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PROPHYLAXIS ABSTRACTS

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Dear Doctor,

At Mectron, we take pride in the quality of our work. Behind every Prophylaxis product there is a global team of dedicated and experienced people collaborating across a spectrum of disciplines, including research and development, product design and engineering, quality testing, clinical evaluations, manufacturing, and distribution.

We do not simply develop units in order to sell them - rather, we really enjoy what we do and we want to share this passion with you.

With each innovation, our collective efforts have one goal: to provide our clinicians with the best products to manage daily practice and consistently deliver successful treatments. It is with great pleasure that we share with you the publication of our latest clinical Abstract volume on Prophylaxis.

As we look ahead to the next years, you can rest assured that Mectron's products will continue to challenge the status quo, by combining the best of dental science, design, and technology to provide innovative, safe, and effective oral treatment solutions.

You are a valued partner and it is our hope you will enjoy reading the scientific evidence provided in this publication.

On behalf of our entire team, thank you for your support and partnership.

The Mectron Team

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Menini M, Dellepiane E, Piccardo P, Baldi D, Gamalero A, Pera P.

Morphological and chemical characteristics of different titanium surfaces treated by bicarbonate and glycine powder air abrasive systems.

Implant Dent. 2015 Feb;24(1):47-56.

Objectives: This in vitro study investigated possible morphological and chemical changes induced by glycine or sodium bicarbonate powder air polishing on machined and acid-etched titanium surfaces.
Materials and Methods: The glycine powder (granulometry <65 µm) and sodium bicarbonate powder (granulometry <150 µm) were applied on 2 machined healing abutments and on 2 acid-etched healing abutments. The samples were characterized by scanning electron microscopy coupled with energy dispersive x-ray spectroscopy. The analyses were performed at different steps: (1) as received, right after opening the abutment packaging; (2) after 20 minutes air exposure; (3) after aging in artificial saliva; (4) after glycine or sodium bicarbonate powder air polishing for 5 seconds; (5) after repetition of steps 3 and 4 with longer time of polishing (20 seconds).
Conclusions: Air polishing using glycine and sodium bicarbonate powder seemed to be safe for professional oral hygiene of titanium dental implants, although acid-etched abutments and abutments treated with bicarbonate harbored more salts. This might indicate a greater plaque accumulation in a clinical situation. However, this result has to be investigated in vivo to understand its clinical relevance.

Ronay V, Merlini A, Attin T, Schmidlin PR, Sahrmann P.

In vitro cleaning potential of three implant debridement methods. Simulation of the non-surgical approach.

Clin Oral Implants Res. 2017 Feb;28(2):151-155.

Objectives: To assess the cleaning potential of commonly used implant debridement methods, simulating non-surgical peri-implantitis therapy in vitro.
Materials and Methods: One-hundred-and-eighty dental implants were ink-stained and mounted in combined soft and hard tissue models, representing peri-implantitis defects with angulations of 30, 60, and 90° covered by a custom-made artificial mucosa. Implants were treated by a dental school graduate and a board-certified periodontist for 120 s with following instruments: Gracey curette, ultrasonic scaler, and an air powder abrasive device with a nozzle for sub-mucosal use utilizing glycine powder. All procedures were repeated 10 times for each instrumentation and defect morphology respectively. Images of the implant surface were taken. Areas with colour remnants were planimetrically determined and their cumulative surface area was calculated. Results were tested for statistical differences using two-way Anova and Bonferroni correction. Micro-morphologic surface changes were analysed on scanning electron microscope (SEM) images.
Results: The areas of uncleaned surfaces (%, mean ± standard deviations) for curettes, ultrasonic tips, and air abrasion accounted for 74.70 ± 4.89%, 66.95 ± 8.69% and 33.87 ± 12.59% respectively. The air powder abrasive device showed significantly better results for all defect angulations ($P < 0.0001$). SEM evaluation displayed considerable surface alterations after instrumentation with Gracey curettes and ultrasonic devices, whereas glycine powder did not result in any surface alterations.
Conclusion: A complete surface cleaning could not be achieved regardless of the instrumentation method applied. The air powder abrasive device showed a superior cleaning potential for all defect angulations with better results at wide defects.

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Schwarz F, Becker K, Renvert S.

Efficacy of air polishing for the non-surgical treatment of peri-implant diseases: a systematic review.

J Clin Periodontol. 2015 Oct;42(10):951-9.

Focused Question: In patients suffering from peri-implant diseases, what is the efficacy of air polishing on changing signs of inflammation compared with control treatments (i.e. alternative measures for plaque removal with or without adjunctive antiseptic and/ or antibiotic therapy)?
Materials and Methods: After electronic database and hand search, 10 full-text articles were independently screened by two reviewers. Finally, a total of five studies (six publications) fulfilled the inclusion criteria. The weighted mean difference (WMD) [p; 95% CI] in bleeding on probing- (BOP) (primary outcome) and probing pocket depth- (PD) reductions was estimated using a random effect model.
Results: All studies reported on residual BOP scores after therapy. A narrative data synthesis did not reveal any major improvement of bleeding index/ BOP or disease resolution following air polishing over mechanical debridement at mucositis sites. At peri-implantitis sites, WMD in BOP reduction between test and control (mechanical debridement with or without local antiseptic therapy, Er:YAG laser) groups was -23.83% [p = 0.048; 95% CI (-47.47, -0.20)] favouring air polishing
Conclusions: While glycine powder air polishing is as effective as the control treatments at mucositis sites, it may improve the efficacy of non-surgical treatment of peri-implantitis over the control measures investigated. A complete disease resolution was commonly not obtained.

Cafiero C, Aglietta M, Iorio-Siciliano V, Salvi GE, Blasi A, Matarasso S.

Implant surface roughness alterations induced by different prophylactic procedures: an in vitro study.

Clin Oral Implants Res. 2017 Jul;28(7):e16-e20.

