

Summary

Guided bone regeneration (GBR) is a reconstructive procedure of alveolar ridge using membranes. This procedure is indicated when there is no sufficient bone for implantation, or in the case of optimal implant installation for esthetic or functional needs. GBR can be performed before implant placement, when there is not enough bone for initial stability of implants and less predictable outcomes (staged approach), or performed simultaneously with implantation (combined approach). GBR techniques have been used for vertical and horizontal ridge augmentations with acceptable results.

In this study, 12 patients were included (12 males patients) who had missing maxillary and mandibular anterior and premolar teeth. Patients were divided into two groups A&B. The implants were delayed loaded after insertion and patients were subjected for observation period of six month during which a series of radiographic pictures , probing depth and bleeding index were taken. The crestal bone height was measured at mesial and distal side of the implants.

The results had shown that GBR technique of implant had shown to be reliable methods if proper selection of the patient and proper surgical procedure had been done.

Conclusion

1. Presently available data demonstrates GBR therapy to be a predictable and successful procedure to be augmented bone in a horizontal or vertical direction at sites exhibiting insufficient bone volume for implant placement under standard conditions among the techniques introduced for vertical ridge augmentation GBR is a successful technique, although distraction osteogenesis allows for vertical bone augmentation than other techniques. For horizontal ridge augmentation resorbable membrane has successful and predictable results.
2. The survival rate obtained through the GBR technique utilized in this study is conditioned by a series of important factors first of all the careful selection of the patients, excellent primary stability, selection of the implant (length, diameter and surface treatment) and a traumatic surgery, proper fixation of GBR membrane by bone tacks or screws.
3. Proper patient selection with good motivation, free of any systemic diseases, parafunctional habits and adequate bone height increase the success rate.

Recommendations

It is recommended to use GBR with fixation to achieved strong bone anchorage, further investigation (histomorphometric) and long-term evaluation are certainly needed to confirm the encouraging results of this clinical study.

It is recommended to use other parameters for assessment of implant success and stability by using RFA (resonance frequency analysis) the measurements results are used for making a significantly stronger bone anchorage implants.

Reference

1. **Ring ME:** A thousand years of dental implants: A definitive history- Part 1, *Compend Contin Educ Dent* 16: 1060 - 1069, 1995.
2. **Diskell TD:** History of implants, *CDA J* 15: 16 - 25, 1987.
3. **Luckey HA, Kubli F Jr:** Summary. In Luckey HA, Kubli F Jr, editors: *Titanium alloys in surgical implants*, Philadelphia, 1983, American Society for Testing and Materials, pp 283 - 290.
4. **Brånemark P-I:** Introduction to osseointegration. In Branemark PI, Zarb GA , Albrektsson T , editors: *Tissue-integrated prostheses, Osseointegration in clinical dentistry* , Chicago , 1985 , Quintessence Publishing Co, Inc, pp 11 - 76 .
5. **BannonBP , Mild EE :** Titanium alloys for biomaterial application: An overview . In Luckey HA, Kubli F Jr, editors: *Titanium alloys in surgical implants* , Philadelphia , 1983 , American Society for Testing and Materials , pp 7 - 15 .
6. **Anh, M-R; An K-A, Choi J-H, Sohn D-S (2004).** "Immediate loading with mini dental implants in the fully edentulous mandible". *Implant Dent* 13: 367–372.PMID 15591999.
7. Four Linkow textbooks online
8. **Annali di Stomatologia - Su alcunicasi** particolarmenteinteressanti di impiantoendosseio con viteautofilettante - Vol XV - Aprile 1966.

9. **US patent** , Stevens, Irving J.; Alexander, Jerry, "Bone Implant", issued 1971-05-25.
10. **Quirynen M, Van Assche N, Botticelli D, Berglundh T (2007)**. "How does the timing of implant placement to extraction affect outcome?". *The International Journal of Oral & Maxillofacial Implants* **22 Suppl**: 203–23. PMID 18437797.
11. **Gahlert M, Röhling S, Wieland M, Sprecher CM, Kniha H, Milz S** (November 2009). "Osseointegration of zirconia and titanium dental implants: a histological and histomorphometrical study in the maxilla of pigs". *Clinical Oral Implants Research* **20**(11): 1247–53.
12. **Klokkevold, PR, Jovanovic, SA**: *Advanced Implant Surgery and Bone Grafting Techniques*. In Newman, Takei, Carranza, editors: *Carranza's Clinical Periodontology*, 9th Edition. Philadelphia: W.B. Saunders Co. 2002. page 907-8.
13. **Bone Grafts**: No Longer Just a Chip Off the Ol' Hip". <http://www.spineuniverse.com/displayarticle.php/article1766.html>.
14. "Bone Graft Alternatives" (PDF). http://www.spine.org/Documents/bone_grafts_2006.pdf. Retrieved 18 January 2009.
15. Bone Allografts
16. **Miller N, Penaud J, Foliguet B, Membre H, Ambrosini P, Plombas M** (December 1996). "Resorption rates of 2 commercially available bioresorbable membranes. A histomorphometric study in a rabbit model". *J. Clin. Periodontol.* **23** (12): 1051–9. PMID8997647.

