposure was tooth-implant-supported fixed partial dentures compared with implant-only supported FPDs.
MAIN OUTCOME MEASURE: The main outcome measure was the failure rate of implants in tooth-implant-supported FPDs after 5 or 10 years of follow-up. Secondary outcome measures included the failure rate of the FPD itself or biological or technical complications.

MAIN RESULTS: The meta-analysis included 555 patients ranging in age from 17 to 83 years who received 1002 implants that supported 538 FPDs. Survival of implants in combined tooth-implant-supported FPDs was 90.1% (95% confidence interval [CI]: 82.4%-94.5%) after 5 years and 82.1% (95% CI: 55.8%-93.6%) after 10 years. Survival of FPDs was 94.1% after 5 years and 77.8% after 10 years. There was no difference in the failure rates of implant abutments (3.4%) or tooth abutments (3.2%) for the FPDs after 5 years. Biological complications were reported in only 2 of 13 studies after 5 years, and the cumulative rate was 11.7%.

CONCLUSIONS: The authors concluded that survival rates for implants and FPDs in combined tooth-implant-supported FPDs were lower than found in a similar meta-analysis of implant-only-supported FPDs. The worse survival data for FPDs after 10 years for combined tooth-implant support (77.8%) compared with implant-only support (86.7%) is based on data in only 60 FPDs.

Survival and complication rates of combined tooth-implant-supported fixed partial dentures.

Nickenig HJ, Schäfer C, Spiekermann H.


Abstract

OBJECTIVES: The objective of this study has been to review the incidence of biological and technical complications in case of tooth-implant-supported fixed partial denture (FPD) treatments on the basis of survival data regarding clinical cases.

MATERIAL AND METHODS: Based on the treatment documentations of a Bundeswehr dental clinic (Cologne-Wahn German Air Force Garrison), the medical charts of 83 patients with tooth-implant-supported FPDs were completely recorded. The median follow-up time was 4.73 (time range: 2.2-8.3) years. In the process, survival curves according to Kaplan and Meier were applied in addition to frequency counts.

RESULTS: A total of 84 tooth-implant (83 patients) connected prostheses were followed (132 abutment teeth, 142 implant abutments (Branemark, Straumann). FPDs: the time-dependent illustration reveals that after 5 years, as many as 10% of the tooth-implant-supported FPDs already had to be subjected to a technical modification (renewal (n=2), reintegration (n=4), veneer fracture (n=5), fracture of frame (n=2)). In contrast to non-rigid connection of teeth and implants, technical modification measures were rarely required in case of tooth-implant-supported FPDs with a rigid connection. There was no statistical difference between technical complications and the used implant system. Abutment teeth and implants: during the observation period, none of the functionally loaded implants (n=142) had to be removed. Three of the overall 132 abutment teeth were lost because of periodontal inflammation. The time-dependent illustration reveals, that after 5 years as many as 8% of the abutment teeth already required corresponding therapeutic measures (periodontal treatment (5%), filling
therapy (2.5%), endodontic treatment (0.5%). After as few as 3 years, the connection related complications of implant abutments (abutment or occlusal screw loosening, loss of cementation) already had to be corrected in approximately 8% of the cases. In the utilization period there was no screw or abutment fracture.

CONCLUSION: Technical complications of implant-supported FPDs are dependent on the different bridge configurations. When using rigid functional connections, similarly favourable values will be achieved as in case of solely implant-supported FPDs. In this study other characteristics like different fixation systems (screwed vs. cemented) or various implant systems had no significant effect to the rate of technical complications.

Survival and complication rates of combined tooth-implant-supported fixed and removable partial dentures.

Nickenig HJ, Spiekermann H, Wichmann M, Andreas SK, Eitner S.


Abstract

PURPOSE:

The aim of this study was to assess and compare clinical outcome results of tooth-implant-supported fixed and removable partial dentures in a selected population group of partially edentulous patients. Biological and technical complications were recorded and reviewed.

MATERIALS AND METHODS:

A retrospective analysis of the dental charts of 224 patients (174 men, 50 women) with a mean age of 51.3 years was carried out. The evaluation included details regarding the survival and technical complications of the prescribed prostheses, as well as the biological and technical complications associated with both types of abutments used, ie, teeth and implants.

RESULTS:

A total of 229 prostheses were supported by 459 implants and 449 teeth. They were monitored for a period of 2 to 10 years (median follow-up time: 6.7 years). At the end of the different observation periods, 14% of the tooth-implant-supported prostheses had undergone technical modifications, with no statistical difference in the occurrence of technical complications between the 2 types of prosthesis. Three of the functionally loaded implants were removed, while 23 abutment teeth were lost (15 had undergone endodontic treatment). Abutment teeth with a reduced attachment level after prosthesis insertion were significantly affected by biological complications (P = .04).

CONCLUSIONS:

The survival data for both types of prosthesis were comparable to prostheses supported solely by implants. There was no difference in the complication rate between primary splinting (fixed) and secondary splinting with telescopic systems (removable). A greater risk
of biological complications was recorded for endodontically treated abutments or teeth with a reduced attachment level.

