The Road to Recovery for Bunion Surgery: Data Analytic Plots to Target Patient Progress

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Disclosures

• Ashlee MacDonald, MD: No conflicts to disclose

• Jeff Houck, PT, PhD: No conflicts to disclose

• Judith F. Baumhauer:
  • American Orthopaedic Foot and Ankle Society: Board or committee member
  • PROMIS Health Organization (PHO): Board or committee member
  • Additional disclosures can be found on the AAOS website.
Introduction/Purpose:

Power of Patient reported outcomes (PROs):

• Provide information on individual patient’s progress throughout a treatment course

• Generate data analytic curves → Predictable Recovery Roadmap
  • Patients who deviate negatively: may have a complication and early intervention can be initiated.
  • Patients who deviate positively: potential to need less physical therapy, early return to sports or work.

4.4 million patients with Hallux Valgus seek care yearly and surgery is equally common.

Purpose: To determine if PROMIS PROs can be used to construct data analytic curves for HV surgery.
Methods

• PROMIS scores prospectively collected between February 2015 and November 2016.

• 65 patients undergoing bunionectomy were identified using ICD-9/10 and CPT codes

• 31 patients met exclusion criteria:
  • < 2 month follow-up
  • Multiple unrelated procedures during the follow-up period
  • Incomplete PROMIS scores

• 35 patients included in the study.
Methods

- Bunionectomy-specific pre-operative cut-off values to achieve and fail to achieve minimally clinically important differences (MCID) in physical function (PF) with 95% specificity and 95% sensitivity were determined using a previously described method.

- Patients stratified based on their pre-operative PF T-scores as above or below the MCID cut-off of 50.2.

- PF was evaluated at 4 follow-up time periods:
  - 1 week post-op
  - 3-4 weeks post-op
  - 6-12 weeks post-op
  - > 13 weeks post-op*

  *Due to small sample size, data from 13-week follow-up was not included in the statistical analysis
# Results

<table>
<thead>
<tr>
<th></th>
<th>Age</th>
<th>Sex</th>
<th>Average Follow-up (weeks)</th>
<th>PROMIS Physical Function Scores</th>
<th>Pre-op</th>
<th>1 week follow-up</th>
<th>3-4 week follow-up</th>
<th>6-12 week follow-up</th>
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<tbody>
<tr>
<td><strong>All patients (n = 34)</strong></td>
<td>55.43 ± 13.69</td>
<td>32 F</td>
<td>17.5 ± 9.63</td>
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<td>48.07 ± 7.11</td>
<td>31.44 ± 11.10</td>
<td>35.59 ± 7.84</td>
<td>45.15 ± 7.94</td>
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<td><strong>High Pre-op Score (PF &gt; 50.2; n = 13)</strong></td>
<td>53.08 ± 12.51</td>
<td>12 F</td>
<td>13.45 ± 6.62</td>
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<td>55.75 ± 4.69</td>
<td>33.07 ± 12.60</td>
<td>37.44 ± 6.42</td>
<td>49.30 ± 5.75</td>
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<td><strong>Low Pre-op Score (PF &lt; 50.2; n = 21)</strong></td>
<td>56.82 ± 14.44</td>
<td>20 F</td>
<td>19.90 ± 10.44</td>
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<td>43.53 ± 3.34</td>
<td>30.47 ± 10.30</td>
<td>34.50 ± 8.53</td>
<td>42.70 ± 8.14</td>
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</tbody>
</table>
Results

Figure 1. Trends in PF stratified based on pre-operative PF cut-off score of T-score > 50.2. Significant differences observed at pre-op visit (p < 0.01) and at 6-12 weeks follow-up (p = 0.02).

**Data points at > 13 weeks represent averages only and are not included in data analysis due to small sample size (n = 5 for high score, n = 15 for low score).
Conclusion/Discussion

• Pre-operative PROMIS PF scores are significant post-operative predictors.

• Patients with pre-operative scores below the bunionectomy-specific cut-off (50.2):
  • Met MCID threshold with changes in PF
  • T-scores significantly lower at 6-12wk follow-up compared to patients with pre-operative PF > 50.2.

• Although short term follow up suggests a significant clinical impact of using PROMIS scores for pre-surgical decisions as well as provides a road map for recovery for patients and surgeons.
References


