

**Prothetisch orientierte Planung einer Implantatversorgung im zahnlosen Kiefer –
Backward-Planning: Gegenüberstellung von zwei verschiedenen Vorgehensweisen**

- [1] Aparicio C, Perales P, Rangert B: Tilted implants as an alternative to maxillary sinus grafting: a clinical, radiologic, and periotest study. Clin Implant Dent Relat Res 3, 39–49 (2001).
- [2] Assif D, Fenton A, Zarb G, Schmitt A: Comparative accuracy of implant impression procedures. Int J Periodontics Restorative Dent 1992;12 (2):112–21.
- [3] [Basten CH](#): The use of radiopaque templates for predictable implant placement. Quintessence Int 26 (9), 609–612 (1995).
- [4] Bayer G, Kistler F, Kistler S et al.: Versorgungsmöglichkeiten ohne Sinusbodenelevation mit angulierten Implantaten – 6 Jahre Erfahrungen. Implantologie 20, 195–204 (2012).
- [5] Nickenig HJ, Wichmann M, Hamel J, Schlegel KA, & Eitner S: Evaluation of the difference in accuracy between implant placement by virtual planning data and surgical guide templates versus the conventional free-hand method – a combined in vivo-in vitro technique using cone-beam CT (Part II). J Craniomaxillofac Surg 38 (7), 488–493 (2010).
- [6] Ongül D, Gökçen-Röhlig B, Şermet B, Keskin H: A comparative analysis of the accuracy of different direct impression techniques for multiple implants. Australian Dental Journal 2012 Jun;57(2):184–9.
- [7] Papaspyridakos P, Lal K, White GS, Weber HP, Gallucci GO: Effect of splinted and nonsplinted impression techniques on the accuracy of fit of fixed implant prostheses in edentulous patients: a comparative study. The International Journal of Oral & Maxillofacial Implants 26 (6), 1267–1272 (2011).
- [8] Patzelt SB, Bahat O, Reynolds MA et al.: The all-on-four treatment concept: a systematic review. Clin Implant Dent Relat Res 2014 Dec;16(6):836–55. doi: 10.1111/cid.12068. Epub 2013 Apr 5.
- [9] Penarrocha-Oltra D, Candel-Marti E, Ata-Ali J et al.: Rehabilitation of the atrophic maxilla with tilted implants: review of the literature. The Journal of Oral Implantology 2013;39(5):625–632.
- [10] Quran AI FA, Rashdan BA, Zomar AAA, Weiner S: Passive fit and accuracy of three dental implant impression techniques. Quintessence International; 43(2):119–25 (2012).
- [11] Rugani P, Kirnbauer B, Arnetzl GV, et al.: Cone beam computerized tomography: basics for digital planning in oral surgery and implantology. International Journal of Computerized Dentistry 12, 131–145 (2009).

