

LITERATUR

Ausgabe: Implantologie Journal 9+10/2017

Thema: Knochenersatzmaterialien und periimplantärer Knochen – Eine Literaturanalyse

Autoren: Univ.-Prof. Dr. med. dent. habil. Wolf-Dieter Grimm, Dr. med. dent. Marco Alexander Vukovic, Dr. med. dent. Ingmar Schau

- 1) Micheelis W, Schiffner U. Vierte Deutsche Mundgesundheitsstudie (DMS IV). Ergebnisse zu oralen Erkrankungsprävalenzen, Risikogruppen und zum zahnärztlichen Versorgungsgrad in Deutschland 2005. In: (IDZ) IdDZ, ed Vol Materialienreihe Band 31 2006; Deutscher Zahnärzte Verlag DÄV, Köln:1-502.
- 2) Strassburg M. 107. Jahrestagung der Deutschen Gesellschaft für Zahn-, Mund- und Kieferheilkunde. Dtsch Zahnärztl Z 1983;38:131.
- 3) DGZMK 2005. Implantologie in der Zahnheilkunde. Wissenschaftliche Stellungnahme. Dtsch Zahnärztl Z 2005;60:915-9416.
- 4) Ellis E, 3rd, McFadden D. The Value of a Diagnostic Setup for full fixed maxillary implant prosthetics. J Oral Maxillofac Surg 2007;65:1764-1771.
- 5) DGZMK 2013. Implantatprothetische Versorgung des zahnlosen Oberkiefers. S3-Leitlinie der DGZMK 2013. online erhältlich: http://www.dgzmk.de/uploads/tx_szdgzmkdocuments/LL_Implantatproth._Versorgg._d._zahnlosen_OK.pdf; AWMF-Registernummer 083-010
- 6) Foitzik, C, Merten HA. Restitutio ad integrum. Vom Knochenersatz zum Knochenaufbau. Balingen: Spitta 1999.
- 7) DGZMK 2013/2. Dentale digitale Volumentomographie. S2k-Leitlinie der DGZMK. Version 9 vom 5. August 2013. online erhältlich: http://www.dgzmk.de/uploads/tx_szdgzmkdocuments/083-005l_S2k_Dentale_Volumentomographie_2013-10.pdf; AWMF-Registernummer 083-005.
- 8) Klein MA, Al-Nawas B. For which clinical indications in dental implantology is the use of bone substitute materials scientifically substantiated? Systematic review, consensus statements and recommendations of the 1st DGI Consensus Conference in September 2010, Aerzen, Germany. Eur J Oral Implantol 2011;4(suppl.):11-29.
- 9) Khoury F. Augmentative Verfahren in der Implantologie. Quintessenz 2009:S.8-11 / S.18-21.

