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Neue Erkenntnisse zur Periimplantitis

[1] Moraschini V, Poubel LA, Ferreira VF, Barboza Edos S: Evaluation of survival and success rates of dental implants reported in longitudinal studies with a follow-up period of at least 10 years: a systematic review. *Int J Oral Maxillofac Surg* 44 (3), 377–388 (2015).

[2] Schwarz F, Derks J, Monje A, Wang HL: Peri-implantitis. *J Periodontol* 89 (Suppl 1), S267–S290 (2018).

[3] Derks J, Tomasi C: Peri-implant health and disease. A systematic review of current epidemiology. *J Clin Periodontol* 42 (Suppl 16), S158–171 (2015).

[4] Derks J, Schaller D, Håkansson J, Wennström JL, Tomasi C, Berglundh T: Peri-implantitis – onset and pattern of progression. *J Clin Periodontol* 43 (4), 383–388 (2016).

[5] Schwarz F. et al.: AWMF-Leitlinie „Periimplantäre Infektionen an Zahnimplantaten, Behandlung“ (2016). https://www.awmf.org/uploads/tx_szleitlinien/083-023m_S3_Perimplant%C3%A4re_Infektionen_2016-08_01.pdf

[6] Dabdoub SM, Tsigarida AA, Kumar PS: Patient-specific analysis of periodontal and peri-implant microbiomes. *J Dent Res* 92 (12 Suppl), 168S–175S (2013).

[7] Charalampakis G, Belibasis GN: Microbiome of peri-implant infections: lessons from conventional, molecular and metagenomic analyses. *Virulence* 6 (3), 183–187 (2015).

[8] Al-Ahmad A, Muzafferiy F, Anderson AC, Wölber JP, Ratka-Krüger P, Fretwurst T, Nelson K, Vach K, Hellwig E: Shift of microbial composition of peri-implantitis-associated oral biofilm as revealed by 16S rRNA gene cloning. *J Med Microbiol* 67 (3), 332–340 (2018).

[9] Duarte PM, Serrão CR, Miranda TS, Zanatta LC, Bastos MF, Faveri M, Figueiredo LC, Feres M: Could cytokine levels in the peri-implant crevicular fluid be used to distinguish between healthy implants and implants with peri-implantitis? A systematic review. *J Periodontal Res* 51 (6), 689–698 (2016).

[10] Ghassib I, Chen Z, Zhu J, Wang HL: Use of IL-1 β , IL-6, TNF- α , and MMP-8 biomarkers to distinguish peri-implant diseases: A systematic review and meta-analysis. *Clin Implant Dent Relat Res* 21 (1), 190–207 (2019).

[11] Berglundh T, Armitage G, Araujo MG, Avila-Ortiz G, Blanco J, Camargo PM, Chen S, Cochran D, Derks J, Figuero E, Hämmmerle CHF, Heitz-Mayfield LJA, Huynh-Ba G, Iacono V, Koo KT, Lambert F, McCauley L, Quirynen M, Renvert S, Salvi GE, Schwarz F, Tarnow D, Tomasi C, Wang HL, Zitzmann N: Peri-implant diseases and conditions: Consensus report of workgroup 4 of the 2017 World Workshop on the Classification of Periodontal and Peri-Implant Diseases and Conditions. *J Clin Periodontol* 45 (Suppl 20), S286–S291 (2018).

