

Bölüm 14

DENTAL İMPLANTOLOJİDE OTOJEN BLOK KEMİK GREFTLERİ

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Brânemark'ın osseointegrasyonu keşfetmesi ile diş hekimliğinde dental implantlar önemli hale gelmiştir(1). Başlangıçta cerrahi yönlendirmeli olan implantoloji dental implantların osseointegrasyonuna odaklıydı. Kısa bir süre sonra dental implantların, kemik yetersizliğinde bile doğal dişlerin olduğu yere veya yakınına yerleştirilmesi gerektiğini öne süren protetik yönlendirmeli bir aşamaya evrilmiştir.

Son zamanlarda dental implantların başarısının üç faktöre (implant üçgeni) bağlı olduğu ortaya konmuştur. Bu faktörler implantların protetik olarak uygun şekilde yerleştirilmesi, osseointegrasyon için yeterli miktarda kemik varlığı, uygun implant hijyeni ve bakımı için sağlıklı peri-implant yumuşak doku varlığıdır. İmplant üçgeninin herhangi bir bileşeninin eksik olması, implant sağlığından veya sağ kalımından ödün vermek olup genellikle de implant başarısızlığına yol açtığı bildirilmiştir (2).

Diş kaybı, travma, tümör rezeksiyonu, enfeksiyon ve uzun süreli dişsizliğe bağlı olarak alveol kemiğindeki atrofi veya rezorbsiyon varlığı çeşitli kemik ogumentasyon uygulamalarının geliştirilmesine yol açmıştır. İdeal bir kemik grefti osteojenik, osteoindüktif ve osteokondüktif özelliklere sahip olmalı ve aynı zamanda erken rezorpsiyon olmadan kemik oluşumu için uygun bir ortam sağlamalıdır. Cerrah, kemik greftinin avantajlarına ve dezavantajlarına göre seçimini belirler. Otojen kemik grefti, ideal bir greft materyalinin tüm gerekli özelliklerine sahip olduğu için greftleme için “altın standart” olarak kabul edilir(3). Otojen blok greftleme, maksilla ve mandibulada geniş vertikal ve/veya horizontal ogumentasyonlar için kullanılır. Bu kitap bölümünde implant diş hekimliğine kullanılan serbest otojen blok kemik greftlerinin ayrıntılı bir biçimde incelenmesi amaçlanmıştır.