- 10) Mellonig JT, Nevins M. Guided Bone Regeneration of Bone Defects Associated With Implants: An Evidence-Based Outcome Assessment. *Int J Periodontics Restorative Dent* 1995;15:168-185.
- 11) Merten HA, Gruber RM, Nitsch A, Ludwig A, Schliephake H. Evaluation oralchirurgischer Augmentationsmaterialien – Ein tierexperimentell-histomorphologischer Vergleich. *Implantologie* 2003;11(3):215-236.
- 12) DGZMK 2012. Implantologische Indikationen für die Anwendung von Knochenersatzmaterialien. S2k-Leitlinie der DGZMK 2012. online erhältlich: <http://www.dgzmk.de/zahnaerzte/wissenschaft-forschung/leitlinien/details/document/implantologische-indikationen-fuer-die-anwendung-von-knochenersatzmaterialien-s2k.html>; AWMF-Registernummer 083-009.
- 13) Proussaefs P, Lozada J. The Use of Intraorally Harvested Autogenous Block Grafts for Vertical Alveolar Ridge Augmentation: A Human Study. *Int J Periodontics Restorative Dent* 2005;25:351-363.
- 14) Amorfini L, Migliorati M, Signori A, Silvestrini-Biavati A, Benedicenti S. Block Allograft Technique versus Standard Guided Bone Regeneration: A Randomized Clinical Trial. *Clin Implant Dent Relat Res* 2013;15(1):7-14.
- 15) Chiapasco M, Casentini P, Zaniboni M. Bone Augmentation Procedures in Implant Dentistry. *Int J Oral Maxillofac Implants* 2009;24(suppl.):237-259
- 16) Aghaloo TL, Moy PK. Which Hard Tissue Augmentation Techniques Are the Most Successful in Furnishing Bony Support for Implant Placement? *Int J Oral Maxillofac Implants* 2007;22(suppl.):49-70.
- 17) Cordaro L, Boghi F, Mirisola di Torresanto V, Torsello F. Reconstruction of the moderately atrophic edentulous maxilla with mandibular bone grafts. *Clin Oral Impl Res* 2012;24:1214-1221.
- 18) Penarrocha-Diago M, Aloy-Prosper A, Penarrocha-Oltra D, Guirado JL, Penarrocha-Diago M. Localized Lateral Alveolar Ridge Augmentation with Block Bone Grafts: Simultaneous Versus Delayed Implant Placement: A Clinical and Radiographic Retrospective Study. *Int J Oral Maxillofac Implants* 2013;28:846-853.
- 19) Benlidayi ME, Gaggl A, Bürger H, Brandner C, Kurkcu M, Ünlügenç H. Comparative study of the osseointegration of dental implants after different bone augmentation techniques: vascularized femur flap, non-vascularized femur graft and mandibular bone graft. *Clin Oral Impl Res* 2011;22:594-599.
- 20) Mertens C, Decker C, Seeberger R, Hoffmann J, Sander A, Freier K. Early bone resorption after vertical bone augmentation – a comparison of calvarial and iliac grafts. *Clin Oral Impl Res* 2013;24:820-825.
- 21) Boronat A, Carrillo C, Penarrocha M, Penarrocha M. Dental Implants Placed Simultaneously with Bone Grafts in Horizontal Defects: A Clinical Retrospective Study with 37 Patients. *Int J Oral Maxillofac Implants* 2010;25:189-196.

- 22) Khoury F, Hidajat H. Stabilisierung unterschiedlich dimensionierter Knochentransplantate. Eine retrospektive Studie. *Implantologie* 2012;20(3):299-307.
- 23) von Arx T, Buser D. Horizontal ridge augmentation using autogenous block grafts and the guided bone regeneration technique with collagen membranes: a clinical study with 42 patients. *Clin Oral Impl Res* 2006;17:359-366.
- 24) Matsumoto MA, Filho HN, Fracischone CE, Consolaro A. Microscopic Analysis of Reconstructed Maxillary Alveolar Ridges Using Autogenous Bone Grafts from the Chin and Iliac Crest. *Int J Oral Maxillofac Implants* 2002;17:507-516.
- 25) Proussaefs P, Lozada J, Kleinman A, Rohrer MD. The Use of Ramus Autogenous Block Grafts for Vertical Alveolar Ridge Augmentation and Implant Placement: A Pilot Study. *Int J Oral Maxillofac Implants* 2002;17(2):238-248.
- 26) Proussaefs P. Clinical and Histologic Evaluation of the Use of Mandibular Tori As Donor Site for Mandibular Block Autografts: Report of Three Cases. *Int J Periodontics Restorative Dent* 2006;26:43-51.
- 27) Tinti C, Parma-Benfenati S, Polizzi G. Vertical Ridge Augmentation: What is the Limit? *Int J Periodontics Restorative Dent* 1996;16:221-229.
- 28) Tinti C, Parma-Benfenati. Vertical Ridge Augmentation: Surgical Protocol and Retrospective Evaluation of 48 Consecutively Inserted Implants. *Int J Periodontics Restorative Dent* 1998;18:435-443.
- 29) Williamson RA. Rehabilitation of the Resorbed Maxilla and Mandible Using Autogenous Bone Grafts and Osseointegrated Implants. *Int J Oral Maxillofac Implants* 1996;11:476-488.
- 30) Triplett RG, Schow SR. Autologous bone grafts and endosseous implants: complementary techniques. *J Oral Maxillofac Surg* 1996;54(4):486-494.
- 31) Misch CM, Misch CE, Resnik RR, Ismail YH. Reconstruction of Maxillary Alveolar Defects With Mandibular Symphysis Grafts for Dental Implants: A Preliminary Procedural Report. *Int J Oral Maxillofac Implants* 1992;7:360-366.
- 32) Misch CM. Comparison of Intraoral Donor Sites for Onlay Grafting Prior to Implant Placement. *Int J Oral Maxillofac Implants* 1997;12:767-776. Thorwarth M, Schlegel KA, Srour S, Wiltfang J. Knöcherner Reparatur ossärer Defekte. *ZWR* 2004;113(9):271-277.
- 33) Thorwarth M, Schlegel KA, Srour S, Wiltfang J. Knöcherner Reparatur ossärer Defekte. *ZWR* 2004;113(9):271-277.
- 34) Marx RE, Morales MJ. Morbidity from bone harvest in major jaw reconstruction: A randomized trial comparing the lateral anterior and posterior approaches to the ilium. *J Oral Maxillofac Surg* 1988;48:196-203.
- 35) Esposito M, Grusovin MG, Coulthard P, Worthington HV. Wirksamkeit verschiedener Augmentationsmethoden im Hinblick auf Dentalimplantate. Eine systematische Übersichtsarbeit (Cochrane) zu randomisierten kontrollierten klinischen Studien. *Implantologie* 2007;15:9-28.