17. **Gottlow J, Nyman S, Karring T, Lindhe J** (September 1984). "New attachment formation as the result of controlled tissue regeneration". *J. Clin. Periodontol.* **11**: 494–503. PMID6384274.
18. **Juodzbaly G, Raustia AM, Kubilius R** (October 2007). "A 5-year follow-up study on one-stage implants inserted concomitantly with localized alveolar ridge augmentation". *J Oral Rehabil* **34**: 781–9. doi:10.1111/j.1365-2842.2006.01679.x. PMID17824891.
19. **Perry R. Klokkevold; Newman, Michael C.; Henry H. Takei** (2006). *Carranza's Clinical Periodontology*. Philadelphia: Saunders. ISBN1-4160-2400-X.
20. **Duskova M, Leamerova E, Sosna B, Gojis O** (November 2006). "Guided tissue regeneration, barrier membranes and reconstruction of the cleft maxillary alveolus". *J Craniofac Surg* **17**: 1153–60. doi:10.1097/01.scs.0000236435.90097.7b. PMID17119421.
21. **Wang HL, Boyapati L** (March 2006). ""PASS" principles for predictable bone regeneration". *Implant Dent* **15**: 8–17. doi:10.1097/01.id.0000204762.39826.0f. PMID16569956.
22. **Adell, R., Lekholm, U., Rockler, B. & Brinemark, P-I.** (1981)
23. **Lekholm, U. & Zarb, G. A.** (1985) Osseointegration in clinical dentistry. In Brinemark, P-I., Zarb, G. A. & Albrektson, T.(eds): Patient selection and preparation, p. 199. Chicago: Quintessence Publ Co.
24. **Ofer et al.** 2005

25. **Nevins et al.** 2006
26. **Rudy et al.:** Intraosseous anchorage of Dental Prosthesis an early 20th century contribution. *Compendium* 29:2-3;2008.
27. **Marion Sims and his silver suture.** *N Engl J Med* .233:631-633;1945.
28. **Thomas HO.** *Cases in Surgery Illustrative of a New Method of Applying the Wire Ligature in Compound Fractures of the lower jaw .* Liverpool, England : Thomas Dobb and Co; 1875.
29. **Zierold AA.** Reaction of bone to various metals . *Arch Surg.*9:365; 1924.
30. **Venable CS, Stuck WG, Beach A.** The effects on bone of the presence of metals based upon electrolysis: an experimental study. *Ann Surg.* 1937;105:917-938.
31. **Venable CS, Stuck WG.** Electrolysis controlling factor in use of metals in treating fractures. *JAMA.* 1938;111:1349-1352.
32. **Leventhal GS.** Titanium, a metal for surgery. *J Bone Joint Surg Am.* 1951;33-A:473-474.
33. **Wataha J:** Materials for Endosseous Dental Implants *J Oral Rehabil*,23: 79-90,1996.
34. **Wilke A, Jager M, Endres S, Landgraff M, Kiessling A, Pfeiffer M and Griss P:** Comprehensive Biocompatibility Testing of a New Semi-rigid titanium Spine Implant in Vitro *Eur J Trauma*, 28:279-288,2002.

35. **AL Wazzan K and AI-Nazzawi A:** Marginal and Internal Adaptation of Commercially Pure Titanium and Titanium-Aluminum-Vanadium Alloy Cast Restorations *J Contemp Dent Pract*,8:19-26,2007.
36. **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.
37. **Cranin AN, Silverbrand H, Sher J, Satler N.** The requirements and clinical performance of dental implants In: Smita DS, Williams DF (Eds), *Biocompatibility of dental materials* Vol II V, Chapter 10. CRC Press: Boca Raton Fl; 1982.
38. **Hille GH.** Titanium for surgical implants. *J Mat* 1966;1:373-83.
39. **Tang L, Eaton JW.** Inflammation responses to biomaterials. *Am J ClinPathol* 1995;103:466-71.
40. **Williams DF.** Definitions in biomaterials. Proceedings of a Consensus Conference of the European Society for Biomaterials, England. Elsevier: New York; 1986.
41. **Vahey JW, Simonian PT, Conrad EU.** Carcinogenicity and metallic implants. *Am J OrthodDentofacialOrthop* 1995;24:319-24.
42. **Arvidson K, Cottler-Fox M, Friberg V.** Cytotoxic effects of Co-Cr alloys on fibroblast derived from human gingiva. *Scand J Dent Res* 1986;95:356-63.
43. **Litsky AS, Spector M.** 'Biomaterials' In Simon SR (Ed) *Orthopedic basic science*. *Am AcadOrthopSurg* 1994;470-3.

44. **Zhang Y ,Bataillon-Linez P, Huang P, Zhao Y, Han Y, Traisnel M, Xu K and Hildebrand H:** Surface Analyses of Micro-arc Oxidized and Hydrothermally Treated Titanium and Effect on Osteoblast Behavior *J Biomed Mater Res*,68A:383-391,2004.
45. **Lautenschlager E and Monaghan P:** Titanium and Titanium Alloys as Dental Materials *Int Dent J*,43:245-253, 1993.
46. **Dermirel F, Saygili G and Sahmali S:** Corrosion Susceptibility of Titanium Covered by Dental Cements *J Oral Rehabil* , 30:1162-1167,2003.
47. **Meffert R,Langer B and Fritz M:**Dental Implants : A Review *J Periodontol* , 63(11):859-870,1992
48. **Thamaraiselvi T and Rajeswari S:**Biomater *Artif Organs*, 18: 9-17,2004.
49. **Villaca J, Novaes A, Souza S, Taba M, Molina G and Carvalho T:** Bioactive Glass Efficacy in the Periodontal Healing Defects in Monkeys *Braz Dent J*,16(1):67-74,2005.
50. **Ballo A, Lassila L, Narhi T and Vallittu P:**In vitro Mechanical Testing of Glass Fiber-reinforced Composite Used as Dental Implants *J Con temp Dent Pract*,9: 41-48,2008.
51. **Moritz N,Rossi S, Vedel E, Tirri T, Ylanen h, Aro H and Narhi T:** Implants Coated with Bioactive Glass by CO₂-Laser, an In vivo Study *J Mater Sci Mater Med*,15:795-802,2004.