Aim: To evaluate surface roughness alterations at the smooth neck of dental implants after the use of eight different prophylactic procedures.
Materials and Methods: 50 tissue level implants (Institut Straumann AG, Basel, Switzerland) were used for the present investigation. The smooth collar of each implant was divided into two segments, each treated with one of eight cleaning procedures: use of a rubber cup (RCZ) or a brush (BZ) combined with an abrasive paste containing zirconium or a paste derived from perlite (RCP, BP); use of 2 composite resin burs reinforced by zirconium glass fibers (F1, F2); and use of an air-polishing system with glycine powder and two power settings (AP1, AP2). The qualitative alterations were recorded by means of a laser profilometer and the mean roughness (Ra) and mean roughness profile depth (Rz) were reported. Twenty untreated surfaces were used as controls.
Results: The implant collars treated with RCZ (Ra = 0.33 μm, Rz = 2.43 μm) or BZ (Ra = 0.30 μm, Rz = 3.70 μm) yielded the highest roughness values, followed by the surfaces treated with RCP (Ra = 0.28 μm, Rz = 2.02 μm), with BP (Ra = 0.25 μm, Rz = 2.16 μm) and by the use of F1 (Ra = 0.27 μm, Rz = 2.22 μm) and F2 (Ra = 0.27 μm, Rz = 2.04 μm). The lowest roughness values were observed in the AP1 (Ra = 0.23 μm, Rz = 1.60 μm) and AP2 (Ra = 0.16 μm, Rz = 1.06 μm) group, respectively. Implant collars treated with AP2 yielded statistically significantly lower (P = 0.01) Rz values compared with untreated surfaces.
Conclusion: All tested procedures did not increase implant surface roughness significantly. Treatment with an air-powder abrasive system at high-pressure setting resulted in a smoothening of the implant collar surface.

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Conserva E, Pisciotta A, Bertoni L, Bertani G, Meto A, Colombari B, Blasi E, Bellini P, De Pol A, Consolo U, Carnevale G.

Evaluation of biological response of STRO-1/c-Kit enriched human dental pulp stem Cells to titanium surfaces treated with two different cleaning systems.

Int J Mol Sci. 2019 Apr 16;20(8).

Peri-implantitis-an infection caused by bacterial deposition of biofilm-is a common complication in dentistry which may lead to implant loss. Several decontamination procedures have been investigated to identify the optimal approach being capable to remove the bacterial biofilm without modifying the implant surface properties. Our study evaluated whether two different systems-Ni-Ti Brushes (Brush) and Air-Polishing with 40 µm bicarbonate powder (Bic40)-might alter the physical/chemical features of two different titanium surfaces-machined (MCH) and Ca++ nanostructured (NCA)-and whether these decontamination systems may affect the biological properties of human STRO-1+/c-Kit+ dental pulp stem cells (hDPSCs) as well as the bacterial ability to produce biofilm. Cell morphology, proliferation and stemness markers were analysed in hDPSCs grown on both surfaces, before and after the decontamination treatments. Our findings highlighted that Bic40 treatment either maintained the surface characteristics of both implants and allowed hDPSCs to proliferate and preserve their stemness properties. Moreover, Bic40 treatment proved effective in removing bacterial biofilm from both titanium surfaces and consistently limited the biofilm re-growth. In conclusion, our data suggest that Bic40 treatment may operatively clean smooth and rough surfaces without altering their properties and, consequently, offer favourable conditions for reparative cells to hold their biological properties.

Aida M, Conserva E, Liccardi F, Colombari B, Consolo U, Blasi E.

Differential efficacy of two dental implant decontamination techniques in reducing microbial biofilm and re-growth onto titanium disks in vitro.

Applied Sciences 9(15):3191.

Dental implants are crucial therapeutic devices for successful substitution of missing teeth. Failure cases are mainly pathogen-associated events, allowing clinical progression toward peri-mucositis or peri-implantitis. The aim of this study was to compare the performance of two mechanical decontamination systems, Nickel-Titanium brush (Brush) and Air-Polishing system with 40 µm bicarbonate powder (BIC-40), by means of a novel bioluminescence-based model that measures microbial load in real time. Briefly, 30 disks were contaminated using the bioluminescent Pseudomonas aeruginosa strain (BLI-P. aeruginosa), treated with Brush (30 s rounds, for 90 s) or BIC-40 (30 s, at 5 mm distance) procedure, and then assessed for microbial load, particularly, biofilm removal and re-growth. Our results showed that Brush and BIC-40 treatment reduced microbial load of about 1 and more than 3 logs, respectively. Furthermore, microbial re-growth onto Brush-treated disks rapidly occurred, while BIC-40-treated disks were slowly recolonized, reaching levels of microbial load consistently below those observed with the controls. In conclusion, we provide evidence on the good performance of BIC-40 as titanium device-decontamination system, the clinical implication for such findings will be discussed.

Diane M. Daubert, Bradley F. Weinstein.

Biofilm as a risk factor in implant treatment.

Periodontol 2000. 2019 Oct;81(1):29-40.

This article summarizes the microbiological findings at dental implants, drawing distinctions between the peri-implant microbiome and the periodontal microbiome, and summarizes what is known regarding biofilm as a risk factor for specific stages of implant treatment. Targeted microbial analysis is reviewed as well as the latest results from open-ended

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sequencing of the peri-implant flora. At this time there remains a lack of consensus for a specific microbial profile that is associated with peri-implantitis, suggesting that there may be other factors which influence the microbiome such as titanium surface dissolution. Therapeutic interventions to address the biofilm are presented at the preoperative, perioperative, and postoperative stages. Evidence supports that perioperative chlorhexidine reduces biofilm-related implant complications and failure. Regular maintenance for dental implants is also shown to reduce peri-implant mucositis and implant failure. Maintenance procedures should aim to disrupt the biofilm without damaging the titanium dioxide surface layer in an effort to prevent further oxidation. Evidence supports the use of glycine powder air polishing as a valuable adjunct to conventional therapies for use at implant maintenance visits. For the treatment of peri-implantitis, nonsurgical therapy has not been shown to be effective, and while surgical intervention is not always predictable, it has been shown to be superior to nonsurgical treatment for decontamination of the implant surface that is not covered by bone.

David K, Katrin N, Bettina D, Christoph R, Peter E, Hari P.

In vitro efficacy of three different implant surface decontamination methods in three different defect configurations.

Clin Oral Implants Res. 2019 Jun;30(6):550-558.

Objectives: Evaluation of in vitro efficacy of three different implant surface decontamination methods in a peri-implant bone defect model.
Materials and Methods: A total of 180 implants were stained with indelible red colour and distributed to standardized peri-implant bone defect resin models with a circumferential defect angulation of 30°, 60°, or 90° (supraosseous defect). Sixty implants were assigned to each type of defect. All implants were cleaned by the same examiner. For each type of defect, 20 implants were cleaned for 2 min with one of 3 devices: curette (CUR), sonicscaler (SOSC), or air abrasion with glycine powder (APA). Thereafter, photographs were taken from both sides of each implant and the cumulative uncleaned implant surface area was measured by colour recognition technique. Scanning electron micrographs (SEM) were examined to assess morphologic surface damages.
Results: The cleaning efficacy as percent (%) of residual colour was significantly different for each of the 3 defect angulations ($p < 0.001$) for each treatment device: 30° CUR: 53.44% > SOSC: 19.69% > APA: 8.03%; 60° CUR: 57.13% > SOSC: 11.4% > APA: 0.13%; and 90° CUR: 48.1% > SOSC: 13.07% > APA: 0.58%. The differences between the three different cleaning modalities within each defect type were also significant ($p < 0.005$). SEM micrographs showed no surface damages after the use of APA.
Conclusion: Air powder abrasion is the most efficient (APA > SOSC > CUR) and less surface damaging treatment modality for each defect angulation in this in vitro model.