- 36) Schliephake H, Neukam FW, Wichmann M. Survival analysis of endosseous implants in bone grafts used for the treatment of severe alveolar ridge atrophy. *J Oral Maxillofac Surg* 1997;55(11):1227-1233.
- 37) Garg AK. Knochen - Biologie, Gewinnung, Transplantation in der zahnärztlichen Implantologie. *Quintessenz* 2006:28-33.
- 38) Spin-Neto R, Stavropoulos A, de Freitas RM, Pereira LA, Carlos IZ, Marcantonio E Jr. Immunological aspects of fresh-frozen allogeneic bone grafting for lateral ridge augmentation. *Clin Oral Impl Res* 2013;24(9):963-8.
- 39) Quattlebaum JB, Mellonig JT, Hensel NF. Antigenicity of freeze-dried cortical bone allograft in human periodontal osseous defects. *J Periodontol* 1988;59:394-397.
- 40) Buck BE, Malinin TI, Brown MD. Bone transplantation and human immunodeficiency virus. An estimate of risk of acquired immunodeficiency syndrome (AIDS). *Clin Orthop* 1989;240:129-136.
- 41) Koylass JM, Valderrama P, Mellonig JT. Histologic Evaluation of an Allogenic Mineralized Bone Matrix in the Treatment of Periodontal Osseous Defects. *Int J Periodontics Restorative Dent* 2012;32:405-411.
- 42) Browning ES, Mealey BL, Mellonig JT. Evaluation of a mineralized cancellous bone allograft for the treatment of periodontal osseous defects: 6-month surgical reentry. *Int J Periodontics Restorative Dent* 2009;29:41-47.
- 43) Gapski R, Neiva R, Oh TJ, Wang HL. Histologic Analyses of Human Mineralized Bone Grafting Material in Sinus Elevation Procedures: A Case Series. *Int J Periodontics Restorative Dent* 2006;26:59-69.
- 44) Noubissi SS, Lozada JL, Boyne PJ, Rohrer MD, Clem D, Kim JS, Prasad H. Clinical, Histologic and Histomorphometric Evaluation of Mineralized Solvent-Dehydrated Bone Allograft (Puros) in Human Maxillary Sinus Grafts. *J Oral Implantol* 2005;31(4):171-179.
- 45) Minichetti JC, D'Amore JC, Hong AY, Cleveland DB. Human histologic analysis of mineralized bone allograft (Puros) placement before implant surgery. *J Oral Implantol* 2004;30(2):74-82.
- 46) Waasdorp J, Reynolds MA. Allogeneic Bone Onlay Grafts for Alveolar Ridge Augmentation: A Systematic Review. *Int J Oral Maxillofac Implants* 2010;25:525-531.
- 47) Plöger M, Schau I. *Allogene Knochenblöcke in der zahnärztlichen Implantologie*. Spitta-Verlag 2010.
- 48) Keith JD, Petrungaro P, Leonetti JA, Elwell CW, Zeren KJ, Caputo C, Nikitakis NG, Schöpf C, Warner MM. Clinical and Histologic Evaluation of a Mineralized Block Allograft: Results from the Developmental Period (2001–2004). *Int J Periodontics Restorative Dent* 2006;26:321–327.
- 49) Peleg M, Sawatari Y, Marx RN, Santoro J, Cohen J, Bejarano P, Malinin T. Use of Corticocancellous Allogeneic Bone Blocks for Augmentation of Alveolar Bone Defects. *Int J Oral Maxillofac Implants* 2010;25:153-162.
- 50) Nissan J, Marilena V, Gross O, Mardinger O, Chaushu G. Histomorphometric

