



SCIENTIFIC **HIGHLIGHTS**

Short overviews on recently
published scientific evidence.

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Edited by Dr. Marcin Maj

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(Stella Kiechle et al. 2023)

and

Immediate Implant Placement in the Esthetic Zone Using a Novel Tapered Implant Design and a Digital Integrated Workflow: A Case Series

(Leon Pariente et al., 2023)

The Reverse Scan Body Protocol: Completing the Digital Workflow

(E Armand Bedrossian et al., 2023)

EDITOR'S CHOICE

Clin Oral Investig. 2023 Jul;27(7):3415-3421

Evaluation of one-piece zirconia dental implants: An 8-year follow-up study

Stella Kiechle, Anja Liebermann, Gerson Mast, Marius Heitzer, Stephan Christian Möhlhenrich, Frank Hölzle, Heinz Kniha, Kristian Kniha



STUDY OBJECTIVES AND METHODS

This prospective 8-year follow-up study investigated one-piece zirconia implants. Patients who had received a one-piece zirconia dental implant (PURE ceramic implant, Institut Straumann GmbH, Basel, Switzerland) were included in this study. Next to the implant survival and success rates, the radiographic and clinical implant parameters were assessed.

RESULTS

- The overall survival rate of 67 zirconia implants in 39 patients was 100%. The overall success rate was 89.6%.
- Around the immediate zirconia implants, the success rate was 94.7%, and around the delayed implants, 87.5%.
- The immediate implants showed a significantly higher bone crest compared to the delayed implants ($p = 0.0120$).
- According to the pink esthetic score, the immediate implants revealed more favorable esthetic results compared to the delayed implants after an 8-year follow-up ($p = 0.0002$).

CONCLUSIONS

After 8 years, the one-piece zirconia implants presented an 89.6% success rate. Regarding the timing of implantation, in individual cases, immediate implantation can have slight advantages over delayed implantation.

Adapted from S. Kiechle et al., Clin Oral Investig. 2023 Jul;27(7):3415-3421, for more info about this publication click [HERE](#)

Int J Periodontics Restorative Dent. 2023 Jun 20

Immediate Implant Placement in the Esthetic Zone Using a Novel Tapered Implant Design and a Digital Integrated Workflow: A Case Series

Leon Pariente, Karim Dada, Susy Linder, Michel Dard

STUDY OBJECTIVES AND METHODS

The purpose of this case series was to assess the application of a novel self-cutting, tapered implant (Straumann® BLX, Institut Straumann AG, Basel, Switzerland) in combination with a digital integrated prosthetic workflow for the immediate placement and restoration. Fourteen consecutive patients, requiring replacement of a single hopeless maxillary or mandibular tooth, meeting the clinical and radiographic indication criteria for immediate implant placement, were treated. All cases followed the same digitally-guided procedure of extraction and immediate implant placement. Immediate temporization with full contoured screw-retained provisionals was performed using an integrated digital workflow.

RESULTS

- The average implant insertion torque was 53.2 ± 14.9 Ncm and ranged between 35 and 80 Ncm, allowing immediate provisional restoration in all cases.
- Final restorations were delivered three months after implant placement.
- An implant survival rate of 100% was observed at the 1-year recall after loading.

CONCLUSIONS

The results of this case series suggest that immediate placement of novel tapered implants and immediate provisionalization using an integrated digital workflow can result in predictable functional and esthetic results for the immediate transition of failing single teeth in the esthetic area.

Adapted from L. Pariente et al., Int J Periodontics Restorative Dent. 2023 Jun 20, for more info about this publication click [HERE](#)

Compend Contin Educ Dent. 2023 Jul-Aug;44(7):e1-e4

The Reverse Scan Body Protocol: Completing the Digital Workflow

E Armand Bedrossian, Panos Paspapyridakos, Edmond Bedrossian, Christopher Gurries



THE ARTICLE OBJECTIVE

Recently developed extraoral techniques have allowed for an alternative approach for the digital acquisition of implant positions in fully edentulous patients. The "reverse scan body protocol" digitally simulates the traditional back-pouring technique long utilized in analog workflows. This article presents two cases in which an extraoral scanning technique was used to capture implant positions, design a prototype, and fabricate the definitive monolithic zirconia full-arch prosthesis.