Retrospective evaluation of complete-arch fixed partial dentures connecting teeth and implant abutments in patients with normal and reduced periodontal support.

Cordaro L, Ercoli C, Rossini C, Torsello F, Feng C.


Abstract

STATEMENT OF PROBLEM: The clinical outcome of complete-arch fixed prostheses supported by implants and natural tooth abutments in patients with normal or reduced periodontal support has been reported by few studies, with controversial results.

PURPOSE: The purpose of this study was to report on the implant success rate, prosthetic complications, and the occurrence of tooth intrusion, when complete-arch fixed prostheses, supported by a combination of implants and teeth, were fabricated for patients with normal and reduced periodontal support.

MATERIAL AND METHODS: Nineteen patients with residual teeth that served as abutments were consecutively treated with combined tooth- and implant-supported complete-arch fixed prostheses and were retrospectively evaluated after a period varying from 24 to 94 months. Nine patients showed reduced periodontal support as a result of periodontal disease and treatment (RPS group), and 10 patients had normal periodontal support of the abutment teeth (more than 2/3 of periodontal support [NPS group]). Ninety implants and 72 tooth abutments were used to support 19 fixed partial dentures. Screw- and cement-retained metal-ceramic and metal-resin prostheses were fabricated with rigid and nonrigid connectors. Implant survival and success rates, occurrence of caries and tooth intrusion, and prosthetic complications were recorded. The number of teeth, implants, prosthetic units, fixed partial dentures, and nonrigid connectors were compared with a t test to assess differences between the 2 groups, while data for the occurrence of intrusions and prosthetic complications were compared with the Fisher exact test (alpha=.05).

RESULTS: One of the 90 implants was lost (99% survival rate) over 24 to 94 months, while 3 implants showed more than 2 mm of crestal bone loss (96% success rate) over the same period. No caries were detected, but 5.6% (4/72) of the abutment teeth exhibited intrusion. Intrusion of abutment teeth was noted in 3 patients who had normal periodontal support (13% of teeth in NPS group) of the abutment teeth and was associated with nonrigid connectors. No intrusion of teeth was noted in the patients exhibiting reduced periodontal support regardless of the type of connector or when a rigid connector was used for either group. The number of intruded teeth was significantly greater in patients with intact periodontal support (P=.03).

CONCLUSIONS: Complete-arch fixed prosthesis supported by implant and tooth abutments may be associated with intrusion of teeth with intact periodontal support when nonrigid connectors are used to join the implant- and tooth-supported sections of the prostheses.
However, fixed partial dentures supported by implants and teeth with reduced periodontal support were not associated with tooth intrusion, regardless of the type of connectors used.

Biomechanical interactions in tooth-implant-supported fixed partial dentures with variations in the number of splinted teeth and connector type: a finite element analysis.

Lin CL, Wang JC, Chang WJ.

Abstract

OBJECTIVE: The aim of this study was to investigate the biomechanical interactions in tooth-implant-supported fixed partial dentures (FPDs) under several loading conditions with different numbers of splinted teeth and connector types (rigid and non-rigid) by adopting the three-dimensional (3D) non-linear finite element (FE) approach.

MATERIAL AND METHODS: A 3D FE FPD model was constructed containing one Frialit-2 implant in the mandibular second-molar region splinted to the first and second premolars. Frictional contact elements were used to simulate realistic interface conditions within the implant system and the non-rigid connector function. The main effects for each level of the three investigated factors (loading condition, number of splinted teeth and connector type) in terms of the stress values and dissimilar mobility of the natural teeth and implant were computed for all models.

RESULTS: The results indicated that load condition was the main factor affecting the stress developed in the implant, bone and prosthesis when comparing the type of connector and the number of splinted teeth. The stress values were significantly reduced in centric or lateral contact situations once the occlusal forces on the pontic were decreased. However, the prosthesis stress for the non-rigid connections was increased more than 3.4-fold relative to the rigid connections. Moreover, the average tooth-to-implant displacement ratios (R(TID)) with a non-rigid connection were obviously larger than those for rigid connections under axial loading forces. Adding an extra tooth to support a three-unit tooth-implant FPD only exploited its function when the prosthesis withstood lateral occlusal forces.

CONCLUSIONS: The load condition is the main factor affecting stress distribution in different components (bone, prosthesis and implant) of tooth-implant-supported FPDs. Minimizing the occlusal loading force on the pontic area through selective grinding procedures could reduce the stress values obviously. A non-rigid connector may more efficiently compensate for the dissimilar mobility between the implant and natural teeth under axial loading forces but with the risk of increasing unfavorable stresses in the prosthesis.

Prosthetic treatment planning on the basis of scientific evidence.

