

Cortellini P, Tonetti M. Long-term tooth survival following regenerative treatment of intrabony defects. J Periodontol 2004; 75:672-8. (28 Refs)

Purpose: To assess the long term survival of sites treated by GTR.

Materials and Methods: A case control study of 175 patients who had received GTR therapy in at least 1 intrabony defect was conducted. The subjects were identified from a previous study and data obtained from those patients who presented for periodontal maintenance procedures over a specific 4 month time period. The systemically healthy subjects demonstrated effective oral hygiene practices and underwent full mouth root planing before treatment of intrabony defect(s) with GTR utilizing either a nonresorbable membrane or absorbable membrane + alloplast was performed. The surgery was completed at least 2 years prior to the start of the study. For the first year following the GTR procedure, patients were seen every month for oral hygiene instructions and professional tooth cleaning. The subjects were asked to participate in the periodontal maintenance program every 3 months. Fifty-eight subjects chose to have dental care provided by their general dentist and were seen for periodontal assessment every 2nd year. Only one intrabony defect per subject was included for analysis. At baseline and at 1 year, plaque scores, bleeding on probing, probe depths, clinical attachment level and recession were recorded. At least every 2 years, CAL and PD were obtained. Also, at baseline, the angle of the defect was measured on a periapical radiograph. Age, gender smoking habits (≥ 10 cig/day), and compliance with maintenance were recorded for each subject. Eighty-six subjects were randomly selected for genotyping to determine if IL-1 polymorphism was present. Statistical analysis assessed ≥ 2 mm loss of CAL with respect to baseline and 1 year post-GTR, as well as tooth loss.

Findings and Conclusions:

1. Six teeth were lost. Of these subjects, all were smokers and 5 did not comply w/ periodontal maintenance. For 4 of those teeth, ePTFE membranes were used; and an absorbable membrane w/ alloplast was used in the other 2 lost teeth.
2. Cigarette smoking, participation in periodontal maintenance, age, and type of regeneration treatment were associated w/ CAL loss ≥ 2 mm from baseline.
3. The risk of CAL loss ≥ 2 mm after 1 year post treatment increased in smokers, and decreased in those compliant w/ 3 month periodontal maintenance.
4. 36 out of 86 subjects were IL-1 genotype positive. No significant relationship was observed between IL-1 genotype and tooth loss or CAL loss.

This retrospective study demonstrates a high success rate in intrabony sites treated w/ GTR. Compliance with periodontal maintenance and smoking have an influence on the success of such procedures.

Stavropoulos A, Karring T. Long-term stability of periodontal conditions achieved following guided tissue regeneration with bioresorbable membranes: case series results after 6-7 years. J Clin Periodontol 2004;31:939-44. (21 Refs)

Purpose: To evaluate the results of GTR treatment of intrabony defects with bioresorbable membranes after 6-7 years and to disclose factors that may influence the long-term outcome

Materials and Methods: 21 patients with at least one interproximal defects showing PPD \geq 7mm and radiographic evidence of an intrabony component \geq 4mm participated this study. Following routine nonsurgical phase, 28 defects were treated with Guidor[®] barrier membrane. The patients received a combination of amoxicillin 750 mg and metronidazole 250 mg for 5 days, starting 1 h prior to surgery. Patients were instructed to avoid brushing the surgical sites for 6 weeks, instead, supragingival prophylaxis was performed once a week for the first 6 weeks. Once a month cleaning regimen was continued following 5 months. After 1 year of GTR treatment, patients were transferred to private practice, and at 6-7 years, patients were recalled for evaluation. At baseline, 1 year F/U, and 6-7 year F/U, the following clinical parameters were measured; PPD, REC, PAL, PI (+/-), BOP(+/-). Association of smoking, frequency of dental visits, oral hygiene and BOP with sites losing \geq 2 mm in PAL was evaluated with Fisher's exact test.

Findings and Conclusions: Three of the treated teeth were extracted, thus, data from 25 defects in 19 patients were available. At baseline, a mean PPD was 8.7 ± 1.1 mm, and a mean PAL was 9.8 ± 1.5 mm. An average residual PPD was 3.8 ± 1.1 mm and a mean PAL gain was 3.8 ± 1.4 mm at 1 year F/U. At 6-7 F/U, 4.7 ± 1.3 mm of residual PPD, and a mean PAL gain of 3.6 ± 1.4 mm was observed. The difference in PPD between 1 year and 6-7 year was statistically significant. Overall, there was no statistically significant differences was found between the 1 year results and 6-7 year results. At the 6-7 year observation, only 16% sites had lost \geq 2mm of the PAL gain obtained 1 year after GTR treatment. None of the sites had lost all of the attachment gain. The majority of the sites (64%) showed PAL gain between 2mm and 4mm and in 20 sites, greater than 6 mm of PAL gain was observed at the 6-7 year exam. Smoking, frequency of professional dental cleaning, oral hygiene and BOP did not seem to influence the change of PPD and PAL gain or the stability of PAL gain. Although crestal bone resorption was evident, the radiographs showed that in most cases almost total resolution of the bone defect had occurred. The authors concluded that clinical improvements achieved by GTR treatment of intrabony defects by means of bioresorbable membranes can be maintained on a long-term basis.

