Platelet-Rich Plasma Added to the Patellar Tendon Harvest Site During Anterior Cruciate Ligament Reconstruction Enhanced Healing


**Question:** In patients having anterior cruciate ligament (ACL) reconstruction, does the addition of platelet-rich plasma (PRP) to the patellar tendon harvest site improve tendon-healing?

**Design:** Randomized (allocation concealed), blinded (outcome assessor), controlled trial with 6 months of follow-up.

**Setting:** São Paulo University Medical School, São Paulo, Brazil.

**Patients:** 37 patients who were < 45 years of age (mean age, 24.3 years; 89% men) with an ACL injury and skeletal maturity entered the study. Exclusion criteria included complex ligament lesions, osteoarthritis, previous surgery on the same joint, postoperative infection, arthrofibrosis, reoperation, and thrombocytopenia. 22 patients (81%) completed a 6-month follow-up.

**Intervention:** Patients were allocated to receive PRP (n = 12) or no PRP (control, n = 15). All patients underwent arthroscopic ACL reconstruction. During anesthesia, PRP was obtained from each patient in the PRP group with use of a cell separator with a platelet apheresis kit (Harmonicare, Braintree, Massachusetts). The peritendon was opened longitudinally and separated from the patellar tendon. A 1-cm wide bone-patellar tendon-bone graft was obtained for ACL reconstruction. The patellar tendon defect was completely filled with 20 to 40 mL of PRP gel in the PRP group; nothing was added to the control group. The tendon was closed to the fat pad with number 3-0 absorbable suture without closing the tendon itself. The peritendon was closed with number 3-0 absorbable suture. Postoperatively, suction drains were placed inside the knee joint and analgesia was carefully monitored. Patients were discharged after 24 hours. Early knee range of motion and progressive weight-bearing with crutches was allowed for 3 weeks.

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>PRP (mm²)</th>
<th>No PRP (mm²)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gap area</td>
<td>4.9</td>
<td>9.4</td>
<td>0.046</td>
</tr>
<tr>
<td>Cross-sectional area</td>
<td>173.0</td>
<td>176.3</td>
<td>0.856</td>
</tr>
<tr>
<td>Insall-Salvati index</td>
<td>1.0</td>
<td>1.1</td>
<td>0.806</td>
</tr>
<tr>
<td>Pain (VAS)</td>
<td>3.8</td>
<td>5.1</td>
<td>0.02</td>
</tr>
</tbody>
</table>

*Mean values are expressed. VAS = visual analog scale (higher scores indicate greater pain).

**Main outcome measures:** The primary outcome was healing of the patellar tendon harvest site assessed by magnetic resonance imaging (MRI) at 6 months. Secondary outcomes were postoperative pain assessed with use of a visual analog scale immediately after surgery. Knee function assessed with use of the Lysholm, International Knee Documentation Committee, Kujala, and Tegner questionnaires, and isokinetic testing results (quadriceps peak torque deficit) were assessed at 6 months.

**Main results:** Patients who received PRP had better healing of the patellar tendon harvest site than control group patients did, as shown by a smaller gap area seen on MRI (Table). The groups did not differ with regard to measurements of the cross-sectional area of the patellar tendon or with regard to patellar height, as measured with use of the Insall-Salvati index (Table). Patients in the PRP group had less postoperative pain (Table). Knee function improved in both groups according to all questionnaires except the Tegner, with no between-group differences. The groups did not differ with regard to the isokinetic testing results.

**Conclusions:** In patients undergoing ACL reconstruction, the addition of platelet-rich plasma to the patellar tendon harvest site improved tissue-healing at the patellar tendon donor site and reduced pain immediately after surgery.

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**References**

**Commentary**

PRP has emerged as a promising but still unproven treatment option in musculoskeletal tissue repair. The randomized controlled trial by de Almeida et al. tested the effect of PRP gel on tendon-healing of the patellar tendon harvest site during ACL reconstruction by comparing the results after implantation of PRP gel with the results of no treatment. It is not clear if patients were blinded to their treatment allocation. The authors claimed that patients who received PRP had better healing of the patellar tendon harvest site than the control group did, with a smaller gap area detected by MRI and less postoperative pain as evaluated with use of a VAS. It is not only the surgical procedure but also well-controlled postoperative rehabilitation that can affect the outcome; thus, a description of the postoperative rehabilitation regimen for the patients in both groups is important, but this information is lacking in this study. Furthermore, evaluation of only one axial MRI section is not sufficient to evaluate tendon-healing. Although established protocols were followed, it would be preferable if the authors reported the quantity of healed area throughout the length of harvested tendon as shown on MRI.

Also, the authors did not demonstrate that PRP treatment contributed to improved patient function as assessed by knee functional scores or isokinetic testing. The goal of ACL reconstruction is to improve the symptoms and function of the patient, including a return to strenuous activities. Since the two groups were similar with respect to outcome scores and isokinetic testing, it is unclear if patients truly derived benefit from the treatment. Lastly, a follow-up of six months may not be sufficient for the evaluation of patient function after ACL reconstruction.

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