Adapted from E Armand Bedrossian et al. Compend Contin Educ Dent. 2023 Jul-Aug;44(7):e1-e4, for more info about this publication click [HERE](#)

Clin Exp Dent Res. 2023 Jun;9(3):418-424

Contour angle and peri-implant tissue height: Two interrelated features of the implant supracrestal complex

Algirdas Puisys, Martin Janda, Viktorija Auzbikaviciute, German O Gallucci, Nikos Mattheos



THE ARTICLE OBJECTIVE

Recent research has suggested the contour of the prosthesis and the vertical height of the peri-implant mucosa as important parameters that can influence the long term health and stability of the peri-implant tissue. In particular, overcontouring of the prosthesis has been correlated with an increased risk for peri-implantitis, while reduced soft tissue height has been associated with marginal bone loss, recession, and other soft tissue complications. Although these two parameters have been investigated as independent in the current literature, clinical experience points toward a close interrelation between transmucosal tissue height and prosthesis contour angle. It is often found that a reduced vertical height of the implant supracrestal complex is the main reason for overcontouring of the prosthesis. At the same time, achieving a favorable contour of 30° or less is not possible unless the clinician has ensured an adequate vertical height of the soft tissue. The purpose of this short communication is to establish the relation between tissue vertical height and prosthesis contour by utilizing a theoretical geometry equation based on the Pythagorean theorem. In doing so, one can use the dimensions of the implant as well as those of the prosthesis at the mucosal margin to calculate the essential vertical height for achieving a favorable prosthesis contour.

CONCLUSIONS

As the treatment plan of the implant supracrestal complex is "top-down," in case of deficient vertical height, subcrestal placement of the implant should be considered to achieve a proper prosthesis contour.

Adapted from Algirdas Puisys et al. Clin Exp Dent Res. 2023 Jun;9(3):418-424, for more info about this publication click [HERE](#)

Periodontol 2000. 2023 Jun 5

The importance of soft tissue condition in bone regenerative procedures to ensure long-term peri-implant health

Mario Rocuzzo, Andrea Rocuzzo, Crystal Marruganti, Stefan Fickl



THE ARTICLE OBJECTIVE

Bone regenerative procedures have been widely proved to be a reliable treatment option to re-create the ideal pre-implant clinical conditions. Nevertheless, these techniques are not free from post-operative complications which might result in implant failure. Consequently, as demonstrated by the increasing recently published evidence, a careful pre- and intra-operative flap evaluation to ensure an ideal and hermetic tension-free wound closure is of paramount importance to successfully treat bony defects. In this respect, several surgical interventions mainly aimed to increase the amount of keratinized mucosa either to allow an optimal healing after a reconstructive procedure or to establish an optimal peri-implant soft tissue seal have been proposed. The present review summarizes the level of evidence on the surgical clinical aspects which have an impact on the soft tissue handling associated with bone reconstructive procedures and on the importance of soft tissue conditions to enhance and maintain peri-implant health in the long-term.

Adapted from Mario Rocuzzo et al. *Periodontol 2000*. 2023 Jun 5, for more info about this publication click [HERE](#)

Int J Oral Maxillofac Implants. 2023 May-Jun;38(suppl):30-36

Ceramic Dental Implants: A Systematic Review and Meta-analysis

Jörg Neugebauer, Todd R Schoenbaum, Joan Pi-Anfruns, Min Yang, Bradley Lander, Markus B Blatz, Joseph P Fiorellini

The aim was to evaluate the performance of one- and two-piece ceramic implants regarding implant survival and success and patient satisfaction. This review followed the PRISMA 2020 guidelines using PICO format and analyzed clinical studies of partially or completely edentulous patients. The electronic search was conducted in PubMed/MEDLINE using Medical Subject Headings (MeSH) keywords related to dental zirconia ceramic implants, and 1,029 records were received for detailed screening. The data obtained from the literature were analyzed by single-arm, weighted meta-analyses using a random-effects model. Forest plots were used to synthesize pooled means and 95% CI for the change in marginal bone level (MBL) for short-term (1 year), mid-term (2 to 5 years), and long-term (over 5 years) follow-up time intervals.

RESULTS

- Among the 155 included studies, the case reports, review articles, and preclinical studies were analyzed for background information. A meta-analysis was performed for 11 studies for one-piece implants.
- The results indicated that the MBL change after 1 year was 0.94 ± 0.11 mm, with a lower bound of 0.72 and an upper bound of 1.16. For the mid term, the MBL was 1.2 ± 0.14 mm with a lower bound of 0.92 and an upper bound of 1.48. For the long term, the MBL change was 1.24 ± 0.16 mm with a lower bound of 0.92 and an upper bound of 1.56.

CONCLUSIONS

Based on this literature review, one-piece ceramic implants achieve osseointegration similar to titanium implants, with a stable MBL or a slight bone gain after an individual initial design depending on crestal remodeling. The risk of implant fracture is low for current commercially available implants. Immediate loading or temporization of the implants does not interfere with the course of osseointegration. Scientific evidence for two-piece implants is rare.

Adapted from Jörg Neugebauer et al. *Int J Oral Maxillofac Implants*. 2023 May-Jun;38(suppl):30-36, for more info about this publication, click [HERE](#)

J Periodontol. 2023 Jun 15

Reliability assessment of the 2018 classification case definitions of peri-implant health, peri-implant mucositis, and peri-implantitis

Lorenzo Marini, Cristiano Tomasi, Rodolfo Gianserra, Filippo Graziani, Luca Landi, Mauro Merli, Luigi Nibali, Mario Rocuzzo, Nicola M Sforza, Maurizio S Tonetti, Federico Deli, Piero Papi, Bianca Di Murro, Mariana A Rojas, Andrea Pilloni

THE GOAL

The aim was to evaluate the reliability and accuracy in the assignment of the case definitions of peri-implant health and diseases according to the 2018 Classification of Periodontal and Peri-implant Diseases and Conditions. Ten undergraduate students, 10 general dentists, and 10 experts in implant dentistry participated in this study. All examiners were provided with clinical and radiographic documentation of 25 dental implants. Eleven out of the 25 cases were also accompanied by baseline readings. Examiners were asked to define all cases using the 2018 classification case definitions.