- [1] Akagawa Y, Hosokawa R, Sato Y, Kamayama K. Comparison between freestanding and tooth-connected partially stabilized zirconia implants after two years' function in monkeys: A clinical and histologic study. *J Prosthet Dent* 80, 551–558 (1998).
- [2] [Buser D](#), [Mericske-Stern R](#), [Bernard JP](#), [Behneke A](#), [Behneke N](#), [Hirt HP](#), [Belser UC](#), [Lang NP](#). Long-term evaluation of non-submerged ITI implants. Part 1: 8-year life table analysis of a prospective multi-center study with 2359 implants. *Clin Oral Implants Res* 8, 161–172 (1997).
- [3] Cadosch D, Chan E, Gautschi OP, Meagher J, Zellweger R, Filgueira L. Titanium IV ions induced human osteoclast differentiation and enhanced bone resorption in vitro. *J Biomed Mater Res A* 91, 29–36 (2009).
- [4] Cadosch D, Sutanto M, Chan E, Mhawi A, Gautschi OP, von Katterfeld B, Simmen H-P, Filgueira L. Titanium uptake, induction of RANK-L expression, and enhanced proliferation of human T-lymphocytes. *J Orthop Res* 28, 341–347 (2010).
- [5] [Cortada M](#), [Giner L](#), [Costa S](#), [Gil FJ](#), [Rodríguez D](#), [Planell JA](#). Galvanic corrosion behavior of titanium implants coupled to dental alloys. *J Mater Sci Mater Med* 11, 287–293 (2000).
- [6] Degidi M, Artese L, Scarano A, Perrotti V, Gehrke P, Piattelli A. Inflammatory infiltrate, microvessel density, nitric oxide synthase expression, vascular endothelial growth factor expression, and proliferative activity in peri-implant soft tissues around titanium and zirconium oxide healing caps. *J Periodontol* 77, 73–80 (2006).
- [7] Fischer J, Schott A, Martin S. Surface micro-structuring of zirconia dental implants. *Clin Oral Impl. Res* 27, 162–166 (2016).
- [8] Foti B, Tavitian P, Tosello A, Bonfil JJ, Franquin JC. Polymetallism and osseointegration in oral implantology: pilot study on primate. *J Oral Rehab* 26, 495–502 (1999).
- [9] Gahlert, M, Burtscher D, Grunert I, Kniha H, Steinhauser E. Failure analysis of fractured dental zirconia implants. *Clin Oral Implants Res* 23: 287–293 (2011).
- [10] Gahlert M, Kniha H, Weingart D, Schild S, Gellrich N-C, Bormann K-H. A prospective clinical study to evaluate the performance of zirconium dioxide dental implants in single-tooth gaps. *Clin Oral Impl Res*, doi:10.1111/clr.12598 (2015). [Epub ahead of print].
- [11] Hisbergues M, Vendeville S, Vendeville Ph. Zirconia: Established facts and perspectives for a Biomaterial in Dental Implantology. *J Biomed Mater Res Part B: Appl Biomater* 88B, 519–529 (2009).
- [12] [Holländer J](#), [Lorenz J](#), [Stübinger S](#), [Hölscher W](#), [Heidemann D](#), [Ghanaati S](#), [Sader R](#). Zirconia Dental Implants: Investigation of Clinical Parameters, Patient Satisfaction, and Microbial Contamination. *Int J Oral Maxillofac Implants* 31, 855–864 (2016) doi: 10.11607/jomi.4511.
- [13] Jung RE, Grohmann P, Sailer I, Steinhart Y-N, Féher A, Hämmerle C, Strub JR, Vach K, Kohal R. Evaluation of a one-piece ceramic implant used for single tooth replacement and three-unit fixed partial dentures. A prospective cohort clinical trial. *Clin Oral Implant Res*, (2015). doi: 10.1111/clr.12670. [Epub ahead of print].
- [14] Kappert HF. Orale Galvanismus unter besonderer Berücksichtigung des Amalgams. *Phillip J* 5, 233–240 (1990).
- [15] Kohal RJ, Weg D, Bächle M, Strub JR. Loaded custom made zirconia and titanium implants show similar osseointegration: An animal experiment. *J Periodontol* 75, 1262–1268 (2004).
- [16] [Lambrecht JT](#), [Filippi A](#), [Künzel AR](#), [Schiel HJ](#). Long-term evaluation of submerged and nonsubmerged ITI solid-screw titanium implants: a 10-year life table analysis of 468 implants. *Int J Oral Maxillofac Implants* 18, 826–834 (2003).