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KAYNAKLAR

1. Branemark P, Hansson B, Adell R, et al. Osseointegrated implants in the treatment of the edentulous jaw. Experience from a 10-year period. *Scand J Plast Reconstr Surg Suppl.* 1977;16:1-132.
2. Tolstunov L. *Vertical Alveolar Ridge Augmentation in Implant Dentistry: A Surgical Manual.* New Jersey: John Wiley & Sons; 2016.
3. Aghaloo T, Felsenfeld A. Principles of repair and grafting of bone and cartilage. In: Bagheri S, Bell R, Khan H (eds.) *Current therapy in oral and maxillofacial surgery.* 1st ed. St Louis: Elsevier; 2012. p. 19-26.
4. Burchardt H. The biology of bone graft repair. *Clin Orthop Relat Res.* 1983(174):28-42.
5. Marx RE. Clinical application of bone biology to mandibular and maxillary reconstruction. *Clin Plast Surg.* 1994;21(3):377-392.
6. Johansson B, Grepe A, Wannfors K, et al. A clinical study of changes in the volume of bone grafts in the atrophic maxilla. *Dentomaxillofac Radiol.* 2001;30(3):157-161. doi:10.1038/sj/dmfr/4600601
7. Chiapasco M, Zaniboni M, Boisco M. Augmentation procedures for the rehabilitation of deficient edentulous ridges with oral implants. *Clin Oral Implants Res.* 2006;17 Suppl 2(S2):136-159. doi:10.1111/j.1600-0501.2006.01357.x
8. Stenderup K, Justesen J, Clausen C, et al. Aging is associated with decreased maximal life span and accelerated senescence of bone marrow stromal cells. *Bone.* 2003;33(6):919-926. doi:10.1016/j.bone.2003.07.005.
9. Draenert FG, Huetzen D, Neff A, et al. Vertical bone augmentation procedures: basics and techniques in dental implantology. *J Biomed Mater Res A.* 2014;102(5):1605-1613. doi:10.1002/jbm.a.34812
10. Urban IA, Nagursky H, Lozada JL, et al. Horizontal ridge augmentation with a collagen membrane and a combination of particulated autogenous bone and anorganic bovine bone-derived mineral: a prospective case series in 25 patients. *Int J Periodontics Restorative Dent.* 2013;33(3):299-307. doi:10.11607/prd.1407
11. Pinholt EM, Solheim E, Talsnes O, et al. Revascularization of calvarial, mandibular, tibial, and iliac bone grafts in rats. *Ann Plast Surg.* 1994;33(2):193-197. doi:10.1097/00000637-199408000-00012
12. Cordaro L, Amade DS, Cordaro M. Clinical results of alveolar ridge augmentation with mandibular block bone grafts in partially edentulous patients prior to implant placement. *Clin Oral Implants Res.* 2002;13(1):103-111. doi:10.1034/j.1600-0501.2002.130113.x
13. Ozaki W, Buchman SR. Volume maintenance of onlay bone grafts in the craniofacial skeleton: micro-architecture versus embryologic origin. *Plast Reconstr Surg.* 1998;102(2):291-299. doi:10.1097/00006534-199808000-00001
14. Dado DV, Izquierdo R. Absorption of onlay bone grafts in immature rabbits: membranous versus enchondral bone and bone struts versus paste. *Ann Plast Surg.* 1989;23(1):39-48. doi:10.1097/00000637-198907000-00008
15. Greenberg AM, Schmelzeisen R. *Craniomaxillofacial reconstructive and corrective bone surgery.* New York: Springer; 2019.
16. Alam A, Nowzari H. Mandibular cortical bone grafts part 1: anatomy, healing process, and influencing factors. *Compend Contin Educ Dent.* 2007;28(4):206-212.
17. Nowzari H, Alam AA. Mandibular cortical bone graft part 2: surgical technique, applications, and morbidity. *Compend Contin Educ Dent.* 2007;28(5):274-280.
18. Cawood J, Stoelinga P. International academy for oral and facial rehabilitation—Consensus Report. *International Journal of Oral Maxillofacial Surgery.* 2006;35(3):195-198.

19. Greenberg JA, Wiltz MJ, Kraut RA. Augmentation of the anterior maxilla with intraoral onlay grafts for implant placement. *Implant Dent.* 2012;21(1):21-24. doi:10.1097/ID.0b013e3182435fd
20. Lindeboom JA, van den Akker HP. A prospective placebo-controlled double-blind trial of antibiotic prophylaxis in intraoral bone grafting procedures: a pilot study. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 2003;96(6):669-672. doi:10.1016/j.tripleo.2003.08.026
21. Acocella A, Bertolai R, Colafranceschi M, et al. Clinical, histological and histomorphometric evaluation of the healing of mandibular ramus bone block grafts for alveolar ridge augmentation before implant placement. *Journal of Cranio-Maxillofacial Surgery.* 2010;38(3):222-230. doi:10.1016/j.jcms.2009.07.004.
22. Montazem A, Valauri DV, St-Hilaire H, et al. The mandibular symphysis as a donor site in maxillofacial bone grafting: a quantitative anatomic study. *Journal of oral maxillofacial surgery.* 2000;58(12):1368-1371.
23. Pikos MA. Mandibular block autografts for alveolar ridge augmentation. *Atlas Oral Maxillofac Surg Clin North Am.* 2005;13(2):91-107. doi:10.1016/j.cxom.2005.05.003
24. Gapski R, Wang HL, Misch CE. Management of incision design in symphysis graft procedures: a review of the literature. *J Oral Implantol.* 2001;27(3):134-142. doi:10.1563/1548-1336(2001)027<0134:MOIDIS>2.3.CO;2
25. von Arx T, Vinzens-Majaniemi T, Burgin W, et al. Changes of periodontal parameters following apical surgery: a prospective clinical study of three incision techniques. *Int Endod J.* 2007;40(12):959-969. doi:10.1111/j.1365-2591.2007.01306.x
26. Raghoobar GM, Meijndert L, Kalk WW, et al. Morbidity of mandibular bone harvesting: a comparative study. *Int J Oral Maxillofac Implants.* 2007;22(3):359-365.
27. Agthong S, Huanmanop T, Chentanez V. Anatomical variations of the supraorbital, infraorbital, and mental foramina related to gender and side. *J Oral Maxillofac Surg.* 2005;63(6):800-804. doi:10.1016/j.joms.2005.02.016
28. De Andrade E, Otomo-Corgel J, Pucher J, et al. The intraosseous course of the mandibular incisive nerve in the mandibular symphysis. *Int J Periodontics Restorative Dent.* 2001;21(6):591-597.
29. Park HD, Min CK, Kwak HH, et al. Topography of the outer mandibular symphyseal region with reference to the autogenous bone graft. *Int J Oral Maxillofac Surg.* 2004;33(8):781-785. doi:10.1016/j.ijom.2004.02.006
30. Froum SJ. *Dental implant complications: etiology, prevention, and treatment.* New Jersey: John Wiley & Sons; 2015.
31. Miller R, Edwards W, Boudet C, et al. Maxillofacial anatomy: the mandibular symphysis. *J Oral Implantol.* 2011;37(6):745-753. doi:10.1563/AIID-JOI-D-10-00136
32. Silva FM, Cortez AL, Moreira RW, et al. Complications of intraoral donor site for bone grafting prior to implant placement. *Implant Dent.* 2006;15(4):420-426. doi:10.1097/01.id.0000246225.51298.67
33. Caldwell S. Bone Grafting Complications. In: Misch C, Resnik R (eds.) *Misch's Avoiding Complications in Oral Implantology.* St. Louis: Elsevier; 2018. p. 440-498.
34. Cotter CJ, Maher A, Gallagher C, et al. Mandibular lower border: donor site of choice for alveolar grafting. *Br J Oral Maxillofac Surg.* 2002;40(5):429-432.
35. Capelli M. Autogenous bone graft from the mandibular ramus: a technique for bone augmentation. *Int J Periodontics Restorative Dent.* 2003;23(3):277-285.
36. Khoury F, Hanser T. Mandibular bone block harvesting from the retromolar region: a 10-year prospective clinical study. *Int J Oral Maxillofac Implants.* 2015;30(3):688-697. doi:10.11607/jomi.4117

