Emdogain Research

: Fogorv Sz. 2007 Oct;100(5):220-32, 211-9.

Emdogain in regenerative periodontal therapy. A review of the literature.

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The goal of regenerative periodontal therapy is the reconstitution of the lost periodontal structures (i.e. the new formation of root cementum, periodontal ligament and alveolar bone). Results from basic research have pointed to the important role of the enamel matrix protein derivative (EMD) in the periodontal wound healing. Histological results from animal and human studies have shown that treatment with EMD promotes periodontal regeneration. Moreover, clinical studies have indicated that treatment with EMD positively influences periodontal wound healing in humans. The goal of the current overview is to present, based on the existing evidence, the clinical indications for regenerative therapy with EMD. Surgical periodontal treatment of deep intrabony defects with EMD promotes periodontal regeneration. Surgical periodontal therapy of deep intrabony defects with EMD may lead to significantly higher improvements of the clinical parameters than open flap debridement alone. The results obtained following treatment with EMD are comparable to those following treatment with GTR and can be maintained over a longer period. Treatment of intrabony defects with a combination of EMD + GTR does not seem to additionally improve the results compared to treatment with EMD alone or GTR alone. The combination of EMD and some types of bone grafts/bone substitutes may result in certain improvements in the soft and hard tissue parameters compared to treatment with EMD alone. Treatment of recession-type defects with coronally repositioned flaps and EMD may promote formation of cementum, periodontal ligament and bone, and may significantly increase the width of the keratinized tissue. Application of EMD seems to provide better long-term results than coronally repositioned flaps alone. Application of EMD may enhance periodontal regeneration in mandibular Class II furcations. The clinical results are comparable to those obtained following GTR.

Perioscopy aided MIS using Enamal Matrix Proteins compared to conventional surgery

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Clinical Trials:

Perioscopy + Emdogain: CAL 3.57mm

Surgery + Emdogain: CAL 1.8mm

Perioscopy + Emdogain: PD reduction 3.56mm

Surgery + Emdogain: PD reduction 2.7mm

Perioscopy + Emdogain: Recession .01mm

Surgery + Emdogain: Recession .9mm

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Minimally invasive surgical technique and enamel matrix derivative in intra-bony defects. I: Clinical outcomes and morbidity.

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AIMS: This case cohort study was designed to evaluate the clinical performance and the intra-operative and post-operative morbidity of the minimally invasive surgical technique (MIST) associated with the application of an enamel matrix derivative (EMD) in the treatment of isolated deep intra-bony defects. MATERIAL AND METHODS: Forty deep isolated intra-bony defects in 40 patients were surgically accessed with the MIST. This technique was designed to limit the mesio-distal flap extension and the corono-apical flap reflection in order to reduce the surgical trauma and increase flap stability. The incision of the defect-associated papilla was performed according to the principles of the papilla preservation techniques. EMD was applied on the debrided and dried root surfaces. Stable primary closure of the flaps was obtained with modified internal mattress sutures. Surgery was performed with the aid of an operating microscope and microsurgical instruments. Clinical outcomes were collected at baseline and at 1 year. Intra-operative and post-operative morbidity was evaluated with questionnaires. RESULTS: The 1-year clinical attachment gain was 4.9+/-1.7 mm ($p<0.0001$ compared with baseline). This corresponded to a 77.6+/-21.9% resolution of the defect. Residual probing pocket depths were 3+/-0.6 mm. A minimal increase of 0.4+/-0.7 mm in gingival recession between baseline and 1 year was recorded. No patients experienced intra-operative pain, while only 14 reported a very moderate perception of the hardship of the surgical procedure [7+/-12 visual-analogue scale (VAS) units, on average]. Primary closure was obtained in all treated sites. At the 1-week follow-up visit, 38 sites (95%) were still closed. Only 12 subjects reported moderate post-operative pain (VAS 19+/-10) that lasted for 26+/-17 h. CONCLUSIONS: These data indicate that the minimally invasive surgical technique, in combination with EMD, can be successfully applied in the treatment of isolated deep intra-bony defects, resulting in excellent clinical outcomes with very limited intra- and post-operative morbidity.