- [17] [Pieralli S](#), [Kohal RJ](#), [Jung RE](#), [Vach K](#), [Spies BC](#). Clinical Outcomes of Zirconia Dental Implants: A Systematic Review. J Dent Res pii: 0022034516664043 (2016). [Epub ahead of print].
- [18] Piconi C, Maccauro G. Zirconia as a biomaterial. Biomaterials 20, 1–25 (1999).
- [19] Reclaru L, Meyer JM. [Study of corrosion between a titanium implant and dental alloys](#). J Dent. 1994 Jun 22, 159–168 (1994).
- [20] Rimondini L, Cerroni L, Carrassi A, Torricelli P. Bacterial colonization of zirconia ceramic surfaces: An in vitro and in vivo study. Int J Oral Maxillofac Implants 17, 793–798 (2002).
- [21] Roehling S, Astasov-Frauenhoffer M, Hauser-Gerspach I, Braissant O, Woelfler H, Waltimo T, Kniha H, Gahlert M. [In Vitro Biofilm Formation On Titanium And Zirconia Implant Surfaces](#). J Periodontol. 7 1–16 (2016) [Epub ahead of print].
- [22] Rohr N, Coldea A, Zitzmann NU, Fischer J. Loading capacity of zirconia implant supported hybrid ceramic crowns. Dent Mater 31, e279–e288 (2015).
- [23] Scarano A, Piattelli M, Caputi S, Favero GA, Piattelli A. Bacterial adhesion on commercially pure titanium and zirconium oxide disks; an in vivo human study. J Periodontol 75, 292–296 (2004).
- [24] Schwenter J, Schmidli F, Weiger R, Fischer J. Adhesive bonding to polymer infiltrated ceramic. Dent Mater J 35, 796–802 (2016).
- [25] [Spies BC](#), [Kohal RJ](#), [Balmer M](#), [Vach K](#), [Jung RE](#). Evaluation of zirconia-based posterior single crowns supported by zirconia implants: preliminary results of a prospective multicenter study. Clin Oral Implants Res Mar 29. doi: 10.1111/clr.12842 (2016). [Epub ahead of print].
- [26] Spies BC, Stampf S, Kohal RJ. Evaluation of Zirconia-Based All-Ceramic Single Crowns and Fixed Dental Prosthesis on Zirconia Implants: 5-Year Results of a Prospective Cohort Study. Clin Implant Dent Relat Res 17, 1014–1028 (2015).
- [27] [Tagger Green N](#), [Machtei EE](#), [Horwitz J](#), [Peled M](#). Fracture of dental implants: literature review and report of a case. Implant Dent 11, 137–143 (2002).
- [28] [Taher NM](#), [Al Jabab AS](#). Galvanic corrosion behavior of implant suprastructure dental alloys. Dent Mater 19, 54–59 (2003).
- [29] [Venugopalan R](#), [Lucas LC](#). Evaluation of restorative and implant alloys galvanically coupled to titanium. Dent Mater 14, 165–172 (1998).
- [30] [Weingart D](#), [Steinemann S](#), [Schilli W](#), [Strub JR](#), [Hellerich U](#), [Assenmacher J](#), [Simpson J](#). Titanium deposition in regional lymph nodes after insertion of titanium screw implants in maxillofacial region. Int J Oral Maxillofac Surg 23, 450–452 (1994).
- [31] Wennerberg A, Albrektsson T, Andersson B, Krol JJ. A histomorphometric and removal torque study of screw-shaped titanium implants with three different surface topographies. Clin Oral Impl Res 6, 24–30 (1995).