Pjetursson BE, Lang NP.
Abstract

The objective of this report is to summarize the results on survival and complication rates of different designs of fixed dental prostheses (FDP) published in a series of systematic reviews. Moreover, the various parameters for survival and risk assessment are to be used in attempt to perform treatment planning on the basis of scientific evidence. Three electronic searches complemented by manual searching were conducted to identify prospective and retrospective cohort studies on FDP and implant-supported single crowns (SC) with a mean follow-up time of at least 5 years. Patients had to have been examined clinically at the follow-up visit. Failure and complication rates were analyzed using random-effects Poisson regression models to obtain summary estimates of 5- and 10-year survival proportions. Meta-analysis of the studies included indicated an estimated 5-year survival of conventional tooth-supported FDP of 93.8%, cantilever FDP of 91.4%, solely implant-supported FDP of 95.2%, combined tooth-implant-supported FDP of 95.5% and implant-supported SC of 94.5% as well as resin-bonded bridges 87.7%. Moreover, after 10 years of function the estimated survival decreased to 89.2% for conventional FDP, to 80.3% for cantilever FDP, to 86.7% for implant-supported FDP, to 77.8% for combined tooth-implant-supported FDP, to 89.4% for implant-supported SC and to 65% for resin-bonded bridges. When planning prosthetic rehabilitations, conventional end-abutment tooth-supported FDP, solely implant-supported FDP or implant-supported SC should be the first treatment option. Only as a second option, because of reasons such as financial aspects patient-centered preferences or anatomical structures cantilever tooth-supported FDP, combined tooth-implant-supported FDP or resin-bonded bridges should be chosen.

Comparison of survival and complication rates of tooth-supported fixed dental prostheses (FDPs) and implant-supported FDPs and single crowns (SCs).

Pjetursson BE, Brägger U, Lang NP, Zwahlen M.


Erratum in:


Comment in:


Abstract

OBJECTIVES: The objective of this systematic review was to assess and compare the 5- and 10-year survival of different types of tooth-supported and implant-supported fixed dental prosthesis (FDPs) and single crowns (SCs) and to describe the incidence of biological and technical complications.

METHODS: Three electronic searches complemented by manual searching were conducted to identify prospective and retrospective cohort studies on FDPs and SCs with a mean follow-up time of at least 5 years. Patients had to have been examined clinically at the follow-
Failure and complication rates were analyzed using random-effects Poisson’s regression models to obtain summary estimates of 5- and 10-year survival proportions.

RESULTS: Meta-analysis of the included studies indicated an estimated 5-year survival of conventional tooth-supported FDPs of 93.8%, cantilever FDPs of 91.4%, solely implant-supported FDPs of 95.2%, combined tooth-implant-supported FDPs of 95.5% and implant-supported SCs of 94.5%. Moreover, after 10 years of function the estimated survival decreased to 89.2% for conventional FDPs, to 80.3% for cantilever FDPs, to 86.7% for implant-supported FDPs, to 77.8% for combined tooth-implant-supported FDPs and to 89.4% for implant-supported SCs. Despite high survival rates, 38.7% the patients with implant-supported FDPs had some complications after the 5-year observation period. This is compared with 15.7% for conventional FDPs and 20.6% for cantilever FDPs, respectively. For conventional tooth-supported FDPs, the most frequent complications were biological complications like caries and loss of pulp vitality. Compared with tooth-supported FDPs, the incidence of technical complications was significantly higher for the implant-supported reconstructions. The most frequent technical complications were fractures of the veneer material (ceramic fractures or chipping), abutment or screw loosening and loss of retention.

CONCLUSION: On the basis of the results of the present systematic review, planning of prosthetic rehabilitations should preferentially include conventional end abutment tooth-supported FDPs, solely implant-supported FDPs or implant-supported SCs. Only for reasons of anatomical structures or patient-centered preferences and as a second option should cantilever tooth-supported FDPs or FDPs supported by combination of implants and teeth be chosen.

Long-term survival and success of oral implants in the treatment of full and partial arches: a 7-year prospective study with the ITI dental implant system.

Romeo E, Lops D, Margutti E, Ghisolfi M, Chiapasco M, Vogel G.


Abstract

PURPOSE: This study evaluated the long-term survival and success of different implant-supported prostheses supported by ITI implants.

MATERIALS AND METHODS: Two hundred fifty consecutive patients were rehabilitated using implant-supported prostheses. Seven hundred fifty-nine implants were loaded. Single-tooth prostheses (n = 106), cantilever fixed partial prostheses (n = 42), fixed partial prostheses (n = 137), fixed complete prostheses (n = 5), implant/tooth-supported prostheses (n = 13), and overdentures (n = 37) were used. The mean follow-up period was 3.85 years. Life table analyses were performed. Implant survival rates were calculated by means of standard life table principles. Statistical analysis was performed to compare the implant survival and success by implant placement site for each type of prosthesis.

RESULTS: The cumulative implant survival rates were calculated for implants supporting single-tooth prostheses (95.6%), cantilever fixed partial prostheses (94.4%), fixed partial prostheses (96.1%), fixed complete prostheses (100%), implant/tooth-connected prostheses
DISCUSSION: Seven-year survival rates were similar for implants supporting single-tooth prostheses, cantilever fixed partial prostheses, fixed partial prostheses, and implant/tooth-supported prostheses. Medium-long term implant survival and success were not influenced by the site (maxilla or mandible). Implant and prosthetic survival rates for overdentures supported by 2 implants were comparable to those for overdentures supported by 3 or more implants.