52. **Drago CJ:** Rates of osseointegration of dental implants with regard to anatomical location . J Prosthodont 1992;1:29-31.
53. **Vult von Steyern P:** All-ceramic Fixed Partial Dentures. Studies on Aluminum Oxid- and Zirconium Dioxid- Based Ceramic Systems Sweden J, Suppl 173:1-69, 2005.
54. **Jarcho M:** Retrospective Analysis of Hydroxyapatite Development for Oral Implant Applications Dent Clin North Am, 36:19-26, 1992.
55. **Lemons J.E.** Dental implant biomaterials .J Am Dent Assoc 121:716-719, 1990.
56. **Sykaras N, Iacopino AM, Mark AV, Triplett RG, Woody RD .**(2000) Implant materials, designs, and surface topographies: Their effect on osseointegration. A literature review. Int J Oral Maxillofac Implant 15:675-690; 2000.
57. **James RA.** Subperiosteal implant design based on peri-implant tissue behavior. N Y J Dent 1983;53:407-414
58. **Linkow LI, Kohen PA.** Benefits and risks of the endosteal blade implant (Harvard Conference, June 1978). J Oral Implantol 1980;9:9-44.
59. **Richard Palmer.** Introduction to Dental Implants. British Dental Journal, Volume 187, No.3, August 14 1999
60. **Bahat O.** Brånemark system implants in the posterior maxilla: clinical study of 660 implants followed for 5 to 12 years. Int J Oral Maxillofac Implants. 2000 Sep-Oct;15:646-53.

61. **Jae-Hoon Lee, Val Frias, Keun-Woo Lee, Robert Wright.** Effect of implant size and shape on implant success rates: a literature review. *J Prosthet Dent* 2005;94:377-81
62. **Khon DH.** Overview of factors important in implant design. *J Oral implantol* 1992;18:204-19
63. **Misch CE.** Implant design considerations for the posterior regions of the mouth. *Implant Dent* 1999;8:376-86.
64. **Misch CE.** Contemporary implant dentistry. 2nd ed. St. Louis: Elsevier; 1999. p. 54.
65. **Quirynen M, Naert I, van Steenberghe D.** Fixture design and overload influence marginal bone loss and fixture success in the Branemark system. *Clin Oral Implants Res* 1992;3:104-11.
66. **Siamos G, Winkler S, Boberick KG.** Relationship between implant preload and screw loosening on implant-supported prostheses. *J Oral Implantol* 2002;28:67-73
67. **Gil Dental Surgery Hospital.** Evaluation of external and internal implant/abutment connections. 2002
68. **William R. Lacefield,** Materials Characteristics of Uncoated/Ceramic-coated Implant materials, *Adv Dent Res*, 13, 21-26 (2007).
69. **Albrektsson T, Berglundh T, Lindhe J, Osseointegration:** Historic background and current concepts. In:—(eds) —*Clinical Periodontology and Implant Dentistry—*, 4th ed., Blackwell Munksgaard, Oxford, 809 – 820 (2003).

70. **Ziv Simon, Philip A, –Watson.** Biomimetic dental implants – New ways to enhance Osseointegration–, *J Can Dent Assoc*, 68(5),286-8 (2002).
71. **Sean S. Kohles, Melissa B. Clark, Christopher A. Brown, James N. Kennedy,** –Direct assessment of profilometric roughness variability from typical implant surface types–, *The int J of oral &Maxil Implants*, 19(4), 510 – 516 (2004).
72. **Jan Eirik Ellingsen, Peter Thomsen, S. Petter Lyngstadaas,** – Advances in dental materials and tissue regeneration–, *Periodontology* 2000, 41, 136 – 156 (2006).
73. **Brunette DM,** –**Mechanical,** Thermal, Chemical and Electrochemical surface treatment of Titanium–, in *Titanium in Medicine* (Ed) Brunette DM, Tengvall P, Textor M, Thomson (eds) Springer-Verlang, Berlin Heidelberg, 231–266 (2001)
74. **John M. Powers, Ronald L. Sakaguchi,** Dental Implants– in *Craig’s Restorative Dental Materials: Dental Implants*, 12th Editon, Elsevier, 555–569 (2006).
75. **Sergey V. Dorozhkin,** –Calcium orthophosphates–, *J Mater Sci.*, 42, 1061–1095 (2007).
76. **Kenneth J. Anusavice,** –Dental Implants– in *Philips’ Science of Dental Materials*, 11th edition, Elsevier, 759-781(2006).