- [12] Carcuac O, Berglundh T: Composition of human peri-implantitis and periodontitis lesions. *J Dent Res* 93 (11), 1083–1088 (2014).
- [13] Garaicoa-Pazmino C, Fretwurst T, Squarize CH, Berglundh T, Giannobile WV, Larsson L, Castilho RM: Characterization of macrophage polarization in periodontal disease. *J Clin Periodontol* 46 (8), 830–839 (2019).
- [14] Fretwurst T, Garaicoa-Pazmino C, Nelson K, Giannobile WV, Squarize CH, Larsson L, Castilho RM: Characterization of macrophages infiltrating peri-implantitis lesions. *Clin Oral Implants Res* 31 (3), 274–281 (2020).
- [15] Albrektsson T, Dahlin C, Jemt T, Sennerby L, Turri A, Wennerberg A: Is marginal bone loss around oral implants the result of a provoked foreign body reaction? *Clin Implant Dent Relat Res* 16 (2), 155–165 (2014).
- [16] Canullo L, Schlee M, Wagner W, Covani U: Montegrotto Group for the Study of Peri-implant Disease. International Brainstorming Meeting on Etiologic and Risk Factors of Peri-implantitis, Montegrotto (Padua, Italy), August 2014. *Int J Oral Maxillofac Implants* 30 (5), 1093–1104 (2015).
- [17] Fretwurst T, Nelson K, Tarnow DP, Wang HL, Giannobile WV: Is metal particle release associated with peri-implant bone destruction? An emerging concept. *J Dent Res* 97 (3), 259–265 (2018).
- [18] Wilson TG Jr, Valderrama P, Burbano M, Blansett J, Levine R, Kessler H, Rodrigues DC: Foreign bodies associated with peri-implantitis human biopsies. *J Periodontol* 86 (1), 9–15 (2015).
- [19] Pettersson M, Pettersson J, Johansson A, Molin Thorén M: Titanium release in peri-implantitis. *J Oral Rehabil* 46 (2), 179–188 (2019).
- [20] Fretwurst T, Buzanich G, Nahles S, Woelber JP, Riesemeier H, Nelson K: Metal elements in tissue with dental peri-implantitis: a pilot study. *Clin Oral Implants Res* 27 (9), 1178–1186 (2016).
- [21] Blum K, Wiest W, Fella C, Balles A, Dittmann J, Rack A, Maier D, Thomann R, Spies BC, Kohal RJ, Zabler S, Nelson K: Fatigue induced changes in conical implant-abutment connections. *Dent Mater* 31 (11), 1415–1426 (2015).
- [22] Mombelli A, Hashim D, Cionca N: What is the impact of titanium particles and biocorrosion on implant survival and complications? A critical review. *Clin Oral Implants Res* 29 (Suppl 18), 37–53 (2018).
- [23] He X, Reichl FX, Wang Y, Michalke B, Milz S, Yang Y, Stolper P, Lindemaier G, Graw M, Hickel R, Högg C: Analysis of titanium and other metals in human jawbones with dental implants – A case series study. *Dent Mater* 32 (8), 1042–1051 (2016).

- [24] Suárez-López Del Amo F, Garaicoa-Pazmiño C, Fretwurst T, Castilho RM, Squarize CH: Dental implants-associated release of titanium particles: A systematic review. *Clin Oral Implants Res* (2018). doi: 10.1111/cir.13372. Epub ahead of print.
- [25] Daubert D, Pozhitkov A, McLean J, Kotsakis G: Titanium as a modifier of the peri-implant microbiome structure. *Clin Implant Dent Relat Res* 20 (6), 945–953 (2018).
- [26] Cionca N, Hashim D, Mombelli A: Zirconia dental implants: where are we now, and where are we heading? *Periodontol 2000* 73 (1), 241–258 (2017).
- [27] Fretwurst T, Müller J, Larsson L, Bronsert P, Hazard D, Castilho R, Kohal R, Nelson K, Igihaut G: Immunohistological composition of peri-implantitis affected tissue around ceramic implants – A pilot study. *J Periodontol* (2020). *In Press*.
- [28] AWMF-Leitlinie „Implantatprothetische Versorgung des zahnlosen Oberkiefers[AK1]“ (2014).
- [29] Lang NP, Wilson TG, Corbet EF: Biological complications with dental implants: their prevention, diagnosis and treatment. *Clin Oral Implants Res* 11 (Suppl 1), 146–155 (2000).
- [29] Ladwein C, Schmelzeisen R, Nelson K, Fluegge TV, Fretwurst T: Is the presence of keratinized mucosa associated with periimplant tissue health? A clinical cross-sectional analysis. *Int J Implant Dent* 1 (1), 11 (2015).
- [30] Sicilia A, Quirynen M, Fontolliet A, Francisco H, Friedman A, Linkevicius T, Lutz R, Meijer HJ, Rompen E, Rotundo R, Schwarz F, Simion M, Teughels W, Wennerberg A, Zühr O: Long-term stability of peri-implant tissues after bone or soft tissue augmentation. Effect of zirconia or titanium abutments on peri-implant soft tissues. Summary and consensus statements. The 4th EAO Consensus Conference 2015. *Clin Oral Implants Res* 26 (Suppl 11), 148–152 (2015).
- [31] Naert I, Duyck J, Vandamme K: Occlusal overload and bone/implant loss. *Clin Oral Implants Res* 23 (Suppl 6), 95–107 (2012).
- [32] Fretwurst T, Nelson K: Supplement of the Oral Reconstruction Foundation Working Group 1 – Medical and geriatric factors. *Int J Prosthodont* (2020). *In Press*.