CONCLUSION: Prostheses supported by ITI implants represent a reliable medium-term treatment. (More than 50 references.)

Tooth-implant connection: a bibliographic review.

Hita-Carrillo C, Hernández-Aliaga M, Calvo-Guirado JL.


Abstract

The aim of this study was to carry out a bibliographic review of all available literature addressing the issue of whether or not the connection of teeth to implants by means of a prosthesis is a viable treatment alternative. Twenty articles from a variety of sources were analyzed and classified in order to draw conclusions. Articles were classified by type and an analysis was made of the different variables considered in each study, obtaining percentages of implant survival ranging from 84.4% to 100%, prosthetic complications ranging from 80% to 90%, and the incidence of dental intrusion ranging from 0 to 5.6%. Biomechanical studies: Some articles studied models in order to assess different connections subjected to force, in which varying results were obtained. Rigid connections appeared to produce the most stress to the natural tooth, periodontal ligament and peri-implant bone; non-rigid connections reduced the stress to the bone, but increased stress to the prosthesis. Clinical studies: The results obtained were disparate. Studies in the medium or short-term show this as a viable treatment alternative, whereas some studies point to a greater risk of complications, although the use of rigid connection decreases the percentage of intrusion. Other bibliographic reviews have concluded that there is a need for more longitudinal studies on the viability of tooth-implant connection, also concluding that complications are greater when this is the chosen treatment. As a viable alternative with an acceptable success rate, this course of treatment is always associated with rigid connection rather than non-rigid connection.
Although intrusion is avoided with rigid connection, this nevertheless remains inadvisable as the primary treatment choice.

Article frei einsehbar unter:
http://www.medicinaoral.com/pubmed/medoralv15_i2_p387.pdf

**Evaluation of stress induced by implant type, number of splinted teeth, and variations in periodontal support in tooth-implant-supported fixed partial dentures: a non-linear finite element analysis.**

Lin CL, Wang JC, Chang SH, Chen ST.


**Abstract**

BACKGROUND: This study investigated the biomechanical interactions in tooth-implant-supported fixed partial dentures (FPDs) with variations in periodontal support, implant system, number of splinted teeth, and load type using the non-linear finite element (FE) approach.

METHODS: The section contours of the alveolar bone, abutment teeth, and prosthesis were acquired using computed tomography (CT) and micro-CT to construct the FE models with normal periodontal support (NPS) and compromised periodontal support (CPS) containing one- and two-piece implants splinted to the first and second premolars. Realistic interface conditions within the implant system were simulated using frictional contact elements. The main effects for each level of investigated factors in terms of stress values and dissimilar mobility of natural teeth and the implant were computed for all models.

RESULTS: Analytic results indicated that the load condition was the predominant factor affecting stress developed in the implant, bone, and prosthesis. Additionally, the oblique occlusal forces increased the stress values relative to that of axial analogs. A splinted system with a two-piece implant increased stress on the bone and decreased stress on the prosthesis compared to that of the one-piece implant. The splinted system with a CPS only slightly increased implant stress on the bone compared to that of the splint system with NPS. Splinting an additional tooth did not significantly impact stress values for the tooth-implant-supported FPD.

CONCLUSIONS: A one-piece structure implant may be better than that of a two-piece structure implant in decreasing bone stress when a natural tooth is planned to connect with an implant. The factors of periodontal support and number of splinted teeth only slightly influenced stress in tooth-implant-supported FPDs.

---

**Freestanding and tooth-implant connected prostheses in the treatment of partially edentulous patients. Part I: An up to 15-years clinical evaluation.**

Naert IE, Duyck JA, Hosny MM, Van Steenberghe D.
Abstract

In 123 patients, 339 implants were connected to 313 teeth by means of fixed partial prostheses (test) and followed up for 1.5-15 years (mean: 6.5). In another ad random selected 123 patients, 329 implants were connected to each other by means of 123 freestanding fixed partial prostheses (control) and were followed up for 1.3-14.5 years (mean: 6.2). The aim of this study was to compare both treatment modalities with each other based on implant, tooth and prosthesis complications. The cumulative implant success, based on implant immobility and/or lack of implant fractures after loading, in the test and control groups amounted to 95% and 98.5%, respectively. Although in the test group 10 implants versus only 1 in the control group failed, a regression analysis of the survival data, based on the cox proportional hazards model, revealed no significant difference. In the test group periapical lesions (3.5%), tooth fracture (0.6%) and tooth extraction due to fatal decay or periodontitis (1%) were observed, besides tooth intrusion (3.4%) and crown cement failure (8%). Framework fracture occurred in 3 patients. In the control group, only 2 abutment screws fractured. The treatment of partial edentulism by means of oral implants was beneficial for our patients. Because of a clear tendency of more implant failures (mobility or fractures) and tooth complications in the tooth-implant connected prostheses, the freestanding solution is the primary option to be considered. To avoid intrusion of abutment teeth, the connection, if made, should be completely rigid.