- Analysis Following Augmentation of the Anterior Atrophic Maxilla with Cancellous Bone Block Allograft. *Int J Oral Maxillofac Implants* 2012;27:84-89.
- 51) Araújo PP, Oliveira KP, Montenegro SC, Carreiro AF, Silva JS, Germano AR. Block allograft for reconstruction of alveolar bone ridge in implantology: a systematic review. *Implant Dent* 2013;22(3):304-308.
- 52) Esposito M, Grusovin MG, Felice P, Karatzopoulos G, Worthington HV, Coulthard P. The efficacy of horizontal and vertical bone augmentation procedures for dental implants – a Cochrane systematic review. *Eur J Oral Implantol.* 2009;2(3):167-184.
- 53) Fiorellini JP, Nevins ML. Localized ridge augmentation/preservation. A systematic review. *Ann Periodontol* 2003;8(1):321-327.
- 54) Nissan J, Ghelfan O, Mardinger O, Calderon S, Chaushu G. Efficacy of Cancellous Block Allograft Augmentation Prior to Implant Placement in the Posterior Atrophic Mandible. *Clin Implant Dent Relat Res* 2011;13:279-285 (NISSAN 2011/2).
- 55) Nissan J, Gross O, Mardinger O, Ghelfan O, Sacco R, Chaushu G. Post-traumatic implant-supported restoration of the anterior maxillary teeth using cancellous bone block allografts. *J Oral Maxillofac Surg* 2011;69:e513-e518 (NISSAN 2011/3).
- 56) Nissan J, Mardinger O, Strauss M, Peleg M, Sacco R, Chaushu G. Implant-supported restoration of congenitally missing teeth using cancellous bone block-allografts. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2011;111:286-291 (NISSAN 2011/4).
- 57) Schliephake H, Neukam F, Scheller H, Bothe KJ. Local Ridge Augmentation Using Bone Grafts and Osseointegrated Implants in the Rehabilitation of Partial Edentulism: Preliminary Results. *Int J Oral Maxillofac Implants* 1994;9:557-564.
- 58) Chiapasco M, Casentini P, Zaniboni M, Corsi E. Evaluation of peri-implant bone resorption around Straumann Bone Level® implants placed in areas reconstructed with autogenous vertical onlay bone grafts. *Clin Oral Impl Res* 2012;23(9):1012-1021.
- 59) Albrektsson T, Zarb G, Worthington P, Eriksson AR. The long-term efficacy of currently used dental implants: A review and proposed criteria of success. *Int J Oral Maxillofac Implants* 1986;1:11-25.
- 60) Roos J, Sennerby L, Lekholm U, Jemt T, Gröndahl K, Albrektsson T. A Qualitative and Quantitative Method for Evaluating Implant Success: A 5-Year Retrospective Analysis of the Branemark Implant. *Int J Oral Maxillofac Implants* 1997;12:504-514.
- 61) Dasmah A, Thor A, Ekestubbe A, Sennerby L, Rasmusson L. Marginal Bone-Level Alterations at Implants Installed in Block versus Particulate Onlay Bone Grafts Mixed with Platelet-Rich Plasma in Atrophic Maxilla. A Prospective 5-Year Follow-Up Study of 15 Patients. *Clin Implant Dent Relat Res* 2013;15:7-14.

