Periodontal regeneration with or without limited orthodontics for the treatment of 2- or 3-wall infrabony defects.

Ogihara S, Wang HL.


Abstract

BACKGROUND:

Limited orthodontics are shown to be effective in the correction of infrabony defects. Studies have also demonstrated the efficacy of using enamel matrix derivative (EMD) with demineralized freeze-dried bone allograft (DFDBA) to treat infrabony defects. This study aims to compare the clinical efficacy of limited orthodontics combined with EMD/DFDBA in the treatment of 2- or 3-wall infrabony defects.

METHODS:

A randomized, parallel clinical trial was conducted in a private periodontal practice (Tokyo, Japan) between April 2004 and October 2008. Treatment period was 1 year with a 1-year follow-up. Forty-seven randomized patients, mean age of 53 ± 10.7 years, were allocated into two intervention groups: ortho/EMD/DFDBA (n = 24) and EMD/DFDBA (n = 23). Each patient had either a 2- or 3-wall infrabony defect of ≥6 mm deep. Probing depth and clinical attachment level were measured at baseline and 1 year. The primary outcome measure was absolute change in probing depth and clinical attachment level from baseline to 1-year follow-up. The secondary outcome measure was absolute change in open probing attachment level gain and percentage defect resolution from baseline to 6-month reentry surgery. Infrabony defects were surgically treated with EMD and DFDBA 4 weeks before application of orthodontic extrusive forces. Reentry surgeries were performed at 6 months after initial surgery.

RESULTS:

Forty-seven patients were analyzed. Both treatment groups showed a significant improvement from baseline with no significant difference between the groups except for the 2-wall defects. The ortho/EMD/DFDBA group had statistically significant open probing attachment level gain (95% confidence level, 3.18 to 4.36; P = 0.036) compared to the EMD/DFDBA group (95% confidence level, 2.26 to 3.24) in 2-wall defects.

CONCLUSION:

Although both treatment modalities were effective in managing 2- or 3-wall infrabony defects, limited orthodontics provided an additional benefit to EMD/DFDBA in 2-wall defects.
Orthodontic treatment of periodontally involved teeth after tissue regeneration.

Ghezzi C, Masiero S, Silvestri M, Zanotti G, Rasperini G.


Abstract

In this consecutive series, 14 patients with severe intrabony defects and pathologic tooth migration were treated with guided tissue regeneration (GTR) and subsequent orthodontic therapy in an attempt to evaluate the validity of this multidisciplinary approach. Probing pocket depths (PPD), clinical attachment levels (CAL), and gingival recessions were assessed at baseline, 1 year after GTR, and at the end of orthodontic therapy. Radiographs were obtained at all time points. Esthetic parameters were recorded with the papilla presence index (PPI). Statistical analyses were carried out to compare the data at each time point.

From baseline to 1 year after GTR, the mean PPD reduction was 5.57 mm, with a residual mean PPD of 2.71 mm; mean CAL gain was 5.86 mm. Both differences were statistically significant. There were no statistically significant differences between 1 year after GTR and the end of orthodontic therapy (mean PPD reduction 0.07 mm; mean CAL gain 0.43 mm). The reduction in PPI reflected the enhancement of papilla height that was observed in 9 of the 14 patients. Within the limits of this research, this study affirms the possibility of a combined orthodontic-periodontal approach that prevents damaging the regenerated periodontal apparatus and produces esthetic improvements as a result of realignments and enhancement of papilla height.

Enhancing the regenerative potential of guided tissue regeneration to treat an intrabony defect and adjacent ridge deformity by orthodontic extrusive force.

Ogihara S, Marks MH.


Abstract

BACKGROUND:

The biologic potential of the periodontal ligament (PDL) can be harnessed to solve complex clinical problems involving several dental disciplines. The purpose of this case report is to demonstrate that orthodontic extrusive force can enhance the regenerative potential of guided tissue regeneration (GTR) to eliminate an intrabony defect and augment a ridge deformity.

METHODS:

Regenerative therapy by open debridement with particulate anorganic cancellous bovine-derived bone xenograft (BDX), bioabsorbable membrane, and minocycline root conditioning was carried out. Eight weeks after the initial surgery, orthodontic extrusion and uprighting simultaneously were initiated.

RESULTS:
Radiographs and reentry documentation demonstrated that orthodontic extrusive force could enhance the regenerative potential of GTR. Consequently, the intrabony defect and alveolar ridge were successfully treated.

CONCLUSION:

This case report demonstrates that orthodontic-regenerative combined therapy can resolve complex clinical problems involving several dental disciplines.

**Movement of periodontally affected teeth after guided tissue regeneration (GTR)--an experimental pilot study in animals.**

Diedrich P, Fritz U, Kinzinger G, Angelakis J.


Abstract

PURPOSE:

The purpose of the present experimental animal study was to examine the relevance of regenerative periodontal therapy (membrane procedure, application of enamel matrix proteins) to subsequent orthodontic tooth movement.

MATERIAL AND METHOD:

After extraction of the third premolars in four foxhounds, 64 three-wall bony defects were artificially generated at the first and second premolars and colonized by periodontopathogenic microorganisms. After 6 months, regenerative periodontal therapy was performed: scaling, conditioning of the root surfaces with citric acid, combination of enamel matrix protein (Emdogain, Biora, Malmö, Sweden) and resorbable Vicryl membrane (Ethicon, Norderstedt, Germany). The defects at the first premolars served as the control group. In the test group eight second premolars were intruded 1 month after surgical intervention; in addition eight premolars were translatorily distalized, i.e. moved both into the defect (pressure side) and away from the defect (tension side). Qualitative histologic analysis was performed on non-decalcified microsection samples using the polychrome sequential labeling and histomorphometry.

RESULTS:

The histologic findings revealed extensive periodontal regeneration in the control group, at the intruded root segments, and on the tension sides. Cemento- and osseoneogenesis yielded mean values of 70-80%, whereas values for epithelial down-growth were low. The bony regeneration on the pressure side was markedly reduced; however, nearly 70% new formation of root cementum with Sharpey's fibers was also recorded.

CONCLUSION:

Periodontal regenerative procedures appear to enhance conditions for the movement of teeth with attachment loss; clinical testing is promising.
Guided tissue regeneration associated with orthodontic therapy.

Diedrich PR.


Abstract

Guided tissue regeneration (GTR) to enhance genuine new periodontal attachment may improve preorthodontic conditions for moving teeth into infrabony defects or for vertical movements of teeth with reduced bone support. The possible benefits of GTR for combined periodontal/orthodontic therapy are discussed and substantiated with preliminary experimental findings.