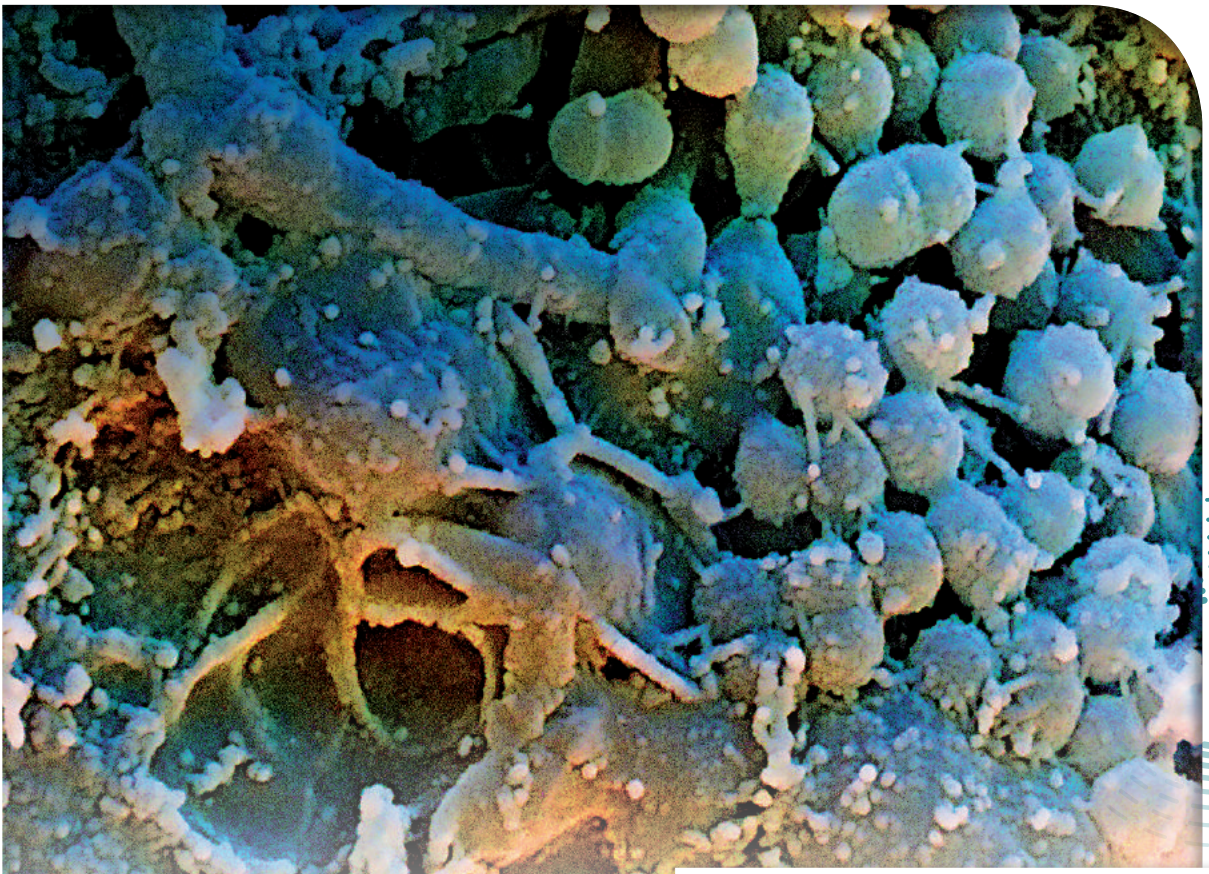
POWER
SCALING



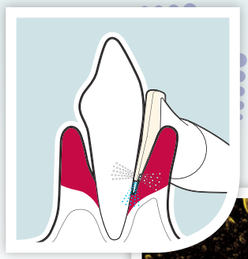
CLINICAL EVIDENCE

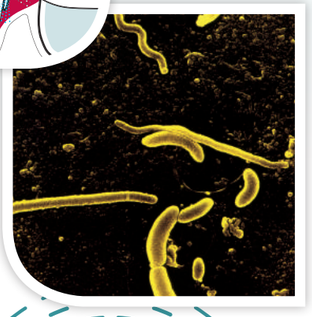
FOR AIR-FLOW® PERIO ON NATURAL TEETH AND IMPLANTS

SCIENTIFIC LITERATURE IN PERIODONTOLOGY

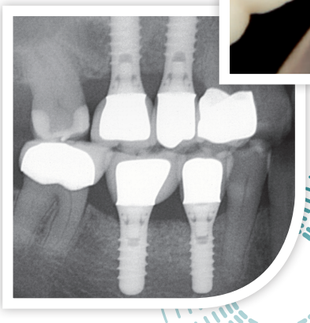
Hu-Friedy ® EMS ELECTRO MEDICAL SYSTEMS


Hu-Friedy
EMS
MAX
MIN
AIR-FLOW®
CLASSIC+SOFT
PERIO+PLUS
AIR-FLOW MASTER®
Min
Liquid
Max
PERIO-FLOW
AIR-FLOW
Min
Power
Max
AIR-FLOW®
PERIO-FLOW®






AIR-FLOW® PERIO
Hu-Friedy



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Please Note: The following studies show a wide range of use. AIR-FLOW® PERIO devices are only approved for use in pockets up to 5 mm in the United States; 10 mm in Canada.