- 62) Firme CT, Vettore MV, Melo M, Vidigal GM. Peri-implant Bone Loss Around Single and Multiple Protheses: Systematic Review and Meta-Analysis. *Int J Oral Maxillofac Implants* 2014;29:79-87.
- 63) Branemark PI, Zarb GA, Albrektsson T. *Gewebeintegrierter Zahnersatz*. Berlin: Quintessenz 1985.
- 64) Bueno Rde B, Adachi P, Castro-Raucci LM, Rosa AL, Nanci A, Oliveira PT. Oxidative nanopatterning of titanium surfaces promotes production and extracellular accumulation of osteopontin. *Braz Dent J* 2011;22:179-184.
- 65) Davies JE. Understanding Peri-Implant Endosseous Healing. *Journal of Dental Education* 2003;67(8):932-949.
- 66) Ivanovski S, Hamlet S, Retzepi M, Wall I, Donos N. Transcriptional profiling of "guided bone regeneration" in a critical-size calvarial defect. *Clin Oral Impl Res* 2011;22:382-389.
- 67) Ivanovski S, Hamlet S, Salvi GE, Huynh-Ba G, Bosshardt DD, Lang NP, Donos N. Transcriptional profiling of osseointegration in humans. *Clin Oral Impl Res* 2011;22:373-381.
- 68) Norton MR. The Influence of Insertion Torque on the Survival of Immediately Placed and Restored Single-Tooth Implants. *Int J Oral Maxillofac Implants* 2011;26:1333-1343.
- 69) Trisi P, Berardi D, Paolantonio M, Spoto G, D'Addona A, Perfetti G. Primary stability, insertion torque, and bone density of conical implants with internal hexagon: is there a relationship? *J Craniofac Surg* 2013;24:841-844.
- 70) Rizkillah N, Fischer S, Kraut RA. Correlation between insertion torque and survival rates in immediately loaded implants in the maxilla: a retrospective study. *Implant Dent* 2013;22:250-254.
- 71) Al-Nawas B, Wagner W, Grötz KA. Insertion Torque and Resonance Frequency Analysis of Dental Implant Systems in an Animal Model with Loaded Implants. *Int J Oral Maxillofac Implants* 2006;21:726-732.
- 72) Raghavendra S, Wood MC, Taylor TD. Early Wound Healing Around Endosseous Implants: A Review of the Literature. *Int J Oral Maxillofac Implants* 2005;20:425-431.
- 73) Simunek A, Kopecka D, Brazda T, Strnad J, Capek L, Slezak R. Development of Implant Stability During Early Healing of Immediate Loaded Implants. *Int J Oral Maxillofac Implants* 2012;27:619-627.
- 74) Bakaeen L, Quinlan P, Schoolfield J, Lang NP, Cochran DL. The Biologic Width Around Titanium Implants: Histometric Analysis of the Implantogingival Junction Around Immediately and Early Loaded Implants. *Int J Periodontics Restorative Dent* 2009;29:297-305.
- 75) Bratu EA, Tandlich M, Shapira L. A rough surface implant neck with microthreads reduces the amount of marginal bone loss: a prospective clinical study. *Clin Oral Impl Res* 2009;20:827-832.
- 76) Cochran DL, Mau LP, Higginbottom FL, Wilson TG, Bosshardt DD, Schoolfield J, Jones AA. Soft and Hard Tissue Histologic Dimensions Around Dental

