Short-to-Mid-term Outcomes Following Interosseous Membrane Reconstruction Using Tightrope Suture-Button Suspensionplasty

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Objective

• To describe our institution’s experience with Interosseous Membrane (IOM) Reconstruction using a mini-Tightrope (TR) suture-button suspensionplasty device (Arthrex, Inc., Naples, FL) for treatment of forearm instability and related disorders.

Methods

• Retrospective review of patients who underwent IOM reconstruction using the mini-TR from 2011-4
• All surgeries performed by two senior surgeon-authors (ALO, RWC)
• Surgeries all performed in conjunction with an ulnar shortening osteotomy and arthroscopic TFCC repair.
• Data queried: Demographics, injury history, prior treatment(s), clinical exam values, QuickDASH scores, subjective satisfaction:
  (1= highest; 5 = lowest)
• Secondary outcomes: complications, additional surgery
• Bivariate statistical analysis:
  Paired t-test for comparison of pre- and post-operative ROM, grip strength, QuickDASH scores

Results

Study Cohort

• Ten patients (7 female, 3 men)
• Mean age: 45.3 years (range 22-59)
• Mean follow-up duration 30 +/- 17 months
• Underlying condition:
  • 8 patients with post-traumatic sequelae of Essex-Lopresti injuries
  • 1 patient with Madelung’s deformity,
  • 1 patient with instability due to a prior failed lateral elbow reconstruction
• 8 TR used primarily, 2 as revision of prior failed surgeries
• Mean interval from initial injury to IOM reconstruction surgery: 26 +/- 18 months

Subjective Outcomes

• 10/10 patients satisfied
  satisfaction = 1.4 +/- 0.7
• Improved QuickDASH (see Table I.)
• Significantly improved Elbow ROM

Table I. Comparison of Pre- and Post-Operative Outcome Measures

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Preoperative</th>
<th>Postoperative</th>
<th>P value</th>
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<tbody>
<tr>
<td>Elbow Flex/Ext Arc (deg.)</td>
<td>97 +/- 24</td>
<td>120 +/- 18</td>
<td>0.03*</td>
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<tr>
<td>Forearm Rotation (deg.)</td>
<td>124 +/- 39</td>
<td>130 +/- 36</td>
<td>0.75</td>
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<tr>
<td>Grip Strength (lbs.)</td>
<td>43 +/- 22</td>
<td>57 +/- 20</td>
<td>0.14</td>
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<tr>
<td>QuickDASH (scaled 0-100)</td>
<td>71 +/- 19</td>
<td>26 +/- 24</td>
<td>0.001*</td>
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</tbody>
</table>

* Denotes statistical significance

Conclusions

• IOM Reconstruction using the Tightrope device is a promising surgical option for the treatment of forearm instability secondary to post-traumatic sequelae and other related deformities
• This technique may prove useful in the primary, secondary or revision settings of forearm reconstruction
• Further investigation is warranted to evaluate long-term patient outcomes, including comparison to other techniques of IOM reconstruction