77. **John A. Hobkirk, Roger M Watson, Lloyd J.J.Searson**, Introducing Dental Implants: Implants: An Introduction–, Elsevier Science, China, 3 – 18 (2003).
78. **John A. Hobkirk, Roger M Watson, Lloyd J.J.Searson**, – Introducing Dental Implants: Implants: An Introduction–, Elsevier Science, China, 3 – 18 (2003).
79. **Michael R Norton**. –The History of Dental Implants: A report–, US Dentistry, 24 – 26 2006The glossary of prosthodontic terms–, J Prosth Dent. 94(1), 58 (July 2005).
80. **Jan Eirik Ellingsen**, Peter Thomsen, S. Petter Lyngstadaas, – Advances in dental materials and tissue regeneration–, Periodontology 2000, 41, 136 – 156 (2006).
81. **Ulrich Joos, Ulrich Meyer**, –New paradigm in implant osseointegration–, Head & Face Medicine, 2,19 (2006).
82. **Ulrich Joos, Andre Büchter, Hans-Peter Wiesmann, Ulrich Meyer**, –Strain driven fast osseointegration of implants–, Head & Face Medicine, 1, 6 (2005).
83. **Naser Godarzi**, Dental implant loading a review report of current literature–, Thesis: Master of Medical Sciences in Odontology. Karolinska University, Stockholm, (2004).
84. **Daniel Lin, Qing Li, Wei Li, Ionut Ichim, Michael Swain**, –Damage evaluation of bone tissues with dental implants– Key Engineering Materials Vols,(348-349), 905-90 (2007).

85. **Brunette DM**, –Mechanical, Thermal, Chemical and Electrochemical surface treatment of Titanium–, in Titanium in Medicine (Ed) Brunette DM, Tengvall P, Textor M, Thomson (eds) Springer-Verlag, Berlin Heidelberg, 231–266 (2001).
86. **Bowers KT, Keller JC, Randolph BA, Wick DG, Michaels CM**, – Optimization of surface micromorphology for enhanced osteoblast responses in vitro– Int J Oral Maxillofac Implants, 7, 302 – 310 (1992).
87. **Sean S. Kohles, Melissa B. Clark, Christopher A. Brown, James N. Kennedy**, –Direct assessment of profilometric roughness variability from typical implant surface types–, The int J of oral & Maxil Implants, 19, 510 – 516 (2004).
88. **Wen HB, Liu Q, de Wijn JR, de Groot K, Cui FZ**, –Preparation of bioactive porous titanium surface by a new two-step chemical treatment– J Mater Sci: Mater Med, 9, 121 – 128 (1998).
89. **Kyo-Han KIM, Narayanan RAMASWAMY**, –Electrochemical surface modification of titanium in dentistry– Dent Mater J, 28(1), 20– 36 (2009).
90. **Aronsson BO, Lausmaa J, Kasemo B**, –Glow discharge plasma treatment for surface cleaning and modification of metallic biomaterials–, J Biomed Mater Res, 35(1), 49-73 (1997).
91. **Kilpadi DW, Lemons JE**, –Surface energy characterization of unalloyed titanium implants–, J Biomed Mater Res, 28, 1419-1425 (1994).

92. **EnoriGemelli, Alex Scariot, Nelson Heriberto Almeida Camargo,** – Thermal Characterization of Commercially Pure Titanium for Dental Applications–, *Mater Res*, 10, 241-246 (2007).
93. **Shan-hui Hsu, Bai-Shuan Liu, Wen-Hung Lin, Heng-Chieh Chiang, Shih-Ching Huang, Shih-Shyong Cheng,** –Characterization and biocompatibility of a titanium dental implant with a laser irradiated and dual-acid etched surface–, *Bio-Med Mater and Eng*, 17, 53–68 (2007).
94. **Rafael SilveiraFaeda, Hewerson Santos Tavares, Rafael Sartori, Antonio Carlos Guastaldi, ElcioMarcantonio Jr.,** –Evaluation of titanium implants with surface modification by laser beam–, Biomechanical study in rabbit tibias. *Braz Oral Res*, 23, 137-43 (2009).
95. **Marticorena M., G Corti, D Olmedo, M B Guglielmotti, S Duhalde,** –Laser surface Modification of Ti implants to improve osseointegration–, *Journal of Physics: Conference Se*
96. **Cochran D, Buser D, Bruggenkate C, WeingartD, Taylor T , Bernard JP, peters F and Simpson J:** The use of reduced healing times on ITI implants with a sand blasted and acid etched (SLA) surface early results from clinical trials on ITI SLA implants *clin oral implant Res* , 13:144-153 ,2002.
97. **Schwarz F, Herten M , Sager M , Wieland M , Dard M and becker J,** bone regeneration in dehiscence type defects at chemically modified (SLAactive) and conventional SLA titanium Implants: A pilot study in dogs *J clin periodontal* 34: 78-86,2007.

98. **Bodine R.T., and Yanase R.T.** Thirty-year report on 28 implant dentures inserted between 1952 and 1959. Paper present at the Symp .On Preprosthetic Surgery, Palm Spring,CA,May 16-18;1985
99. **Brandt Hans H.** Einleitung.In;Brand Hans H(eds) , Einfuhrung in die implantologiemuchen; Wien ;Baltimore: urban und Schwazrz-enberg 5-13;1996.
100. **Bone Grafts:** No Longer Just a Chip Off the Ol' Hip.Jeffrey C. Wang, MD"Bone Graft AlternativesRetrieved 18 January 2009.
101. **Bone Allografts:** Buck BE, Malinin T, Brown MD. Bone transplantation and human immunodeficiency virus. ClinOrthop 1994;303:8–17.
102. **Callan DP, Rohrer MD.** Use of bovine-derived hydroxyapatite in the treatment of edentulous ridge defects: a humanclinical and histologic case report. J Periodontol 1993; 64: 575-82.
103. **Misch CE, Dietsh F.** Bone-grafting materials in implant dentistry. Implant Dent 1993; 2: 158-67.
104. **Carvalho AL, Faria PE, Grisi MF, Souza SL, Taba MJ, Palioto DB, et al.** Effects of granule size on the osteoconductivityof bovine and synthetic hydroxyapatite: a histologic and histometric study in dogs. JOral Implantol 2007;33: 267-76.
105. **Misiek DJ, Kent JN, Carr RF.** Soft tissue responses to hydroxylapatite particles of different shapes. J Oral MaxillofacSurg 1984; 42(3): 150-60.

