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Abstract There is no method of treatment that has been proven to accelerate the rate of tendon healing or to improve the quality of the regenerating tendon. Low level laser photostimulation has gained a considerable attention for enhancing tissue repair in a wide spectrum of applications. However, there is controversy regarding the effectiveness of laser photostimulation for improvement of the healing process of surgically repaired tendons. Accordingly, the present study was conducted to evaluate the role of helium–neon (He–Ne) laser photostimulation on the process of healing of surgically repaired Achilles tendons. Thirty unilateral Achilles tendons of 30 Raex rabbits were transected and immediately repaired. Operated Achilles tendons were randomly divided into two equal groups. Tendons at group A were subjected to He–Ne laser (632.8 nm) photostimulation, while tendons at group B served as a control group. Two weeks later, the repaired Achilles tendons were histopathologically and biomechanically evaluated. The histopathological findings suggest the favorable qualitative pattern of the newly synthesized collagen of the regenerating tendons after He–Ne laser photostimulation. The biomechanical results support the same favorable findings from the functional point of view as denoted by the better biomechanical properties of the regenerating tendons after He–Ne laser photostimulation with statistical significance ($p \leq 0.01$) at most of the biomechanical parameters. He–Ne laser photostimulation reported a great value after surgical repair of ruptured and injured tendons for a better functional outcome. It could be applied safely and effectively in humans, especially with respect to the proposed long-term clinical outcome.

Keywords Laser photostimulation - Achilles tendon - Surgery
