Platelet-rich plasma (PRP) increases healing process of rats’ Achilles tendons


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• **Tendon** = tissue which does *not heal easily*.

• Recently, several studies, essentially in vitro and, more recently, a few in clinical practice, have demonstrated the *positive effects of platelets on the healing process* of different tissues.

• A local injection of *platelet-rich plasma (PRP)*, which releases many growth factors, has the potentiality to enhance the tendon healing process.
Objective

• The aim of our experiment was to ascertain whether the use of platelet-rich plasma (PRP) was of interest for accelerating the healing process of the Achilles tendon after surgical induced lesion.
Methods

• All experimental procedures and protocols used in this investigation were reviewed and approved by the Institutional Animal Care and Use Committee of the University of Liège.

• **60 rats** were divided into 2 groups:
  – A: control (no injection).
  – B: PRP injection.

• **A 5mm defect** was surgically induced in the rats’ Achilles tendons after **resection of plantaris tendon**.
Methods

- Rats of *group B* received a *PRP injection* in situ after the surgery.
- Afterwards, rats of *both groups* were placed in their cages *without immobilization*.
Methods

- After 5, 15 and 30 days, the traumatized Achilles tendons of 10 rats of both groups were removed and dissected during their healing process.

- Immediately after sampling, tendons were submitted to a biomechanical tensile test up to rupture, using a “Cryo-jaw”.
- Rats were then euthanized.
- Statistical analyses were made with an ANOVA.
Methods
Methods
Results: force (N)

Graph showing the force over time for two conditions: Contrôle and PRP. The graph plots force (N) against time (days) with error bars indicating variability. The Contrôle line shows a steady increase in force, while the PRP line shows a more rapid increase over the same period.
Results: section (mm$^2$)

- Control
- PRP
Results: force/weight (N/100g)
Results: constraint (MPa)

- **Contrôle**
- **PRP**
• We demonstrated that the *force* necessary to *induce tendon rupture* during biomechanical tensile test study was *greater* for tendons which had been submitted to an *injection of PRP*.

• These results were noticed and *significant from day 5 onwards*. 
Conclusion

• This experimentation has shown that PRP injections could accelerate tendon healing process and increase the force needed to rupture tendons in their healing process.

• This “accelerating” process can be observed as early as day 5.
Thank you for your attention.

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