

Extracorporeal shock wave therapy induces alveolar bone regeneration in experimental periodontitis.

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Device and producing company:

DermaGold®, MTS, Konstanz, Germany.

Introduction:

Periodontal inflammation with alveolar bone resorption is one of the hallmarks of periodontal disease, elicited in response to several periodontal pathogens including *Porphyromonas gingivalis*. We hypothesized that extracorporeal shock wave therapy (ESWT) could promote the regeneration of alveolar bone following *P. gingivalis*-induced gingival inflammatory reactions leading to periodontal disease in a rat model.

Methods:

Rats were infected with *P. gingivalis* for 10 weeks, which caused measurable alveolar bone resorption. The infected rats were then treated with a single episode of 100, 300, or 1000 impulses of shock waves generated with a DermaGold® on both cheeks at energy levels 0.1 mJ/mm². Maxillary and mandibular alveolar bone levels were determined at 3, 6, and 12 weeks by radiography following ESWT and compared to untreated controls.

Results:

PCR evaluation of the oral microbial samples demonstrated that 85-100% of the rats were infected with *P. gingivalis* during the experimental periodontal disease period. *P. gingivalis* infected rats treated with ESWT at 300 and 1000 impulses demonstrated significantly improved maxillary and mandibular alveolar bone levels at 3 weeks than those demonstrated by untreated controls, which remained for at least 6 weeks in most rats.

Discussion:

ESWT has been shown to regulate/activate several genes (TGF- β 1, IGF-1, BMP2) linked to bone formation in rats. Thus, both resident cells and infiltrating inflammatory/immune cells in gingival and periodontal tissues might also reflect functional alterations from ESWT.

Conclusion:

The results demonstrated effective regeneration of alveolar bone in *P. gingivalis* infected rats by ESWT and suggested that ESWT may be a useful adjunct in the regeneration of periodontal tissues following periodontal disease.