

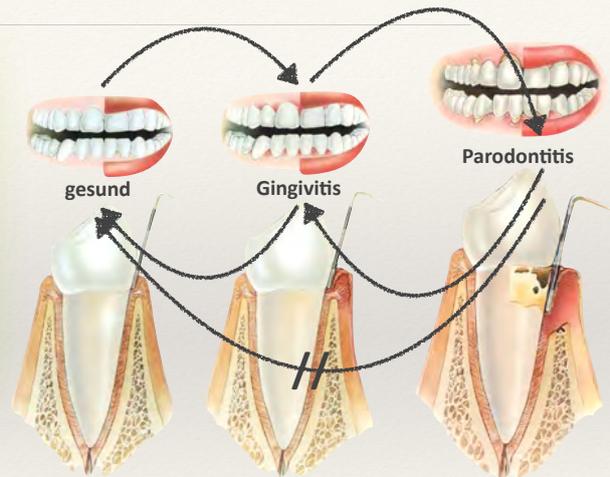
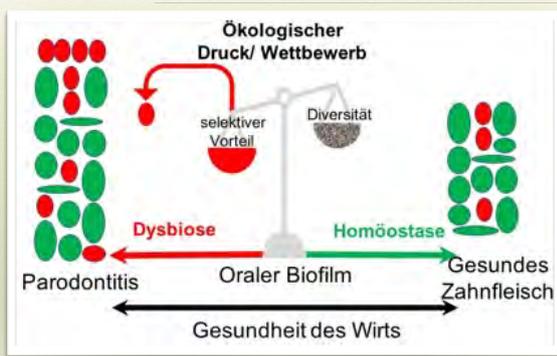
Prof. Dr. Christian Graetz

Pulverwasserstrahltherapie in der Parodontologie: ein Update zur Guided Biofilm Therapy

Der Referent zeigt an für folgende Unternehmen in den letzten 5 Jahren beratend tätig gewesen zu sein, Honorare für Vortragstätigkeiten oder Forschungs-/ Studiengelder erhalten zu haben:



Therapieansatz?



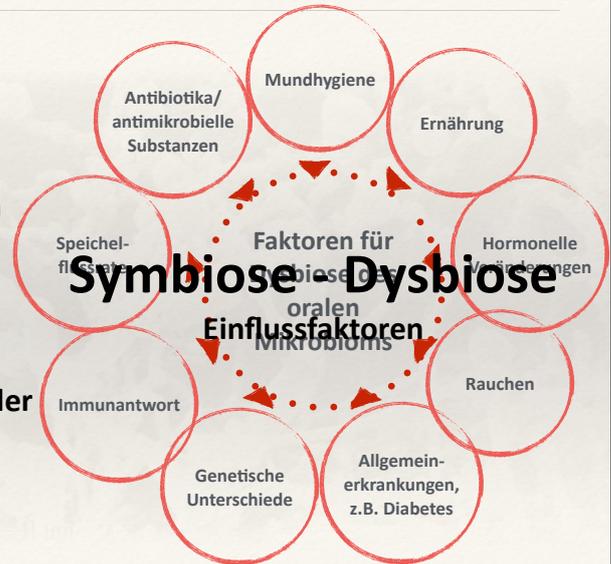
Problem:

Biofilme sind nur vorübergehend besiegbar.

Therapieansatz?

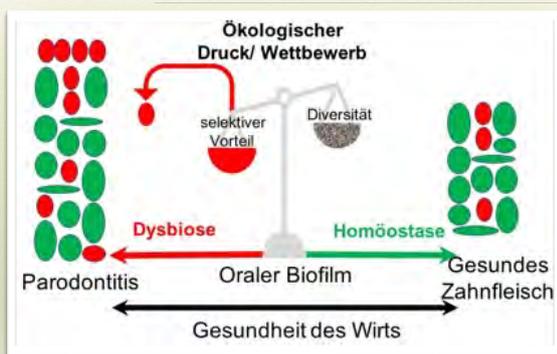
Orale Biofilme:

- Sind **physiologischer Bestandteil** der Mundhöhle,
- bei Symbiose zu **Dysbiose** werden **Virulenzfaktoren** hochreguliert (Immunreaktion beachten!),
- diese Faktoren beeinflussen **Destruktionsprozess** (multikausal),
- diese Faktoren beeinflussen sich auch **untereinander** (Circulus vitiosus).



Kilian et al 2016, Brit Den J, 221, 10, 657-666

Therapieansatz?



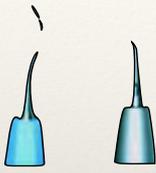
Problem:

Biofilme sind nur vorübergehend besiegbar.

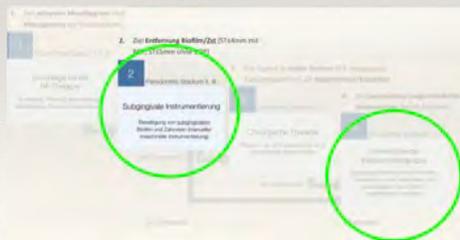
Lösung:

Professionelle mechanische Biofilmreduktion?

Professionelle mechanische Biofilmreduktion - Was ist zeitgemäß?

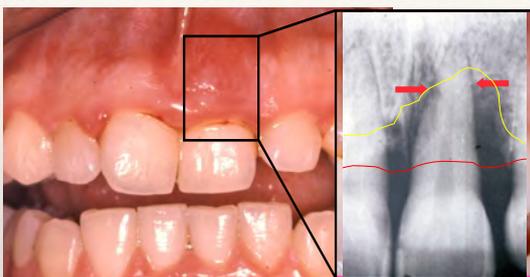


Back to the Roots ... ?
Sind Kürette & Co. 2024 up to date?

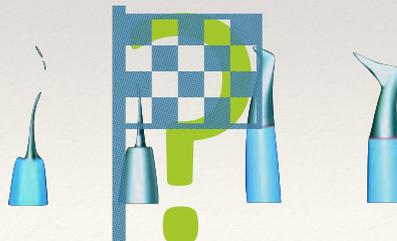
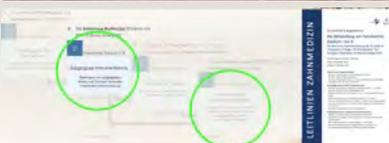


Albucasis (Abu el Quasim, Cordoba) De chirurgica ca. 1000 n. Chr. „Über das Schaben an den Zähnen“

Instrumentenauswahl



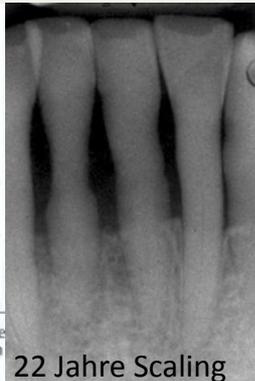
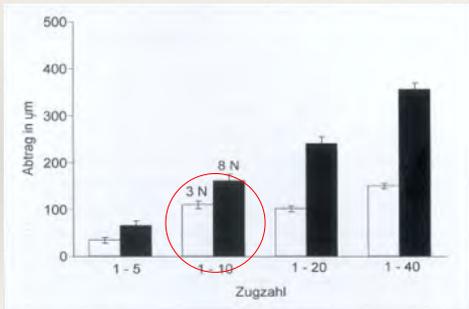
Patientin, 20Jahre, Nichtraucherin, Rötung Regio 21



Instrumentierung der Wurzeloberfläche - Ziel der Maßnahme definieren!