Lupi SM, Granati M, Butera A, Collesano V, Rodriguez Y, Baena R.

Air-abrasive debridement with glycine powder versus manual debridement and chlorhexidine administration for the maintenance of peri-implant health status: a six-month randomized clinical trial.

Int J Dent Hyg. 2017 Nov;15(4):287-294.

Study Design: This single-masked, randomized and six-month clinical intervention trial including two study groups was planned to evaluate the efficacy of maintenance treatment with glycine powder on the periodontal health of peri-implant tissues.
Methods: A total of 46 patients with partial or total edentulism, carrying a total of 88 implants, were assigned either to an air abrasive with the glycine powder treatment group (AAD) or to a manual debridement and chlorhexidine administration treatment group (MDA). Clinical data were collected before treatment and at 3 and 6 months after the treatment. Plaque index (PI), bleeding index (BOP), probing depth (PD), clinical attachment level (CAL) and bleeding score (BS) were analysed.
Results: After 3 months, AAD treatment statistically significantly improved BS ($P < 0.05$); at 6 months, AAD treatment

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statistically significantly improved indexes PD, PI, BOP and BS ($P < 0.05$). In addition, the AAD treatment proved to be more effective than MDA in maintaining the peri-implant health of PD at three and 6 months, and of PI at 6 months ($P < 0.05$). There were no significant changes of CAL in both groups, and all the indexes remained within the physiological levels.
Conclusions: Within the limits of the study, treatment with glycine seems appropriate in the maintenance of peri-implant health and more effective than the traditional treatment with plastic curette and chlorhexidine.

Riben-Grundstrom C, Norderyd O, André U, Renvert S.

Treatment of peri-implant mucositis using a glycine powder air-polishing or ultrasonic device: a randomized clinical trial.

J Clin Periodontol. 2015 May;42(5):462-9.

Aim: To evaluate the clinical treatment effects of a glycine powder air-polishing or ultrasonic device on peri-implant mucositis.
Materials and Methods: Thirty-seven patients with one implant diagnosed with peri-implant mucositis (probing depth ≥4 mm (0.2N) and bleeding on probing (BOP) (primary outcome)) were randomly assigned to treatment with either glycine powder air-polishing (GPAP) or ultrasonic (US) debridement. Treatment was performed at baseline and at 3 and 6 months. Professional supra gingival cleaning was performed at 9 and 12 months. Oral hygiene instructions were reinforced at each visit.
Results: At 12 months there was a statistically significant reduction in mean plaque score, bleeding on probing and number of periodontal pockets ≥4 mm within the treatment groups compared to baseline. The percentages of diseased sites were significantly reduced for both groups.
Conclusions: Treatment with a glycine powder air-polishing or an ultrasonic device is effective in non-surgical treatment of peri-implant mucositis.

De Siena F, Corbella S, Taschieri S, Del Fabbro M, Francetti L.

Adjunctive glycine powder air-polishing for the treatment of peri-implant mucositis: an observational clinical trial.

Int J Dent Hyg. 2015 Aug;13(3):170-6.

Objectives: The aim of this study was to make a comparative evaluation of professional oral hygiene with or without the adjunct of glycine air-powder system for the treatment of peri-implant mucositis.
Methods: After the application of inclusion and exclusion criteria, patients were divided in two groups: in control group, patients were treated with professional oral hygiene manoeuvres (POH) while in the test group, glycine air-powder system (SGA) was adjuncted to professional oral hygiene. Probing depth (PD), bleeding index (BI) and plaque index (PI) were measured at baseline, and 3 and 6 months after the treatment.
Results: A total of 30 patients (15 per group) were selected for the study. In POH e SGA group, PD was, 2.86 ± 0.37 and 3.00 ± 0.36 mm at baseline, 2.90 ± 0.53 and 2.62 ± 0.50 mm after 3 months, 2.96 ± 0.56 and 2.41 ± 0.54 mm after 6 months, respectively, significantly lower in SGA group in the last follow-up visit. In both groups, both PI and BI decreased over time.
Conclusions: The present reports showed that both techniques were useful for the treatment of peri-implant mucositis. In the test group (with glycine powder), a significant reduction of probing depth was observed.

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Ji YJ, Tang ZH, Wang R, Cao J, Cao CF, Jin LJ.

Effect of glycine powder air-polishing as an adjunct in the treatment of peri-implant mucositis: a pilot clinical trial.

Clin Oral Implants Res. 2014 Jun;25(6):683-9.

Glycine powder air-polishing (GPAP) has the potential to effectively erase biofilms and may improve the treatment efficacy of peri-implant mucositis. This pilot clinical trial evaluated the effect of GPAP as an adjunct in treating peri-implant mucositis.
Materials and Methods: Twenty-four subjects having at least one implant with peri-implant mucositis were randomly assigned to test (12 subjects with 17 implants) and control (12 subjects with 16 implants) groups. Following baseline assessment, all subjects received oral hygiene instruction and non-surgical debridement. In the test group, the sites with probing depth (PD) ≥4 mm were additionally treated by GPAP for 5 sec. Clinical parameters were measured at 1-week, 1-month, and 3-month recall visits.
Results: At the 3-month visit, the mean reductions in PD at site level were 0.93 ± 0.93 mm and 0.91 ± 0.98 mm in the test and control groups, respectively ($P < 0.05$), and no significant difference existed between two groups. Mean bleeding score was also significantly reduced in both groups after the intervention. No complications or discomfort were reported during the study.
Conclusions: This pilot clinical trial suggests that non-surgical mechanical debridement may effectively control peri-implant mucositis, and adjunctive GPAP treatment seems to have a limited beneficial effect as compared with mechanical debridement alone. However, further clinical trials with a large sample size are needed to confirm this preliminary observation.

Steiger-Ronay V, Merlini A, Wiedemeier DB, Schmidlin PR, Attin T, Sahrmann P.

Location of unaccessible implant surface areas during debridement in simulated peri-implantitis therapy.

BMC Oral Health 17, 137 (2017).