Shabahang S, Boshali K, Boyne PJ et al. Effect of teeth with periradicular lesions on adjacent dental implants. Oral surg Oral Med Oral Pathol Oral Radiol Endod 2003;96:321-6.

Purpose: To determine the effect of periradicular lesions on osseointegration of dental implant with or without the treatment of the adjacent tooth and implant surface.

Materials and Methods: Five 18-month-old healthy foxhound dogs were used in this study. Four mandibular and 4 maxillary premolar teeth were extracted. Ten 3.75X 10mm threaded solid core Ti implants, and ten 3.75 X 8 mm threaded solid core implants were placed in the mandible close to the fourth and the first premolar root apices. Similarly, ten 3.75 X 10mm HA-coated and ten 3.75 X 8mm HA-coated placed in the maxillae adjacent to the fourth and first premolars. To determine the effect of treated and untreated periradicular lesions and detoxification of the implant surfaces, the implants were randomly assigned to 2 control and 2 experimental groups. Group A, no treatment of the adjacent premolar; Group B, induction of a periradicular lesion followed by non-surgical root canal therapy of the premolar. Group C, induction of a periradicular lesion followed by non-surgical root canal therapy of the premolar and surgical detoxification of the implant surface. Group D, induction of periradicular lesion and no treatment of the tooth. After 7 ½ months, block sections were prepared and the percentage of osseointegration was analyzed histomorphometrically.

Findings and Conclusions: Periradicular lesions developed in all teeth in groups B, C, and D and extended to the implants. Evaluation of the specimens showed an average of 54% osseointegration for implants in group A, 74% in group B, 56% in group C, and 68% in group D. No significant difference in the amount of osseointegration among 4 treatment groups and the non-treatment control. Detoxification of the implant surface did not have a positive impact on the amount of osseointegration. Presence of endodontically treated teeth in close proximity to endentulous areas should not be a contraindication for implant placement.

Time	Procedure
0	Extraction of premolars and placement of implants
8 weeks	Lesions induction in adjacent implants
in premolars in groups	B and C
17 weeks	Instrumentation of teeth in B and C and
medication	w/Ca hydroxide
18 weeks	Obturation of teeth in groups B and C
18 weeks	Surgical exposure and detoxification of
implants in group C	
22 weeks	Lesion induction in teeth in group D
30 weeks	Perfusion and harvesting of specimens

Rosenberg ES, et al. A comparison of characteristics of implant failure and survival in periodontally compromised and periodontally healthy patients: A clinical report. Int J Oral Maxillofac Implants 2004; 19:873-9. (36 Refs)

Purpose: To compare implant survival and patterns of implant failure in periodontally compromised and periodontally healthy patients.

Materials and Methods: Retrospective data was collected from patients who were treated in a private practice over a 13 year span(1986-1999). Each patient's medical and dental history was reviewed. All patients were classified as either PCP or PHP following a thorough clinical and radiographic diagnosis. Patients were classified as Periodontally Compromised (PCP) if they had a history of periodontal disease that resulted in tooth loss. Patients were classified as Periodontally Healthy (PHP) if tooth loss was not caused by periodontal disease, and if no loss of attachment (with the exception of facial or lingual recession) or probing depths greater than 3 to 4 mm was present at the time of implant placement. Eight implant systems were available and were classified according to implant surface texture; smooth machined titanium, SLA, TPS, AE, or HA. All implants were surgically placed in the same manner and final prosthetic restorations placed. All patients were recalled and evaluated at least every 3 months through 1999. At each recall visit, individual implants were assessed for mobility and clinical signs of inflammation. Removable and screw-retained appliances were removed at least once a year to check for mobility. Bleeding on probing was recorded around implants and natural teeth and treated with either S&RP or surface cleaning with a cavitron jet or plastic implant instruments. Implant failure was defined by the criteria of Albrektsson, and the implant failed if it demonstrated clinical mobility, evidenced continuous radiolucency around the implant, or displayed continuous bone loss which necessitated removal or surgical intervention. Failures were divided into 5 stages according to the time of failure. Stage 1 was the period between placement of the implant and second-stage surgery. Stage 2 was the period between second-stage surgery and placement of the definitive prosthesis. Stage 3 was the first year after placement of the definitive prosthesis. Stage 4 began at 1 year and lasted until 5 years after delivery of the prosthesis. Stage 5 began 5 years after delivery of the definitive prostheses.