RESULTS

- The Fleiss kappa was 0.50 (95% CI: 0.48 to 0.51) and the mean quadratic weighted kappa value was 0.544.
- Complete agreement with the gold standard diagnosis was achieved in 59.8% of the cases.
- Expertise in implantology affected accuracy positively ($p < 0.001$) while the absence of baseline readings affected it negatively ($p < 0.001$).

CONCLUSIONS

Both reliability and accuracy in assigning case definitions to dental implants according to the 2018 classification were mostly moderate. Some difficulties arose in the presence of specific challenging scenarios.

Adapted from Lorenzo Marini et al. J Periodontol. 2023 Jun 15, for more info about this publication click [HERE](#)

Clin Implant Dent Relat Res. 2023 Aug;25(4):743-751

Prevention of peri-implant disease in edentulous patients with fixed implant rehabilitations

Marta Revilla-León, Burak Yilmaz, John C Kois, Wael Att

THE GOAL

The aim was to provide an overview about the current approaches to prevent peri-implant diseases in edentulous patients with complete-arch implant-supported prostheses, and to review the clinical applications of the latest digital technologies for implant prosthodontics. A review of the guidelines to prevent peri-implant diseases in patient's receiving complete-arch implant-supported prostheses including facially driven treatment planning procedures using either conventional or digital methods, computer-aided implant planning procedures, and prosthodontic design variables including the optimal number and distribution of dental implants, implant to abutment connection type, implant or abutment level design, screw- or cement-retained alternatives, prostheses contours, and material selection is provided. Furthermore, an outline of the current therapeutic management approaches to address peri-implant diseases is reviewed.

CONCLUSIONS

Clinicians should understand and know different planning and design-related variables that can affect biological and mechanical complication rates of complete-arch implant-supported prostheses. Maintenance protocols are fundamental for minimizing biological and mechanical complications.

Adapted from Marta Revilla-León et al. Clin Implant Dent Relat Res. 2023 Aug;25(4):743-751, for more info about this publication click [HERE](#)

Clin Oral Investig. 2023 Jun;27(6):3009-3019

Influence of antiresorptive/antiangiogenic therapy on the extension of experimentally induced peri-implantitis lesions

Frank Schwarz, Kathrin Becker, Fanya Lukman, Katharina Melissa Müller, Victoria Sarabhai, Nicole Rauch, Robert Kerberger, Ausra Ramanauskaitė, Robert Sader, Karina Obreja



THE GOAL

The aim was to investigate the extension of experimentally induced peri-implantitis lesions under various antiresorptive and antiangiogenic medications. Forty-eight albino rats had randomly received the following medications (dual application, n = 8 each): (1) amino-bisphosphonate (zoledronate) (Zo), (2) RANKL inhibitor (denosumab) (De), (3) antiangiogenic (bevacizumab) (Be), (4) Zo+Be, (5) De+Be, or (6) no medication (Co). Ligature- and lipopolysaccharide-induced peri-implantitis lesions were established at 2 maxillary implants over a period of 16 weeks. Histological (e.g., apical extension and surface area of the inflammatory cell infiltrate-aICT, ICT; defect length; defect width; CD68 positive cells) and bone micromorphometric (μ CT) outcomes were assessed. The animal was defined as a statistical unit.

RESULTS

- A total of n = 38 animals (Zo = 6, De = 6, Be = 8, Zo + Be = 6, De + Be = 5, Co = 7) were analyzed.
- ICT's were commonly marked by a positive CD68 antigen reactivity. Comparable median aICT (lowest-Zo: 0.53 mm; highest-Be: 1.22 mm), ICT (lowest-De + Be: 0.00 mm²; highest-Co: 0.49 mm²), defect length (lowest-Zo: 0.90 mm; highest-Co: 1.93 mm) and defect width (lowest-De+Be: 1.27 mm; highest-Be: 1.80 mm) values were noted in all test and control groups.
- Within an inner (diameter: 0.8 mm) cylindrical volume of interest, the bone microstructure did not significantly differ between groups.

CONCLUSIONS

The present analysis did not reveal any marked effects of various antiresorptive/ antiangiogenic medications on the extension of experimentally induced peri-implantitis lesions. The extension of peri-implantitis lesions may not be facilitated by the antiresorptive and antiangiogenic medications investigated.

Adapted from Frank Schwarz et al. Clin Oral Investig. 2023 Jun;27(6):3009-3019, for more info about this publication click [HERE](#)

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