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Effects of platelet-rich plasma (PRP) on the healing of Achilles tendons of rats.

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Abstract

Platelet-rich plasma (PRP) contains growth factors involved in the tissular healing process. The aim of the study was to determine if an injection of PRP could improve the healing of sectioned Achilles tendons of rats. After surgery, rats received an injection of PRP (n = 60) or a physiological solution (n = 60) in situ. After 5, 15, and 30 days, 20 rats of both groups were euthanized and 15 collected tendons were submitted to a biomechanical test using cryo-jaws before performing transcriptomic analyses. Histological and biochemical analyses were performed on the five remaining tendons in each group. Tendons in the PRP group were more resistant to rupture at 15 and 30 days. The mechanical stress was significantly increased in tendons of the PRP group at day 30. Histological analysis showed a precocious deposition of fibrillar collagen at day 5 confirmed by a biochemical measurement. The expression of tenomodulin was significantly higher at day 5. The messenger RNA levels of type III collagen, matrix metalloproteinases 2, 3, and 9, were similar in the two groups at all time points, whereas type I collagen was significantly increased at day 30 in the PRP group. In conclusion, an injection of PRP in sectioned rat Achilles tendon influences the early phase of tendon healing and results in an ultimately stronger mechanical resistance.

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