- Implants in the Canine Restored with Smaller-Diameter Abutments: A Paradigm Shift in Peri-implant Biology. *Int J Oral Maxillofac Implants* 2013;28:494-502.
- 77) Koutouzis T, Neiva R, Nonhoff J, Lundgren T. Placement of Implants with Platform-Switched Morse Taper Connections with the Implant-Abutment Interface at Different Levels in Relation to the Alveolar Crest: A Short-Term (1-Year) Randomized Prospective Controlled Clinical Trial. *Int J Oral Maxillofac Implants* 2013;28:1553-1563.
- 78) Grimm WD, Gassmann G, Kübler J, Engler-Hamm D, Jackowski J. The effect of subcrestal placement of the polished surface of implants on marginal soft and hard tissues: a retrospective clinical study. *Int Poster J Dent Oral Med* 2006;8:Poster 310.
- 79) Albrektsson T, Zarb G, Worthington P, Eriksson AR. The long-term efficiency of currently used dental implants: A review and proposed criteria of success. *Int J Oral Maxillofac Implants* 1986;1:11-25.
- 80) Adell R, Lekholm U, Rockler B, Branemark PI. A 15-year study of osseointegrated implants in the treatment of the edentulous jaw. *Int J Oral Surg* 1981;10:387-416.
- 81) Neukam F. Lebenserwartung von Implantaten und Implantatlager. Wissenschaftliche Stellungnahme der DGZMK. *Dtsch Zahnärztl Z* 2000;55
- 82) Becker W, Becker BE, Hujuel P, Abu Ras Z, Goldstein M, Smidt A. Prospective Clinical Trial Evaluating a New Implant System for Implant Survival, Implant Stability and Radiographic Bone Changes. *Clin Implant Dent Relat Res* 2013;15:15-21.
- 83) Almeida FD, Carvalho AC, Fontes M, Pedrosa A, Costa R, Noletto JW, Almeida Barros Mourao CF. Radiographic Evaluation of Marginal Bone Level Around Internal-Hex Implants with Switched Platform: A Clinical Case Report Series. *Int J Oral Maxillofac Implants* 2011;26:587-592.
- 84) Cammack GV 2nd, Nevins M, Clem DS 3rd, Hatch JP, Mellonig JT. Histologic evaluation of mineralized and demineralized freeze-dried bone allograft for ridge and sinus augmentations. *Int J Periodontics Restorative Dent* 2005;25:231-237.
- 85) Rothamel D, Schwarz F, Herten M, Ferrari D, Mischkowski RA, Sager M, Becker J. Vertical Ridge Augmentation Using Xenogenous Bone Blocks: A Histomorphometric Study in Dogs. *Int J Oral Maxillofac Implants* 2009;24:243-250.
- 86) Gholami G, Najafi B, Mashhadiabbas F, Goetz W, Najafi S. Clinical, histologic and histomorphometric evaluation of pocket preservation using a synthetic nanocrystalline hydroxyapatite in comparison with a bovine xenograft: a randomized clinical trial. *Clin Oral Impl Res* 2012;23:1198-1204.
- 87) Ghanaati S, Barbeck M, Willerhausen I, Thimm B, Stuebinger S, Korzinskas T, Obreja K, Landes C, Kirkpatrick CJ, Sader Ra. Nanocrystalline Hydroxyapatite Bone Substitute Leads to Sufficient Bone Tissue Formation Already after 3

Months: Histological and Histomorphometrical Analysis 3 and 6 Months following Human Sinus Cavity Augmentation. *Clin Oral Implant Dent Relat Res* 2013;15:883-892.