AIR-FLOW® INCREASINGLY SIGNIFICANT IN MODERN PROPHYLAXIS

AIR-FLOW® PERIO Scientific Evidence

The objective of successful prophylaxis is to achieve and maintain an apathogenic microbial environment in the patient long-term through oral hygiene measures both at home and by a professional. Not only will this maintain oral health for life, but it will also contribute towards improving health overall. Over 30 years ago, Ramfjord[1] was one of the first to point out the paramount importance of biofilm management; he maintained that even in patients with imperfect oral hygiene the results of periodontal therapy could be stabilized over a period of years if they were recalled every three months for professional subgingival and supragingival plaque control.

The literature over the subsequent 20 years has confirmed and expanded on this observation by Ramfjord. Periodontology today goes one step further: if the potential of modern, non-surgical periodontal therapy is consistently applied, the need for periodontal surgical intervention will significantly decrease.

Modern air-polishing devices (AIR-FLOW®) and their specific powders for subgingival application are becoming increasingly significant in the context of maintenance therapy. However, before they can be introduced into routine everyday practice, science must provide sound evidence of the safety, efficacy and endurance of new methods compared with a variety of other procedures – from a clinical as well as ethical viewpoint.

The following literature on the use of air-polishing devices (AIR-FLOW®) in periodontology can be summarized as follows:

- The indication for the use of air-polishing devices (AIR-FLOW®) was expanded by the development of new glycine-based powders. Thus air-polishing devices (AIR-FLOW®) can also be used subgingivally to remove biofilm in the context of periodontal maintenance therapy as well as to clean implants.
- The superiority of air-polishing devices (AIR-FLOW®) compared with other biofilm management methods is shown in clinical as well as microbial parameters. Air-polishing devices (AIR-FLOW®) are efficient, reliable, safe, time-saving and gentle on tissues. Treatment is also associated with greater patient comfort.

The clinical study results listed here make persuasive reading.

Yours Faithfully,

DR. KLAUS-DIETER BASTENDORF
Joint practice[2] of Dr. Bastendorf + Dr. Schmid, Germany

[1] Tooth mobility and periodontal therapy Fleszar TJ, Knowles JW, Morrison EC, Burgett FG, Nissle RR, Ramfjord SP Journal of Clinical Periodontology, 1980; 7:495-505

[2] For over 30 years "Successful prophylaxis" has been the recipe of success of the joint practice of Dr. Bastendorf + Dr. Schmid in Eislingen (Southern Germany). Today approximately 30 dental professionals work day in-day out in the practice that specialises in prophylaxis, in maintaining healthy natural teeth. To do this, Dr. Bastendorf relies on EMS equipment and accessories and is therefore speaking from personal experience when it comes to the use of AIR-FLOW® air-polishing devices in prophylaxis as a whole (editorial comments)

NATURAL TEETH

AIR-POLISHING vs.
HAND INSTRUMENTATION

Subjects	23
Environment	in vivo
Duration	6 months

SUBGINGIVAL PLAQUE REMOVAL AT INTERDENTAL SITES USING A LOW ABRASIVE AIR POLISHING POWDER

Petersilka GJ, Tunkel J, Barakos K, Heinecke A, Häberlein I, Flemmig TF
Journal of Periodontology, 2003 March; 74(3):307-11

AIM:

To evaluate the efficacy of a new air-polishing powder in subgingival plaque removal at interdental sites during periodontal maintenance therapy

CONCLUSION:

In periodontal maintenance therapy, air-polishing with glycine-based powder is more effective than hand instrumentation in removing subgingival plaque at interdental sites with up to 5 mm probing depth, in addition to being time-efficient and safe

MATERIAL AND METHODS

TEST GROUP AND CONTROL GROUP:

- 23 subjects with generalized moderate to severe periodontitis and at least one tooth per quadrant with a probing depth of 3–5 mm at interdental sites were selected
- Each subject had completed initial periodontal therapy and was receiving supportive periodontal therapy

DEVICES:

