

Maymon-Gil T, Weinberg E, Nemcovsky C, **Weinreb M**. Enamel Matrix Derivative Promotes Healing of a Surgical Wound in the Rat Oral Mucosa. *J Periodontol*. 2016 May;87(5):601-9.

Abstract

**BACKGROUND:** Enamel matrix proteins (EMPs) play a role in enamel formation and the development of the periodontium. Sporadic clinical observations of periodontal regeneration treatments with enamel matrix derivative (EMD), a commercial formulation of EMPs, suggest that it also promotes post-surgical healing of soft tissues. In vitro studies showed that EMD stimulates various cellular effects, which could potentially enhance wound healing. This study examines the in vivo effects of EMD on healing of an oral mucosa surgical wound in rats.

**METHODS:** A bilateral oral mucosa wound was created via a crestal incision in the anterior edentulous maxilla of Sprague-Dawley rats. Full-thickness flaps were raised, and, after suturing, EMD was injected underneath the soft tissues on one side, whereas the EMD vehicle was injected in the contralateral side. Animals were sacrificed after 5 or 9 days, and the wound area was subjected to histologic and immunohistochemical analysis of the epithelial gap, number of macrophages, blood vessels, proliferating cells, and collagen content in the connective tissue (CT). Gene expression analysis was also conducted 2 days post-surgery.

**RESULTS:** EMD had no effect on the epithelial gap of the wound. On both days 5 and 9, EMD treatment increased significantly the number of blood vessels and the collagen content. EMD also enhanced (by 20% to 40%) the expression of transforming growth factors  $\beta$ 1 and  $\beta$ 2, vascular endothelial growth factor, interleukin-1 $\beta$ , matrix metalloproteinase-1, versican, and fibronectin.

**CONCLUSION:** EMD improves oral mucosa incisional wound healing by promoting formation of blood vessels and collagen fibers in CT.