106. **Yang Y, Dennison D, Ong JL.** Protein adsorption and osteoblast precursor cell attachment to hydroxyapatite of different crystallinities. *Int J Oral Maxillofac Implants* 2005; 20: 187-92.
107. **LeGeros RZ, LeGeros JP, Daculsi G, Kijkowska R.** Calcium phosphate biomaterials: preparation, properties, and biodegradation. In: Wise DL, Trantolo DJ, Altobelli DE, Yaszemski MJ, Gresser JD, Schwartz ED, editors. *Encyclopedic Handbook of Biomaterials and Bioengineering*. New York, NY: Marcel Dekker; 1995.
108. **Takeshita F, Ayukawa Y, Iyama S, Suetsugu T, Oishi M.** Histological comparison of early wound healing following dense hydroxyapatite granule grafting and barrier placement in surgically-created bone defects neighboring implants. *J Periodontol* 1997; 68: 924-32.
109. **Deligianni DD, Katsala ND, Koutsoukos PG, Missirlis YF.** Effect of surface roughness of hydroxyapatite on human bone marrow cell adhesion, proliferation, differentiation and detachment strength. *Biomaterials* 2001; 22: 87-96.
110. **Oonishi H, Hench LL, Wilson J, Sugihara F, Tsuji E, Kushitani S, et al.** Comparative bone growth behavior in granules of bioceramic materials of various sizes. *J Biomed Mater Res* 1999; 44: 31-43.
111. **Ugarte J, de Sena L, Perez C, Aguiar P, Rossi A and Soares G:** Influence of processing parameters on structural Characteristics of porous calcium phosphate samples: A Study using an experimental design method. *mat Res*: 8(1) 71-76, 2005

112. **Kim HW , Koh YH, Yoon BH and Kim HE** : Reaction sintering and mechanical properties of hydroxyapatite-Zirconia composites with calcium fluoride additions J Am Ceram, Soc, 85: 1634-1636,2002
113. **Albrektsson T , Zarb G , Erkiison AR:** The long term efficacy of currently used dental implants.Int J Oral Maxillofac implants 1986; 1:11-25
114. **Begley CT , Doherty** : Comparative study of the osteoinductive properties of bioceramics biomaterials 1995;16:1181-1189
115. **Schropp L, Wenzel A, Kostopoulos L, Karring T.** Bone healing and soft tissue contour changes following singletoothextraction: a clinical and radiographic 12-month prospective study. Int J Periodontics Restorative Dent 2003;23: 313-23.
116. **Urist MR. Bone:** formation by autoinduction. Science 1965; 150(3698): 893-9.
117. **Buch F, Albrektsson T, Herbst E.** The bone growth chamber forquantification of electrically induced osteogenesis. J Orthop Res 1986; 4: 194-203.
118. **Ilizarov GA.** The tension-stress effect on the genesis and growth of tissues: Part II. The influence of the rate andfrequency of distraction. ClinOrthopRelat Res 1989; (239): 263-85.
119. **Dahlin C, Linde A, Gottlow J, Nyman S.** Healing of bone defects by guided tissue regeneration. PlastReconstrSurg1988; 8: 672-6.

120. **Nyman S, Karring T, Lindhe J, Planten S.** Healing following implantation of periodontitis-affected roots into gingival connective tissue. *J Clin Periodontol* 1980; 7: 394-401.
121. **Melcher AH.** On the repair potential of periodontal tissues. *J Periodontol* 1976; 47: 256-60.
122. **Karring T, Nyman S, Lindhe J.** Healing following implantation of periodontitis affected roots into bone tissue. *J Clin Periodontol* 1980; 7: 96-105.
123. **126 Dahlin C, Gottlow J, Linde A, Nyman S.** Healing of maxillary and mandibular bone defects using a membrane technique. An experimental study in monkeys. *Scand J Plast Reconstr Surg Hand Surg* 1990; 24: 13-9.
124. **Dahlin C, Sennerby L, Lekholm U, Linde A, Nyman S.** Generation of new bone around titanium implants using a membrane technique: an experimental study in rabbits. *Int J Oral Maxillofac Implants* 1989; 4: 19-25.
125. **Schenk RK, Buser D, Hardwick WR, Dahlin C.** Healing pattern of bone regeneration in membrane-protected defects: a histologic study in the canine mandible. *Int J Oral Maxillofac Implants* 1994; 9: 13-29.
126. **Wang HL, Carroll MJ.** Guided bone regeneration using bone grafts and collagen membranes. *Quintessence Int* 2001; 32: 504-15.
127. **Wang HL, Boyapati L.** "PASS" principles for predictable bone regeneration. *Implant Dent* 2006; 15: 8-17.