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The use of Emdogain in periodontal and osseous regeneration

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The goal of regenerative periodontal therapy is the reconstitution of the lost periodontal structures (i. e. the new formation of root cementum, periodontal ligament and alveolar bone). Results from basic research have pointed to the important role of an enamel matrix protein derivative (EMD) in periodontal wound healing. Histological results from experiments in animals and from human case reports have shown that treatment with EMD promotes periodontal regeneration. Moreover, clinical studies have indicated that treatment with EMD positively influences periodontal wound healing in humans.

Five-year follow-up of regenerative periodontal therapy with enamel matrix derivative at sites with angular bone defects.

Full Abstract

BACKGROUND: This prospective case series report aimed at analyzing the long-term (5 years) stability of clinical attachment level (CAL) gains following regenerative therapy with the use of enamel matrix proteins in intrabony defects. METHODS: A total of 114 consecutively treated periodontal patients (mean age: 55.8 years) were initially included. Each subject exhibited at least one deep proximal intrabony defect with the inclusion criteria of 1) probing depth (PD)>or=5 mm, 2) clinical attachment loss>or=6 mm, and 3) radiographic evidence of a >or=3-mm intrabony component. A total of 146 defects met the criteria for inclusion. At least 6 months after the completion of an initial phase of mechanical infection control, a baseline examination was performed to characterize the experimental site. Reconstructive therapy with the use of enamel matrix proteins was subsequently performed. Experimental sites were reexamined 1 and 5 years after reconstructive surgery. Primary efficacy variables were considered to be changes in PD, CAL, soft tissue recession (REC), and radiographic defect depth (RDD). Stepwise regression analysis was employed for evaluation of predicting factors of CAL change between the 1- and 5-year reexaminations. RESULTS: A total of 82 patients (102 defects) were included in the analysis. One year following the regenerative surgery, a mean CAL gain of 4.3 mm (P<0.001), a mean PD reduction of 4.9 mm (P<0.001), and a mean increase in REC of 0.6 mm (P<0.001) were recorded. At the 5-year follow-up, a further mean PD reduction of 0.3 mm (P>0.05), CAL gain of 1.1 mm (P<0.01), and reduction in recession of 0.8 mm (P<0.01) had taken place. Radiographs revealed that the bone defect had been reduced in depth with an average of 2.9 mm at 1 year (P<0.001). No statistically significant alteration in defect depth was observed between 1 and 5 years of follow-up. The stepwise regression analysis identified the degree of REC and residual PD at 1 year as significant predictors of CAL change between 1 and 5 years. CONCLUSION: Results demonstrated long-term (5 years) stability of CAL gains following regenerative therapy with the use of enamel matrix proteins in intrabony defects.

Abstract

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Clinical and Histologic Evaluation of Non-Surgical Periodontal Therapy With Enamel Matrix Derivative: A Report of Four Cases

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Background: Enamel matrix derivative (EMD) is a composite of proteins that was demonstrated histologically to work as an adjunct to periodontal regenerative surgical therapy. The purpose of this study was to evaluate the clinical and histologic effects of EMD as an adjunct to scaling and root planing.

Methods: Four patients with severe chronic periodontitis and scheduled to receive complete dentures were accrued. Probing depth and clinical attachment levels were obtained. Unlimited time was allowed for hand and ultrasonic instrumentation. A notch was placed in the root ≥1 to 2 mm from the apical extent of root planing. EMD was inserted into the pocket, and a periodontal dressing was placed. Patients were seen every 2 weeks for plaque control. At 6 months post-treatment, soft tissue measurements were repeated, and the teeth were removed en bloc and prepared for histomorphologic analysis.

Results: Probing depth reduction and clinical attachment level gain were obtained in three-fourths of the specimens. Three of the four specimens analyzed histologically demonstrated new cementum, bone, periodontal ligament, and connective tissue attachment coronal to the notch. In one specimen, the gingival margin had receded below the notch.

Conclusions: The results were unexpected and may represent an aberration. However, the substantial reduction in deep probing depths and clinical attachment level gain in three of four specimens, in addition to the histologic findings of new cementum, new bone, a new periodontal ligament, and a new connective tissue attachment, suggest that EMD may be useful as an adjunct to scaling and root planing in single-rooted teeth.