- Test group: Treatment was performed using an AIR FLOW® S1 and a glycine-based air-polishing powder (Clinpro™ Prophy Powder, 3M ESPE) at medium water and powder settings
- Positive control: Treatment was performed using sterile Gracey curettes Nos 5/6, 7/8, 11/12 and 13/14

PROCEDURE:

- Treatment assignment was random, using a split-mouth design
- Two quadrants in each patient were assigned to test treatment (subgingival air-polishing with glycine-based powder), and two were assigned to positive control treatments (hand instrumentation)
- Microbial sampling was performed before and immediately after therapy on one tooth per quadrant with an interdental probing depth of 3–5 mm
- Additionally, one tooth not undergoing therapy was selected in each half of the patient's mouth, and samples were taken twice (two negative control teeth)
- In the test group, the spray of powder, air and water was aimed into the periodontal pocket for 5 sec per surface for subgingival plaque removal
- Positive control treatment was performed using 4 sterile Gracey curettes, and treatment terminated when no more plaque was visible on the instrument
- Plaque samples were taken by inserting sterile paper points to the bottom of the pocket for 10 sec
- The mean reduction in colony-forming units (CFU) was assessed by anaerobic culture
- Periodontal maintenance treatments and plaque sampling were repeated three times at quarterly intervals

RESULTS:

- The test treatment produced a significantly greater reduction in mean CFU than the positive control treatment
- No significant difference was observed between positive and negative controls

NATURAL TEETH

AIR-POLISHING vs. HAND INSTRUMENTATION

Subjects	27
Environment	in vivo
Duration	3 months

SUBGINGIVAL PLAQUE REMOVAL IN BUCCAL AND LINGUAL SITES USING A NOVEL LOW ABRASIVE AIR-POLISHING POWDER

Petersilka GJ, Steinmann D, Häberlein I, Heinecke A, Flemmig TF
Journal of Clinical Periodontology, 2003 April; 30(4):328-333

AIM:

To evaluate the efficacy of subgingival plaque removal in buccal and lingual sites during supportive periodontal therapy with a glycine-based air-polishing powder

CONCLUSION:

In supportive periodontal therapy, air-polishing with glycine-based powder is more effective than hand instrumentation in removing subgingival biofilm from periodontal pockets of 3–5 mm in depth, and offers greater patient comfort

MATERIAL AND METHODS

TEST GROUP AND CONTROL GROUP:

- 27 subjects with generalized moderate to severe periodontitis were selected
- Each subject had completed initial periodontal therapy and was receiving supportive periodontal therapy at regular three-month intervals

DEVICES:

- Test group: Treatment was performed using an AIR FLOW® S1 and a glycine-based air-polishing powder (Clinpro™ Prophy Powder, 3M ESPE) at medium water and powder settings
- Positive control: Treatment was performed using sterile Gracey curettes Nos 5/6, 7/8, 11/12 and 13/14

PROCEDURE:

- In a split-mouth design, the dentition was divided into two quadrants
- In each of the test and control quadrants, one tooth with a pocket probing depth of 3–5 mm at the buccal or lingual site and without furcation invasion was selected for microbial sampling before and immediately after therapy
- Two negative control teeth were selected for sampling the subgingival micro-flora twice, without preceding therapy
- In the test group, the spray of powder, air and water was aimed into the periodontal pocket for 5 sec per surface for subgingival plaque removal
- Positive control treatment was performed using 4 sterile Gracey curettes, and treatment terminated when no more plaque was visible on the instrument
- Plaque samples were taken by inserting sterile paper points to the bottom of the pocket for 10 sec
- The mean reduction in colony-forming units (CFU) was assessed by anaerobic culture
- Therapy and plaque sampling were repeated after three months
- Subjects were asked to rate the perceived level of pain or discomfort on a visual analog scale (VAS) as follows: 1 – uncomfortable; 10 – comfortable

RESULTS:

- The test treatment produced a significantly greater reduction in mean CFU than the positive control treatment
- The test treatment was rated as more pleasant than hand instrumentation

NATURAL TEETH

AIR-POLISHING vs. HAND INSTRUMENTATION

Subjects	60
Environment	in vivo & in vitro
Duration	3 months

SUBGINGIVAL DEBRIDEMENT EFFICACY OF GLYCINE POWDER AIR-POLISHING

Flemmig TF, Hetzel M, Topoll H, Gerss J, Haeberlein I, Petersilka GJ
Journal of Periodontology, 2007 June; 78(6):1002-1010

AIM:

To evaluate the subgingival debridement efficacy of glycine powder air-polishing in periodontal pockets of various depths, in order to determine the method's potential application in supportive periodontal therapy

CONCLUSION:

Glycine powder air-polishing for 5 seconds per surface is effective and time efficient in removing subgingival biofilm in periodontal pockets with a probing depth of approximately 4 mm