128. **Greenstein G, Caton JG.** Biodegradable barriers and guided tissue regeneration. *Periodontol 2000* 1993; 1: 36-45.
129. **Hardwick R, Hayes BK, Flynn C.** Devices for dentoalveolar regeneration: an up-to-date literature review. *J Periodontol* 1995; 66: 495-505.
130. **Scantlebury TV.** 1982-1992: a decade of technology development for guided tissue regeneration. *J Periodontol* 1993; 64(11 Suppl): 1129-37.
131. **Buser D.** Twenty years of guided bone regeneration in implant dentistry. 2nd ed. Chicago, IL: Quintessence; 2009.
132. **Buser D, Bragger U, Lang NP, Nyman S.** Regeneration and enlargement of jaw bone using guided tissue regeneration. *Clin Oral Implants Res* 1990; 1: 22-32.
133. **Lundgren D, Lundgren AK, Sennerby L, Nyman S.** Augmentation of intramembraneous bone beyond the skeletal envelope using an occlusive titanium barrier. An experimental study in the rabbit. *Clin Oral Implants Res* 1995;6: 67-72.
134. **Lundgren AK, Sennerby L, Lundgren D.** Guided jaw-bone regeneration using an experimental rabbit model. *Int J Oral Maxillofac Surg* 1998; 27: 135-40.
135. **Watzinger F, Luksch J, Millesi W, Schopper C, Neugebauer J, Moser D, et al.** Guided bone regeneration with titanium membranes: a clinical study. *Br J Oral Maxillofac Surg* 2000; 38: 312-5.

136. **Hoffmann O, Bartee BK, Beaumont C, Kasaj A, Deli G, Zafiropoulos GG.** Alveolar bone preservation in extraction sockets using non-resorbable PTFE membranes: a retrospective non-randomized study. *J Periodontol* 2008; 79:1355-69.
137. **Pitaru S, Tal H, Soldinger M, Noff M.** Collagen membranes prevent apical migration of epithelium and support new connective tissue attachment during periodontal wound healing in dogs. *J Periodontol Res* 1989; 24: 247-53.
138. **Blumenthal NM.** The use of collagen membranes to guide regeneration of new connective tissue attachment in dogs. *J Periodontol* 1988; 59: 830-6.
139. **Minabe M, Kodama T, Kogou T, Tamura T, Hori T, Watanabe Y, et al.** Different cross-linked types of collagen implanted in rat palatal gingiva. *J Periodontol* 1989; 60: 35-43.
140. **Miller, Benjamin F.; Keane, Claire B. (1992).** Encyclopedia and dictionary of medicine, nursing, and allied health. Philadelphia: Saunders. ISBN 0-7216-3456-7.
141. Mosby's medical, nursing, & allied health dictionary. St. Louis: Mosby. 2002. p. 1240. ISBN 0-323-01430-5.
142. **Brånemark PI** (September 1983). "Osseointegration and its experimental background". *The Journal of Prosthetic Dentistry* **50**: 399–410.

143. **Albrektsson, Tomas; Zarb, George A.** (1989). The Branemarkosseointegrated implant. Chicago: Quintessence Pub. Co. ISBN 978-0-86715-208-1.
144. **Beumer, John;** Lewis, Steven (1989). The Branemark implant system: clinical and laboratory procedures. St. Louis: Ishiyaku EuroAmerica. ISBN 0-912791-62-4.
145. Close to the Edge - Brånemark and the Development of Osseointegration, edited by Elaine McClarence, Quintessence 2003.
146. **Basarir K, Erdemli B, Can A, Erdemli E, Zeyrek T.**Osseointegration in arthroplasty: can simvastatin promote bone response to implants? IntOrthop 2007.
147. **Wong MM, Rao LG, Ly H, Hamilton L, Ish-Shalom S, Sturtridge W, Tong J, McBroom R, Josse RG, Murray TM.** In vitro study of osteoblastic cells from patients with idiopathic osteoporosis and comparison with cells from non-osteoporotic controls. Osteoporos Int 1994;4:21-31.
148. **Babbush CA, Kent J, Misiek D:** titanium plasma-sprayed screw implant for the reconstruction of the edentulous mandible. J Oral Maxillofac Surg 44;274-82, 1986.
149. **Misch CE, Wang HL, Misch CM, Sharawy M, Lemons J, Judy KW:** Rationale for the application of immediate load in implant dentistry :part I. Implant dent, 13:310-21, 2004.

150. **Albrektsson T, Zarb GA, Worthington P, et al.** The long-term efficacy of currently used dental implants: A review and proposed criteria of success. *Int J Oral Maxillofac Implants.* 1986;1:1-25.
151. **Ten Bruggenkate C, van der Kwast WA, Oosterbeek HS.** Success criteria in oral implantology: A review of the literature. *Int J Oral Implantol.* 1990;7:45-53.
152. **Misch CE.** Implant success or failure: Clinical assessment in implant dentistry. In: Misch CE, ed. *Contemporary Implant Dentistry.* St. Louis: Mosby; 1993: 33-66.
153. **Misch CE.** The implant quality scale: A clinical assessment of the health disease continuum. *Oral Health.* 1998;15:15-25.
154. **James RA.** Peri-implant considerations. *Dent Clin North Am.* 1980;24:415-420.
155. **Salvi G, Lang N.** Diagnostic parameters for monitoring peri-implant conditions. *Int J Oral Maxillofac Implants.* 2004; 19(suppl):116-127.
156. **Steflik DE, Koth DC, McKinney RV Jr.** Human clinical trials with the single crystal sapphire endosteal dental implant: Three year results, statistical analysis, and validation of an evaluation protocol. *J Oral Implantol.* 1987;13:39-53.
157. **Becker W, Becker BE, Newman MG, et al.** Clinical microbiologic findings that may contribute to dental implant failure. *Int J Oral Maxillofac Implants.* 1990;5: 31-38.

158. **Takarada H and Kinebuchi T:** Clinical evaluation of hydroxyapatite coated titanium artificial tooth root. Kokubyogak-kaizasshi."The jurnal of stomatological society."
159. **De kok 1, Chang S, MoriartJ , and Cooper L.**A retrospective analysis of perimplant tissue responses at immediate load/provisionalizedmicrothreaded implants, int J maxillofac impl 21:405-41,2006.
160. **Araujo MG, Sukekava F, WennstromJL ,Lindhe J.** Tissue modeling following implant placement in fresh extraction sockets . Clin Oral impl res 17:615-625,2006.