„Die Intervention zielt auf die Beseitigung (Reduktion) von subgingivalem Biofilm sowie Zahnstein und kann mit der Entfernung von Anteilen der Wurzeloberfläche (Wurzelmement) verbunden sein.“

(s3-LL „Leitlinie zur Behandlung der Parodontitis“)



(Kieser, 1994)

Abb. 6 Kumulativer Wurzelsubstanzabtrag durch Handinstrumente in Abhängigkeit von den bei der Bearbeitung aufgewandten Kräften (3 N = 300 g, 8 N = 800 g) (nach Zappa et al.⁴⁾)

Zappa U, Smith B, Simona C, Graf H, Case D, Kim W. Root substance removal by scaling and root planing J Periodontol. 1991 Dec;62(12):750-4.

...Handinstrumente zu kompliziert? NEIN, nur behndlersensitiv!

Systematisches überlappendes Instrumentieren!

1. - Vorderansicht
2. - Mittelansicht
3. - Nachansicht
4. - Vorderansicht

AMERICAN EAGLE INSTRUMENTS INC.
Seltor DENTISTRY & DESIGN

Double Gracey™ - Anterior

Double Gracey™ - Posterior

Instrument	Schneide	Fläche
Universalkürette	90°	Fazialfläche, Lateralfläche, Rücken
Spezialkürette	110°	Lateralfläche
„Double“ Spezialkürette	110°	Lateralfläche

Graetz et al. (2015) Subgingival instrumentation to remove simulated plaque in vitro: influence of operators' experience and type of instrument. Clin Oral Investig 19, 987-995.

Instrumentenauswahl - Trends?



J Clin Periodontol 2008; 35 (Suppl. 1): 1-7. doi: 10.1111/j.1600-0512.2008.02236.x

M. Scalet and W. Teughels on behalf of group A of the European Workshop on Periodontology¹
¹Chairman and Dean, Faculty of Odontology, Universidad Complutense de Madrid, Spain
²Associate Professor, School of Dentistry, Department of Periodontology, University of Leuven, Belgium

Innovations in non-surgical periodontal therapy: Consensus Report of the Sixth European Workshop on Periodontology

Scalet M, Teughels W. Innovations in non-surgical periodontal therapy: Consensus Report of the Sixth European Workshop on Periodontology. J Clin Periodontol 2008; 35 (Suppl. 1): 1-7. doi: 10.1111/j.1600-0512.2008.02236.x

Abstract
 Introduction: The remit of this working group was to update the existing knowledge base in non-surgical periodontal therapy. The published systematic reviews from the fourth EAP Workshop formed the starting point for this update and in addition specific innovations not covered in previous workshops were included.
 Material and Methods: The literature was systematically searched and critically reviewed. Five manuscripts were produced in five specific topics identified as areas where innovative approaches have been developed in non-surgical periodontal therapy and which were deemed to be surgically important for patient care and clinical practice.
 Results: The results and conclusions of the review process are presented in the following papers, together with the group consensus statements, clinical implications and directions for future research.
 A systematic review of the effects of full mouth debridement with and without antiseptics in patients with chronic periodontitis.
 Advances in Power Driven Instrumentation.
 Laser application in non-surgical periodontal therapy – a systematic review.
 Antimicrobial therapy in periodontitis: the use of systemic antibiotics against the subgingival biofilm.
 The cost-effectiveness of appropriate periodontal care for patients with chronic periodontitis.

Key words: consensus; instrumentation; laser; non-surgical; periodontal therapy
 Accepted for publication 20 May 2008

Conflict of interest and source of funding statement
 Group A participants declared that they had no conflict of interest.
 The 6th European Workshop has been financially supported by an unrestricted educational grant from Stratusson AB.
 The sponsor had no input on the program or on the deliberation of the European Workshop.



T. Adriaens, G. Armitage, P. Barbet, J. Chapelle, T. Fleming, D. Hansen, P. Hansson, M. A. Kalkbrenner, N. C. Lame, J. Nordin, T. Pevsner, P. Schwartz, W. C. Tan, C. Tonetti, D. Waisleder & J. Weissen

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 Journal compilation © 2008 Blackwell Munksgaard



A paradigm shift in mechanical biofilm management? Subgingival air polishing: a new way to improve mechanical biofilm management in the dental practice
 Anton Scalet, Dr med dent, Dr hc (mult), MS/PhD
 Dr med dent/Christian Becker, PhD, MSc/Berlin, Dr Johannes Erbe, Dr med dent/Carsten Langer, Dr med dent/Petra Schmalz, Dr med dent/Brigitte Dierckx-Hofemeier/Clara Walter, Dr med dent/Julia DDD, PhD/Thomas F. Fleming, Dr med dent, Dr med

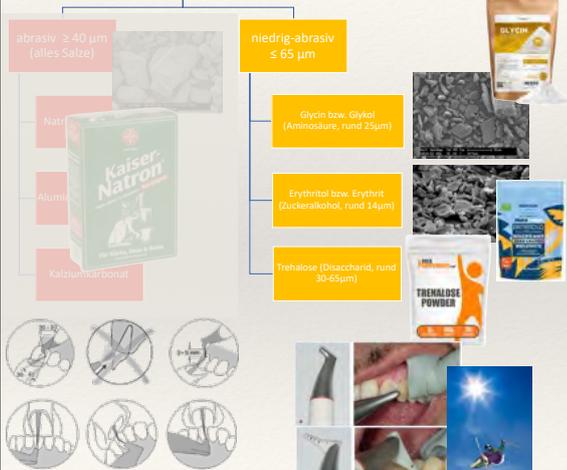
Scalet et al. (2013) A paradigm shift in mechanical biofilm management? Subgingival air polishing: a new way to improve mechanical biofilm management in the dental practice. Quintessence Int 44, 475-477. doi:10.3290/j.qi.a29615.



Instrumentenauswahl



Pulver (alle wasserlöslich)



Indikation	Substanz	Härte (Mohs)	Mittlere Partikelgröße	Wasserlöslich
Supragingival / Schmelz	Natriumbikarbonat	2,5	40-250µm	Bedingt
	Kalziumkarbonat	3	45µm	Nein
	Aluminiumtrihydroxid	2,5-4	80-325µm	Nein
	Kalziumphosphatsilikat (NovMin®)	6	25-120µm	Nein
Supra- & subgingival Schmelz/ Dentin/ Wurzelzement / Füllungen	Glycin	2	25-65µm	Ja
	Erythritol	<2	14µm	Ja
	Trehalose	-	30 - 65µm	Ja

Technik um ca. 1975 entwickelt (Graumann et al. 2013)

Strafela-Bastendorf, N. & Bastendorf K.-L. (2020) Ein Zuckeraustauschstoff macht Karriere in der Zahnmedizin. zm 110, 14: 42-46.
 Seidel, M. & Graetz, C. (2019) Mechanische Biofilamentfernung: Was, womit und wie funktioniert's? ZMK 35, 2-7.