MATERIAL AND METHODS

TEST GROUP AND CONTROL GROUP:

- 60 subjects aged 18 and over with severe periodontitis, a pocket depth of ≢ 6 mm at one or more sites and a hopeless prognosis were selected
- The subjects were randomly assigned to subgingival debridement with a glycine-based powder on instrumented or non-instrumented teeth

DEVICES:

- Test group: AIR FLOW® S1 and a glycine-based powder (Clinpro™ Prophy Powder, 3M ESPE)
- Control group: Teeth which were neither instrumented nor treated with glycine powder air-polishing served as negative controls

PROCEDURE:

- Each subject was randomly assigned one of the following interventions on one tooth
- Subgingival debridement with glycine powder air-polishing was performed on:

1. Instrumented teeth (I)

1.1 Supra- and subgingival debridement was performed using curettes and sonic scalers

1.2 After therapy, subgingival recolonization was allowed to occur for three months under normal oral hygiene procedures performed by the patient

1.3 After three months, each surface (buccal, lingual, mesial and distal) of the investigated tooth was treated with glycine powder air-polishing for 5 sec

1.4 The powder was delivered using an EMS AIR-FLOW® S1 device, with the spray of air, powder and water aimed directly into the periodontal pocket in a coronal to apical direction at an acute angle with the root surface

2. Non-instrumented teeth (NI)

2.1 Teeth that had not received any previous supra- and subgingival instrumentation were used and treated in the same manner as described in 1.3 and 1.4

- Before extraction, the gingival index and the probing depth were measured at 6 sites per tooth
- After extraction, the teeth were stained with 0.5% toluidine blue and the subgingival debridement was assessed

RESULTS:

- The median debridement depth was 2 mm in I teeth and 1.86 mm in NI teeth, while the median debrided root surface was 49.24% and 45.64% respectively
- In anatomic pocket depths of 2–3 mm, the relative debridement depth ranged from 60–80% for the I teeth and 60–75% for the NI teeth (corresponding values for the debrided root surface: 60–70% in I teeth and 50–60% in NI teeth)
- In control teeth, virtually all subgingival root surfaces were stained

NATURAL TEETH

GLYCINE vs. SODIUM BICARBONATE vs. HAND INSTRUMENTATION

Subjects	10
Environment	in vivo
Duration	4 – 6 weeks

EFFECT OF GLYCINE POWDER AIR-POLISHING ON GINGIVA

Petersilka GJ, Faggion Jr CM , Stratmann U, Gerss J, Ehmke B, Haeberlein I, Flemmig TF Journal of Clinical Periodontology, 2008 April; 35(4):324-32

AIM:

To evaluate the safety and efficacy of glycine powder in comparison with sodium bicarbonate powder and hand instrumentation on gingival epithelium in vivo, using histological analysis

CONCLUSION:

Glycine powder air-polishing is safe and causes less gingival erosion than hand instrumentation and sodium bicarbonate air-polishing

MATERIAL AND METHODS

TEST GROUP AND CONTROL GROUP:

- 10 subjects in total were selected
- Each subject received full mouth supra- and subgingival debridement under local anesthesia and presented 4 to 6 weeks later with a ≥ 5 mm probing depth on at least 4 teeth in each of the two sextants

DEVICES:

- Test group: Teeth were debrided using an AIR-FLOW® S1 and a glycine-based powder (Clinpro™ Prophy Powder, 3M ESPE)
- Control group: Teeth were debrided using an AIR-FLOW® S1 and a sodium bicarbonate powder (AIR-FLOW® CLASSIC Powder)
- Control group: Hand instrumentation was performed using a sharp Gracey curette No 7/8

PROCEDURE:

- Three methods of root instrumentation were randomly assigned to one tooth in each sextant: Glycine powder air-polishing, sodium bicarbonate air-polishing and hand instrumentation
- One tooth in each sextant remained untreated and served as a negative control. Debridement was limited to the buccal or lingual surface
- Test teeth were debrided using either glycine powder or sodium bicarbonate, and the spray of air, powder and water was directed into the buccal or lingual aspect of the periodontal pocket at an angle of 60° – 90° to the root surface. Treatment was performed for 5 sec per tooth
- Debridement by hand instrumentation was performed until no more plaque was visible on the instrument
- One set of biopsies was obtained from 4 teeth in one sextant immediately following debridement
- A second set of biopsies was obtained from 4 teeth in the other sextant 14 days after debridement to assess soft tissue healing
- Damaged gingival epithelium was assessed by light microscopy and quantified by a histological score as follows: 1 – least erosion; 4 – most erosion

RESULTS:

- Glycine powder air-polishing resulted in minor erosions of the gingival epithelium (scores 1 and 2), while the positive control specimens displayed moderate to severe erosions with scores of 2 to 4
- There were significant differences between glycine powder air-polishing and the positive controls
- After 14 days, the gingival epithelium was completely reestablished in all groups

NATURAL TEETH

AIR-POLISHING vs.
HAND INSTRUMENTATION

Subjects	50
Environment	in vivo
Duration	7 days

SUBGINGIVAL PLAQUE REMOVAL USING A NEW AIR-POLISHING DEVICE

Moëne R, Décaillet F, Andersen E, Mombelli AJournal of Periodontology, 2010; 81:79-88

AIM:

To evaluate patient acceptance, the safety and the short-term microbiologic effect of the AIR-FLOW® PERIO Method in subjects on maintenance care, with residual pockets of ≥ 5 mm

CONCLUSION:

Subgingival air-polishing with AIR-FLOW® PERIO is more time efficient than hand instrumentation

Air-polishing is safe and more acceptable for the patients

MATERIAL AND METHODS

TEST GROUP AND CONTROL GROUP:

- 50 subjects with a residual periodontal pocket depth of ≥ 5 mm were selected
- Each subject received periodontal maintenance in two separate quadrants
- None of the subjects presented obvious signs of persisting massive subgingival calculus

DEVICES:

- Test group: Glycine-based powder (25 µm, AIR-FLOW® PERIO Powder) was introduced subgingivally for 5 sec using an AIR-FLOW Master® with PERIO-FLOW® nozzle
- Control group: Hand instrumentation was performed for 5 minutes per site, using Gracey curettes without anesthesia
- Subjects were randomly assigned to receive test treatment in one quadrant and control treatment in another quadrant

PROCEDURE:

- The following clinical variables were recorded at 6 sites per tooth: Plaque index, pocket depth, bleeding on probing and recession
- Two days prior to subgingival treatment, subgingival plaque samples were collected from the two study sites by inserting sterile paper points to the bottom of the pocket
- Oral tissue safety was evaluated based on a visual inspection for change in color and texture, signs of abrasion or any other irregularity of the soft and hard tissues in the oral cavity
- After removal of the supragingival hard and soft deposits, all pockets ≥ 5 mm in the test quadrant were treated with AIR-FLOW® using the disposable PERIO-FLOW® nozzle and AIR-FLOW® PERIO Powder. The control group was treated with hand instrumentation
- The time spent on subgingival treatments was noted for both groups
- Subjects were asked to rate the perceived level of pain or discomfort on a visual analog scale (VAS) as follows: 0 – uncomfortable; 10 – comfortable
- After 7 days, subgingival plaque samples were collected from the two study sites. The plaque index, bleeding on probing and oral tissue changes were noted respectively

RESULTS:

- Pain: Perceived pain was lower with air-polishing
- Comfort: Air-polishing was rated as more comfortable than hand instrumentation (VAS 9 compared to 2.2)
- Time: Less time was required for the test treatment (0.5 min per site with air-polishing) than for the control treatment (1.4 min per site with hand instrumentation)
- Microbiological level: No significant differences were seen

NATURAL TEETH

AIR-POLISHING vs. SCALING AND ROOT PLANNING

Subjects	30
Environment	in vivo
Duration	3 months

RANDOMIZED CONTROLLED TRIAL ASSESSING EFFICACY AND SAFETY OF GLYCINE POWDER AIR-POLISHING IN MODERATE TO DEEP PERIODONTAL POCKETS

Flemmig TF, Arushanov D, Daubert D, Rothen M, Mueller G, Leroux BG
Journal of Periodontology – Online; 2011

AIM:

To evaluate the efficacy and safety of subgingivally applied glycine powder air-polishing in removing bacterial biofilm in moderate to deep periodontal pockets, in comparison to conventional scaling and root planing (SRP)

CONCLUSION:

Subgingival glycine powder air-polishing with AIR-FLOW® PERIO is more effective in removing subgingival biofilm in moderate to deep periodontal pockets than scaling and root planing

The method is safe and comfortable for patients

Full-mouth glycine powder air-polishing may result in a beneficial shift of the oral microbiota

MATERIAL AND METHODS

TEST GROUP AND CONTROL GROUP:

- 30 subjects with chronic periodontitis and having completed initial periodontal therapy were selected
- Each subject had a pocket probing depth of 4–9 mm on at least two teeth, with 3 mm of residual alveolar bone and detectable levels of Porphyromonas gingivalis and Tannerella forsythia

DEVICES:

- Test group: Treatment was performed using an AIR-FLOW Master® with PERIO-FLOW® nozzle and glycine-based powder (25 µm, AIR-FLOW® PERIO Powder)
- Control group: SRP was performed using curettes and scalers, followed by coronal polishing with rubber cups and polishing paste