المخلص باللغة العربية

تحظى زراعة الأسنان باهتمام كبير من الباحثين في السنوات الأخيرة لتطورها لذلك استخدمت أحدث التقنيات لتقديم نتائج مرضية للمرضى وحل كثير من المشكلات التي تعوق زراعة الأسنان.

لقد اثبتت الدراسات في الفترة الأخيرة ان اسخدام الأغشية القابلة للتحلل مع تثبيتها فوق مشتقات العظام المصنعة لمعالجة الخلل العظمي الذي يتعارض مع وضع الزراعات مما يساعد على نمو العظم على اسطح الزراعات بشكل اسرع وافوى مما يساعد على حدوث الالتصاق بين العظم و الزراعات في هذه الرسالة جرى البحث على التطرق لأستخدام هذه الأغشية القابلة للتحلل في الجهة الأمامية م الفكين العلوي و السفلي واشتملت الدراسة على زرع اثني عشر زرعة من نظام ليجسى للأسنان ذات الجذر الواحد كما استخدمت مشتقات العظم للتغلب على الخلل العظمي الموجود في محل الزرعة وبعد انتعاء فترة المتابعة اتضح ان هذه الأغشية لها دور فعال و ناجح في ثبات الزراعات وقوتها مما يحقق رضاء المرض وحصولهم على أفضل نتائج.

التقرير السريري للأغشية القابلة للتحليل المثبتة في حرجة زرع الأسنان

رسالة مقدمة الى

كلية طب الفم و الأسنان – جامعة القاهرة

توطئة للحصول على درجة الماجستير في قسم

جراحة الفم والوجه والفكين

رسالة مقدمة من

الطبيبة / ماجدة محمد أبو العينين

دبلوم طب الفم و أمراض اللثة – جامعة القاهرة

كلية طب الفم والأسنان

جامعة القاهرة

٢٠١٤

المشرفون

أ.د. قدرى ناصر

أستاذ بقسم جراحة الفم و الوجه و الفكين

كلية طب الفم والأسنان

جامعة القاهرة

أ.د. خالد علام

أستاذ بقسم جراحة الفم و الوجه و الفكين

كلية طب الفم والأسنان

جامعة القاهرة

Abstract

Guided bone regeneration (GBR) is a reconstructive procedure of alveolar ridge using membranes. This procedure is indicated when there is no sufficient bone for implantation, or in the case of optimal implant installation for esthetic or functional needs. GBR can be performed before implant placement, when there is not enough bone for initial stability of implants and less predictable outcomes (staged approach), or performed simultaneously with implantation (combined approach). GBR techniques have been used for vertical and horizontal ridge augmentations with acceptable results.

In this study, 12 patients were included (12 males patients) who had missing maxillary and mandibular anterior and premolar teeth. Patients were divided into two groups A&B. The implants were delayed loaded after insertion and patients were subjected for observation period of six month during which a series of radiographic pictures, probing depth and bleeding index were taken. The crestal bone height was measured at mesial and distal side of the implants.

The results had shown that GBR technique of implant had shown to be reliable methods if proper selection of the patient and proper surgical procedure had been done.

Keywords:

Fixed Biodegradable -Implant Surgery

المخلص العربي

تحظى زراعة الأسنان باهتمام كبير من الباحثين في السنوات الأخيرة لتطورها لذلك استخدمت أحدث التقنيات لتقديم نتائج مرضية للمرضى وحل كثير من المشكلات التي تعوق زراعة الأسنان.

لقد اثبتت الدراسات في الفترة الأخيرة ان اسخدام الأغشية القابلة للتحلل مع تثبيتها فوق مشتقات العظام المصنعة لمعالجة الخلل العظمي الذي يتعارض مع وضع الزراعات مما يساعد على نمو العظم على اسطح الزراعات بشكل اسرع وافوى مما يساعد على حدوث الالتصاق بين العظم و الزراعات في هذه الرسالة جرى البحث على التطرق لأستخدام هذه الأغشية القابلة للتحلل في الجهة الأمامية م الفكين العلوي و السفلي واشتملت الدراسة على زرع اثني عشر زرعة من نظام ليجسى للأسنان ذات الجذر الواحد كما استخدمت مشتقات العظم للتغلب على الخلل العظمي الموجود في محل الزرعة وبعد انتعاء فترة المتابعة اتضح ان هذه الأغشية لها دور فعال و ناجح في ثبات الزراعات وقوتها مما يحقق رضاء المرض وحصولهم على أفضل نتائج.

