



Update Keramikimplantate

Metallfrei liegt im Trend

Ein Beitrag von Felix Burkhardt, Stefano Pieralli, PD Dr. Benedikt Spies und Prof. Dr. Florian Beuer

Literaturangabe

- [1] Andreiotelli M, Wenz HJ, Kohal RJ (2009). Are ceramic implants a viable alternative to titanium implants? A systematic literature review. *Clinical Oral Implants Research.*, 20, 32–47.
- [2] Blaschke C, Volz U (2006). Soft and hard tissue response to zirconium dioxide dental implants—a clinical study in man. *Neuro Endocrinology Letters.*, 27 Suppl 1, 69–72.
- [3] Brånemark PI, Hansson BO, Adell R, Breine U, Lindström J, Hallén O, Ohman A (1977). Osseointegrated implants in the treatment of the edentulous jaw. Experience from a 10-year period. *Scandinavian Journal of Plastic and Reconstructive Surgery. Supplementum.*, 16, 1–132.
- [4] Cosgarea R, Gasparik C, Dudea D, Culic B, Dannewitz B, Sculean A (2015). Peri-implant soft tissue colour around titanium and zirconia abutments: a prospective randomized controlled clinical study. *Clinical Oral Implants Research.*, 26, 537–544.
- [5] Cutler R, Lindemann J, Ulvensøen J, Lange H (1994). Damage-resistant SrO-doped Ce-TZP/Al₂O₃ composites. *Mater Des.*, 15(3):123–133.
- [6] Kern JS, Kern T, Wolfart S, Heussen N (2016). A systematic review and meta-analysis of removable and fixed implant-supported prostheses in edentulous jaws: post-loading implant loss. *Clinical Oral Implants Research.*, 27, 174–195.
- [7] Kobayashi K, Kuwajima H, Masaki T (1981). Phase change and mechanical properties of ZrO₂-Y₂O₃ solid electrolyte after ageing. *Solid State Ionics.*, 3–4, 489–493.
- [8] Lange FF (1982). Transformation toughening. *Journal of Materials Science.*, 17, 240–246.
- [9] Linkevicius T, Vindasiute E, Puisys A, Linkeviciene L, Maslova N, Puriene A (2013). The influence of the cementation margin position on the amount of undetected cement. A prospective clinical study. *Clinical Oral Implants Research.*, 24, 71–76.
- [10] Mellinghoff J (2006). Erste klinische Ergebnisse zu dentalen Schraubenimplantaten aus Zirkonoxid. *Z Zahnärztl Impl;* 22:288–293
- [11] Nakamura K, Kanno T, Milleding P, Ortengren U (2010). Zirconia as a dental implant abutment material: a systematic review. *The International Journal of Prosthodontics.*, 23, 299–309.
- [12] Osman RB, Swain MV, Atieh M, Ma S, Duncan W (2014). Ceramic implants (Y-TZP): are they a viable alternative to titanium implants for the support of overdentures? A randomized clinical trial. *Clinical Oral Implants Research.*, 25, 1366–1377.
- [13] Palmero P, Fornabaio M, Montanaro L, Reveron H, Esnouf C, Chevalier J (2015). Towards long lasting zirconia-based composites for dental implants. Part I: innovative synthesis, microstructural characterization and in vitro stability. *Biomaterials.*, 50:38–46.
- [14] Pauling L (1960). *The Nature of the Chemical Bond and the Structure of Molecules and Crystals: An Introduction to Modern Structural Chemistry.* Cornell University Press.
- [15] Payer M, Heschl A, Koller M, Arnetzl G, Lorenzoni M, Jakse N (2015). All-ceramic restoration of zirconia two-piece implants—a randomized controlled clinical trial. *Clinical Oral Implants Research.*, 26, 371–376.
- [16] Piconi C, Maccauro G (1999). Zirconia as a ceramic bio-material. *Biomaterials.*, 20, 1–25.
- [17] Pieralli S, Kohal RJ, Jung RE, Vach K, Spies BC (2017). Clinical Outcomes of Zirconia Dental Implants: A Systematic Review. *Journal of Dental Research.*, 96, 38–46.
- [18] Pieralli S, Kohal RJ, Rabel K, von Stein-Launsitz M, Vach K, Spies BC (2018). Clinical outcomes of partial and full-arch all-ceramic implant-supported fixed dental prostheses. A systematic review and meta-analysis. *Clinical Oral Implants Research.*, 29 Suppl 18, 224–236.