Instrumentenauswahl



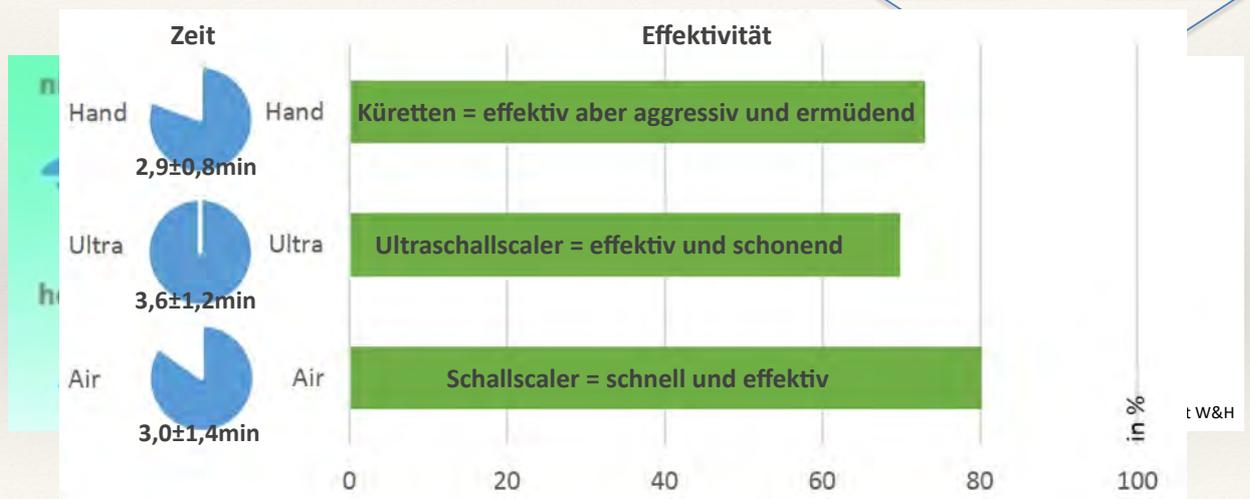
Quelle: <https://dentalwissen.com/schmerzempfindlichkeit/>



Aufklärungs-pflicht!

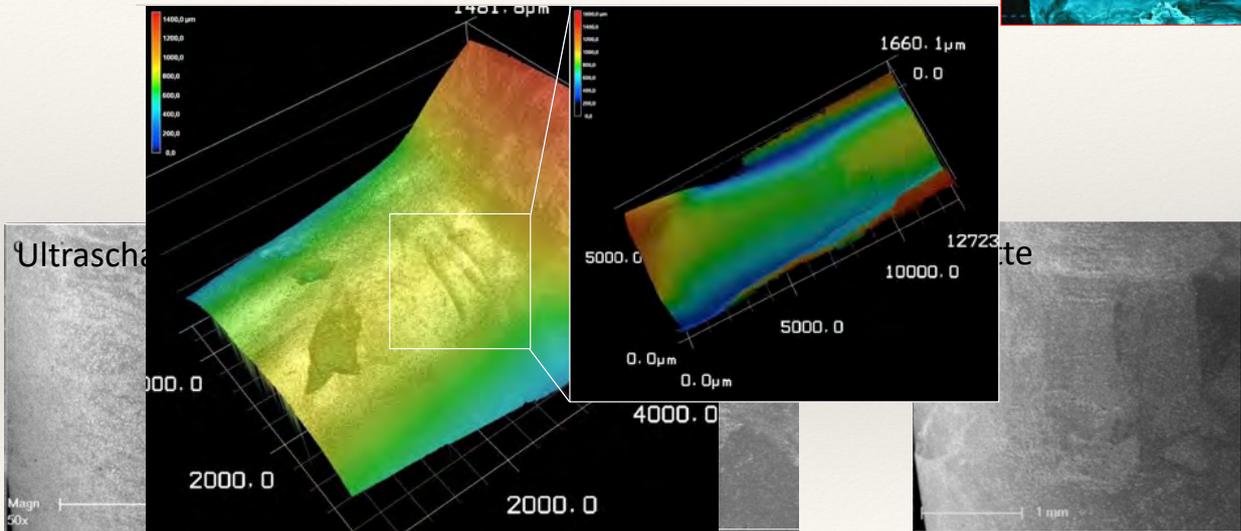
Graetz, C., Bräuning, A. & Dörfer, C. E. (2017) Instrumentierung der Wurzeloberfläche im Rahmen der Parodontitistherapie. Quintessenz 68, 643-658
 Moene, R., F. Decaillet, E. Andersen, and A. Mombelli. "Subgingival Plaque Removal Using a New Air-Polishing Device." J Periodontol 81, no. 1 (2010): 79-88.
 Petersilka, G. "Re: "Subgingival Plaque Removal Using a New Air-Polishing Device". Moene R, Decaillet F, Andersen E, Mombelli A. (J Periodontol 2010;81:79-88.)" J Periodontol 81, no. 7 (2010): 962-3.
 Graziani et al. "Complications and Treatment Errors in Nonsurgical Periodontal Therapy." Periodontol 2000 92, no. 1 (2023): 21-61.

Instrumentenauswahl



Graetz et al. Comparative Evaluation of Root Surface Roughness after Periodontal Scaling using Manual, Ultrasonic and Sonic Scaler – An in-vitro Profilometric Study. 2015
 Graetz et al. Subgingival instrumentation to remove simulated plaque in vitro: influence of operators' experience and type of instrument. 2015

Instrumentenauswahl



Graetz et al. Comparative Evaluation of Root Surface Roughness after Periodontal Scaling using Manual, Ultrasonic and Sonic Scaler – An in-vitro Profilometric Study, 2015

Instrumentenauswahl

	Mean Ra±SD [μm]			p-value AIR-TIG	P-value GRA-TIG	p-value AIR-GRA
	Ultraschallscaler TIG	Schallscaler AIR	Graceykürette GRA			
Alle Zähne/Seiten (ΔRa in μm)	-0,02 (-0,17/0,37)	0,22 (-0,04/0,86)	0,96 (0,48/1,96)	<0,001	<0,001	<0,001

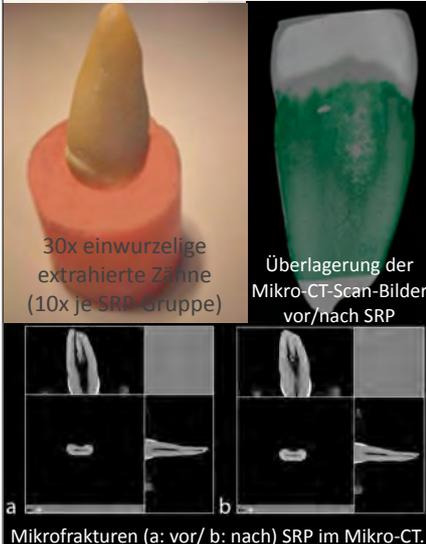


Fazit: Teils ergibt sich sogar eine Glättung der Oberfläche nach Ultraschallscaleranwendung.

