Trends in PROMIS Scores in the Early Post-Operative Period Following Various Lateral Ankle Ligament Reconstructive Techniques

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The Ankle Sprain

• Lateral ankle ligament injuries account for 25% of musculoskeletal injuries

• Non-surgical treatments first

• Approximately 15% develop chronic instability necessitating surgery
Lateral Ankle Ligament Reconstruction Outcomes

• Long-term studies on surgical treatments and satisfaction show 90% good to excellent outcomes

• Current scoring systems for evaluating outcomes and monitoring progression of foot and ankle conditions have deficiencies.
  • Functional evaluations limited by time of healing

• Satisfaction evaluated only after months of recovery
PROMIS

PROMIS instruments are reliable, valid and responsive and can be collected efficiently and quickly in a clinic setting. PROMIS scores provide the opportunity to monitor progress from the patient’s perspective over the course of treatment.

• URMC Orthopaedics:
  • Collects PROMIS on every patient at every visit
  • PROMIS CAT instruments: Physical Function, Pain Interference, Depression
  • Scores available immediately in electronic medical record for provider to discuss with patient
  • Database of scores available to researchers
Purpose

• To evaluate the trends in post-operative PROMIS physical function (PF), pain interference (PI), and depression scores in patients undergoing lateral ankle ligament reconstruction.

• Intended to be an illustration of how PROMIS scores can be used in a clinical setting

• No attempt to show one procedure superior to another
Methods

• Reviewed PROMIS scores prospectively obtained from all patients evaluated in our foot and ankle clinic between February 2015 and October 2016.

• 111 patients identified who underwent lateral ankle ligament reconstruction using ICD-9/10 and CPT codes
Exclusion Criteria:

1. Less than three-month follow-up
2. Incomplete PROMIS scores
3. Other documented surgeries unrelated to lateral ankle instability occurring during the follow-up period

Total 55* patients met inclusion criteria

*2 patients had other types of reconstruction and were not included in this analysis
Surgical Treatments

- Provider preference
- Patient Characteristics
  - Ligament laxity
  - Activity level

BG = modified Broström-Gould.
- Stretched ligaments are divided and tightened “tummy tuck”

BG+FT = modified Broström-Gould augmented with suture anchors
- BG plus fiber tape to secure “tummy tuck with backup”

Allograft
- Cadaver tendon woven to recreate stretched tendons

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### Demographics and Clinical Characteristics

<table>
<thead>
<tr>
<th></th>
<th>Allograft (n=17)</th>
<th>BG (n=21)</th>
<th>BG+FT (n=15)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td>37.22 ± 10.94</td>
<td>40 ± 14.52</td>
<td>40.9 ± 15.0</td>
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<tr>
<td><strong>Gender</strong></td>
<td></td>
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<tr>
<td>Gender</td>
<td>5 M</td>
<td>4 M</td>
<td>6 M</td>
</tr>
<tr>
<td></td>
<td>17 F</td>
<td>24 F</td>
<td>11 F</td>
</tr>
<tr>
<td><strong>BMI</strong></td>
<td>31.22 ± 8.04</td>
<td>30.46 ± 14.52</td>
<td>33.76 ± 8.66</td>
</tr>
<tr>
<td><strong>Pre-op PF</strong></td>
<td>41.98 ± 7.19</td>
<td>38.78 ± 7.43</td>
<td>41.41 ± 4.73</td>
</tr>
<tr>
<td><strong>Pre-op PI</strong></td>
<td>57.77 ± 6.65</td>
<td>62.06 ± 6.59</td>
<td>60.97 ± 5.44</td>
</tr>
<tr>
<td><strong>Pre-op D</strong></td>
<td>47.27 ± 9.98</td>
<td>51.39 ± 9.69</td>
<td>50.71 ± 8.58</td>
</tr>
<tr>
<td><strong>Follow-up (weeks)</strong></td>
<td>31.86 ± 14.08</td>
<td>28.15 ± 13.90</td>
<td>28.68 ± 16.02</td>
</tr>
<tr>
<td><strong>Cavovarus Reconstruction</strong></td>
<td>4 (23.5%)</td>
<td>3 (14.3%)</td>
<td>3 (20.0%)</td>
</tr>
<tr>
<td><strong>OCD procedures</strong></td>
<td>5 (29.4%)</td>
<td>6 (28.6%)</td>
<td>2 (13.3%)</td>
</tr>
</tbody>
</table>

*We are operating on the RIGHT people!*

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Data Analysis

• PROMIS PF, PI, and depression scores were evaluated at each post-operative visit.
  • Scores grouped for purposes of analysis

• Changes in scores were calculated as compared to baseline pre-operative scores and compared at each follow-up time point using two-way ANOVA.

• Differences in reconstruction type in patients undergoing allograft, modified Broström-Gould (BG), or modified Broström-Gould augmented with fibertape (BG+FT) were also evaluated.
PF was significantly worse at 2 and 4-6 week follow-up (p<0.05) and significantly better at >12 weeks follow-up (p<0.01).

Overall trend demonstrates a return to baseline at 8-12 week follow-up and continued improvement at >12 weeks post-op.
• PI significantly improved from baseline beginning at 8-12 week follow-up (p=0.02).

• >12 week follow-up ½ SD improvement suggests meaningful clinical improvement
• Important to acknowledge the role mental health plays in treatment outcomes.

• Depression was unchanged from baseline at 2 weeks and 4-6 week follow-up, then significantly improved thereafter (p<0.01).

• Better functioning and decreased pain results in improved mood!
Delay in PF recovery in group starting at 8-12 weeks.

At >12 weeks we see nearly significant slower improvement in PF compared to (p = 0.07) and (p = 0.051).

Important to investigate further with more data to determine if these trends persist because they may have clinical significance.
What do the PROMIS scores tell us?

• Clinical expectations are reflected in PROMIS scores

• Surgery in patients with baseline scores ≥ 1 SD away from mean can improve function and decrease pain

• Improving physical function and pain can affect mood

• There are definite trends in recovery that can be used for pre-operative counseling and to guide patient expectations after surgery
What else can we learn?

- How much does mental health status affect physical function and pain interference? What can we do about it?
- Is the delay in recovery seen in the BG+FT group typical?
  - If yes, helps to set expectations for patients who need this type of surgery

The PROMIS data may provide additional insight into which procedure might work best in a value-based care model.

More data will help provide answers – benefit of PROMIS - URMC and other Institutions
Questions?