Background: An in vitro model for peri-implantitis treatment was used to identify areas that are clinically difficult to clean by analyzing the pattern of residual stain after debridement with commonly employed instruments.
Methods: Original data from two previous publications, which simulated surgical (SA) and non-surgical (NSA) implant debridement on two different implant systems respectively, were reanalysed regarding the localization pattern of residual stains after instrumentation. Two blinded examiners evaluated standardized photographs of 360 initially ink-stained dental implants, which were cleaned at variable defect angulations (30, 60, or 90°), using different instrument types (Gracey curette, ultrasonic scaler or air powder abrasive device) and treatment approaches (SA or NSA). Predefined implant surface areas were graded for residual stain using scores ranging from one (stain-covered) to six (clean). Score differences between respective implant areas were tested for significance by pairwise comparisons using Wilcoxon-rank-sum-tests with a significance level $\alpha = 5\%$.
Results: Best scores were found at the machined surface areas (SA: 5.58 ± 0.43, NSA: 4.76 ± 1.09), followed by the tips of the threads (SA: 4.29 ± 0.44, NSA: 4.43 ± 0.61), and areas between threads (SA: 3.79 ± 0.89, NSA: 2.42 ± 1.11). Apically facing threads were most difficult to clean (SA: 1.70 ± 0.92, NSA: 2.42 ± 1.11). Here, air powder abrasives provided the best results.
Conclusion:
Machined surfaces at the implant shoulder were well accessible and showed least amounts of residual stain. Apically facing thread surfaces constituted the area with most residual stain regardless of treatment approach.

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de Tapia B, Mozas C, Valles C, Nart J, Sanz M, Herrera D.

Adjunctive effect of modifying the implant-supported prosthesis in the treatment of peri-implant mucositis.

J Clin Periodontol. 2019 Oct;46(10):1050-1060.

Aim: To evaluate the adjunctive effect of modifying the implant-supported prosthesis to facilitate access to oral hygiene when treating peri-implant mucositis.
Materials and Methods: A 6-month randomized clinical trial was designed. Patients with peri-implant mucositis were treated by implant surface debridement with plastic curettes and a plastic tipped ultrasonic device. Then, they were randomly assigned to either modifying their prosthesis to allow for better oral hygiene (test group) or not (control group). Subsequently in both groups, individualized oral hygiene instructions were provided. Clinical and radiographical outcomes were evaluated at baseline and 1, 3 and 6 months after treatment.
Results: 48 patients were included, and 45 completed the clinical trial (24 test and 21 control patients). After 6 months, changes in the modified bleeding index between the control and test groups were 0.50 (standard deviation -SD = 0.70) and 1.14 (SD = 0.96), respectively (p = 0.01). The changes in implant probing pocket depth at 6 months were -0.02 (SD = 0.61) and 0.31 (SD = 1.20) mm, respectively (p = 0.04).
Conclusions: Modifying the contour of the prostheses to improve access for oral hygiene significantly improved the clinical outcomes after standard mechanical treatment of peri-implant mucositis.

Stein JM, Hammächer C, Michael SS.

Combination of ultrasonic decontamination, soft tissue curettage, and submucosal air polishing with povidone-iodine application for non-surgical therapy of peri-implantitis: 12 month clinical outcomes.

J Periodontol. 2018;89: 139-147.

Background: The aim of this study is to evaluate clinical outcomes of a concept for non-surgical peri-implantitis combining stepwise mechanical debridement measures with adjuvant povidone-iodine application with and without systemic antibiotics.
Methods: Forty-five patients with chronic periodontitis and a total of 164 screw-typed implants with peri-implantitis were included. Peri-implantitis was defined as radiographic bone loss of > 2 mm, probing depth (PD) ≥5 mm with bleeding on probing (BOP). Stepwise treatment of implants was performed with ultrasonic debridement, soft tissue curettage (STC), glycine powder air polishing (GPAP), and a repeated submucosal application of povidone-iodine. Teeth with PD > 4 mm were treated simultaneously according to the same concept except STC. In cases with severe periodontitis (n = 24), amoxicillin and metronidazole (AM) were prescribed for 7 days.
Results: After 12 months, implants treated without AM showed significant reductions (P < 0.05) of mean PD (1.4 ± 0.7 mm), clinical attachment level (CAL) (1.3 ± 0.8 mm), and BOP (33.4% ± 17.2%). In deep pockets (PD > 6 mm) changes of mean PD (2.3 ± 1.3 mm), CAL (2.0 ± 1.6 mm), and BOP (44.0% ± 41.7%) were more pronounced. Intake of AM did not significantly influence the changes in these parameters. However, the reduction of implant sites with PD > 4 mm and BOP was significantly higher in patients with AM than in those without AM (31.8% ± 12.6% versus 20.8% ± 14.7%; P < 0.05).
Conclusions: The combination of ultrasonic debridement, STC, and GPAP with adjuvant povidone-iodine led to significant clinical improvements at implants. Systemic antibiotics had limited effects on the reduction of persisting implant sites with treatment need.

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Kawashima H, Sato S, Kishida M, Yagi H, Matsumoto K, Ito K.

Treatment of titanium dental implants with three piezoelectric ultrasonic scalers: an in vivo study.

J Periodontol. 2007 Sep;78(9):1689-94.

Background: Dental implants require regular maintenance. It is crucial that the instrument used for maintenance be able to remove plaque and calculus from the implant surface effectively and efficiently, while causing minimal damage to its circumference. Some ultrasonic scalers may be useful for implant maintenance; however, no clinical study has examined this. This study evaluated the treatment of titanium implants with three piezoelectric scalers in vivo.
Methods: Fourteen patients underwent implant treatment in which plaque and calculus were removed from the abutment surfaces with ultrasonic scalers. The abutments were treated with scalers with carbon (VS; N = 7), plastic (PS; N = 7), or metallic (ES; N = 7) tips. The abutment surface characteristics were examined after instrumentation using scanning electron microscopy. The amount of plaque remaining and roughness were estimated using a modification of the remaining plaque and calculus score and the modified roughness score, respectively. In addition, the abutment surfaces were imaged with a laser profilometer and a laser scanning electron microscope (SEM).
Results: The remaining plaque and calculus scores did not differ significantly among the VS, PS, and ES groups. VS and PS produced a significantly smoother abutment surface than ES. The laser SEM three-dimensional images also demonstrated that VS and PS produced smooth abutment surfaces, whereas ES resulted in damaged surfaces.
Conclusions: VS and PS produced clean, smooth abutment surfaces. Piezoelectric scalers with non-metal tips are suitable for use in dental implant maintenance.

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Petersilka GJ, Tunkel J, Barakos K, Heinecke A, Häberlein I, Flemmig TF.

Subgingival plaque removal at interdental sites using a low-abrasive air polishing powder.

J Periodontol. 2003 Mar;74(3):307-11.

