

**Ausgabe:** Implantologie Jahrbuch 2016, S. 27-31

**Thema:** Anwendungsbeobachtung einer  $\beta$ -TCP-basierten Knochenersatzmaterialpaste

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## Literatur

1. Al-Sabbagh M, Bhavsar I. Key Local and Surgical Factors Related to Implant Failure. *Dent. Clin. North Am* 2015; 59(1):1–23.
2. Del Fabbro M, Rosano G, Taschieri S: Implant survival rates after maxillary sinus augmentation. In: *Eur. J. Oral Sci* 2008; 116 (6), S. 497–506.
3. Sanz I, Garcia-Gargallo M, Herrera D, Martin C, Figuero E, Sanz M. Surgical protocols for early implant placement in post-extraction sockets: a systematic review. *Clin Oral Implants Res* 2012; 23 Suppl 5:67–79.
4. Horowitz R, Holtzclaw D, Rosen PS. A review on alveolar ridge preservation following tooth extraction. *J Evid Based Dent Pract* 2012; 12(3 Suppl):149–60.
5. Esposito M, Grusovin MG, Polyzos IP, Felice P, Worthington HV. Timing of implant placement after tooth extraction: immediate, immediate-delayed or delayed implants? A Cochrane systematic review. *Eur J Oral Implantol* 2010; 3(3):189–205.
6. AlGhamdi AS, Shibly O, Ciancio SG. Osseous grafting part II: xenografts and alloplasts for periodontal regeneration – a literature review. *J Int Acad Periodontol* 2010; 12:39–44.
7. Pareek A, Torrelles X, Rius J, Magdans U, Gies H. Role of water in the surface relaxation of the fluorapatite (100) surface by grazing incidence x-ray diffraction. *Phys Rev* 2007; B75:035418.
8. Barrère F, van Blitterswijk CA, de Groot K. Bone regeneration: molecular and cellular interactions with calcium phosphate ceramics. *Int J Nanomedicine* 2006; 1:317–332.
9. Damien CJ, Parsons JR. Bone graft and bone graft substitutes: a review of current technology and applications. *J Appl Biomater* 1991; 2:187–208.
10. Jensen OT, Sennerby L. Histologic analysis of clinically retrieved titanium microimplants placed in conjunction with maxillary sinus floor augmentation. *Int J Oral Maxillofac Implants* 1998; 13:513–521.
11. Kessler P, Thorwarth M, Bloch-Birkholz A, Nkenke E, Neukam FW. Harvesting of bone from the iliac crest – comparison of the anterior and posterior sites. *Br J Oral Maxillofac Surg* 2005; 43:51–56.
12. Cornell CN: Osteoconductive materials and their role as substitutes for autogenous bone grafts. In: *Orthop. Clin. North Am* 1999; 30 (4), S. 591–598.
13. Nade S, Armstrong L, McCartney E, Baggaley B: Osteogenesis after bone and bone marrow transplantation. The ability of ceramic materials to sustain osteogenesis from

- transplanted bone marrow cells: preliminary studies. In: *Clin. Orthop. Relat. Res* 1983; (181), S. 255–263.
14. Predecki P, Stephan JE, Auslaender BA, Mooney VL, Kirkland K: Kinetics of bone growth into cylindrical channels in aluminum oxide and titanium. In: *J. Biomed. Mater. Res* 1972; 6(5), S. 375–400.
  15. Martin C, Winet H, Bao J: Acidity near eroding polylactide-polyglycolide in vitro and in vivo in rabbit tibial bone chambers. In: *Biomaterials* 1996; 17(24):2373–80.
  16. Peters F, Reif D: Functional materials for bone regeneration from beta tricalcium phosphat. *Materialwissenschaft und Werkstofftechnik* 2004;35:203–7.
  17. Ghanaati S, Barbeck M, Orth C, Willershausen I, Thimm BW, Hoffmann C, et al. Influence of b-tricalcium phosphate granule size and morphology on tissue reaction in vivo. *Acta Biomater* 2010a; 6(12):4476–87.
  18. Ghanaati S, Orth C, Barbeck M, Willershausen I, Thimm BW, Booms P, et al. Histological and histomorphometrical analysis of a silica matrix embedded nanocrystalline hydroxyapatite bone substitute using the subcutaneous implantation model in Wistar rats. *Biomed Mater* 2010b; 5(3):035005.
  19. Ghanaati SM, Thimm BW, Unger RE, Orth C, Kohler T, Barbeck M et al. Collagen-embedded hydroxylapatite-beta-tricalcium phosphate-silicon dioxide bone substitute granules assist rapid vascularization and promote cell growth. *Biomed Mater* 2010c; 5(2):25004.
  20. Ghanaati S, Barbeck M, Hilbig U, Hoffmann C, Unger RE, Sader RA, et al.: An injectable bone substitute composed of beta-tricalcium phosphate granules, methylcellulose and hyaluronic acid inhibits connective tissue influx into its implantation bed in vivo. In: *Acta Biomater* 2011; 7(11), S. 4018–4028.
  21. Uemura T, Kojima H, Saito T. Osteoinductive substances and materials. In: Wnek GE, Bowlin GL, editors. *Encyclopedia of biomaterials and biomedical engineering*. New York: Dekker; 2004. p. 1190–7.
  22. Hak DJ. The use of osteoconductive bone graft substitutes in orthopaedic trauma. *J Am Acad Orthop Surg* 2007; 15(9):525–36.
  23. Moore WR, Graves SE, Bain GI. Synthetic bone graft substitutes. *ANZ J Surg* 2001; 71(6):354–61.
  24. Weiss P, Layrolle P, Clergeau LP, Enckel B, Pilet P, Amouriq Y, et al. The safety and efficacy of an injectable bone substitute in dental sockets demonstrated in a human clinical trial. *Biomaterials* 2007; 28(22):3295–305.
  25. Fuchs S, Ghanaati S, Orth C, Barbeck M, Kolbe M, Hofmann A, et al. Contribution of outgrowth endothelial cells from human peripheral blood on in vivo vascularization of bone tissue engineered constructs based on starch polycaprolactone scaffolds. *Biomaterials* 2009; 30(4):526–34.