Freestanding and tooth-implant connected prostheses in the treatment of partially edentulous patients Part II: An up to 15-years radiographic evaluation.

Naert IE, Duyck JA, Hosny MM, Quirynen M, van Steenberghe D.

Abstract

A total of 123 patients were followed between January 1983 and July 1998 with 140 tooth-implant connected prostheses. The age of the patients at prosthesis installation ranged from 20 to 79 years (mean 51.8). 339 (Brånemark(R) system) implants were connected to 313 teeth. The loading time ranged from 1.5 to 15 years (mean: 6.5). 123 patients were randomly selected as a control group with freestanding implant-supported prostheses only. The age of the patients at prosthesis installation ranged from 22 to 78 years (mean 52.3). The loading time for the 329 freestanding (Brånemark(R) system) implants ranged from 1.3 to 14.5 years (mean: 6.2). Evolution of the marginal bone stability around the implant in the tooth-implant connected as well as the freestanding group was studied with respect to the prognosis of the implants. Over the period from 0 to 15 years, there was significantly more marginal bone loss (0.7 mm) in tooth-implant connected versus freestanding prostheses. No significant difference in marginal bone loss was found between the non-rigid tooth-implant connected prostheses versus freestanding prostheses. However, there was a significant difference in marginal bone loss for rigid and multi-connected tooth-implant connected prostheses versus freestanding ones. The results of this study indicate that more bone is lost around implants which are rigidly connected to teeth. This suggests that bending load, which is increased in tooth-implant connected prostheses, might be responsible for this phenomenon. These
observations favor the use of freestanding prostheses whenever possible. However, the clinical significance of greater bone loss in rigid versus non-rigid connections might outweigh the annoying phenomenon of tooth intrusion in the case of non-rigid tooth connection, when connection is considered.

**Cantilever fixed prostheses utilizing dental implants: a 10-year retrospective analysis.**

Becker CM.


Department of Restorative Dentistry, University of Colorado Health Science Center, School of Dentistry, Denver, Colorado, USA. cebecker@earthlink.net

**Abstract**

OBJECTIVE: The dental literature has been unclear about long-term success of fixed cantilever prostheses supported by dental implants. The disappointing results reported when cantilever fixed partial dentures (FPDs) are supported with natural teeth are not directly applicable to implant cantilever FPDs. This article reports on 10 years of implant-retained fixed prostheses primarily in the maxillary arch using the ITI dental implant system.

METHOD AND MATERIALS: Sixty cantilever prostheses using 115 ITI dental implants on 36 patients were placed and monitored over a 10-year period.

RESULTS: No implant fractures, abutment fractures, porcelain fractures, prosthesis fractures, soft tissue recession, or radiographic bone loss were recorded. All 60 cantilevered prostheses remain in satisfactory function.

CONCLUSION: Positive, long-term results, using implant-retained cantilever FPDs can be achieved by: (1) using a rough surface implant of 4.1 mm or greater; (2) using an implant/abutment design that reduces stacked moving parts and reduces the implant-to-crowns ratio; and (3) using a cementable prosthesis design that eliminates the need for occlusal screw retention.

**Bone level changes at implants supporting crowns or fixed partial dentures with or without cantilevers.**

Hälg GA, Schmid J, Hämmerle CH.


Clinic of Fixed and Removable Prosthodontics and Dental Material Science, Dental School, University of Zurich, Zurich, Switzerland. gianni.haelg@zzmk.uzh.ch

**Abstract**
OBJECTIVE: The aim of this study was to analyze whether or not a cantilever extension on a fixed dental prosthesis (FDP) supported by implants increased the amount of peri-implant bone loss or technical complications compared with reconstructions without cantilevers.

MATERIALS AND METHODS: Fifty-four partially dentate patients with a total of 54 FDPs supported by 78 implants were enrolled in the study. Twenty-seven FDPs were with cantilever and 27 FDPs were without cantilever (control group). All FDPs were supported by one or two implants and were located in the posterior maxilla or mandible. The primary outcome variable was change in peri-implant marginal bone level from the time of FDP placement to the last follow-up visit. FDPs were under functional loading for a period of 3 up to 12.7 years. Statistical analysis was carried out with Student's t-test. Regression analyses were carried out to evaluate the influence of confounding factors on the peri-implant bone level change. In addition, implant survival rates were calculated and technical complications assessed.

RESULTS: After a mean observation period of 5.3 years, the mean peri-implant bone loss for the FDPs with cantilevers was 0.23 mm (SD+/-0.63 mm) and 0.09 mm (SD+/-0.43 mm) for FDPs without cantilever. Concerning the bone level change at implants supporting FDPs with or without cantilevers no statistically significant differences were found. The regression analysis revealed that jaw of implant placement had a statistically significant influence on peri-implant bone loss. When the bone loss in the cantilever group and the control group were compared within the maxilla or mandible separately, no statistically significant difference was found. Implant survival rates reached 95.7% for implants supporting cantilever prostheses and 96.9% for implants of the control group. Five FDPs in the cantilever group showed minor technical complications, none were observed in the control group.