PROCEDURE:

- In the test group, the nozzle was inserted mesially, buccally, distally and lingually into the periodontal pocket until resistance was felt, and treatment was performed for 5 sec/site. Supragingival and subgingival biofilm in shallow periodontal pockets (≤ 3 mm) was removed by applying glycine-based powder supragingivally
- No time limit was set for SRP (control group)
- Both groups were asked to rinse with Chlorhexidine 0.12% for 2 min twice daily for two weeks
- Subgingival biofilm was collected from the sites immediately before and after subgingival debridement
- The following clinical variables were recorded at baseline, 10 and 90 days after treatment: Periodontal pocket depth, bleeding on probing, gingival recession and plaque index

RESULTS:

- At baseline and at day 10, subgingival glycine powder air-polishing resulted in significantly lower total viable counts in moderate to deep pockets, in comparison to SRP
- At day 90, total P. gingivalis counts in the oral cavity were significantly reduced following full-mouth glycine powder air-polishing, in comparison to SRP
- Comfort levels were high for both treatments
- No adverse effects were observed with glycine powder air polishing

NATURAL TEETH

AIR-POLISHING vs. ULTRASONICS

Subjects	20
Environment	in vivo
Duration	60 days

SUBGINGIVAL DEBRIDEMENT OF PERIODONTAL POCKETS BY AIR POLISHING IN COMPARISON WITH ULTRASONIC INSTRUMENTATION DURING MAINTENANCE THERAPY

Wennström JL, Dahlén G, Ramberg P
Journal of Clinical Periodontology 2011; 38:820-827

AIM:

To evaluate the clinical and microbiological effects and perceived treatment discomfort of root debridement by subgingival air-polishing in comparison with ultrasonic instrumentation in patients on supportive periodontal therapy (SPT)

CONCLUSION:

No significant differences in clinical or microbiological outcomes were observed between the two methods of subgingival root debridement of moderate/deep periodontal pockets, in supportive periodontal therapy patients

Air-polishing with AIR-FLOW® PERIO was judged to be more comfortable

MATERIAL AND METHODS

TEST GROUP AND CONTROL GROUP:

- 20 subjects undergoing treatment for moderate/advanced chronic periodontitis and involved in an SPT program were selected
- Two sites with a probing pocket depth of 5–8 mm and bleeding on probing (BOP) in each of two quadrants were randomly assigned to one of the two groups

DEVICES:

- Test Group: Air-polishing was performed for two times 5 sec per site using an AIR-FLOW Master® with PERIO-FLOW® Nozzle and glycine-based powder (25 µm; AIR-FLOW® PERIO Powder). Water and powder were set at 75%
- Control Group: Ultrasonic scaling was performed for 30 sec per site using an EMS Piezon® Master 400 and Perio Slim instrument. Power was set at 75%

PROCEDURE:

- The following clinical variables were recorded at baseline, and 14 and 60 days post-treatment: Oral hygiene status, marginal gingival bleeding, periodontal pocket depth (PPD), relative attachment level and BOP
- No anesthesia was used during treatment
- Microbiological analysis of subgingival samples was performed immediately before and after debridement, as well as two and 14 days post-treatment
- The presence of 12 species associated with periodontal disease was evaluated

RESULTS:

- Significant reduction in BOP, PPD and relative attachment levels were found after two months, in both groups
- Significant reductions in periodontitis-associated bacterial species were found immediately and two days after treatment in both groups
- No statistically significant differences were observed in clinical and microbiological variables between the two treatment procedures at any of the examination intervals
- Air-polishing with AIR-FLOW® was judged to be more comfortable than ultrasonic debridement

A PARADIGM SHIFT IN MECHANICAL BIOFILM MANAGEMENT? SUBGINGIVAL AIR POLISHING: A NEW WAY TO IMPROVE MECHANICAL BIOFILM MANAGEMENT IN THE DENTAL PRACTICE

Bastendorf KD, Becker C, Bush B, Einwag J, Lanoway C, Platzer U, Schmage P, Schoeneich B, Walter C, Wennström JL, Flemmig TF, Sculean A Consensus conference during the Europerio 7 Congress in Vienna, Austria, on 7 June 2012 Quintessence International, 2013 July/August; 44(7):475-477

AIM:

To review current evidence from the literature during a consensus conference held during the Europerio 7 Congress in Vienna (2012). To reach a consensus on the clinical relevance of the subgingival use of air polishing and to make practical recommendations for the clinician

CONCLUSION:

Subgingival air-polishing with the new generation of powders is efficient, fast, comfortable and safe