- [1] Atieh MA, Alsabeeha NH, Faggion CM Jr, Duncan WJ: The frequency of peri-implant diseases: a systematic review and meta-analysis. *J Periodontol* 84, 1586–1598 (2013).
- [2] Costa FO, Takenaka-Martinez S, Cota LO, Ferreira SD, Silva GL, Costa JE: Peri-implant disease in subjects with and without preventive maintenance: a 5-year follow-up. *J Clin Periodontol* 39, 173–181 (2012).
- [3] Hallström H, Lindgren S, Twetman S: Effect of a chlorhexidine-containing brush-on gel on peri-implant mucositis. *Int J Dent Hyg* (2015); doi: 10.1111/idh.12184.
- [4] Jepsen S, Berglundh T et al.: Primary prevention of peri-implantitis: Managing peri-implant mucositis. *J Clin Periodontol* 42 (Suppl 16), 152–157 (2015).
- [5] De Waal YC, Van Winkelhoff AJ, Meijer HJ, Winkel EG: Differences in peri-implant conditions between fully and partially edentulous subjects: a systematic review. *J Clin Periodontol* 40, 266–286 (2013).
- [6] Teughels W, Van Assche N, Sliepen I, Quirynen M: Effect of material characteristics and/or surface topography on biofilm development. *Clin Oral Impl Res* 17 (Suppl 2), 68–81 (2006).
- [7] Lang NP, Berglundh T et al: Periimplant diseases: where are we now? – Consensus of the Seventh European Workshop on Periodontology. *J Clin Periodontol* 38 (Suppl 11), 178–181 (2011).
- [8] Todescan S, Lavigne S, Kelekis-Cholakakis A: Guidance for the maintenance care of dental implants: clinical review. *J Can Dent Assoc* 78, c107 (2012).
- [9] Rühling A, Wulff J, Schwahn C, Kocher T: Surface wear on cervical restorations and adjacent enamel and root cementum caused by stimulated long-term maintenance therapy. *J Clin Periodontol* 31, 293–298 (2004).
- [10] Lendenmann U, David G, Gigerl S, Schwenninger M, Roulet J-F: Oberflächeneffekte von Prophylaxepasten auf Komposite. *Prophylaxe impuls* 15, 71–76 (2011).
- [11] Yazici AR, Antonson DE, Campillo M, Antonson SA, Karaman E, Munoz C: Effect of prophylactic pastes on ceramic surface roughness. *J Dent Res* 91 (Spec Iss A), 1059 (2012).
- [12] Koller M, Arnetzl GV, Arnetzl G: Oberflächenqualität von Vollkeramik nach Pulverstrahlbehandlung – Eine in vitro Pilotstudie. *Stomatologie* 107, 123–126 (2010).
- [13] Besimo CE, Guindy JS, Lewetag D, Meyer J: Marginale Passgenauigkeit und Bakteriendichtigkeit von verschraubten implantatgetragenen Suprastrukturen. *Parodontologie* 3, 217–229 (2000).
- [14] Nekkalapudi S, Mikulski LM, Gurund S, Appachu K, Andreana S: Antimicrobial effect of a chlorhexidine varnish as coating on implant abutments. *IADR Boston 2015, Abstr* 4026.
- [15] Twetman S, Hallgren A, Sköld K, Modéer T: Effect of a chlorhexidine-containing varnish on gingival inflammation. *J Dent Res* 76, 234 (1997).
- [16] Fischer K, Sbicego S: Wissenschaftliche Dokumentation Cervitec Plus. Ivoclar Vivadent AG 2010.
- [17] Fischer K, Sbicego S: Wissenschaftliche Dokumentation Cervitec Gel. Ivoclar Vivadent AG 2010.

ZMK (32)11 2016, S. 758–761

Dr. Kai Höckl

Verschraubte zweiteilige Zirkonoxidimplantate: Neues aus der Praxis

- [1] Hashim D, Cionca N, Courvoisier DS, Mombelli A: [A systematic review of the clinical survival of zirconia implants](#). Clin Oral Investig 20 (7), 1403–1417 (2016).
- [2] Wenneberg A, Ide-Ektessabi A, Hatkamata S: Titanium release from implants prepared with different surface roughness. Clin Oral Implants Res 15, 505–512 (2004).
- [3] Rader CP, Sterner T, Jakob F, Schütze N, Eulert J: Cytokine response of human macrophage-like cells after contact with polyethylene and pure titanium particles. J Arthroplasty 14, 840–848 (1999).
- [4] Dörner T, Haas J, Loddenkemper C, von Baehr V, Salama A: Implant-related inflammatory arthritis. Nature Clin Pract Rheumatol 2, 53–56 (2006).
- [5] [Jank S](#), [Hochgatterer G](#): Success rate of two-piece zirconia implants: a retrospective statistical analysis. Implant Dent 25 (2), 193–198 (2016).