CONCLUSION: Within the limitations of this study it was concluded that cantilever on FDPs did not lead to a higher implant failure rate and did not lead to more bone loss around supporting implants compared with implants supporting conventional FDPs. In contrast to these results more technical complications were observed in the group reconstructed with cantilever.

A systematic review of the survival and complication rates of implant supported fixed dental prostheses with cantilever extensions after an observation period of at least 5 years.

Aglietta M, Siciliano VI, Zwahlen M, Brägger U, Pjetursson BE, Lang NP, Salvi GE.
University of Bern, School of Dental Medicine, Bern CH-3010, Switzerland.

Comment in:

- Evid Based Dent. 2010;11(2):50-1.

Abstract

OBJECTIVE: The aim of this systematic review was to assess the survival rates of short-span implant-supported cantilever fixed dental prostheses (ICFDPs) and the incidence of technical and biological complications after an observation period of at least 5 years.
MATERIAL AND METHODS: An electronic MEDLINE search supplemented by manual searching was conducted to identify prospective or retrospective cohort studies reporting data of at least 5 years on ICFDPs. Five- and 10-year estimates for failure and complication rates were calculated using standard or random-effect Poisson regression analysis.

RESULTS: The five studies eligible for the meta-analysis yielded an estimated 5- and 10-year ICFDP cumulative survival rate of 94.3% [95 percent confidence interval (95% CI): 84.1-98%] and 88.9% (95% CI: 70.8-96.1%), respectively. Five-year estimates for peri-implantitis were 5.4% (95% CI: 2-14.2%) and 9.4% (95% CI: 3.3-25.4%) at implant and prosthesis levels, respectively. Veneer fracture (5-year estimate: 10.3%; 95% CI: 3.9-26.6%) and screw loosening (5-year estimate: 8.2%; 95% CI: 3.9-17%) represented the most common complications, followed by loss of retention (5-year estimate: 5.7%; 95% CI: 1.9-16.5%) and abutment/screw fracture (5-year estimate: 2.1%; 95% CI: 0.9-5.1%). Implant fracture was rare (5-year estimate: 1.3%; 95% CI: 0.2-8.3%); no framework fracture was reported. Radiographic bone level changes did not yield statistically significant differences either at the prosthesis or at the implant levels when comparing ICFDPs with short-span implant-supported end-abutment fixed dental prostheses.

CONCLUSIONS: ICFDPs represent a valid treatment modality; no detrimental effects can be expected on bone levels due to the presence of a cantilever extension per se.

Bone level change at implant-supported fixed partial dentures with and without cantilever extension after 5 years in function.

Department of Periodontology, Faculty of Odontology, The Sahlgrenska Academy at Göteborg University, SE 405 30 Göteborg, Sweden. wennstrom@odontologi.gu.se

Abstract

OBJECTIVE: The aim of this study was to retrospectively analyze whether the inclusion of cantilever extensions increased the amount of marginal bone loss at free-standing, implant-supported, fixed partial dentures (FPDs) over a 5-year period of functional loading.

MATERIAL AND METHODS: The patient material comprised 45 periodontally treated, partially dentate patients with a total of 50 free-standing FPDs supported by implants of the Astra Tech System. Following FPD placement (baseline) the patients were enrolled in an individually designed supportive care program. A set of criteria was collected at baseline to characterize the FPDs. The primary outcome variable was change in peri-implant bone level from the time of FPD placement to the 5-year follow-up examination. The comparison between FPDs with and without cantilevers was performed at three levels: FPD level, implant level, and surface level. Bivariate analysis was performed by the use of the Mann-Whitney U-test and stepwise regression analysis was utilized to evaluate the potential influence of confounding factors on the change in peri-implant bone level.

RESULTS: The overall mean marginal bone loss for the implant-supported FPDs after 5 years in function was 0.4 mm (SD, 0.76). The bone level change at FPDs placed in the
maxilla was significantly greater than that for FPDs in the mandible (0.6 versus 0.2 mm; p<0.05). No statistically significant differences were found with regard to peri-implant bone level change over the 5 years between FPDs with and without cantilevers at any of the levels of comparisons. The multivariate analysis revealed that the variables jaw of treatment and smoking had a significant influence on peri-implant bone level change on the FPD level, but not on the implant or surface levels. The model explained only 10% of the observed variance in the bone level change.

CONCLUSION: The study failed to demonstrate that the presence of cantilever extensions in an FPD had an effect on peri-implant bone loss.

Survival and complication rates of combined tooth-implant-supported fixed partial dentures.

Nickenig HJ, Schäfer C, Spiekermann H.


Abstract

OBJECTIVES:

The objective of this study has been to review the incidence of biological and technical complications in case of tooth-implant-supported fixed partial denture (FPD) treatments on the basis of survival data regarding clinical cases.