RESULTS

- Air-polishing devices have shown to be efficient in removing both sub and supragingival biofilm and stains
- The new generation of powders and devices with subgingival nozzles provide better access to subgingival and interdental areas
- In shallow pockets up to 4 mm and in deeper pockets ≥ 5 mm, air-polishing removes biofilm significantly more efficiently than hand curettes
- Full-mouth glycine powder air-polishing results in a significantly decreased load of Porphyromonas gingivalis in the oral cavity
- Subgingival biofilm removal with air-polishing is considerably faster than hand instrumentation or ultrasonics
- Glycine-based air-polishing is perceived as more comfortable by the patients than hand instrumentation or ultrasonics
- Subgingival air-polishing with glycine-based powder is safe if used as per recommendation

IMPLANTS

COMPARISON OF DIFFERENT AIR-POLISHING POWDERS

Subjects	6
Environment	in vivo & in vitro
Duration	16 days

INFLUENCE OF DIFFERENT AIR-ABRASIVE POWDERS ON CELL VIABILITY AT BIOLOGICALLY CONTAMINATED TITANIUM DENTAL IMPLANTS SURFACES

Schwarz F, Ferrari D, Popovski K, Hartig B, Becker J
Journal Biomed Mater Res B Appl Biomater, 2009 January; 88(1):83-91

AIM:

To evaluate the influence of different types of air-polishing powder on cell viability on biologically contaminated titanium surfaces

CONCLUSION:

Cell viability on biologically contaminated titanium surfaces is mainly influenced by the type and particle size of the powder. Glycine-based powders have proven to be efficient without altering the titanium surfaces

MATERIAL AND METHODS

TEST GROUP AND CONTROL GROUP:

- 6 healthy non-smoking subjects with a good level of oral hygiene and no sign of periodontal disease were selected

DEVICES:

- AIR-FLOW® S1. Power and water were set at 4.5 bar static pressure and 60 ml water/min
- 4 powders were tested: AIR-FLOW® SOFT, PERIO and CLASSIC Powders, and Clinpro™ Prophy Powder (3M ESPE)
- Titanium discs (Straumann)

PROCEDURE:

- Prior to investigation all subjects received professional tooth cleaning
- Each subject was fitted with an acrylic appliance for the upper jaw, with 4 titanium discs to collect supragingival biofilm
- After staining with erythrosine dye, only those specimens showing homogenous biofilm formation were included in the study
- A total of 128 titanium discs were collected and randomly assigned to an AIR-FLOW® system using one of the 4 different types of powder
- A standard handpiece was mounted on a translation stage and guided onto the implant surface using two different distances (1 and 2 mm) and angulations (30° and 90°)
- A total of 8 titanium discs were included in each group and fixed on a translation stage
- Each titanium disc received a single (1x) and a repeated (2x) treatment. Treatment time was set at 20 sec
- Non-contaminated and untreated titanium surfaces served as controls
- Residual biofilm areas (%), surface alterations (1x and 2x) and cell viability were assessed

RESULTS:

- Residual biofilm areas: After a single surface treatment, all groups revealed a significant decrease of mean residual biofilm areas with both nozzle distances (1 and 2 mm) and angulations (30° and 90°). After repeated surface treatments, the biofilm was completely removed
- Repeated treatment: Surface alteration was observed with the AIR-FLOW® CLASSIC Powder, while the other powders (AIR-FLOW® SOFT and PERIO Powders, and Clinpro™ Prophy Powder, 3M ESPE) did not produce any alterations at either distance or angulation
- Cell viability: The highest mean values were recorded in the control group, followed by the AIR-FLOW® CLASSIC Powder group. They were significantly higher than those recorded in the AIR-FLOW® SOFT, Powder Clinpro™ Prophy Powder and AIR-FLOW® PERIO Powder groups

IMPLANTS

AIR-POLISHING vs. HAND INSTRUMENTATION

Subjects	33
Environment	in vivo
Duration	6 months

NON-SURGICAL TREATMENT OF PERIIMPLANTITIS USING AN AIR-ABRASIVE DEVICE OR MECHANICAL DEBRIDEMENT AND LOCAL APPLICATION OF CHLORHEXIDINE: A PROSPECTIVE, RANDOMIZED, CONTROLLED CLINICAL STUDY

Sahm N, Becker J, Santel T, Schwarz F
Journal of Clinical Periodontology; 2011; 38: 872-878

AIM:

To evaluate and compare the efficacy of an air-polishing device with mechanical debridement and local application of Chlorhexidine (CHX) for non-surgical treatment of periimplantitis

CONCLUSION:

Both treatment procedures resulted in comparable but limited clinical attachment level gains at 6 months

Air-polishing (EMS AIR-FLOW® PERIO) was associated with significantly higher reductions in bleeding on probing than mechanical debridement