Background: The aim of the study was to test the efficacy of a novel low-abrasive air polishing powder in subgingival plaque removal at interdental sites during periodontal maintenance therapy (PMT).
Methods: Using a split mouth design, subgingival plaque was removed in 23 PMT patients using a low abrasive powder using a standard air polishing unit (test) or curets (positive control). Before and immediately after treatment, subgingival plaque samples were taken from interdental sites with 3 to 5 mm probing depth (PD) at 2 test teeth and 2 positive control teeth. To evaluate the influence of sampling on the microflora, plaque samples were also taken twice at 2 teeth without therapy with PD of 3 to 5 mm (negative control). PMT treatment and plaque sampling were repeated 3 times at quarterly intervals. Anaerobe cultivation was utilized to assess the mean reduction of total colony forming units (CFU) immediately after treatment.
Results: Test treatment resulted in a significantly greater reduction in subgingival bacterial counts (log 1.9 +/- 0.7) than positive control treatment (log 1.1 +/- 0.6) and subgingival plaque sampling alone (log 0.5 +/- 0.5; $P < 0.05$). Differences between positive and negative control were not significant ($P < 0.05$).
Conclusions: The novel low-abrasive air polishing powder is superior to curets in removing subgingival plaque at interdental sites with up to 5 mm probing depth in PMT.

Simon CJ, Munivenkatappa Lakshmaiah Venkatesh P, Chickanna R.

Efficacy of glycine powder air polishing in comparison with sodium bicarbonate air polishing and ultrasonic scaling – a double-blind clinico-histopathologic study.

Int J Dent Hyg. 2015 Aug;13(3):177-83.

Subgingival biofilm removal using glycine powder air polishing (GPAP) has antecedently been shown to be safe. The hypothesis that GPAP is efficacious during periodontal maintenance therapy and results in less gingival erosion than sodium bicarbonate air polishing (SBAP) or ultrasonic scaling was assessed.
Methods: Initial periodontal therapy was performed in each of the 22 chronic periodontitis patients having residual 5 mm probing depth in each quadrant and were randomly assigned to one of the following interventions: GPAP (test), SBAP (positive control), ultrasonic scaling (positive control) or no treatment. Clinical parameters were assessed, and gingival biopsies were taken immediately after instrumentation and sent for histological quantification.
Results: Significant improvement in plaque and gingival index scores were noted in glycine powder air-polishing and ultrasonic group. GPAP resulted in minor erosion of the gingival epithelium (score 1 & 2), whereas positive control specimens displayed moderate to severe erosions (score 3 & 4). Difference between GPAP and positive control was significant. ($P < 0.05$).
Conclusion: GPAP results in clinically significant improvement in plaque and gingival index scores and histologically causes less gingival erosion than SBAP or ultrasonic instrumentation, further supporting the safety of this debridement technique in periodontal maintenance therapy.

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Bühler J, Amato M, Weiger R, Walter C.

A systematic review on the effects of air polishing devices on oral tissues.

Int J Dent Hyg. 2016 Feb;14(1):15-28.

Objectives: Air-polishing devices are used for the instrumentation of the root surface. Their potential of harm to the hard and/or soft tissues needs to be considered during periodontal treatment. The objective of this systematic review was to analyse the effects of air polishing devices on oral tissues.
Methods: The electronic databases MEDLINE, EMBASE and the Cochrane Library were screened for studies published through 18 November 2013. The surface modifications on human cementum, dentine or gingiva after the instrumentation were considered as outcomes.
Results: Of the 1266 abstracts screened, 17 studies were included in the analysis. Different air polishing powders consisting of sodium bicarbonate, calcium carbonate, pumice or glycine were used in different ex vivo or in vitro settings. Thirteen publications reported data on the effects of air polishing devices on cementum and dentine. Hard tissue modifications, including defect depths and volume, caused by sodium bicarbonate or calcium carbonate powders were significantly greater compared to powders consisting of glycine. The soft tissue modifications using different modes of instrumentation were assessed in four publications. The data demonstrate less potential of harm to the gingiva after spraying with glycine powder compared to sodium bicarbonate powder or instrumentation with curettes.
Conclusion: Glycine powder air polishing may be safely applied to human root surfaces and gingivae.

Hongsathavij R, Kuphasuk Y, Rattanasuwan K.

Clinical comparison of the stain removal efficacy of two air polishing powders.

Eur J Dent. 2017 Jul-Sep;11(3):370-375.

Objectives: Air polishing with sodium bicarbonate powders with a grain size of 40 µm is recommended for patient comfort. However, the efficacy of small grain size on stain removal has not been adequately studied. This study aimed to compare the stain removal efficacy of sodium bicarbonate powders with grain sizes of 65 and 40 µm and to evaluate patient acceptance and operator opinion after using both air polishing powders.
Materials and Methods: A double-blind, randomized, split-mouth study was conducted with 35 participants with moderate to heavy dental staining on both sides of the upper teeth. Removal of dental stains on the index teeth was performed using sodium bicarbonate powders with a grain size of either 65 or 40 µm. The time taken to completely remove all dental stains was recorded. After treatment, a questionnaire was used to evaluate patient acceptance and the operator's opinion.
Results: The average time for the removal of all stains by powder was 4.5 ± 3.6 min with a grain size of 65 µm and 4.4 ± 3.8 min with a grain size of 40 µm. The difference in the average time between the two groups was not significant (P = 0.461). The operator's opinions of the two powders were identical, and patient acceptance did not differ significantly between the two types of powders.
Conclusions: The 40 µm sodium bicarbonate powder removed dental stains as efficiently as the 65-µm powder. Powder handling and patient acceptance were comparable between grain sizes of 65 and 40 µm.

Guerra F, Mazur M, Rinaldo F, Corridore D, Pasqualotto D, Nardi GM, Ottolenghi L.

Clinical procedure in sealing pit and fissure using technological aids: VistaCam iX Proof and Combi.

senses and sciences. 3.10.14616/sands-2016-1-157162.

The effectiveness of sealants in preventing pits and fissures decay is currently assessed by retention as principal clinical evaluation criteria. Among the determinants for sealant retention, an incomplete removal of plaque debris can cause lack of adhesion at the sealant-enamel interface. Therefore, in order to optimize the caries prevention outcome, clinical procedures

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of biofilm detection and cleansing are crucial. Technological aids can help clinicians in these critical phases. A clinical procedure is described of sealant application using VistaCam iX Proof fluorescence camera for quantitative assessment of surface demineralization and Combi air polishing unit for plaque removal. Pre and post air polishing intraoral VistaCam iX Proof images show the effectiveness of glycine airpolish technology in plaque removal. The results encourage technological aided clinical procedures in enhancing sealant application for pit and fissures caries prevention. Further clinical research is needed to validate our preliminary outcomes.

Tsang YC, Corbet EF, Jin LJ.

Subgingival glycine powder air-polishing as an additional approach to non-surgical periodontal therapy in subjects with untreated chronic periodontitis.

J Periodontal Res. 2018 Jun;53(3):440-445.

