Predictors of Functional Disability in Patients Undergoing Anterior Cruciate Ligament Reconstruction

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Predictors of Functional Disability in Patients Undergoing Anterior Cruciate Ligament Reconstruction

Michael Korn MD, Caleb Gulledge BS, Chaoyang Chen MD, Vasilios Moutzouros MD, Eric Makhni MD
ACL Reconstruction

- Primary restraint to anterior tibial translation
- >175,000 ACL reconstructions annually
- $1 billion annual costs
- Variable postoperative function and return to sport
- Options for reconstruction
  - Bone-tendon-bone, hamstrings, quad tendon autograft
  - Tendon allograft
Patient Reported Outcome Measures

- **PROMIS**
  - 2004 NIH initiative
  - Item banks organized by health domains (physical, mental health, etc)
  - Computer Adaptive Testing
  - Quick, efficient, validated

- **MCID**
  - What is a meaningful benefit to the patient?
  - Smallest change in outcomes score necessary to be considered meaningful improvement
Study Design

- **Purpose:** What patient factors are associated with poor preoperative function?
  - Which patients can be **optimized**?
  - Which patients are unlikely to benefit?

- **Retrospective analysis of 145 patients undergoing ACL reconstruction**
  - PROMIS Physical Function, Pain, and Depression domains
  - Patient demographics, radiographic findings, and injury history were analyzed
Results

- Wide variability in preoperative PROMIS scores
- PROMIS Physical Function negatively correlated with BMI, Pain, and Depression
Results

- Meniscus tears associated with lower Physical Function
- Physical therapy associated with higher Physical Function
- Meniscus tears associated with higher pain
Conclusions

1. Wide range in PROMIS scores in patients undergoing ACL reconstruction
2. Physical therapy and low BMI associated with better preoperative function
3. Worse preoperative function in patients with depressive symptoms
4. Some patients undergoing ACL reconstruction may be unlikely to benefit from surgery
Future Directions

- Can we use preoperative PROMIS scores to predict which patients are likely or unlikely to benefit from surgery?

<table>
<thead>
<tr>
<th>PROMIS Domain</th>
<th>Post-op Visit</th>
<th>$P$</th>
<th>Percent Probability of Achieving MCID$^a$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Likely to Achieve MCID</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>95%</td>
</tr>
<tr>
<td>Physical Function</td>
<td>3 months</td>
<td>0.003</td>
<td>≤36.4</td>
</tr>
<tr>
<td></td>
<td>6 months</td>
<td>&lt;0.001</td>
<td>≤38.2</td>
</tr>
</tbody>
</table>
References


- Papuga MO, Beck CA, Kates SL, Schwarz EM, Maloney MD. Validation of GAITRite and PROMIS as high-throughput physical function outcome measures following ACL reconstruction. *Journal of orthopaedic research : official publication of the Orthopaedic Research Society.* 2014;32:793-801.


Thank you