- [19] Rabel K, Spies BC, Pieralli S, Vach K, Kohal RJ (2018). The clinical performance of all-ceramic implant-supported single crowns: A systematic review and meta-analysis. *Clinical Oral Implants Research.*, 29 Suppl 18, 196–223.
- [20] Roehling S, Woelfler H, Hicklin S, Kniha H, Gahlert M (2016). A Retrospective Clinical Study with Regard to Survival and Success Rates of Zirconia Implants up to and after 7 Years of Loading. *Clinical Implant Dentistry and Related Research.*, 18, 545–558.
- [21] Roehling S, Schlegel KA, Woelfler H, Gahlert M (2018). Performance and outcome of zirconia dental implants in clinical studies: A metaanalysis. *Clinical Oral Implants Research.*, 29, 135–153.
- [22] Sandhaus S (1968). Tecnica e strumentario dell' impianto C.B.S. (Cristalline Bone Screw). *Informatore Odontostomatologico.*, 4, 19–24.
- [23] Sanz-Martín I, Sanz-Sánchez I, Carrillo de Albornoz A, Figuero E, Sanz M (2018). Effects of modified abutment characteristics on peri-implant soft tissue health: A systematic review and meta-analysis. *Clinical Oral Implants Research.*, 29, 118–129.
- [24] Schulte W, Heimke G (1976). Das Tübinger Sofort-Implantat. *Die Quintessenz.*, 27, 17–23.
- [25] Spies BC, Sauter C, Wolkewitz M, Kohal RJ (2015)a. Alumina reinforced zirconia implants: effects of cyclic loading and abutment modification on fracture resistance. *Dental Materials: Official Publication of the Academy of Dental Materials.*, 31, 262–272.
- [26] Spies BC, Balmer M, Patzelt SBM, Vach K, Kohal RJ (2015)b. Clinical and Patient-reported Outcomes of a Zirconia Oral Implant: Three-year Results of a Prospective Cohort Investigation. *Journal of Dental Research.*, 94, 1385–1391.
- [27] Spies BC, Nold J, Vach K, Kohal RJ (2016)a. Two-piece zirconia oral implants withstand masticatory loads: An investigation in the artificial mouth. *Journal of the Mechanical Behavior of Biomedical Materials.*, 53, 1–10.
- [28] Spies BC, Witkowski S, Butz F, Vach K, Kohal RJ (2016) b. Bi-layered zirconia/fluor-apatite bridges supported by ceramic dental implants: a prospective case series after thirty months of observation. *Clinical Oral Implants Research.*, 27, 1265–1273.
- [29] Spies BC, Maass ME, Adolfsson E, Sergo V, Kiemle T, Berthold C, Gurian E, Fornasaro S, Vach K, Kohal RJ (2017). Long-term stability of an injection-molded zirconia bone-level implant: A testing protocol considering aging kinetics and dynamic fatigue. *Dental Materials: Official Publication of the Academy of Dental Materials.*, 33, 954–965.
- [30] Thoma DS, Ioannidis A, Cathomen E, Hämmerle CHF, Hüsler J, Jung RE (2016). Discoloration of the Peri-implant Mucosa Caused by Zirconia and Titanium Implants. *The International Journal of Periodontics & Restorative Dentistry.*, 36, 39–45.
- [31] Zaugg LK, Zehnder I, Rohr N, Fischer J, Zitzmann NU (2018). The effects of crown venting or pre-cementing of CAD/CAM-constructed all-ceramic crowns luted on YTZ implants on marginal cement excess. *Clinical Oral Implants Research.*, 29, 82–90.