Background and Objective: Glycine powder air-polishing (GPAP) is an alternative approach to removing subgingival plaque biofilms for effective periodontal therapy. This study aimed to investigate the effect of subgingival GPAP as an additional approach to nonsurgical periodontal treatment in subjects with chronic periodontitis.
Materials and Methods: Twenty-seven nonsmoking subjects were recruited. Two quadrants in each subject were randomly assigned, according to a split-mouth design, to receive scaling and root planing (SRP) and GPAP (Test group) or SRP and air flushing with water (Control group) at sites with probing depth ≥5 mm. Clinical parameters, gingival crevicular fluid volumes and the concentrations of interleukin-1β and interleukin-1ra in gingival crevicular fluid were measured at baseline and 1, 3 and 6 months after the treatments.
Results: At baseline, no statistically significant difference in periodontal and gingival crevicular fluid parameters was found between the Test and Control groups. Overall, the periodontal conditions of all subjects showed significant improvement after the treatments. Notably, the Test group showed greater reduction in gingival crevicular fluid volume (0.37 ± 0.26 μL) than the Control group (0.23 ± 0.30 μL) at 3 months ($P < .05$). The gingival crevicular fluid levels of interleukin-1β and interleukin-1ra showed a significant decrease in both groups at 6 months, and no significant difference was found between the groups.
Conclusion: These preliminary results suggest that GPAP, as an additional approach to nonsurgical periodontal treatment, may be beneficial for the short-term improvement of subclinical inflammation when measured by gingival crevicular fluid volume. Further longitudinal studies with larger sample sizes are required to clarify the exact benefits of GPAP treatment for controlling inflammation and maintaining long-term periodontal health.

Bühler J, Amato M, Weiger R, Walter C.

A systematic review on the patient perception of periodontal treatment using air polishing devices.

Int J Dent Hyg. 2016 Feb;14(1):4-14.

Objectives: Air polishing devices are used as an alternative to traditional instrumentation of the root surface. The objective of the systematic review was to analyse patient perception, that is pain and discomfort during treatment with air polishing devices in periodontal therapy.
Methods: The electronic databases MEDLINE, EMBASE and the Cochrane library were screened for studies published through 18th November 2013. Patient perception served as primary outcome.
Results: Of the 1266 abstracts screened, nine studies reporting data on patient perception using a visual analogue scale or a patient interview were included in the analysis. Different air polishing powders consisting of sodium bicarbonate, glycine or erythritol were used. Reported discomfort of non-surgical periodontal therapy was consistently equal or lower when air polishing powders consisting of glycine or erythritol were applied compared with root surface instrumentation using hand instruments or ultrasonic devices.

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Conclusion: Air polishing with powders consisting of glycine seems to be associated with less discomfort during non-surgical periodontal therapy, that is supra- and subgingival air polishing.

Petersilka GJ, Steinmann D, Häberlein I, Heinecke A, Flemmig TF.

Subgingival plaque removal in buccal and lingual sites using a novel low abrasive air-polishing powder.

J Clin Periodontol. 2003 Apr;30(4):328-33.

Aim of the Study: This study was aimed at assessing the efficacy of subgingival plaque removal in buccal and lingual sites during supportive periodontal therapy (SPT) using a novel low abrasive air-polishing powder.
Materials and Methods: In 27 SPT patients, subgingival debridement was performed using the novel air-polishing powder (test) and hand instruments (positive control) in a randomized split mouth design. Before and immediately after treatment, subgingival plaque samples were taken from two teeth with pockets of 3-5 mm depth in both groups. To assess the influence of plaque sampling on the microflora, samples were also taken twice from two untreated teeth (negative control). The mean reduction in total colony forming units (CFU) was assessed by anaerobic culture. The patients' perception of treatment was assessed by a visual analog score (VAS). Therapy and plaque sampling were repeated after a 3-month interval.
Results: Test treatment resulted in a significantly greater reduction in mean CFU than positive control treatment (log 1.7+/-0.98 and log 0.61+/-0.79 respectively; $p<0.05$). Following both treatments, the CFU reduction was significantly greater compared to negative control treatment (log 0.06+/-0.49; $p<0.05$). In addition, test treatment was perceived as significantly more pleasant than hand instrumentation ($p<0.05$).
Conclusion: The novel low abrasive air-polishing powder is superior to curettes in removing subgingival plaque from pockets of 3-5 mm depth in supportive periodontal therapy and offers greater patient comfort.

Flemmig TF, Hetzel M, Topoll H, Gerss J, Haeberlein I, Petersilka G.

Subgingival debridement efficacy of glycine powder air polishing.

J Periodontol. 2007 Jun;78(6):1002-10.

Background: Glycine powder air polishing (GPAP) has been shown to be significantly more effective in reducing the subgingival cultivable microflora in shallow periodontal pockets compared to curets and is safe when applied directly to root surfaces. The purpose of this study was to assess the subgingival debridement efficacy of GPAP in periodontal pockets with various depths.
Methods: In each of 60 patients with severe periodontitis, one tooth with a probing depth (PD) > or =6 mm was randomly assigned to one of the following interventions: GPAP performed in teeth instrumented 3 months earlier (I); GPAP performed in previously non-instrumented teeth (NI); or no treatment (control). GPAP was performed for 5 seconds per surface. After extraction, teeth were stained with 0.5% toluidine blue, and subgingival debridement efficacy was assessed.
Results: Overall, median debridement depth was 2.00 mm in I teeth and 1.86 mm in NI teeth, and the median debrided root surface was 49.24% and 45.64%, respectively. In anatomic PDs (APDs) of 2 to 3 mm, relative debridement depth (debridement depth/APD) ranged from 65% to 80% and 60% to 75% in I and NI teeth, respectively; the corresponding values for debrided root surface were 60% to 70% and 50% to 60%. In control teeth, virtually all subgingival root surfaces were stained. Clinical PD measurements were a median of 1.05 mm deeper than APD.
Conclusion: GPAP for 5 seconds per surface is effective in removing most of the subgingival biofilm in periodontal pockets with an APD < or =3 mm.

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Petersilka G, Faggion CM Jr, Stratmann U, Gerss J, Ehmke B, Haeberlein I, Flemmig TF.

Effect of glycine powder air-polishing on the gingiva.

J Clin Periodontol. 2008 Apr;35(4):324-32.

