

B-2. Effect of Electrical Stimulation on Bone Formation in the Extraction Socket of Rat

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On the basis of the evidence that electrical stimulation could promote healing and regeneration of bone, this study was performed to investigate the effects of electrical stimulation on rat extraction socket, and to evaluate the potential of clinical application of electrical stimulation.

Forty rats were used and divided into control groups(10)and the experimental groups(30) in this study. The maxillary 1st molar were extracted in both groups. In experimental group, electrical stimulation was given at the current intensity of 1mA(Test-1), 10mA(Test-2), 25mA(Test-3) each day. At 1, 3, 5, 7 days after the tooth extraction, rats in both groups were serially sacrificed. And the specimens were prepared with Hematoxylin-Eosin stain for the light microscopic evaluation.

The results of this study were as follows;

1. At 1 day after the extraction, the periodontal ligament was found in the extraction socket wall. The formation of blood clot with dense infiltration of inflammatory cells in control group and there were less inflammatory cells in test group.
2. At 3 day after the extraction, the cells and collagen of the periodontal ligament were so actively proliferated and synthesized that invaded into the connective tissue of the extraction sockets in the control group. There were the formation of new bone in the basal & lateral portion of socket wall in test -2 and -3.
3. At 5 days after the extraction, there were no formation of new bone in control group. But the more electrical stimulation was applied, the more formation of new bone in test group.
4. At 7 days after the extraction, the extraction sockets were almost filled with trabecular bone in each group. Bone maturity was remarkable in test-3.
5. The electrical stimulation at 10mA and 25mA was more effective in the bone formation at 5 and 7 days after the extraction.

From the above results, electrical stimulation could promote the extraction socket wound healing, and be utilized in the clinical application of the residual ridge expansion.