Graetz et al. Comparative Evaluation of Root Surface Roughness after Periodontal Scaling using Manual, Ultrasonic and Sonic Scaler – An in-vitro Profilometric Study, 2015

Instrumentenauswahl

Fazit: Teils ergibt sich sogar eine Glättung der Oberfläche nach Ultraschallscaleranwendung?



Yildiz et al. 2023 untersuchten verschiedene Instrumentierungen in Bezug auf Zementverlust, Porosität und Mikrorissbildung nach SRP mit Hilfe der Mikro-Computertomographie (CT).

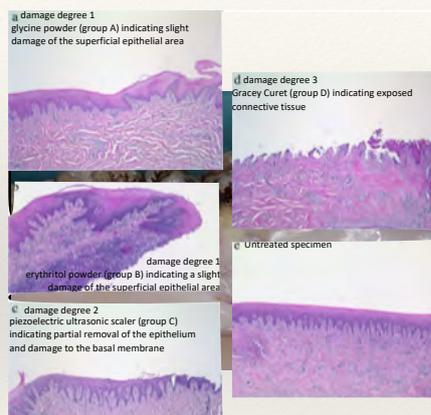
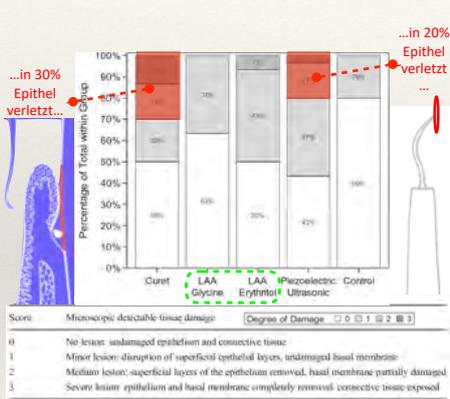
Group	VOLUME			TIME			MICRO-FRACTURE			POROSITY		*p
	Mean±SD	Median (Min-Max)	Post Hoc Test	Mean±SD	Median (Min-Max)	Post Hoc Test	Mean±SD	Median (Min-Max)	Post Hoc Test	Mean±SD	Median (Min-Max)	
1. Gracey Curette*	55.66±26.91	57.55 (11.94-103.26)	a-b p=0.191	46.50±4.83	45.5 (40-55)	a-b p=0.311	3.20±0.78	3 (2-4)	a-b *p=0.001	0.278±0.186	0.192 (0.095-0.613)	
2. Ultrasonic scaler*	26.98±20.37	22.13 (4-66.79)	a-c p=0.051	37.60±8.27	34 (27-50)	a-c p=0.019	8.60±3.06	8 (5-14)	a-c p=0.004	0.344±0.218	0.279 (0.121-0.846)	0.475
3. Diamond	96.20±24.14	93.59	b-c	57.80±5.47	58.5	b-c	6.5±1.35	6.5 (4-8)	b-c	0.252±0.179	0.169	

Fazit der Autoren (cave: In-vitro-Studie = Limitationen):

- Diamantfräser bewirken den **größten Zementverlust**,
 - Küretten und Ultraschallscaler vergleichbar, jedoch
1. Ultraschallscaler wegen der Bildung von Mikrorissen vorsichtig und
 2. Küretten wegen des Substanzverlustes nicht wiederholend einzusetzen!

Yildiz et al. Micro-CT evaluation of the effect of various ScRp instrumentation methods on cement loss, porosity and micro-crack formation. Int J Dent Hyg. 2023.

Instrumentenauswahl



Clinical Oral Investigations
https://doi.org/10.1007/s00784-019-2036-5

SHORT COMMUNICATION

Evaluation of an ex vivo porcine model to investigate the effect of low abrasive polishing

Gregor Petersilka^{1,2}, Ralph Hecker¹, Raphael Koch³, Benjamin Ehmke⁴, Nicole Anweiler⁵

Received: 12 October 2017 / Accepted: 20 June 2018
© The Author(s) 2018

Abstract
Objectives: Evaluation of an ex vivo porcine model to investigate the influence of periodontal instrumentation on soft tissue. Material and methods: In each of 120 pig mandibles, one molar tooth was chosen at random and instrumented. For subgingival debridement, two different low abrasive polishing powders (glycine d₅₀ = 25 µm, erythritol d₅₀ = 14 µm, n = 30 teeth each), curets, and a piezoelectric ultrasonic scaler were used (n = 30 teeth each). Thirty teeth in 30 other mandibles served as the untreated control. Gingival biopsies were histologically assessed for destruction using a four-grade scale. Results: The porcine model was deemed suitable for the planned investigation. Hand instrumentation and ultrasonic scaling caused higher tissue damage than both low abrasive polishing modes (Fisher's exact test, p = 0.0025). Glycine powder led to less, yet non-statistical noticeable gingival changes compared to erythritol-based powder (Fisher's exact test, p = 0.39). Conclusion: An animal model using pig jaws may be used as a preliminary model to analyze biological effects of periodontal instrumentation in advance of studies performed in human tissues. Among the techniques assessed, low abrasive polishing (LAA) caused the smallest tissue damage. Clinical relevance: To avoid gingival damage using LAA, histological observations of gingival tissue are needed. Since numerous powders for LAA have been developed and it may be expected that additional products will follow, it appears to be useful to establish ex vivo animal models to prove the powder safety.

Keywords Low abrasive polishing · Periodontal instrumentation · Porcine model · Erythritol · Glycine

Introduction
An alternative, low abrasive polishing (LAA) has been developed to make the treatment easy while allowing gentle debridement [1]. Potential harmful effects of polishing on oral tissues have been addressed earlier [1–3]. Nevertheless, data comparing the effect of various low abrasive media on oral soft tissue is rare, as since the inauguration of LAA in 2003, numerous new products such as powders consisting of erythritol, tricalcium phosphate, tetracalcium, aluminum trioxide, and hydroxyapatite have been introduced. Using live animals or working on human patients in research to date leads to a rise in costs and complicates obtaining new knowledge. Examining animal models instead may facilitate determination of safety and efficacy of new therapies [10–12]. Among animal tissues, porcine buccal gingiva obtained from aluminum bears excellent histological resemblance when compared to human oral tissue [13]. Therefore, the intention of this study was to establish and evaluate the usability of a porcine periodontal treatment model for LAA and to

Footnotes:
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Institute of Biostatistics, University Münster, Schötenbergstraße 56, 48149 Münster, Germany
Clinic for Periodontology and Conservative Dentistry, University Münster, Wilhelmstrasse 36, 48149 Münster, Germany

PLM-And-ref: 79 Jul. 2018

Springer

Fazit:

Alle vier untersuchten Instrumente sind schonend zu Weichgeweben!
code 2-3 bei Kürette/US*, code 1-2 bei Erythritol* und 0-1 bei Glycine ggü. unbehandelter Gingiva
(*signifikant)

Kontroverse - PWS und/ oder Politur

Zusammenfassung:

- **Schmelz:** Rauigkeitsänderungen messbar (klinisch relevant?)
- **Dentin:** aufsteigende Rauigkeit von (1.) Politur vs. (2.) PWS vs. (3.) Kürette und interessanterweise keine Rauigkeitsänderungen durch Polieren nach Kürette/ nach PWS

PWS war weniger invasiv als die Kürette, jedoch brachte abschließendes Polieren mit Gummikelch/Paste keine Verringerung der Rauigkeit auf Dentin/ Schmelz!