- [1] Apse, P., Zarb, G. A., Schmitt, A., Lewis, D. W.: The longitudinal effectiveness of osseointegrated dental implants. The Toronto Study: peri-implant mucosal response. *Int J Periodontics Restorative Dent* 11(2), 94–111 (1991).
- [2] Beikler, T., Abdeen, G., Schnitzer, S., Sälzer, S., Ehmke, B., Heinecke, A., Flemmig T. F.: Microbiological shifts in intra- and extraoral habitats following mechanical periodontal therapy. *J Clin Periodontol* 31(9), 777–783 (2004).
- [3] Curtis, M. A., Percival, R. S., Devine, D., Darveau, R. P., Coats, S. R., Rangarajan, M., Tarelli, E., Marsh, P. D.: Temperature dependent modulation of *Porphyromonas gingivalis* lipid A structure and interaction with the innate host defenses. *Infect Immun* 79, 1187–1193 (2011).
- [4] Böhnke, N.: Fortgeschrittene Parodontitis – sind Implantate die Erfolg versprechende Lösung? ZMK 23, 560–564 (2007).
- [5] Danser, M. M., Timmermann, M. F., van Winkelhoff, A. J., van der Velden, U.: The effect of periodontal treatment on periodontal bacteria on the oral mucous membranes. *J Periodontol* 67(5), 478–485 (1996).
- [6] Elter, C., Heuer, W., Demling, A., Hannig, M., Heidenblut, T., Bach, F. W., Stiesch-Scholz, M.: Supra- and subgingival biofilm formation on implant abutments with different surface characteristics. *Int J Oral Maxillofac Implants* 23(2), 327–334 (2008).
- [7] Franke, M., Tietmann, C., Bröseler, F.: Periimplantitis – eine neue Herausforderung. Diagnostik, Präventionsstrategien und Nachsorge. *Parodontologie* 24(1), 69–75 (2013).
- [8] Heitz-Mayfield, L. J.: Peri-implant diseases: diagnosis and risk indicators. *J Clin Periodontol* 35(8), 292–304 (2008).
- [9] Heuer, W., Elter, C., Demling, A., Neumann, A., Suerbaum, S., Hannig, M., Heidenblut, T., Bach, F. W., Stiesch-Scholz, M.: Analysis of early biofilm formation on oral implants in man. *J Oral Rehabil* 34(5), 377–382 (2007).
- [10] Klein, H., Palmer, C. E.: Studies on dental caries. VII. Sex differences in dental caries experience of elementary school children. *Public Health Rep* 53, 1685–1690 (1938).
- [11] Lange, D. E., Plagmann, H. C., Eenboom, A., Promesberger, A.: Klinische Bewertungsverfahren zur Objektivierung der Mundhygiene. *Dtsch Zahnärztl Z* 32(1), 44–47 (1977).
- [12] Lee, K. H., Maiden, M. F. J., Tanner, A. C. R., Weber, H. P.: Microbiota of successful osseointegrated Dental Implants. *J Periodontol* 70(2), 131–137 (1999).
- [13] Leonhardt, A., Adolfsson, B., Lekholm, U., Wikstrom, M., Dahlen, G. A.: A longitudinal microbiological study on osseointegrated titanium implants in partially edentulous patients. *Clin Oral Implants Res* 4(3), 113–120 (1993).
- [14] Lindhe, J., Meyle, J.: Peri-implant diseases: Consensus Report of the Sixth European Workshop on Periodontology. *J Clin Periodontol* 35(8), 282–285 (2008).
- [15] Meyle, J.: Mechanische, chemische und lasertechnische Behandlungen für Implantatoberflächen bei marginalen Knochenabbau. *Parodontologie* 24, 151–161 (2013).
- [16] Mombelli, A., van Oosten, M. A., Schurch, E. Jr, Lang, N. P.: The microbiota associated with successful or failing osseointegrated titanium implants. *Oral Microbiol Immunol* 2(4), 145–151 (1987).
- [17] Petit, M. D., van Steenberghe, T. J., Timmerman, M. F., de Graaff, J., van der Velden, U.: Prevalence of periodontitis and suspected periodontal pathogens in families of adult periodontitis patients. *J Clin Periodontol* 21(2), 76–85 (1994).
- [18] Popp, S.: Zur mikrobiologischen Situation bei Patienten vor und nach Implantatversorgung [Dissertation]. Jena: Friedrich-Schiller-Universität (2010).

