TENDON LESION AND PLATELET-RICH PLASMA (PRP) INJECTION: RAT MODEL

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Introduction

- **Positive effect of platelets** on the healing process of different tissues (skin, bones...)
- Platelets contain *lots of growth factors* enhance the healing process.
- Aim of our experiment: *interest of PRP for accelerating the healing process of Achilles tendons of rats after surgical induced lesion.*
**Methods**

90 rats: 5mm defect surgically induced in the **Achilles tendons**

- **Group A**
  - Control
  - 45 rats

- **Group B**
  - PRP treatment in situ after the surgery
  - 45 rats
Methods

• Rats of group B: in situ PRP injection

• Then: rats of both groups were placed in their cages without immobilization.
Methods

Dissection and sampling of traumatized tendons: 15 rats/group

Day 0

Dissection and sampling of traumatized tendons: 15 rats/group

Biomechanical tensile test up to rupture ("Cryo-jaw") + samples for biochemical and histological analyses

Euthanasia

Day 15

Day 30
Methods

• **Transcriptomic analyses** → expression of **type III collagen, MMP-9** and tenomodulin RNA.

• **Hydroxyproline dosage** → quantification of collagen during the healing process.

• **Histological study** *(HE + MT)* → on the 15 remaining rats of each group.
Results

**Breaking strength**

<table>
<thead>
<tr>
<th>Time (days)</th>
<th>Force (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>15</td>
<td>60</td>
</tr>
<tr>
<td>30</td>
<td>80</td>
</tr>
</tbody>
</table>

- Control
- PRP

* indicates a significant difference.
Results

Surface area of the tendons

Time (days)

Section (mm²)

* Control

* PRP
Results

Constraints

Constraints (MPa)

Time (days)

Control

PRP

*
Results

Semi-quantification of the LG staining

![Graph showing semi-quantification of LG staining over time in days.](image)
Results

Collagen concentration on histological sections

Collagen / unit surface

Control
PRP

Time (days)
Results

Col III

Arbitrary units / 28S

Time (days)

Control
PRP
Results

MMP-9

Arbitrary units / 28S

Control
PRP

Time (days)

0,8 1,0 1,2 1,4 1,6 1,8 2,0 2,2 2,4 2,6 2,8

5 15 30
Results

Tenomodulin

Arbitrary units / 28S

Time (Days)

Control
PRP
Conclusion

- Accelerates tendon healing process
- Improves tendon quality
- Increases the force needed to rupture tendon
Thank you for your attention.

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