الكلمات الدالة:

التقرير السريري - الأغشية القابلة للتحليل المثبتة

استمارة معلومات الرسائل التي تمت مناقشتها

الكلية : كلية طب الفم والأسنان. جامعة القاهرة القسم : جراحة الفم والوجه والفكين

1. الدرجة العلمية : ماجستير دكتوراه
2. بيانات الرسالة

عنوان الرسالة باللغة العربية:

التقرير السريري للأغشية القابلة للتحليل المثبتة في جراحة زرع الأسنان

عنوان الرسالة باللغة الإنجليزية:

Clinical Assessment of Fixed Biodegradable Membrane in Implant Surgery

التخصص الدقيق : جراحة الفم والوجه والفكين

تاريخ المناقشة : 2014/5/10

3. بيانات الطالب:

الاسم: ماجدة محمد أبو العينين الجنسية: مصرية النوع : أنثى

العنوان : 26 ش 28 امبابه - جيزة رقم التليفون: 01061238092

جهة العمل : مستشفى رمد امبابه

4. المشرفون على الرسالة :

أ.د. قدرى ناصر أستاذ بقسم جراحة الفم و الوجه و الفكين كلية طب الفم والأسنان جامعة القاهرة

أ.د. خالد علام أستاذ بقسم جراحة الفم و الوجه و الفكين كلية طب الفم والأسنان جامعة القاهرة

5. مستخلص الرسالة : (Abstract)

1-5 باللغة العربية :

تحظى زراعة الأسنان باهتمام كبير من الباحثين في السنوات الأخيرة لتطورها لذلك استخدمت أحدث

التقنيات لتقديم نتائج مرضية للمرضى وحل كثير من المشكلات التي تعوق زراعة الأسنان.

لقد اثبتت الدراسات في الفترة الأخيرة ان اسخدام الأغشية القابلة للتحلل مع تثبيتها فوق مشتقات العظام

المصنعة لمعالجة الخلل العظمى الذي يتعارض مع وضع الزرعات مما يساعد على نمو العظم على اسطح

الزرعات بشكل اسرع وافوى مما يساعد على حدوث الالتصاق بين العظم و الزرعات في هذه الرسالة جرى

البحث على التطرق لأستخدام هذه الأغشية القابلة للتحلل في الجهة الأمامية م الفكين العلوي و السفلي واشتملت الدراسة على زرع اثني عشر زرعة من نظام ليجسى للأسنان ذات الجذر الواحد كما استخدمت مشتقات العظم للتغلب على الخلل العظمي الموجود في محل الزرعة وبعد انتعاش فترة المتابعة اتضح ان هذه الأغشية لها دور فعال و ناجح في ثبات الزراعات وقوتها مما يحقق رضاء المرض وحصولهم على أفضل نتائج.

الكلمات الدالة:

التقرير السريري - الأغشية القابلة للتحليل المثبتة

مستخلص الرسالة (باللغة الإنجليزية)

باللغة الأجنبية: 2-5

Guided bone regeneration (GBR) is a reconstructive procedure of alveolar ridge using membranes. This procedure is indicated when there is no sufficient bone for implantation, or in the case of optimal implant installation for esthetic or functional needs. GBR can be performed before implant placement, when there is not enough bone for initial stability of implants and less predictable outcomes (staged approach), or performed simultaneously with implantation (combined approach). GBR techniques have been used for vertical and horizontal ridge augmentations with acceptable results.

In this study, 12 patients were included (12 males patients) who had missing maxillary and mandibular anterior and premolar teeth. Patients were divided into two groups A&B. The implants were delayed loaded after insertion and patients were subjected for observation period of six month during which a series of radiographic pictures , probing depth and bleeding index were taken. The crestal bone height was measured at mesial and distal side of the implants.

The results had shown that GBR technique of implant had shown to be reliable methods if proper selection of the patient and proper surgical procedure had been done.

Keywords:

Fixed Biodegradable -Implant Surgery

6. أهم النتائج التطبيقية التي تم التوصل إليها:

1. Presently available lable data demonstrates GBR therapy to be a predictable and successful procedure to be augment bone in a horizontal or vertical direction at sites exhibiting insufficient bone volume for implant placement under standard conditions among the techniques introduced for vertical ridge augmentation GBR is successful technique , although distraction osteogenesis allows for vertical bone augmentation than other techniques. for horizontal ridge augmentation resorbable membrane has successful and predictable results.
2. The survival rate obtained through the GBR technique utilized in this study is conditioned by series of important factors first of all the careful selection of the patients, excellent primary stability, selection of the implant (length , diameter and surface treatment) and a tramatic surgery, proper fixation of GBR membrane by bore tacks or screw .
3. Proper patient selection with good motivation, free of any systemic diseases, parafunctional habits and adequate bone height increase the success rate.

1. ما هي الجهات التي يمكن أن تستفيد من هذا البحث :

1-7 كليات طب الفم والأسنان والمعاهد البحثية :

جامعة القاهرة ، جامعة الأسكندرية، جامعة عين شمس

لا

2. هل توجد علاقة قائمة بإحدى هذه الجهات : نعم

في حاله نعم انكر هذه الجهات : المستشفيات والمعاهد التعليمية

ما هي طبيعة العلاقة :

مشروع بحثي :

تعاون أكاديمي :

(انكر ما هي : لا)

مشروع ممول من جهة ثالثة

(

تنكر)

أخرى

3. هل توافق على التعاون مع جهات مستفيدة من خلال الجامعة :

لا (لماذا)

نعم

(أ) لتطبيق البحث

(ب) لاستكمال البحث

(ج) أخرى (تذكر)

4. هل تم نشر بحوث مستخرجة من الرسالة في مجالات أو مؤتمرات علمية

(تذكر مع جهة النشر والمكان والتاريخ)

Cairo Dental Journal 1 -10

2 -10

3-10

5. هل سبق التقدم لتسجيل براءات اختراع (تذكر مع الجهة والمكان والتاريخ)

لا

6. هل توافق على إعطاء البيانات المذكورة في هذه الاستمارة لجهات أخرى .

نعم لا

توقيع المشرفين :

توقيع الطالب : ماجدة محمد أبو العينين

أ.د. قدري ناصر

أ.د. خالد علام

التاريخ:

وكيل الكلية للدراسات العليا