PLOS ONE

RESEARCH ARTICLE

Impact of air-polishing using erythritol on surface roughness and substance loss in dental hard tissue: An ex vivo study

Anne B. Kruse¹, Stephan Formele¹, Kirstin Vach^{1,2}, Elmar Hellwig¹, Petra Ratka-Kriger¹, Nadine Schuster³

¹ Faculty of Medicine and Medical Center, Department of Operative Dentistry and Periodontology, University of Freiburg, Freiburg, Germany, ² Faculty of Medicine and Medical Center, Institute of Medical Biometry and Statistics, University of Freiburg, Freiburg, Germany, ³ Hannover Medical School, Department of Conservative Dentistry, Periodontology and Preventive Dentistry, Hannover, Germany

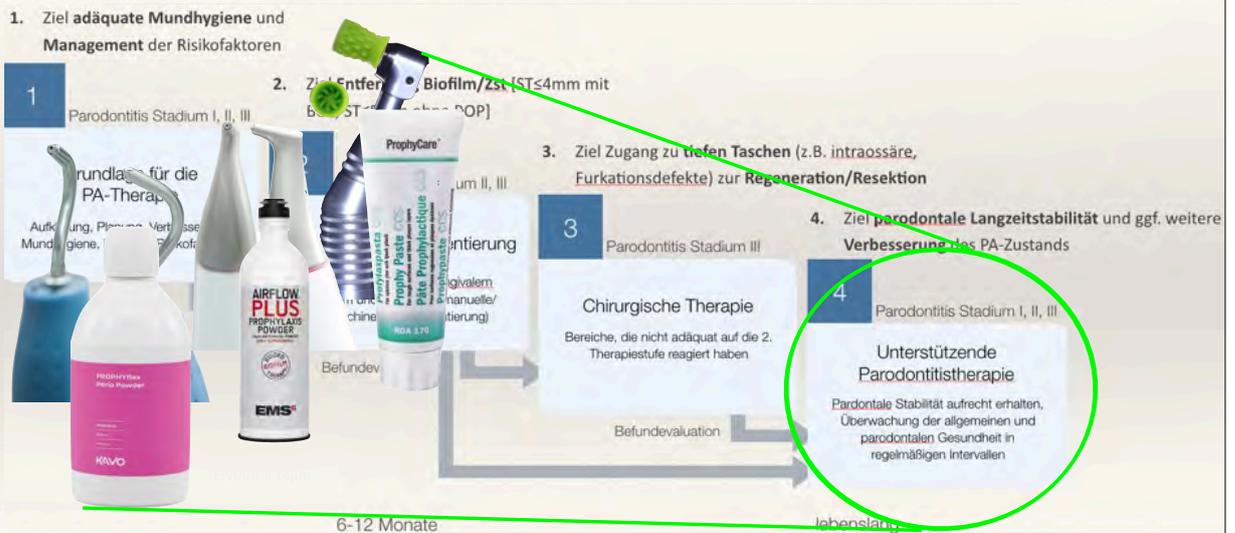


Abstract

This ex vivo study aimed to investigate surface roughness and substance loss after treatment with different professional cleaning methods and to determine whether subsequent polishing with a rubber cup and polishing paste is necessary. Samples that had natural surfaces of human enamel and dentin were prepared (baseline) and treated with either a curette, air-polishing with erythritol, a rubber cup and polishing paste, or a combination thereof (treatment). Subsequently, all samples were immersed in an ultrasonic bath (ultrasonic) to remove residues from the treatment procedures. The surface roughness values sRa and sRz as well as tissue loss were measured profilometrically. Linear regression models were used to compare group differences (roughness and loss) considering the corresponding baseline values. The significance level was set at $p < 0.05$. sRa increased significantly after treatment with curettes or air-polishing with erythritol in both enamel ($p < 0.001$) and dentin ($p < 0.001$) of flat samples. The same effect was observed for sRz in dentin ($p < 0.001$) but not for enamel compared to negative control. Polishing with a rubber cup and paste alone had no significant effect on roughness values. When combined with other treatments, the effect of curettes or air-polishing with erythritol dominated the effect. In enamel, none of the tested methods led to measurable tissue loss. In dentin, air-polishing with erythritol caused ~50% tissue loss compared to the curette. Conclusively, for enamel, treatment effects on roughness were measurable but of limited clinical relevance. For dentin, air-polishing resulted in a smaller but significant roughness increase and less tissue loss compared to the curette. Polishing with a rubber cup and paste did not affect surface roughness. Regarding the clinical application, the use of air-polishing seems to be a less invasive procedure than using a curette; polishing with rubber cup and paste offers no advantage in terms of reducing roughness as a final procedure.

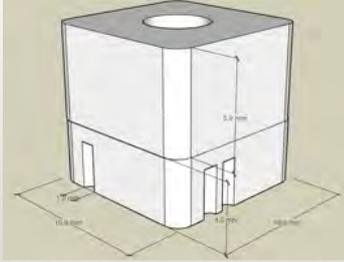
Kruse et al. "Impact of Air-Polishing Using Erythritol on Surface Roughness and Substance Loss in Dental Hard Tissue: An Ex Vivo Study." PLoS One 19, no. 2 (2024): e0286672.

Instrumentenauswahl



Instrumentenauswahl

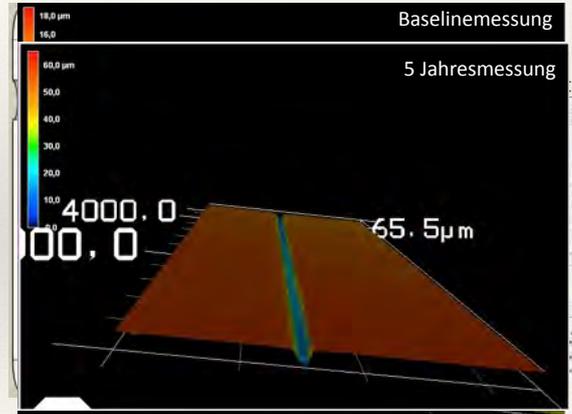
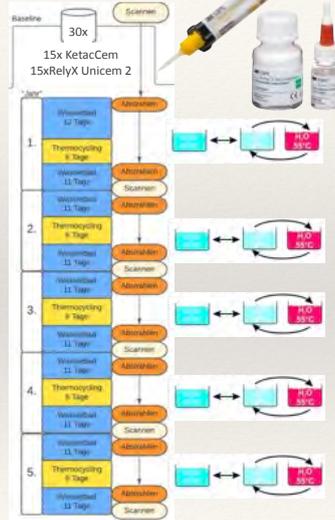
Keramikkronenreplik (Zirkon)