Objectives: Safety and efficacy of glycine powder air-polishing (GPAP) in removing subgingival biofilm have been previously demonstrated. The hypothesis that GPAP results in less gingival erosion than sodium bicarbonate air-polishing (SBAP) or hand-instrumentation was assessed.
Materials and Methods: In each of 10 patients, eight teeth with a residual probing depth of at least 5 mm following initial periodontal therapy were randomly assigned to the following interventions: GPAP (test), SBAP (positive control), hand-instrumentation (positive control), or no treatment (negative control). In each group, gingival biopsies were taken immediately after instrumentation and one 14 days later. Damaged gingival epithelium (GE) was assessed by light microscopy and quantified by a histological score (values 1-4). Differences between groups were evaluated using the marginal homogeneity test.
Results: GPAP resulted in minor erosions of the GE (scores 1 and 2), whereas positive control specimens displayed moderate to severe erosions (scores 2-4). Differences between GPAP and positive controls were significant ($p<0.05$). Fourteen days following instrumentation GE under assessment was found to be intact in all groups.
Conclusion: The data indicated that GPAP results in less gingival erosion than SBAP or hand instrumentation, further supporting the safety of this new debridement technique.

Flemmig TF, Arushanov D, Daubert D, Rothen M, Mueller G, Leroux BG.

Randomized controlled trial assessing efficacy and safety of glycine powder air polishing in moderate-to-deep periodontal pockets.

J Periodontol. 2012 Apr;83(4):444-52.

Background: Supragingivally applied glycine powder air polishing (SupraGPAP) has been shown to remove biofilms in shallow periodontal pockets. This study assesses efficacy and safety of subgingivally applied glycine powder air polishing (SubGPAP) in moderate-to-deep periodontal pockets.
Methods: Patients with chronic periodontitis and intraoral Porphyromonas gingivalis (P. gingivalis) and Tannerella forsythia who completed initial therapy were randomly assigned to receive SubGPAP in periodontal pockets with probing depths of 4 to 9 mm, SupraGPAP in all other shallow periodontal sites, and at mucous membranes followed by removal of calculus using curets (full-mouth GPAP) or scaling and root planing followed by coronal polishing (SRP). Patients rinsed with 0.12% chlorhexidine gluconate after debridement, and twice daily, for 2 weeks.
Results: All 30 patients enrolled completed the baseline, day 10, and day 90 visits. SubGPAP resulted in significantly lower total viable bacterial counts in moderate-to-deep pockets when compared to SRP immediately after debridement and at day 10 ($P <0.05$). Total P. gingivalis counts in the oral cavity were significantly reduced after full-mouth GPAP compared to SRP at day 90 ($P <0.05$). Patients' comfort levels were high for both treatments. There were no adverse events related to full-mouth GPAP.
Conclusion: The results indicate that SubGPAP is more efficacious in removing subgingival biofilm in moderate-to-deep periodontal pockets than SRP. Furthermore, full-mouth GPAP may result in a beneficial shift of the oral microbiota and appears to be well tolerated.

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Nardi GM, Di Giorgio R, Sabatini S.

Effectiveness of tips for delicate micro-ultrasonic root planing comparing to tips for traditional ultrasonic root planning.

Ann Stomatol (Roma). 2012 Jul-Dec; 3(3-4): 90–94.

Aim: The present study wants to evaluate the effectiveness in the improvement of several periodontal indices, such as probing pocket depth, bleeding on probing and plaque index, and the patient subjective preference to the treatment of root planning with tips for delicate -micro ultrasonic therapy comparing to traditional ones.
Methods: Thirty patients were selected for our randomized split mouth study; in each patient two quadrants (test) were treated with tips for delicate micro-ultrasonic root planing, and two quadrants (control) with tips for traditional ultrasonic root planing. Probing pocket depth, bleeding on probing and plaque index were collected at baseline, after six weeks and after six months. Patients were asked to assess the subjective preference of the type of treatment with Visual Analogue Scale (Vas) especially designed and immediately administered after the treatment.
Results: Probing pocket depth and plaque index had a parallel improvement in both groups, while the bleeding on probing improved significantly in test group. The majority of patients (23 to 30, 76,6%) has expressed preference with VAS for the treatment with new tips.
Conclusion: The new tips created for periodontal maintaining can be really advantageous in terms of reduction of plaque and bleeding indexes; the main point in favor of these tips is the reduction of the discomfort for the patient. Finally this approach tends to be less time consuming than a manual instrumentation method.

Graetz C, Plaumann A, Wittich R, Springer C, Kahl M, Dörfer CE, El-Sayed KF.

Removal of simulated biofilm: an evaluation of the effect on root surfaces roughness after scaling.

Clin Oral Investig. 2017 May;21(4):1021-1028.

Background: Despite the development of less invasive devices, a debate exists about the benefits and risks of hand versus powered root surface instrumentation used in supportive periodontal therapy (SPT). The aim of the in vitro study was to differentially compare plaque removal efficacy and root surface roughening of newly developed sonic, ultrasonic scaler, and curettes in the hands of experienced versus less experienced operators.
Materials and Methods: Sonic (AIR), ultrasonic devices (TIG), and double-gracey curettes (GRA) were utilized by seven experienced (EO) and four less experienced operators (LO) for root surface instrumentation of standardized plastic teeth on manikins' heads in a randomized sequence. The proportion of residual simulated plaque (RSP area in %) was planimetrically assessed, and the average root surface roughness produced (Ra and ΔRa in μm) was measured by a precision profilometer.
Results: The uninstrumented root surfaces showed a Ra of (median (Q25/Q75)) 1.00 μm (0.83/1.16). Following instrumentation, EO left significantly less RSP than LO regardless of the used instruments (20.00 % (10.00/34.00) vs. 26.00 % (12.00/44.00) $p < 0.001$), whereas the ΔRa values (0.29 μm (-0.04/0.96) vs. 0.35 μm (-0.04/1.01), $p = 0.237$) failed to show significant differences. The surface roughness was higher with GRA followed by AIR then TIG regardless of operators' experience ($p < 0.001$).
Conclusion: Within the limits of the present study, the sonic device was most efficient in plaque removal, while the ultrasonic device produced the least surface roughness.
Clinical Relevance: All three tested instruments seem effective in the mechanical root debridement during SPT, whereat the ultrasonic device show the smoothest root surface of all.

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Leite Bdos S, Fagundes NC, Aragón ML, Dias CG, Normando D.

Cleansing orthodontic brackets with air-powder polishing: effects on frictional force and degree of debris.

Dental Press J Orthod. 2016 Jul-Aug;21(4):60-5.

Introduction: Debris buildup on the bracket-wire interface can influence friction. Cleansing brackets with air-powder polishing can affect this process.
Objective: The aim of this study was to evaluate the frictional force and amount of debris remaining on orthodontic brackets subjected to prophylaxis with air-powder polishing.
Methods: Frictional force and debris buildup on the surface of 28 premolar brackets were evaluated after orthodontic treatment. In one hemiarch, each bracket was subjected to air-powder polishing (n = 14) for five seconds, while the contralateral hemiarch (n = 14) served as control. Mechanical friction tests were performed and images of the polished bracket surfaces and control surfaces were examined. Wilcoxon test was applied for comparative analysis between hemiarches at $p < 0.05$.
Results: Brackets that had been cleaned with air-powder polishing showed lower friction (median = 1.27 N) when compared to the control surfaces (median = 4.52 N) ($p < 0.01$). Image analysis showed that the control group exhibited greater debris buildup (median = 2.0) compared with the group that received prophylaxis with air-powder polishing (median = 0.5) ($p < 0.05$).
Conclusion: Cleansing orthodontic brackets with air-powder polishing significantly reduces debris buildup on the bracket surface while decreasing friction levels observed during sliding mechanics.