MATERIAL AND METHODS

TEST GROUP AND CONTROL GROUP:

- 33 subjects with at least one screw-type titanium implant, showing clinical and radiographic signs of initial to moderate periimplantitis, were selected

DEVICES:

- Test group: Treatment was performed using an AIR-FLOW Master® with PERIO-FLOW® nozzle and glycine-based powder (25 µm, AIR-FLOW® PERIO Powder)
- Control group: Mechanical debridement was performed using carbon curettes (Straumann), followed by the application of CHX (GlaxoSmithKline)

PROCEDURE:

- 4 weeks before the treatment, all subjects received professional supragingival implant and tooth cleaning using rubber cups and polishing paste
- The same procedure was repeated at baseline, and 2, 4, 6, 8, 10, 12, 16, 20 and 24 weeks after treatment
- Treatments for both groups were performed under anesthesia
- Using the single-use PERIO-FLOW® nozzle, glycine-based powder was delivered subgingivally along the mesial, distal, vestibular and oral surfaces for 5 sec/site
- Mechanical debridement was carried out using carbon curettes until the operator was satisfied with the calculus removal. This was followed by pocket irrigation with 0.1% CHX digluconate solution, and submucosal application of 1% CHX gel
- The following clinical variables were evaluated at baseline, and three and 6 months post-treatment: Plaque index, bleeding on probing (BOP), periodontal pocket depth (PPD), mucosal recession and clinical attachment level
- All measurements were taken at 6 aspects per implant

RESULTS:

- At 6 months, the air-polishing group revealed significantly higher reductions in BOP in comparison to sites treated with mechanical debridement
- The clinical attachment level gains and PPD reductions were comparable

IMPLANTS

AIR-POLISHING vs. ULTRASONICS

Subjects	15
Environment	in vivo
Duration	1 month

THE EFFECT OF AIR-FLOW® GLYCINE POWDER AND HAND INSTRUMENTATION ON PERI-IMPLANT SOFT TISSUES: A SPLIT MOUTH PILOT STUDY

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AIM:

To compare the efficacy of traditional teflon curettes with an air-polishing device using glycine-based powder in the periodontal therapy of dental implants

CONCLUSION:

Air-polishing with AIR-FLOW® PERIO was observed to be more effective and less invasive than Teflon curettes for maintenance of periimplant soft tissues

MATERIAL AND METHODS

TEST GROUP AND CONTROL GROUP:

- 15 edentulous subjects with overdentures supported by 2 implants in the mandibular region were selected
- Each of the 2 implants per subject was randomly assigned to either hand instrumentation or air-polishing

DEVICES:

- Test group: Air-polishing was performed using an EMS AIR-FLOW Master® with PERIO-FLOW® nozzle and glycine-based powder (25 µm, AIR-FLOW® Powder PERIO)
- Control group: Mechanical debridement was performed using teflon curettes (Universal Implant Deplaquer, Hawe Neos) for subgingival deposits and a scaler (IH 6/7 tips; Hu-Friedy) for removal of plaque from the abutments

PROCEDURE:

- The following clinical variables were evaluated before treatment (T0), at one hour (T1), 1 week (T2) and 4 weeks (T3) post-treatment: bleeding on probing, periodontal pocket depth and bacterial count within the gingival sulcus
- Periodontal probing was done using a plastic probe (PerioWise®, Premier Dental) at T0, T2 and T3
- Microbial analysis from perio-implant sulcus was done by inserting sterile paper points at all time points
- Air-polishing was performed for 5 sec per site whereas the time spent on hand instrumentation was not noted

RESULTS:

- A significant effect modification of the Glycine Air-polishing compared to hand instrumentation with respect to time was found for periodontal pocket depth, bleeding on probing and bacterial count

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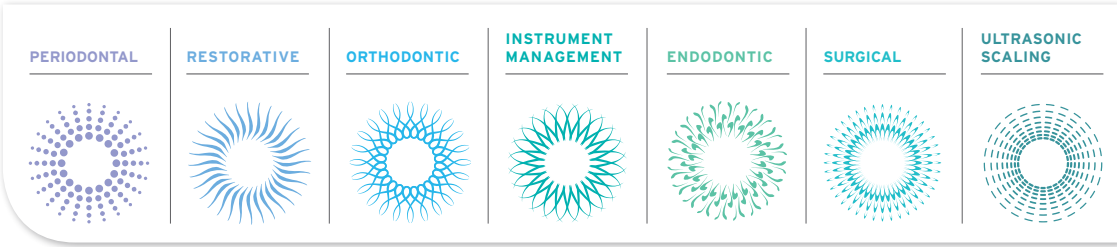

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