MATERIAL AND METHODS:

Based on the treatment documentations of a Bundeswehr dental clinic (Cologne-Wahn German Air Force Garrison), the medical charts of 83 patients with tooth-implant-supported FPDs were completely recorded. The median follow-up time was 4.73 (time range: 2.2-8.3) years. In the process, survival curves according to Kaplan and Meier were applied in addition to frequency counts.

RESULTS:

A total of 84 tooth-implant (83 patients) connected prostheses were followed (132 abutment teeth, 142 implant abutments (Branemark, Straumann). FPDs: the time-dependent illustration reveals that after 5 years, as many as 10% of the tooth-implant-supported FPDs already had to be subjected to a technical modification (renewal (n=2), reintegration (n=4), veneer fracture (n=5), fracture of frame (n=2)). In contrast to non-rigid connection of teeth and implants, technical modification measures were rarely required in case of tooth-implant-supported FPDs with a rigid connection. There was no statistical difference between technical complications and the used implant system. Abutment teeth and implants: during the observation period, none of the functionally loaded implants (n=142) had to be removed. Three of the overall 132 abutment teeth were lost because of periodontal inflammation. The time-dependent illustration reveals, that after 5 years as many as 8% of the abutment teeth already required corresponding therapeutic measures (periodontal treatment (5%), filling therapy (2.5%), endodontic treatment (0.5%)). After as few as 3 years, the connection related complications of implant abutments (abutment or occlusal screw loosening, loss of
cementation) already had to be corrected in approximately 8% of the cases. In the utilization period there was no screw or abutment fracture.

CONCLUSION:
Technical complications of implant-supported FPDs are dependent on the different bridge configurations. When using rigid functional connections, similarly favourable values will be achieved as in case of solely implant-supported FPDs. In this study other characteristics like different fixation systems (screwed vs. cemented) or various implant systems had no significant effect to the rate of technical complications.

When to choose which retention element to use for removable dental prostheses.
Zitzmann NU, Rohner U, Weiger R, Krastl G.

Erratum in

Abstract
The aim of this article is to introduce criteria for planning treatment with a removable dental prosthesis (RDP) in a partially dentate arch, including the indications for placement of dental implants. The retention of RDPs is achieved through clasps, adhesive attachments, crowns, and fixed partial dentures with intra- or extracoronal attachments, telescopes, root caps, and/or prefabricated interradicular retainers. RDP designs vary from a removable partial denture to an overdenture prosthesis. Potential abutment teeth are selected for RDP retention according to their prognosis, their position in the arch, and the planned prosthesis design. Retainer selection mainly depends on the remaining tooth substance, the intra- and intermaxillary relationships, esthetics, and financial aspects. With dental implants as additional retainers, the supportive area for the RDP is increased, the soft tissue load is minimized, and the extension of the base of the prosthesis can be reduced to enhance a patient's comfort. For RDP planning, strategic considerations are needed to determine the appropriate prosthesis design, to select the abutment teeth, and to choose the appropriate retention element for each particular abutment.

Within-subject comparisons of maxillary fixed and removable implant prostheses: Patient satisfaction and choice of prosthesis.

Abstract
Dental implants provide patients with restorative options for the edentulous maxilla. Both fixed and removable prostheses can be attached to the edentulous maxilla, but the efficacy of different designs has not been determined. In this two-session within-subject crossover trial we compared maxillary implant retained fixed prostheses with removable implant overdentures opposed by mandibular implant-supported overdentures. Sixteen patients, who had previously received mandibular implants, entered the study and received four to six maxillary implants. After dropouts as a consequence of a lack of osseointegration and general health problems, 13 remained. Of these, five received the removable prosthesis first and eight the fixed prosthesis. After 2 months, the prostheses were exchanged and the second was also worn for 2 months. Psychometric measurements of general satisfaction with the prostheses as well as comfort, ability to speak, stability, esthetics, ease of cleaning and occlusion were obtained once each prosthesis had been worn for 2 months. Chewing ability was assessed for seven types of food. Removable long-bar overdentures received significantly higher ratings of general satisfaction than fixed prostheses (P = 0.003). Patients also rated their ability to speak and ease of cleaning significantly better with the removable overdentures. Nine patients chose to keep the removable prosthesis and four preferred to keep the fixed prosthesis. The results suggest that maxillary removable overdentures on multiple implants may provide patients with better function than fixed prostheses.

Maxillary removable prostheses retained by telescopic crowns on two implants or two canines.

Weng D, Richter EJ.


