The Effect of Microcurrent Electrical Stimulation on Tendon Healing/
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ABSTRACT

Background: Microcurrent electrical stimulation (MES) has a significant role 
in the healing process. It can promote healing in a variety of bone and skin lesions. The purpose of the study: to investigate the biomechanical effect of 
MES on tendon healing, and to determine if there was an effect of polarity during application. Materials and Methods: 70 male New Zealand rabbits; 
ten of which served as normal group were used as standard biomechanical s data, and the remaining 60 rabbits were randomly allocated into two groups; 
cathodal MES (n=30), or anodal MES (n=30). Each group was further subdivided into three groups according to the study period; 3, 5 and 8 weeks. 
Both hind limbs were completely tenotomized, sutured and immobilized in a plaster cast. The right side received either cathodal or anodal application over 
the injured tendon site, while the left side served as control. Treatment was given duration 30 minutes and was administered in the frequency of 5 sessions/ week. The biomechanical analysis included; load at break (N), 
ultimate tensile strength (UTS) (N), extension at break (mm), and stiffness 
(N/mm) values. Results: The study revealed that MES enhance the healing of 
Achilles tendon, there were significant differences between the treated and untreated sides, there was significant increase in load at break, UTS, and stiffness values in the cathodal group more than the anodal group at the 3 week period, while there was significant increase in the measured values in the anodal group more than the cathodal at 5 and 8 week periods (P<0.05). 
Conclusion: MES accelerated the healing process of tendon and it was suggested that the polarity of MES application could be an important factor to 
be considered in treating soft tissues as tendons; application of negative polarity at the initial then switching to the positive one. 
Key Words: MES, Tendon healing, Biomechanical analysis