1. Seite 2. Seite 3. Seite

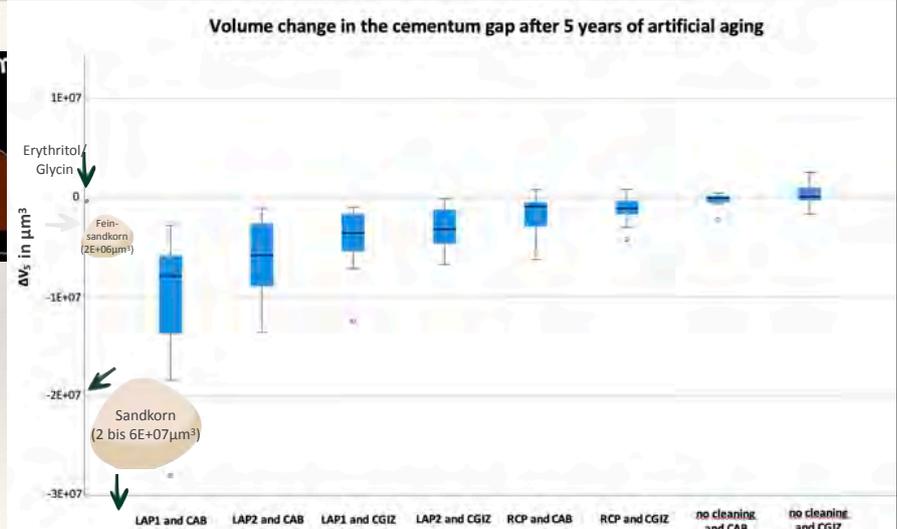
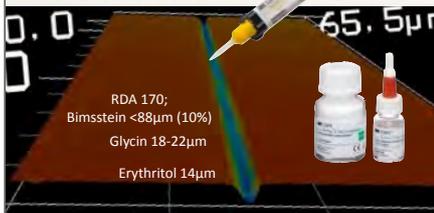


4. Seite: keine Reinigung (nur Alterung)



Cyris, M., ... C. Graetz. "Long-Term Effect of Simulated Five Years Professional Mechanical Biofilm Removal on the Luting Gap of Ceramic Restorations." BMC Oral Health 24, no. 1 (2024): 291.

Instrumentenauswahl



Cyris, M., ... C. Graetz. "Long-Term Effect of Simulated Five Years Professional Mechanical Biofilm Removal on the Luting Gap of Ceramic Restorations." BMC Oral Health 24, no. 1 (2024): 291.

Instrumentenauswahl

1. Ziel **adäquate Mundhygiene** und Management der Risikofaktoren

1 Parodontitis Stadium I, II, III

2. Ziel **Entfernung Biofilm/Zst** [ST \leq 4mm mit BOP, ST \leq 5mm ohne BOP]

2 Parodontitis Stadium II, III

3. Ziel Zugang zu **tiefen Taschen** (z.B. intraossäre, Furkationsdefekte) zur **Regeneration/Resektion**

4. Ziel **parodontale Langzeitstabilität** und ggf. weitere Verbesserung des PA-Zustands



4 Parodontitis Stadium I, II, III
Unterstützende Parodontitis
Parodontale Stabilität aufrecht erhalten, Überwachung der allgemeinen und parodontalen Gesundheit in regelmäßigen Intervallen

6-12 Monate

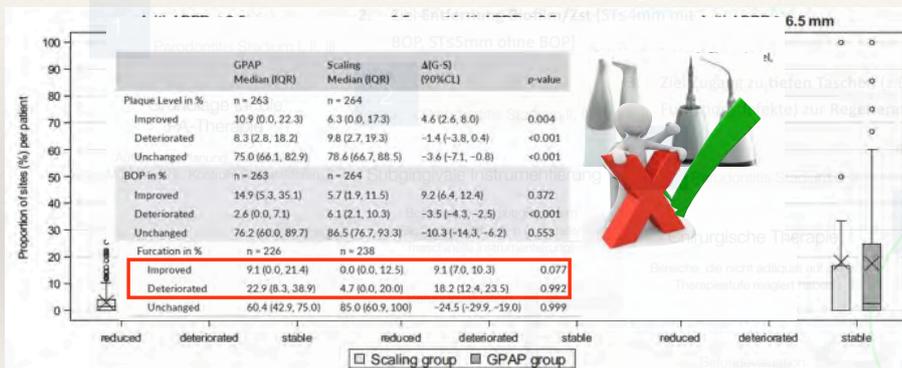
lebenslang

Petersilka et al. (2021) Retrospective analysis of the long-term effect of subgingival air polishing in supportive periodontal therapy. J Clin Periodontol 48, 263-271. doi:10.1111/jcpe.13392.

Instrumentenauswahl

1. Ziel **adäquate Mundhygiene** und Management der Risikofaktoren

Kein Unterschied zw. konventionellen SRP (+Politur) vs. PWS mit niedrig abrasieren Pulvern in der UPT.



Petersilka et al. (2021) Retrospective analysis of the long-term effect of subgingival air polishing in supportive periodontal therapy. J Clin Periodontol 48, 263-271. doi:10.1111/jcpe.13392.



Instrumentenauswahl

Reinigungsfähigkeit des Furkationsbereiches ist komplex - auch in der UPT!



Abb. 3: Relative Reinigungseffektivität (RCE)

Die In-vitro-Daten bestätigen klinische Behandlungsergebnisse mit **überlegener Reinigungsleistung im Furkationsbereich** für konventionelle **Schall- und Ultraschallscaler** (Petersilka et al. 2021), zeigen aber auch deutlich die **erforderliche Behandlungszeit** auf.

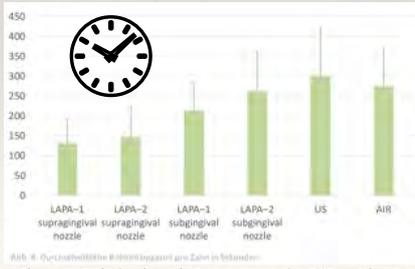


Abb. 4: Durchschn. relative Effektivität (RCE) pro Zahn in Sekunden

Borenus, H., Seidel, M., Schorr, S., Christofzik, D., Graetz, C. Experimentelle Studie zur Effektivität der subgingivalen Entfernung simulierter Plaque im Furkationsbereich. Posterpräsentation DGParo Jahrestagung 2021



Instrumentenauswahl

Reinigungsfähigkeit des Furkationsbereiches ist komplex - gerade in der UPT!