- [19] Popp, F.: Zur klinisch-mikrobiologischen Situation bei Patienten mit Implantatversorgung – Eine Beobachtungsstudie [Dissertation] Jena: Friedrich-Schiller-Universität (2015).
- [20] Sachdeo, A., Haffajee, A. D., Socransky, S. S.: Biofilms in the edentulous oral cavity. *J Prosthodont* 17(5), 348–356 (2008).
- [21] Saito, K., Takahashi, N., Horiuchi, H., Yamada, T.: Effects of glucose on formation of cytotoxic endproducts and proteolytic activity of *Prevotella intermedia*, *Prevotella nigrescens* and *Porphyromonas gingivalis*. *J Periodontal Res* 36(6), 355–360 (2001).
- [22] Sanderink, R. B. A., Saxer, U. P.: Periimplantitistherapie durch “Biofilm-management”? *Quintessenz* 61(9), 1087–1090 (2010).
- [23] Saxer, U. P., Mühlemann, H. R.: Motivation und Aufklärung. *Schweiz Monatsschr Zahnheilkd* 85(9), 905–919 (1975).
- [24] Scarano, A., Piattelli, M., Caputi, S., Favero, G. A., Piattelli, A.: Bacterial adhesion on commercially pure titanium and zirconium oxide disks: an *in vitro* human study. *J Periodontol* 75(2), 292–296 (2004).
- [25] Seitz, O., Dehner, J-F, Schürmann, C., Landes, C., Frank, S., Schlee, M., Sader, R.: Periimplantitis. *Der MKG-Chirurg* 4, 295–300 (2011).
- [26] Shibli, J. A., Martins, M. C., Lotufo, R. F., Marcantonio, E. Jr.: Microbiologic and radiographic analysis of ligature-induced peri-implantitis with different dental implant surfaces. *Int J Oral Maxillofac Implants* 18(3), 383–390 (2003).
- [27] Sigusch, B. W., Höft, H. D., Rabold, C., Pfister, W.: Profile parodontalpathogener Bakterien bei Implantatpatienten. *ZWR* 115(12), 547–551 (2006).
- [28] Silness, J., Loe, H.: Periodontal disease in pregnancy. II. Correlation between oral hygiene and periodontal condition. *Acta Odontol Scand* 22(2), 121–135 (1964).
- [29] Smalley, J. W., Birss, A. J., Percival, R., Marsh, P. D.: Temperature elevation regulates iron protoporphyrin IX and hemoglobin binding by *Porphyromonas gingivalis*. *Curr Microbiol* 41(5), 328–335 (2000).
- [30] Socransky, S. S., Haffajee, A. D., Cugini, M. A., Smith, C., Kent, R. L. Jr.: Microbial complexes in subgingival plaque. *J Clin Periodontol* 25(2), 134–144 (1998).
- [31] Takahashi, N., Saito, K., Schachtele, C. F., Yamada, T.: Acid tolerance and acid-neutralizing activity of *Porphyromonas gingivalis*, *Prevotella intermedia* and *Fusobacterium nucleatum*. *Oral Microbiol Immunol* 12(6), 323–328 (1997).
- [32] Takahashi, N.: Microbial ecosystem in the oral cavity: metabolic diversity in an ecological niche and its relationship with oral diseases. In: Watanabe M, Takahashi, N., Takada, H., editors. *Interface Oral Health Science. International Congress Series No. 1984*. Amsterdam (Netherlands): Elsevier. p 103–112 (2005).
- [33] Takahashi, N.: Oral microbiom metabolism: from “who are they” to “what are they doing?” *J Dent Res* 94(2), 1628–1637 (2015).
- [34] Tanner, A., Maiden, M. F., Lee, K., Shulman, L. B., Weber, H. P.: Dental implant infections. *Clin Infect Dis* 25(2), 213–217 (1997).
- [35] van Winkelhoff, A. J., Goené, R. J., Benschop, C., Folmer, T.: Early colonization of dental implants by putative periodontal pathogens in partially edentulous patients. *Clin Oral Implants Res* 11(6), 511–520 (2000).
- [36] WHO: Oral Health Surveys. Basic methods. 4th ed. Geneva (1997).

