Comparing ACL outcomes: 1 year vs 2 years

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I have no financial conflicts to disclose.
Background

• Anterior cruciate ligament (ACL) injuries are most prevalent amongst active and young individuals. Despite the success of surgical intervention in treating ACL injuries, the ideal timeline for patients to return to sport post ACL reconstruction has been widely debated.

• Commonly, 9 to 12 months have often been used as an arbitrary time point for patients to return to sports. However, there have been few studies demonstrating patients’ outcomes after the 1 year mark.
Outcome Measures

**Primary outcome measure:**
To evaluate patient’s improvement in functional status between 1 and 2 years post-operatively

**Secondary outcome measure:**
To evaluate the proportion of patients who have returned to pre-injury sports at 1 year VS 2 years

Hypothesis

• 1 year Post ACL reconstruction, patients will experience continual improvement in functional status
• Patients take close to 2 years to achieve near complete recovery post op
Methodology

• A prospective review of 56 patients (42 males and 12 females), mean age of 27.1 years underwent 4 strand hamstring graft ACL reconstruction

• Patients who had concomitant bucket handle tears were excluded from the study

• Single senior surgeon in single centre

• Follow up for 2 years with IKDC subjective, Lysholm, Tegner scores at each regular interval (3, 6, 9, 12, 18 and 24 months)

• Statistical analysis with paired Student T test
Results Part 1

<table>
<thead>
<tr>
<th></th>
<th>Pre-injury</th>
<th>1 year</th>
<th>2 years</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Subjective IKDC</strong></td>
<td>56.7</td>
<td>81.1*</td>
<td>86.9 (p=0.016)</td>
</tr>
<tr>
<td><strong>Tegner</strong></td>
<td>3.63</td>
<td>5.6*</td>
<td>6.4 (p=0.053)</td>
</tr>
<tr>
<td><strong>Lysholm</strong></td>
<td>71.2</td>
<td>91.4*</td>
<td>90.2 (p=0.52)</td>
</tr>
</tbody>
</table>

- Subjective IKDC scores increased significantly between 1 and 2 years.
- Tegner scores increased between 1 and 2 years (p=0.053), almost reaching statistical significance.
- No significant difference was seen for Lysholm scores between 1 and 2 years.
- All scores increased from pre-injury to 1 year.

* = P <0.0001
Results Part 2

<table>
<thead>
<tr>
<th>IKDC Category</th>
<th>Pre-op (proportion)</th>
<th>1 year (proportion)</th>
<th>2 years (proportion)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IKDC A</td>
<td>4.1%</td>
<td>51.4%</td>
<td>67.9%</td>
</tr>
<tr>
<td>IKDC B</td>
<td>14.3%</td>
<td>44.7%</td>
<td>32.1%</td>
</tr>
<tr>
<td>IKDC C</td>
<td>81.6%</td>
<td>2.7%</td>
<td>0%</td>
</tr>
</tbody>
</table>

+47.3% \[\text{IKDC A}\] \[\text{Pre-op to 1 year}\]
+16.5% \[\text{IKDC A}\] \[\text{1 year to 2 years}\]
+30.4% \[\text{IKDC B}\] \[\text{Pre-op to 1 year}\]
-12.6% \[\text{IKDC B}\] \[\text{1 year to 2 years}\]

When IKDC objective scores were evaluated pre-operatively, 4.1% were IKDC A; 14.3% IKDC B and 81.6% IKDC C. At one year, 51.4% were IKDC A, 44.7% IKDC B and 2.7% IKDC C. And at 2 years post surgery, 67.9% were IKDC A, 32.1% IKDC Bs and 0% IKDC. The improvement in IKDC category from 0 to 1 year and 1 to 2 years demonstrate that patients improve beyond 1 year post operatively.
Results Part 3 (comparing it to current literature)

<table>
<thead>
<tr>
<th></th>
<th>Ardern et al (2015)</th>
<th>Our Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year return close to pre-injury level</td>
<td>31%</td>
<td>47%</td>
</tr>
<tr>
<td>2 year return close to pre-injury level</td>
<td>60%</td>
<td>60%</td>
</tr>
</tbody>
</table>

- In a prospective study of 122 patients by Ardern et al, they found that only 31% of patients were close to pre-injury levels at 1 year. When they were evaluated at 2 years, 60% of patients were back to pre-injury levels.
- This is congruent to our study findings (47% at 1 year and 60% at 2 years) that patients often require more than the frequently assumed 9-12 months for return to pre-injury level.
Discussion

• The improvement in subjective IKDC and tegner scores between 1 and 2 years gives evidence that patients continue to improve in functional status after 1 year of ACL reconstruction.

• We see a similar trend with objective IKDC scores at pre-injury, 1 year and 2 years that add on to evidence that patients continue to improve 1 year post surgery.

• In a separate study by Ithurburn et al (2019) using KOOS scores, all subscales were higher at 2 years post return to sport.

<table>
<thead>
<tr>
<th>Variable</th>
<th>RTS</th>
<th>2 years post-RTS</th>
<th>p-Value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>KOOS-Pain</td>
<td>73.1% (n=49)</td>
<td>86.6% (n=58)</td>
<td>0.057</td>
</tr>
<tr>
<td>KOOS-Symptoms</td>
<td>59.7% (n=40)</td>
<td>77.6% (n=52)</td>
<td>0.027</td>
</tr>
<tr>
<td>KOOS-ADL</td>
<td>86.6% (n=58)</td>
<td>95.5% (n=64)</td>
<td>0.063</td>
</tr>
<tr>
<td>KOOS-Sport</td>
<td>65.7% (n=44)</td>
<td>83.6% (n=56)</td>
<td>0.003</td>
</tr>
<tr>
<td>KOOS-QOL</td>
<td>26.9% (n=18)</td>
<td>71.6% (n=48)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>All KOOS Subscales</td>
<td>25.4% (n=17)</td>
<td>59.7% (n=40)</td>
<td>0.024</td>
</tr>
</tbody>
</table>

Table adopted from M.P Ithurburn et al (2019) displaying various KOOS scores at Return to sport (RTS) and 2 years post RTS.
Discussion

• The limitations of the study include that of single centre, single surgeon with relatively small numbers. However, this removes potential confounders such as different surgical technique, rehabilitation protocols etc that may have a huge influence on outcomes.

• We also excluded patients who had bucket handle tears, but included patients who underwent concomitant meniscal debridements. This was because we felt that this is more reflective of the generic patient population (as isolated ACL injuries are rare), and to optimize outcomes, it is general practice to debride significant meniscal tears that may affect a patient’s outcomes.

• In a large study of 4691 patients by LaPrade et al, it has also been shown that patients with ACL reconstruction and meniscal resections do not fare worse than isolated ACL reconstructions.
Conclusion

Patients continue to improve in function 1 year post ACL reconstruction surgery, verified by improvement in scores on validated knee scoring systems, as well as the increased proportion of patients who returned to sport at 2 years.
References