Patient level mean (±SEM) recordings for the clinical parameters at baseline, 6, 9, and 12 months and mean change (Δ) from baseline and 6 months

	Baseline	3 months	6 months	9 months	12 months	Δ ₀₋₆	p	Δ ₆₋₁₂	p	Δ ₀₋₁₂	p
PD	3.2 ± 0.1	2.9 ± 0.1	2.8 ± 0.1	2.7 ± 0.1	2.7 ± 0.1	-0.4 ± 0.0	<0.001	-0.2 ± 0.0	0.094	-0.5 ± 0.1	<0.001
CAI	4.0 ± 0.2	3.7 ± 0.2	3.6 ± 0.2	3.5 ± 0.2	3.4 ± 0.2	-0.6 ± 0.1	<0.001	-0.1 ± 0.1	0.797	-0.6 ± 0.1	<0.001
Plaque	56.1 ± 4.3	45.5 ± 4.3	46.5 ± 4.5	45.6 ± 4.4	45.5 ± 4.4	-10.6 ± 1.0	<0.001	1.0 ± 1.1	0.809	-11.5 ± 4.4	<0.001
BIOP	54.2 ± 4.1	38.4 ± 4.1	35.6 ± 4.1	32.9 ± 4.1	32.9 ± 4.1	-15.8 ± 1.3	<0.001	-2.7 ± 1.3	0.033	-21.9 ± 3.3	<0.001

Probing depth (PD) and clinical attachment level (CAI) in mm

Site furcation level mean (±SEM) recordings for the clinical parameters and gingival crevicular fluid volume at baseline, and at 6 and 12 months and mean change (Δ) from baseline and 6 months

	Baseline	p	6 months	p	12 months	p	Δ ₀₋₆	p	Δ ₆₋₁₂	p	Δ ₀₋₁₂	p
ICI												
Test	4.8 ± 0.4		4.0 ± 0.4		3.7 ± 0.4		-0.9 ± 0.2	<0.001	-0.2 ± 0.2	0.331	-1.0 ± 0.2	<0.001
Control	4.6 ± 0.2		3.5 ± 0.3		3.4 ± 0.3		-1.0 ± 0.2	<0.001	-0.1 ± 0.2	0.534	-1.2 ± 0.2	<0.001
Difference	0.2 ± 0.3	0.468	0.5 ± 0.4	0.192	0.4 ± 0.4	0.232	0.20 ± 0.3	0.454	-0.9 ± 0.3	0.001	0.2 ± 0.3	0.540
CAL												
Test	5.5 ± 0.4		5.2 ± 0.4		5.1 ± 0.4		-0.3 ± 0.3	0.175	-0.1 ± 0.2	0.507	-0.4 ± 0.2	0.119
Control	5.0 ± 0.3		4.4 ± 0.3		4.5 ± 0.3		-0.6 ± 0.1	<0.001	0.1 ± 0.1	0.584	-0.5 ± 0.2	0.004
Difference	0.5 ± 0.4	0.221	0.8 ± 0.4	0.033	0.6 ± 0.4	0.097	0.3 ± 0.2	0.107	-0.2 ± 0.2	0.404	0.2 ± 0.2	0.448

Signifikante Verringerung der Sondierungstiefe unabhängig der Behandlungsart

Nach 6 bzw. 12 Monaten im Mittel signifikanter Gewinn an CAL bei Kontrolle

Ulvik et al. BMC Oral Health 2021, 21:38 | <https://doi.org/10.1186/s12903-021-01307-3>

RESEARCH ARTICLE Open Access

A 12-month randomized controlled trial evaluating erythritol air-polishing versus curette/ultrasonic debridement of mandibular furcations in supportive periodontal therapy

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Background: Due to complex morphology and limited access, the clarity of the furcation area is extremely challenging. Therefore, novel therapeutic approaches need to be tested to potentially overcome debridement limitations. The aim of the present study was to evaluate the clinical and microbiological effects following erythritol air-polishing versus curette/ultrasonic debridement of mandibular furcations in supportive periodontal therapy.

Methods: A 12-month randomized controlled trial evaluating erythritol air-polishing versus curette/ultrasonic debridement of mandibular furcations in supportive periodontal therapy. The primary outcome was the change in probing depth (PD) at baseline, 6, 9, and 12 months. Secondary outcomes were clinical attachment level (CAL), gingival crevicular fluid volume (GCFV), and patient-reported outcomes (ICI, BIOP).

Results: At baseline, the mean PD was 3.2 mm, CAL was 4.0 mm, and GCFV was 4.8 μg/ml. At 12 months, the mean PD was 2.7 mm, CAL was 3.4 mm, and GCFV was 3.7 μg/ml. The mean change in PD from baseline to 12 months was -0.5 mm (p < 0.001). The mean change in CAL from baseline to 12 months was -0.6 mm (p < 0.001). The mean change in GCFV from baseline to 12 months was -1.1 μg/ml (p < 0.001).

Conclusions: Erythritol air-polishing resulted in a significant reduction in PD, CAL, and GCFV compared to curette/ultrasonic debridement. The results suggest that erythritol air-polishing is a promising therapeutic approach for the treatment of mandibular furcations in supportive periodontal therapy.

Keywords: Erythritol air-polishing, Curette/ultrasonic debridement, Mandibular furcations, Supportive periodontal therapy, Probing depth, Clinical attachment level, Gingival crevicular fluid volume, Patient-reported outcomes

Abbreviations: PD, Probing depth; CAL, Clinical attachment level; GCFV, Gingival crevicular fluid volume; ICI, Index of Gingival Inflammation; BIOP, Bleeding on Probing; SEM, Standard Error of the Mean; Δ, Change; p, p-value; *p < 0.05; **p < 0.01; ***p < 0.001.

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Source: <https://dentalwissen.com/schmerzempfindliche-zahne/>



Ulvik et al. A 12-month randomized controlled trial evaluating erythritol air-polishing versus curette/ultrasonic debridement of mandibular furcations in supportive periodontal therapy. BMC Oral Health. 2021

Instrumentenauswahl



Methode (RCT):

- 41 Patienten mittels GBT oder SRP in halbjährlicher UPT; primärer Parameter BOP nach 12 Monaten (sekundär: ST, CAL, FG & Patientenkomfort (VAS in mm))

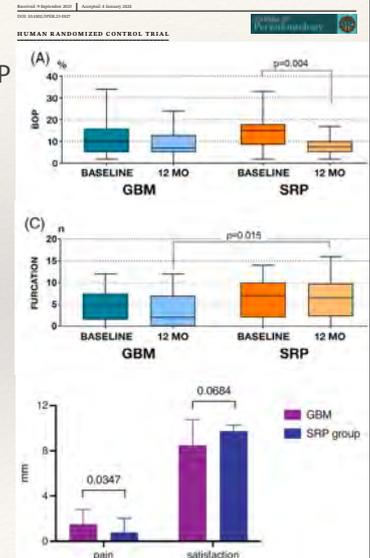
Ergebnisse:

- BOP sank mit SRP von 14,7% auf 7,9% ($p=0,004$) (GBT: 12,2% auf 9,0% ($p=0,191$))
- FG mit GBT signifikant seltener als mit SRP ($p=0,015$)
- Weniger Missempfindungen mit SRP ($p=0,347$), Gesamtzufriedenheit gleich
- Behandlungsdauer ohne statistisch signifikanten Unterschied ($p=0,188$).