Antibiotika als Zusatz zur Parodontaltherapie: Resultate eines Forschungsprojekts zu Einsatzkriterien, klinischem Nutzen, Einfluss auf die allgemeine Gesundheit und Gefahr einer Resistenzbildung

- [1] Almaghlouth, A., Giannopoulou, C., Cancela, J., Décaillot, F., Cionca, N. & Mombelli, A. (2011). Multiplex analysis of serologic markers in periodontitis and health. *Journal of Dental Research* 90, 2982.
- [2] Almaghlouth, A. A., Cionca, N., Cancela, J. A., Décaillot, F., Courvoisier, D. S., Giannopoulou, C. & Mombelli, A. (2014). Effect of periodontal treatment on peak serum levels of inflammatory markers. *Clinical Oral Investigations* 18, 2113–2121.
- [3] Décaillot, F., Giannopoulou, C., Cionca, N., Almaghlouth, A. & Mombelli, A. (2012). Microbial profiles of patients seeking treatment for periodontitis: Influence of origin, smoking and age? *Schweizerische Monatsschrift für Zahnmedizin* 122, 198–204.
- [4] Giannopoulou, C., Cionca, N., Almaghlouth, A., Cancela, J., Courvoisier, D. S. & Mombelli, A. (2016). Systemic Biomarkers in 2-Phase Antibiotic Periodontal Treatment: A Randomized Clinical Trial. *Journal of Dental Research* 95, 349–355.
- [5] Mombelli, A., Almaghlouth, A., Cionca, N., Courvoisier, D. S. & Giannopoulou, C. (2015). Differential benefits of amoxicillin-metronidazole in different phases of periodontal therapy in a randomized controlled crossover clinical trial. *Journal of Periodontology* 86, 367–375.
- [6] Mombelli, A., Cionca, N. & Almaghlouth, A. (2011). Does adjunctive antimicrobial therapy reduce the perceived need for periodontal surgery? *Periodontology* 2000 55, 205–216.
- [7] Mombelli, A., Cionca, N., Almaghlouth, A., Cherkaoui, A., Schrenzel, J. & Giannopoulou, C. (2016). Effect of Periodontal Therapy With Amoxicillin-Metronidazole on Pharyngeal Carriage of Penicillin- and Erythromycin-Resistant Viridans Streptococci. *Journal of Periodontology* 87, 539–547.