37. Khoury F, Khoury C. Mandibular bone block grafts: diagnosis, instrumentation, harvesting techniques and surgical procedures. In: F Khoury HA, P Missika editor. *Bone Augmentation in Implant Dentistry*. Chicago: Quintessence 2007. p. 115-212.
38. Misch CM. Use of the mandibular ramus as a donor site for onlay bone grafting. *Journal of Oral Implantology*. 2000;26(1):42-49. doi:10.1563/1548-1336(2000)026<0042:UOTMRA>2.3.CO;2.
39. Misch CM. The harvest of ramus bone in conjunction with third molar removal for onlay grafting before placement of dental implants. *Journal of oral maxillofacial surgery*. 1999;57(11):1376-1379.
40. Misch CE. Maxillary sinus augmentation for endosteal implants: organized alternative treatment plans. *Int J Oral Implantol*. 1987;4(2):49-58.
41. De Riu G, Meloni MS, Pisano M, et al. Mandibular coronoid process grafting for alveolar ridge defects. *Oral Surg Oral Med Oral Pathol Oral Radiol*. 2012;114(4):430-436. doi:10.1016/j.oooo.2011.11.031
42. Sakkas A, Schramm A, Karsten W, et al. A clinical study of the outcomes and complications associated with zygomatic buttress block bone graft for limited preimplant augmentation procedures. *J Craniomaxillofac Surg*. 2016;44(3):249-256. doi:10.1016/j.jcms.2015.12.003
43. Gellrich NC, Held U, Schoen R, et al. Alveolar zygomatic buttress: A new donor site for limited preimplant augmentation procedures. *J Oral Maxillofac Surg*. 2007;65(2):275-280. doi:10.1016/j.joms.2005.11.081
44. Solaiman MM, EL Mahallawy AS, Hassan NE. Evaluation of the zygomatic buttress as a donor site for ridge augmentation prior to implant insertion in the esthetic zone. *J Alexandria Dental Journal*. 2018;43(1):48-54.
45. Herford AS, Nguyen K. Complex bone augmentation in alveolar ridge defects. *Oral Maxillofac Surg Clin North Am*. 2015;27(2):227-244. doi:10.1016/j.coms.2015.01.003
46. Nguyen TTH, Eo MY, Kuk TS, et al. Rehabilitation of atrophic jaw using iliac onlay bone graft combined with dental implants. *International Journal of Implant Dentistry*. 2019;5(1):1-11.
47. Nkenke E, Weisbach V, Winckler E, et al. Morbidity of harvesting of bone grafts from the iliac crest for preprosthetic augmentation procedures: a prospective study. *Int J Oral Maxillofac Surg*. 2004;33(2):157-163. doi:10.1054/ijom.2003.0465
48. Stellingsma K, Raghoobar GM, Visser A, et al. The extremely resorbed mandible, 10-year results of a randomized controlled trial on 3 treatment strategies. *Clin Oral Implants Res*. 2014;25(8):926-932. doi:10.1111/clr.12184
49. Tayapongsak P, Wimsatt JA, LaBanc JP, et al. Morbidity from anterior ilium bone harvest. A comparative study of lateral versus medial surgical approach. *Oral Surg Oral Med Oral Pathol*. 1994;78(3):296-300. doi:10.1016/0030-4220(94)90057-4
50. Cricchio G, Lundgren S. Donor site morbidity in two different approaches to anterior iliac crest bone harvesting. *Clin Implant Dent Relat Res*. 2003;5(3):161-169. doi:10.1111/j.1708-8208.2003.tb00198.x
51. Zijderveld SA, ten Bruggenkate CM, van Den Bergh JP, et al. Fractures of the iliac crest after split-thickness bone grafting for preprosthetic surgery: report of 3 cases and review of the literature. *J Oral Maxillofac Surg*. 2004;62(7):781-786. doi:10.1016/j.joms.2003.12.018
52. Zouhary KJ. Bone graft harvesting from distant sites: concepts and techniques. *Oral Maxillofac Surg Clin North Am*. 2010;22(3):301-316, v. doi:10.1016/j.coms.2010.04.007
53. Coulthard P, Oliver R, Khan Afzadi KA, et al. The efficacy of local anaesthetic for pain after iliac bone harvesting: a randomised controlled trial. *Int J Surg*. 2008;6(1):57-63. doi:10.1016/j.ijsu.2007.07.002
54. Almainan M, Al-Bargi HH, Manson P. Complication of anterior iliac bone graft harvesting in 372 adult patients from May 2006 to May 2011 and a literature review. *Craniomaxillofac Trauma Reconstr*. 2013;6(4):257-265. doi:10.1055/s-0033-1357510