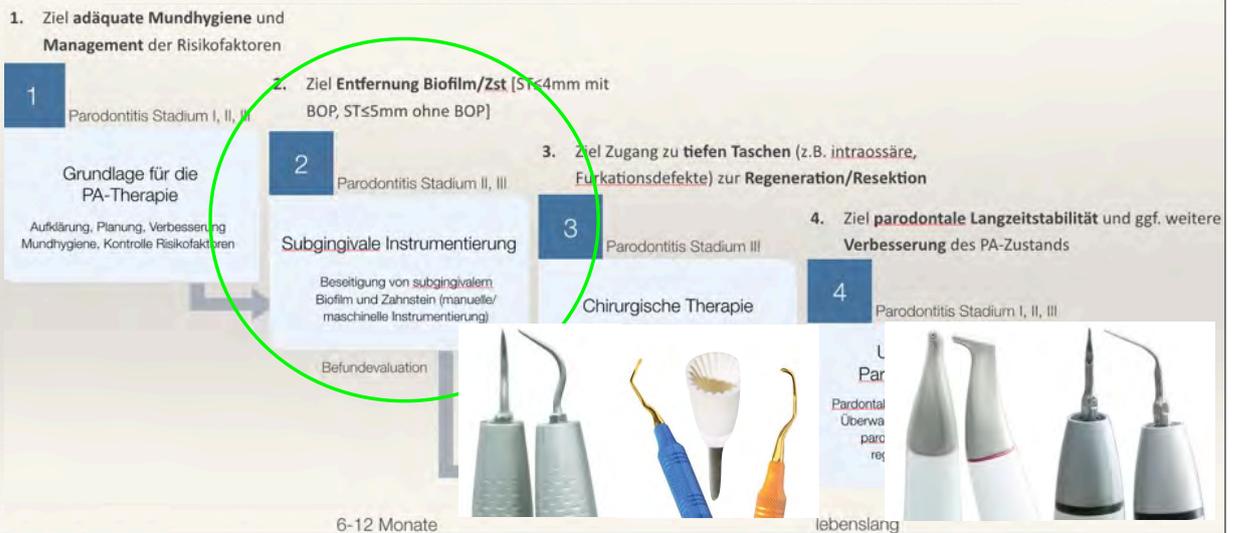
Schlussfolgerung der Autoren:

Bei **regelmäßiger UPT** führte das konventionelle Vorgehen mit SRP zu signifikanter BOP-Reduktion, ansonsten waren GBT & SRP ähnlich wirksam.

Stahli et al. "Clinical Evaluation of a Novel Protocol for Supportive Periodontal Care: A Randomized Controlled Clinical Trial." J Periodontol (2024).



Instrumentenauswahl



Cyris et al. Antinfektiöse Therapie mittels verschiedener Behandlungsprotokolle – Therapieergebnisse aus der curricularen Lehre. unpublished



Instrumentenauswahl



Ergebnisse:

- Nach einer mittleren Beobachtungsdauer von 136±49Tagen beendeten 60 Patienten (Stadium III/IV:n=36/n=24; Grad A/B/C:n=1/n=31/n=28) die Studie und die Behandlungsergebnisse konnten statistisch analysiert werden:

Kein statistisch signifikanter Unterschied hinsichtlich des angestrebten klinischen Behandlungsergebnisses (TST≤4mm ohne BAS: 74,0% (mod. GBT)/ 76,1% (Control); p=0,060) nach AIT mittels beider Protokolle:

- TST-Reduktion an >50% aller erkrankten Zahnflächen (mod. GBT vs. Control: 57,0% vs. 58,7%; p=0,067),
- Anzahl an Stellen mit positivem BAS (T2) bei Control signifikant geringer (mod. GBT vs. Control: 15,9% vs. 14,3%; p=0,037),
- Behandlungsdauer mittels mod. GBT signifikant kürzer (mod. GBT vs. Control: 30,3±28,3min vs. 34,6±24,5min; p<0,001).



...mit mod. GBT ca. 20Minuten im Rahmen der AIT aller Quadranten eingespart.

Cyris et al. Antinfektiöse Therapie mittels verschiedener Behandlungsprotokolle – Therapieergebnisse aus der curricularen Lehre. unpublished

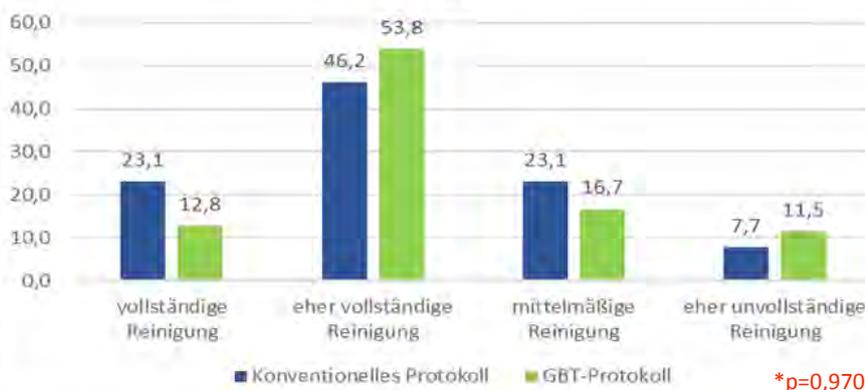


Instrumentenauswahl



Fragebogengestützter Teil: Wie beurteilen Studierenden des 3. klinischen Semesters die Vorgehensweisen?

4. Wie schätzen Sie die Effektivität der Instrumentenkombination ein?



Schlussfolgerungen:

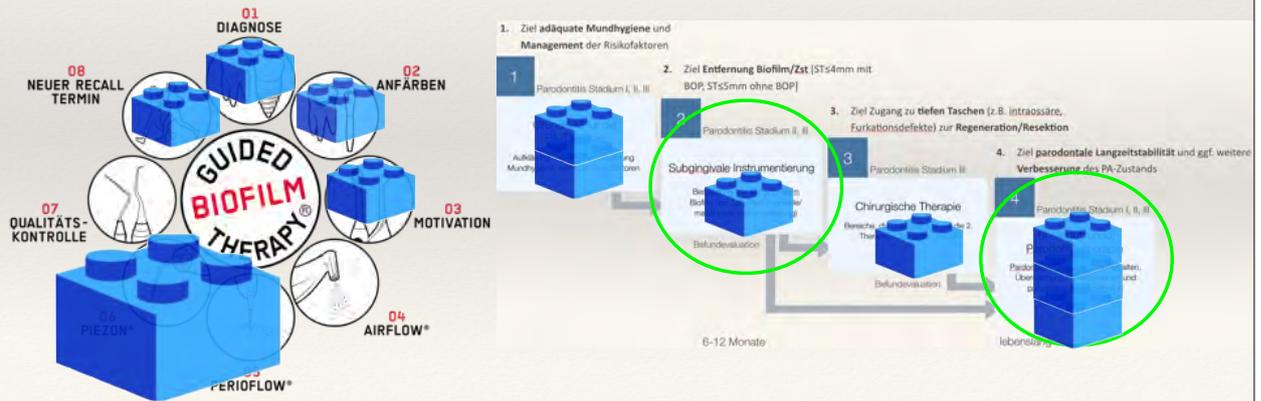
- mod. GBT-Protokoll wurde ggü. konventioneller Instrumentierung **als angenehmer, zeitsparender und leichter** beurteilt
- beide Methoden wurden **als gleich effektiv** beurteilt (cave: Wahrnehmung des Reinigungserfolges durch vorheriges Anfärben bei beiden Methoden)

Cyris et al. Nicht-chirurgische Parodontitistherapie in der curricularen Lehre – Methoden der Wurzeloberflächenbearbeitung im Fokus. Wissenschaftliches Poster, DGZMK Hamburg, 2023



Take home message

Erfolg durch Patientenindividualisierte **risikoorientierte Behandlung** mit Maßnahmen angepasst an Schweregrad/Risikofaktoren



Vielen Dank für Ihre Aufmerksamkeit!



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