- [1] Quirynen M., De Soete M., Boschmans G. & van Steenberghe D. (2006) Benefit of one-stage full-mouth disinfection” is explained by disinfection and root planing within 24 hours: a randomized controlled trial. *J Clin Periodontol* 33, 639–47.
- [2] Caffesse R. G., Sweeney P. L., Smith B. A. (1986) Scaling and root planing with and without periodontal flap surgery. *J Clin Periodontol* 13, 205–10.
- [3] Rabbani G. M., Ash M. M., Caffesse R. G. (1981) The effectiveness of subgingival scaling and root planing in calculus removal. *J Periodontol* 52, 119–23.
- [4] Nagy R. J., Otomo-Corgel J., Stambaugh R. (1992) The effectiveness of scaling and root planing with curets designed for deep pockets. *J Periodontol* 63, 954–9.
- [5] Greenstein G., Research S. A. T. C. O. T. A. A. O. P. (2005) Position paper: The role of supra- and subgingival irrigation in the treatment of periodontal diseases. *J Periodontol* 76, 2015–27.
- [6] Forabosco A., Galetti R., Spinato S. & Casolari C. (1996) A comparative study of a surgical method and scaling and root planing using the Odontoson. *J Clin Periodontol* 23, 611–4.
- [7] Rosling B., Hellström M. K., Ramberg P. & Lindhe J. (2001) The use of PVP-iodine as an adjunct to non-surgical treatment of chronic periodontitis. *J Clin Periodontol* 28, 1023–31.
- [8] Schreier H., Erdos G., Reimer K. & Fleischer W. (1997) Molecular effects of povidone-iodine on relevant microorganisms: an electron-microscopic and biochemical study. *Dermatology* 195 Suppl 2, 111–6.
- [9] Mayeux P. R. (1997) Pathobiology of lipopolysaccharide. *J Toxicol Environ Health* 51, 415–35.
- [10] Gocke D. J., Ponticas S., Pollack W. (1985) In vitro studies of the killing of clinical isolates by povidone-iodine solutions. *J Hosp Infect* 6 Suppl A, 59–66.
- [11] Fachinformation Betadine. 2007.
- [12] Sahrman P., Puhon M. A., Attin T., Schmidlin P. R. (2010) Systematic review on the effect of rinsing with povidone-iodine during nonsurgical periodontal therapy. *J Periodontal Res* 45, 153–64.
- [13] Sahrman P., Sener B., Ronay V. & Schmidlin P. R. (2012) Clearance of topically-applied PVP-iodine as a solution or gel in periodontal pockets in men. *Acta Odontol Scand* 70, 497–503.
- [14] Sahrman P., Imfeld T., Ronay V. & Schmidlin P. R. (2014) Povidone-iodine gel and solution as adjunct to ultrasonic debridement in nonsurgical periodontitis treatment: an RCT pilot study. *Quintessence Int* 45, 281–90.
- [15] A.J. B. (2006) Allergie auf Iod - Faktum oder Fiktion? *Schweiz Med Forum* 6, 8–10.
- [16] Dewachter P., Mouton-Faivre C. (2015) [Allergy to iodinated drugs and to foods rich in iodine: Iodine is not the allergenic determinant]. *Presse Med* 44, 1136–45.
- [17] Caufield P. W., Allen D. N., Childers N. K. (1987) In vitro susceptibilities of suspected periodontopathic anaerobes as determined by membrane transfer assay. *Antimicrob Agents Chemother* 31, 1989–93.
- [18] Yoneyama A., Shimizu M., Tabata M. & Hikida M. (2006) In vitro short-time killing activity of povidone-iodine (Isodine Gargle) in the presence of oral organic matter. *Dermatology* 212 Suppl 1, 103–8.
- [19] Tonetti M. S., D’Aiuto F., Nibali L. & Deanfield J. (2007) Treatment of periodontitis and endothelial function. *N Engl J Med* 356, 911–20.
- [20] Duvall N. B., Fisher T. D., Hensley D. & Vandewalle K. S. (2013) The comparative efficacy of 0.12% chlorhexidine and amoxicillin to reduce the incidence and magnitude of bacteremia during third molar extractions: a prospective, blind, randomized clinical trial. *Oral Surg Oral Med Oral Pathol Oral Radiol* 115, 752–63.

- [21] Seo S. K., Xiao K., Huang Y. T. & Papanicolaou G. A. (2014) Impact of peri-transplant vancomycin and fluoroquinolone administration on rates of bacteremia in allogeneic hematopoietic stem cell transplant (HSCT) recipients: a 12-year single institution study. *J Infect* 69, 341–51.
- 22. Sahrman P., Manz A., Attin T. & Schmidlin P. R. (2015) Effect of application of a PVP-iodine solution before and during subgingival ultrasonic instrumentation on post-treatment bacteraemia: a randomized single-centre placebo-controlled clinical trial. *J Clin Periodontol* 42, 632–9.