

**Mechanische Biofilmentfernung: Was, womit und wie funktioniert's?**

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**Literatur**

- [1] Schweizerische Zahnärzte-Gesellschaft Qualitätsleitlinien in der Zahnmedizin. Bern: Schweizerische Zahnärzte-Gesellschaft, 2000.
- [2] Schätzle M, Faddy MJ, Cullinan MP, Seymour GJ, Lang NP, Bürgin W, Anerud A, Boysen H, Loe H. The clinical course of chronic periodontitis: Predictive factors in periodontal disease. *J Clin Periodontol* 2009; 36:365-371.
- [3] Lang NP, Schätzle MA, Loe H. Gingivitis as a risk factor in periodontal disease. *J Clin Periodontol* 2009; 10:3-8.
- [4] Slots J. Subgingival microflora and periodontal disease. *J Clin Periodontol* 1979; 6:351-382.
- [5] Kocher T, König J, Hansen P, Rühling A. Subgingival polishing compared to scaling with steel curettes: a clinical pilot study. *J Clin Periodontol* 2001; 28:194-199.
- [6] Kopic TJ, O'Leary TJ, Kafrawy AH. Total calculus removal: an attainable objective? *J Periodontol* 1990; 61:16-20.
- [7] Nevins M, Becker W, Kornman K. Proceedings of the world workshop in clinical periodontics. Princeton, New Jersey: American Academy of Periodontology, 1989.
- [8] Low SB, Mott A. Laser technology to manage periodontal disease: a valid concept? *J Evid Based Dent Pract* 2014; 14:154-159.
- [9] Graetz C, Schwendicke F, Plaumann A, Rauschenbach S, Springer C, Kahl M, Sälzer S, Dörfer CE. Subgingival instrumentation to remove simulated plaque in vitro: influence of operators' experience and type of instrument. *Clin Oral Investig* 2015; 19:987-995.
- [10] Rühling A, Schlemme H, König J, Kocher T, Schwahn C, Plagmann HC. Learning root debridement with curettes and power-driven instruments. Part I: a training program to increase effectivity. *J Clin Periodontol* 2002; 20:622-629.
- [11] Leppäniemi J. et al. The influence of PVD coatings on the wear performance of steel dental curettes. *Key Engineering Materials* 2016; 674:289-295.
- [12] Smith EM, Sonstegard DA, Anderson WH, Jr. Carpal tunnel syndrome: contribution of flexor tendons. *Arch Phys Med Rehabil* 1977; 58:379-385.

- [13] McAtamney L, Nigel Corlett E. RULA: a survey method for the investigation of work-related upper limb disorders. *Appl Ergon* 1993; 24:91-99.
- [14] Schmidlin PR, Beuchat M, Busslinger A, Lehmann B, Lutz F. Tooth substance loss resulting from mechanical, sonic and ultrasonic root instrumentation assessed by liquid scintillation. *J Clin Periodontol* 2001; 28:1058-1066.
- [15] Trenter SC, Landini G, Walmsley AD. Effect of loading on the vibration characteristics of thin magnetostrictive ultra-sonic scaler inserts. *J Periodontol* 2003; 74:1308-1315.
- [16] Sanz M, Teughels W. Innovations in non-surgical periodontal therapy: Consensus Report of the Sixth European Workshop on Periodontology. *J Clin Periodontol* 2008; 35:3-7.
- [17] Graetz C, Plaumann A, Bielfeldt J, Tillner A, Salzer S, Dorfer CE. Efficacy versus health risks: An in vitro evaluation of power-driven scalers. *J Indian Soc Periodontol* 2015; 19:18-24.
- [18] Graetz C, Bielfeldt J, Tillner A, Plaumann A, Dörfer C. Spatter contamination in dental practices – how can it be prevented? *Rev Med Chir Soc Med Nat* 2014; 118:1122-1134.
- [19] Harrel SK, Barnes JB, Rivera-Hidalgo F. Aerosol and splatter contamination from the operative site during ultrasonic scaling. *J Am Dent Assoc* 1998; 129:1241-1249.
- [20] Harrel SK. Airborne spread of disease-the implications for dentistry. *J Calif Dent Assoc* 2004; 32:901-906.
- [21] Petersilka G, Stypmann J. Die Verwendung von Ultraschallscalern bei Patienten mit Herzschrittmachern und implantierten Defibrillatoren. Gemeinsame Wissenschaftliche Mitteilung der Deutschen Gesellschaft für Parodontologie (DG PARO) und der Deutschen Gesellschaft für Zahn-, Mund- und Kiefer-heilkunde (DGZMK). *Parodontologie* 2014; 25:325-328.
- [22] Moene R, Decaillet F, Mombelli A. Subgingivaes Airpolishing - Neue Perspektiven für die parodontale Erhaltungsphase. *Schweiz Monatsschr Zahnmed* 2010; 120:891-911.
- [23] Petersilka GJ, Bell M, Haberlein I, Mehl A, Hickel R, Flemmig TF. In vitro evaluation of novel low abrasive air polishing powders. *J Clin Periodontol* 2003; 30:9-13.
- [24] Barnes CM. An In-Depth Look at Air Polishing. *Dimensions of Dental Hygiene* 2010; 8:32, 34-36, 40.
- [25] 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; 14:15-28.