- 88) Bornstein MM, Al-Nawas B, Kuchler U, Tahmaseb A. Consensus Statements and Recommended Clinical Procedures Regarding Contemporary Surgical and Radiographic Techniques in Implant Dentistry. *Int J Oral Maxillofac Implants* 2014;29,Suppl. 78-82.
- 89) Al-Nawas B, Schiegnitz E. Augmentation procedures using bone substitute materials or autogenous bone – a systematic review and meta-analysis. *Eur J Oral Implantol* 2014;7(suppl 2):219-234.
- 90) Jensen SS, Terheyden H. Bone Augmentation Procedures in Localized Defects in the Alveolar Ridge: Clinical Results with Different Bone Grafts and Bone-Substitute Materials. *Int J Oral Maxillofac Implants* 2009;24(suppl.):218-236.
- 91) Al-Nawas B, Kämmerer PW, Morbach T, Ophoven F, Wagner W. Retrospective Clinical Evaluation of an Internal Tube-in-Tube Dental Implant After 4 Years, with Special Emphasis on Peri-Implant Bone Resorption. *Int J Oral Maxillofac Implants* 2011;26:1309-1316.
- 92) Marx RE, Tursun R. A Qualitative and Quantitative Analysis of Autologous Human Multipotent Adult Stem Cells Derived from Three Anatomic Areas by Marrow Aspiration: Tibia, Anterior Ilium, and Posterior Ilium. *Int J Oral Maxillofac Implants* 2013;28:e290-e294.
- 93) de Freitas RM, Susin C, Spin-Neto R, Marcantonio C, Wikesjö UM, Pereira LA, Marcantonio E Jr. Horizontal ridge augmentation of the atrophic anterior maxilla using rhBMP-2/ACS or autogenous bone grafts: a proof-of-concept randomized clinical trial. *J Clin Periodontol* 2013;40:968-975.
- 94) Froum SJ, Wallace S, Cho SC, Khouly I, Rosenberg E, Corby P, Froum S, Bromage T, Schoor R, Norman R, Tarnow DP. Histomorphometric comparison of different concentrations of recombinant human bone morphogenetic protein with allogeneic bone compared to the use of 100% mineralized cancellous bone allograft in the maxillary sinus grafting. *Int J Periodontics Restorative Dent* 2013;33:721-730.
- 95) Arnold WH, Becher S, Dannan A, Widera D, Dittmar T, Jacob M, Mannherz HG, Kaltschmidt B, Kaltschmidt C, Grimm WD. Morphological characterization of periodontium-derived human stem cells. *Ann Anat.* 2010;192(4):215-219.
- 96) imm WD, Dannan A, Becher S, Gassmann G, Arnold W, Varga G, Dittmar T. The Ability of Human Periodontium-Derived Stem Cells to Regenerate Periodontal Tissues: A Preliminary In Vivo Investigation. *Int J Periodontics Restorative Dent* 2011;31:e94-e101.
- 97) Sauerbier S, Giessenhagen B, Gutwerk W, Rauch P, Xavier SP, Oshima T, Nagursky H, GutwaldR, SChmelzeisen R. Bone Marrow Aspirate Concentrate Used with Bovine Bone Mineral to Reconstruct Vertical and Horizontal

Mandibular Defects: Report of Two Techniques. *Int J Oral Maxillofac Implants* 2013;28:e310-e314.

- 98) Widera D, Grimm WD, Moebius JM, Mikenberg I, Piechhaczek C, Gassmann G, Wolff NA, Thévenod F, Kaltschmidt C, Kaltschmidt B. Highly efficient neural differentiation of human somatic stem cells, isolated by minimally invasive periodontal surgery. *Stem Cells Dev* 2007;16(3):447-460.
- 99) Grimm WD, A Dannan, B Giesenhagen, I Schau, G Varga, MA Vukovic, SV Sirak. Translational Research: Palatal-derived Ecto-mesenchymal Stem Cells from Human Palate: A New Hope for Alveolar Bone and Cranio-Facial Bone Reconstruction. *Int J Stem Cells* 2014;7(1):23-29.
- 100) Grimm WD, Plöger M, Schau I, Vukovic MA, Shchetinin EV, Akkalaev AB, Avanesian RA, Sirak SV. Complex, three-dimensional reconstruction of critical size defects following delayed implant placement using stem cell-containing subepithelial connective tissue graft and allogenic human bone blocks for horizontal alveolar bone augmentation: A case report as proof of clinical study principles. *Medical News of North Caucasus* 2014;2:122-127.
- 101) Grimm WD, Plöger M, Schau I, Vukovic MA, Shchetinin EV, Arutunov AV, Sirak SV. Prefabricated 3D allogenic bone block in conjunction with stem cell-containing subepithelial connective tissue graft for horizontal alveolar bone augmentation: a case report as proof of clinical study principles. *Medical News of North Caucasus* 2014;2:169-172.