55. Caccamese JF, Jr., Ruiz RL, Costello BJ. Costochondral rib grafting. *Atlas Oral Maxillofac Surg Clin North Am.* 2005;13(2):139-149. doi:10.1016/j.cxom.2005.05.004
56. Tessier P, Kawamoto H, Matthews D, et al. Taking long rib grafts for facial reconstruction-tools and techniques: III. A 2900-case experience in maxillofacial and craniofacial surgery. *J Plastic reconstructive surgery.* 2005;116(5):38S-46S.
57. Kline Jr RM, Wolfe SA. Complications associated with the harvesting of cranial bone grafts. *J Plastic reconstructive surgery.* 1995;95(1):5-13; discussion 14-20.
58. Ruiz RL, Turvey TA, Costello BJ, et al. Cranial bone grafts: craniomaxillofacial applications and harvesting techniques. *Atlas Oral Maxillofac Surg Clin North Am.* 2005;13(2):127-137. doi:10.1016/j.cxom.2005.07.002
59. Gordh M, Alberius P. Some basic factors essential to autogeneic nonvascularized onlay bone grafting to the craniofacial skeleton. *Scand J Plast Reconstr Surg Hand Surg.* 1999;33(2):129-146.
60. Moreira-Gonzalez A, Papay FE, Zins JE. Calvarial thickness and its relation to cranial bone harvest. *Plast Reconstr Surg.* 2006;117(6):1964-1971. doi:10.1097/01.prs.0000209933.78532.a7
61. Frodel JL, Jr., Marentette LJ, Quatela VC, et al. Calvarial bone graft harvest. Techniques, considerations, and morbidity. *Arch Otolaryngol Head Neck Surg.* 1993;119(1):17-23. doi:10.1001/archotol.1993.01880130019002
62. Flood L. *Advanced Craniomaxillofacial Surgery: Tumor, Corrective Bone Surgery and Trauma* Ehrenfeld M, Futran N, Manson P, Prein J, editors: Thieme; 2020. 1-1 p.
63. Tessier P, Kawamoto H, Posnick J, et al. Complications of harvesting autogenous bone grafts: a group experience of 20,000 cases. *Plast Reconstr Surg.* 2005;116(5 Suppl):72S-73S. doi:10.1097/01.prs.0000173841.59063.7e