- [26] Muller N, Moene R, Cancela JA, Mombelli A. Subgingival air-polishing with erythritol during periodontal maintenance: randomized clinical trial of twelve months. *J Clin Periodontol* 2014; 41:883-889.
- [27] Sculean A, Bastendorf KD, Becker C, Bush B, Einwag J, Lanoway C, Platzer U, Schmage P, Schoeneich B, Walter C, Wennström JL, Flemmig TF. A paradigm shift in mechanical biofilm management? Subgingival air polishing: a new way to improve mechanical biofilm management in the dental practice. *Quintessence Int* 2013; 44:475-477.
- [28] 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; 83:444-452.
- [29] Sahrman P, Ronay V, Schmidlin PR, Attin T, Paque F. Three-dimensional defect evaluation of air polishing on extracted human roots. *J Periodontol* 2014; 85:1107-1114.
- [30] Bühler J, Schmidli F, Weiger R, Walter C. Analysis of the effects of air polishing powders containing sodium bicarbonate and glycine on human teeth. *Clin Oral Investig* 2015; 19:877-885.
- [31] Petersilka G, Faggion CM, Stratmann U, Gerss J, Ehmke B, Haeberlein I, Flemmig TF. Effect of glycine powder air-polishing on the gingiva. *J Clin Periodontol* 2008; 35:324-332.
- [32] Biazussi BR, Perrotti V, D'Arcangelo C, Elias CN, Bianchini MA, Tumedei M, de Vasconcellos DK. Evaluation of the effect of air polishing with different abrasive powders on the roughness of implant abutment surface: an in vitro study. *J Oral Implantol*. 2019; 45:202-206.
- [33] 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; 1:4-14.
- [34] Neuenfeldt ES, Schmid B, Safi A, Haberlein I. Hypersensitivity Treatment: New Air-Polishing Powder for Occlusion of Dentinal Tubules. *J Dent Res* 2014; 93:1212.
- [35] Hashino E, Kuboniwa M, Alghamdi SA, Yamaguchi M, Yamamoto R, Cho H, Amano A. Erythritol alters micro-structure and metabolomic profiles of biofilm composed of *Streptococcus gordonii* and *Porphyromonas gingivalis*. *Mol Oral Microbiol* 2013; 28:435-451.
- [36] Petersilka G, Panitz W, Weresch R, Eichinger M, Kern U. Luftemphyseme im Rahmen der Parodontitistherapie. Eine Fallserie mit kritischer Literaturübersicht. *Parodontologie* 2010; 21:165-175.
- [37] Hochleitner S. Pulverstrahltechnik in der Parodontologie. *Plaque N Care* 2013; 1:14–17.

- [38] Ren C, McGrath C, Jin L, Zhang C, Yang Y. The effectiveness of low-level laser therapy as an adjunct to non-surgical periodontal treatment: a meta-analysis. *J Periodontal Res.* 2017; 52:8-20.
- [39] Azaripour A, Dittrich S, Van Noorden CJ F, Willershausen B. Efficacy of photodynamic therapy as adjunct treatment of chronic periodontitis: a systematic review and meta-analysis. *Lasers Med Sci* 2018, 33:407-423.
- [40] Graetz C, Bräuning A, Plaumann A, Springer C, Kahl M, Dörfer CE. Antinfektiöse Therapie – Instrumente zur Wurzeloberflächenbearbeitung im Fokus. *Parodontologie* 2016; 27:165–183.