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PATHOLOGICAL CORRELATIONS

Pisano P Jr, Mazzola JG, Tassiopoulos A, Romanos GE.

Electrosurgery and ultrasonics on patients with implantable cardiac devices: Evidence of side effects in the dental practice.

Quintessence Int. 2016 Feb;47(2):151-60.

Objective: Implantable cardiac pacemakers and cardiac defibrillators (ICDs) have been introduced in the care of patients with cardiac dysrhythmias. Most dental practitioners demonstrate extreme caution when treating patients with ICDs. This paper presents a review of the available literature on these devices and how they interact with dental electrosurgery and ultrasonic device use.
Results: Based on the analysis of the literature, this view is not corroborated by the current clinical data, and appears to be misguided. While further in-vivo studies are needed to truly determine the true level of risk, the evidence suggests that there is no contraindication for electrosurgery or ultrasonics use in patients with ICDs.
Conclusion: Using the precautions stated in this analysis, the risk of any deleterious effect on ICD function is minimal.

Mauri-Obradors E, Merlos A, Estrugo-Devesa A, Jané-Salas E, López-López J, Viñas M.

Benefits of non-surgical periodontal treatment in patients with type 2 diabetes mellitus and chronic periodontitis: A randomized controlled trial.

J Clin Periodontol. 2018 Mar;45(3):345-353.

Background: Periodontitis and diabetes are highly prevalent conditions whose association has long been recognized.
Objective: To evaluate the effect of non-surgical periodontal treatment on serum HbA1c (haemoglobin A1c or glycated haemoglobin) levels in patients with type 2 diabetes.
Research Design and Methods: This was a 6-month, single-masked, randomized clinical trial based on 90 patients (HbA1c: 7.7% (61 mmol/mol) ± 1.13%) who were randomly assigned to either the treatment group (oral hygiene instructions + scaling and root planing using ultrasound and Gracey curettes) or the control group (oral hygiene instructions + supragingival removal of plaque and calculus using ultrasound). Pocket depth, gingival index, and plaque index were assessed at baseline and after 3 and 6 months together with determinations of fasting plasma glucose, HbA1c, and bacterial counts.
Results: Treatment significantly improved the periodontal and metabolic parameters ($p < .05$), whereas in the control group no improvement was observed. These results were consistent with the bacteriological results in most but not all cases.
Conclusion: Non-surgical periodontal treatment resulted in a better glycaemic status of type 2 diabetes patients and demonstrated the importance of oral health in their general health.

Tsobgny-Tsague NF, Lontchi-Yimagou E, Nana ARN, Tankeu AT, Katte JC, Dehayem MY, Bengondo CM, Sobngwi E.

Effects of nonsurgical periodontal treatment on glycated haemoglobin on type 2 diabetes patients (PARODIA 1 study): a randomized controlled trial in a sub-Saharan Africa population.

BMC Oral Health. 2018 Feb 26;18(1):28.

Background: There is a burglar association between diabetes and periodontitis. Many studies has shown that periodontitis treatment can help improving glycemic control in diabetes patients but little evidence of non-surgical treatment benefit is available in sub Saharan african diabetes patients. We aimed to assess the effects of non-surgical periodontal treatment (NSPT) of chronic periodontitis on glycaemic control in poorly controlled type 2 diabetes patients (T2D) in a sub-Saharan Africa urban setting.

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PATHOLOGICAL CORRELATIONS

Methods: FA total of 34 poorly controlled T2D patients with chronic periodontitis aged 51.4 ± 8.8 years (mean ± SD), with known duration of diabetes of 55.5 ± 42.6 months, and HbA1c of 9.3 ± 1.3% were randomly assigned to two groups. The treatment group (Group 1, n = 17) received immediate ultrasonic scaling, scaling and root planning along with subgingival 10% povidone iodine irrigation, whereas the control group (Group 2, n = 17) was assigned to receive delayed periodontal treatment 3 months later. Pharmacological treatment was unchanged and all participants received the same standardized education session on diabetes management and dental hygiene. The primary outcome was the 3-month change in HbA1c from baseline. Plaque index (PI), gingival bleeding index (GBI), pocket depth (PD), clinical attachment loss (CAL) were also assessed prior to, at 6 and 12 weeks after enrolment.
Results: Two subjects in each group were excluded from the study. Data were analyzed on thirty patients (15 per group). Non-surgical periodontal treatment with education for better dental hygiene (group 1) significantly improved all periodontal parameters whereas education only (group 2) improved only the plaque index among all periodontal parameters. Immediate non-surgical periodontal treatment induced a reduction of HbA1c levels by 3.0 ± 2.4 points from 9.7 ± 1.6% at baseline to 6.7 ± 2.0% 3 months after NSPT, (p ▪ 0.001) but the change was not significant in group 2, from mean 8.9 ± 0.9% at baseline vs 8.1 ± 2.6% after 3 months (p = 0.24).
Conclusion: Non-surgical periodontal treatment markedly improved glycaemic control with an attributable reduction of 2.2 points of HbA1c in poorly controlled T2D patients in a sub Saharan setting.

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EMPHYSEMA

Lee ST, Subu MG, Kwon TG.

Emphysema following air-powder abrasive treatment for peri-implantitis.

Maxillofac Plast Reconstr Surg. 2018 May 13;40(1):12.

Background: Subcutaneous emphysema refers to swelling caused by the presence of air or gas in the interstices of loose connective tissue. In the head and neck area, it may follow the fascial planes and is characterized by sudden swelling, crepitus on palpation, infrequent pain, and air emboli on radiography. It usually occurs as a complication in dental treatment. Some reports have described subcutaneous emphysema caused by dental procedures; however, severe emphysema related to peri-implantitis after treatment has not been documented. Accordingly, the current report describes a rare case of subcutaneous cervical emphysema resulting from the use of an air-powder abrasive device to treat peri-implantitis.

Case presentation: Based on a review of the existing literature and the present case, nine cases of subcutaneous emphysema due to air-powder abrasive device have been reported. In most cases, the emphysema resolved over time after treatment with prophylactic antibiotics; among these, two were related to peri-implantitis management.

Conclusion: Considering the frequent use of air-powder abrasive devices to treat peri-implantitis, the potential risk of iatrogenic emphysema related to this procedure needs to be addressed more extensively.

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