Findings and Conclusions: A total of 1,511 implants were placed in 334 patients. 151 Periodontally Compromised Patients (PCP) received 923 implants while 181 Periodontally Healthy Patients received 588 implants. Of the 1,511 implants placed, 123 failed; representing an overall implant survival rate of 92.15%. The survival rates of implants placed in the PHP group was slightly higher than the PCP group (93.7 % vs. 90.7%). When the data was analyzed according to surface texture, only HA-coated implants showed a significant difference in implant survival between the two groups. HA-coated implants failed 2.5 times more often in the PCP group than the PHP group. A clear difference existed between the two groups when failure patterns were analyzed. In the PHP group, 94.6% of failure occurred at stage 1, 2, or 3. In the PCP group, 74.4% of failure occurred at stage 1, 2, or 3. A higher percentage of late failures were found in the PCP group (25.6% vs. 5.4% PHP). This

finding was more evident in the HA-coated implant group. Two clear types of failures were distinguished in this study. 1) The failure to osseointegrate occurred with turned-surface implants placed in the posterior maxilla and occurs up to 1 year after loading. This time of failure occurred relatively frequently in both the PCP and PHP group; however, no significant differences were found which indicated that a history of periodontitis in a particular site or patient does not affect the healing process of osseointegration. 2) Peri-implantitis-related failure occurs after 1 year of loading and typically occurred with HA-coated implants in the PCP group. The overall survival rate was above 90%. The elimination of HA-coated implants from the total number of implants increases the overall survival rate to 93.9% for the PHP group and 92.9% for the PCP. With adequate customized recall and maintenance programs following implant placement and loading, implants placed in PCP have survival rates similar to those of implants placed in PHP.

Polimeni G, Koo K-T, Qahash M, et al. Prognostic factors for alveolar regeneration: effect of a space-providing biomaterial on guided tissue regeneration. J Clin Periodontol 2004;31: 725-729. (19 Refs)

Purpose: To evaluate the effect of a space-providing coral-derived biomaterial on alveolar bone regeneration in conjunction with GTR

Materials and Methods: Four male Beagle dogs exhibiting intact mandibular premolar dentition without crowding or evidence of periodontal disease were used. Periodontal defects were created around the third and fourth mandibular premolar teeth bilaterally. The first, second premolar, and the first molar were extracted. Alveolar bone was removed around the circumference of the remaining premolar teeth and the root surfaces were instrumented to remove the cementum. Clinical defect height from the CEJ to the reduced alveolar crest was set to 6mm. In a split-mouth design, experimental conditions included implantation of the CI biomaterials conjunction with GTR (cGTR) and GTR without the CI. Experimental conditions were alternated between left and right jaw quadrants in subsequent animals. The animals were euthanized at week 4 post-surgery and teeth with surrounding soft and hard tissues were removed en bloc. The ePTFE devices were not removed during the healing interval. Through a histometric analysis, the following parameters were recorded for the buccal and the lingual surfaces for the section: (1) Bone regeneration (vertical bone height): distance between the apical extension of the root planing and the coronal extension of alveolar bone formation along the planed root, (2) Wound area: area circumscribed by the planed root surface, the ePTFE device, and the base of the defect at the level of the apical extension of the root planing.

Findings and Conclusions: Sites with larger wound area exhibited greater bone regeneration than sites with smaller wound areas. The unadjusted mean bone regeneration in sites with cGTR was significantly greater than that in sites with GTR alone. However, there was no significant difference in the mean bone regeneration between cGTR group and GTR alone, after adjusting for wound area. The results in this study suggest that bone regeneration following GTR is dictated by space-provision. The coral biomaterial effectively enhances space-provision, and this appears to be the principal mechanism by which this biomaterial supports bone regeneration rather than postulated osteoconductive properties.

Wound area (mm)	Treatment	Mean	SE	P
<3	GTR	1.02	0.18	0.998
	cGTR	1.02	0.45	
3-7	GTR	2.07	0.25	0.83
	cGTR	2.01	0.19	
>7	GTR	2.05	0.45	0.49
	cGTR	2.37	0.18	