Abstract

Precision telescopic attachments allow for rigid connection between removable prostheses and abutments. However, it is still unknown whether implants can bear similar long-term loading forces as teeth when telescopic crowns are used as retention devices. It was the aim of this prospective clinical study to observe maxillary removable partial dentures that were retained by telescopic crowns on two endosseous implants in the canine regions. In a control group, identical dentures were fabricated that were retained by telescopic crowns on the maxillary canines. The implant group consisted of 14 patients, and the control group included 8 patients. Mean observation time of the prostheses was 25.6 months. Radiographic bone levels and periodontal parameters did not reveal specific differences between the two groups. However, five implants failed, and there were no failures in the control group. Survival rates were 48.9% for the implant group and 100% for the control group, with a significant difference between the two groups. Within the limits of this study, it is concluded that the telescopic connection might be too rigid (thus delivering overloading) for two single implants in the canine region of the maxilla supporting a removable denture.
Does the type of implant prosthesis affect outcomes for the completely edentulous arch?

Bryant SR, MacDonald-Jankowski D, Kim K.


Erratum in


Abstract

PURPOSE:

A systematic review, including meta-analysis, was conducted to answer the question "Does the type of implant prosthesis affect outcomes for the completely edentulous arch?" The current paper was to assess the impact of fixed or removable prosthesis type on implant survival and success outcomes.

MATERIALS AND METHODS:

Pertinent literature was identified through December 31, 2005 using a PubMed search strategy and hand-searching of relevant journals, a personal library, and reference lists from included studies. Inclusion and exclusion criteria were applied to the titles and abstracts and subsequently to the full text of included references. The 72 included studies reported oral implant survival or success, crestal bone levels or loss, and/or prosthesis success or maintenance differentiated by arch and by prosthesis type (fixed or removable, splinted or nonsplinted) established either in 1-year randomized clinical trials or 5-year observational studies.

RESULTS:

Statistical analysis revealed only a site-specific rather than a design-specific finding that implant survival for mandibular fixed prosthesis groups had a 6.6% greater implant survival than maxillary fixed prostheses groups (P < .001). The observation of greater implant failure for removable over fixed prostheses groups in the maxilla appeared likely due to deficient preoperative bone volume in the removable prosthesis groups.

DISCUSSION:

There is little evidence that implant survival or success is affected directly by prosthesis type based on current designs studied for at least 5 years. Prosthesis maintenance does appear to vary with different prosthesis designs.

CONCLUSION:

While this study suggests implant survival and success may not be affected by variation across the established types of implant prostheses, maintenance demands can vary with implant prosthesis type, especially with overdenture attachments. Clinicians should remain diligent in basing implant prosthodontic technique on established protocols.
Within-subject comparisons of implant-supported mandibular prostheses: choice of prosthesis.

Feine JS, de Grandmont P, Boudrias P, Brien N, LaMarche C, Taché R, Lund JP.


Abstract

Although previous studies have demonstrated that implant-supported prostheses are more satisfactory and efficient for edentulous patients than are conventional prostheses, until now no investigation has directly compared different types of implant-supported prostheses. We carried out a within-subject cross-over clinical trial with fixed and long-bar removable implant-supported mandibular prostheses. Fifteen subjects were randomly divided into two groups. One group received the fixed prosthesis first, while the other first received the removable. After a two-month adaptation period, psychometric measurements of various aspects of the prostheses and physiological tests of masticatory efficiency were carried out. The prostheses were then changed, and the procedures repeated. At the end of the study, subjects chose the prosthesis they wished to keep. In this paper, we report on the data gathered at this last appointment. Eight subjects chose the fixed (F group), and seven chose the removable (R group). Both groups rated stability and ability to chew with the fixed as significantly better than with the removable. However, the R group rated ease of cleaning as the most important factor governing their decision, followed by esthetics and stability. The F group considered stability to be the most important factor in their decision, followed by chewing ability and ability to clean. There was a tendency for the removable to be chosen by older subjects (+50 years). These results suggest that patients choose fixed or removable implant-supported prostheses for specific reasons, and that patient attitudes should be considered when the design of a prosthesis is being planned for an individual patient.

A review of clinical and technical considerations for fixed and removable implant prostheses in the edentulous mandible.

Zitzmann NU, Marinello CP.


Abstract

PURPOSE:

The aim of the present article is to review some of the technical treatment options for implant prostheses restoring the edentulous mandible, mainly based on the Brånemark system.

MATERIALS AND METHODS:

Clinical and technical aspects are discussed for the three established concepts: (1) implant-supported fixed prosthesis, (2) removable implant-supported overdenture, and (3) combined implant-retained and soft tissue-supported overdenture prosthesis.

RESULTS:
The framework of an implant-supported fixed screw-retained prosthesis can be processed in gold, Co-Cr alloy, or titanium with casting, laser-welding, or milling techniques. To improve the stability and retention of a conventional complete denture, one to four implants are indicated, and unsplinted (single attachments) or splinted designs (bar systems) can be applied. The design of the overdenture prosthesis must be carefully planned according to the requirements to ensure adequate stability and optimal form, contour, and esthetics, and the patient's best comfort.

CONCLUSION:

A large variety of different treatment modalities exist for both the fixed and removable mandibular implant prosthesis. Clinical and technical aspects should be considered at the beginning of the treatment to: (1) select the optimal implant position, (2) establish an adequate number of functional units, (3) select the appropriate retainers, and (4) apply the best technique for framework processing and veneering.