Criteria Based Return to Sport Testing is Associated with Lower Recurrence Rates Following Arthroscopic Bankart Repair

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I (and/or my co-authors) have something to disclose.

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Introduction

• Traditionally return to sports (RTS) following shoulder stabilization surgery is subjective:
  - strength
  - range of motion
  - arbitrary passage of time (5-6 mo)
• Recurrence rate in literature 3-23%
• RTS criteria-based testing popularized for ACL and decreases ACL graft failure¹
Introduction

- Traditionally return to sports (RTS) following shoulder stabilization surgery is subjective:
  - strength
  - range of motion
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- Recurrence rate in literature 3-23%
- RTS criteria-based testing popularized for ACL and decreases ACL graft failure¹
- Previous work describing our criteria based RTS test at 6mos after Bankart surgery:
  - 88% failed at least 1 component
  - suggests objective assessment of strength may be needed to detect potential deficits
  - may influence recurrence rates after return to sports²
• **PURPOSE:** Evaluate the impact of criteria based RTS test on recurrence rate after arthroscopic Bankart surgery
Purpose/Hypothesis

• **PURPOSE:** Evaluate the impact of criteria based RTS test on recurrence rate after arthroscopic Bankart surgery

• **HYPOTHESIS:** Athletes who undergo a criteria based RTS test to guide return to play will have a lower recurrence rate when compared to those who did not.
Methods

• Retrospective review, case-controlled study
• Minimum 1 year follow up
• **Case group** - 36 competitive high school and college athletes Arthroscopic anterior labral repair 2016-2018
  – No bone loss >13.5%, no MDI, no off-track
  – Completed postoperative rehabilitation
  – Completed RTS battery at 6 months
• **Control group** - 36 matched consecutive historical cases 2014-2015
  – Did not undergo criteria based RTS testing

<table>
<thead>
<tr>
<th>PHASED REHABILITATION</th>
</tr>
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<tbody>
<tr>
<td>Phase 1 (6 weeks)</td>
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<td>– Sling x 4 weeks (No AROM)</td>
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<td>– Scapular posture/mobility</td>
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<td>– RC Isometrics at 4 weeks</td>
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<tr>
<td>Phase 2 (6-12 weeks)</td>
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<td>– Gradual increase ROM to goal</td>
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<tr>
<td>– Submaximal tissue loading</td>
</tr>
<tr>
<td>– Dynamic stabilization and posture</td>
</tr>
<tr>
<td>– Neuromuscular control</td>
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<tr>
<td>Phase 3 (12-24 weeks)</td>
</tr>
<tr>
<td>– Normalization of strength and NM control</td>
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<td>– Develop power for higher level activities (sport specific)</td>
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RETURN TO SPORT TESTING (6 MOS)
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• **Control group** - 36 matched consecutive historical cases 2014-2015
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• Recurrence defined as symptomatic instability requiring revision stabilization
• Statistical analysis included descriptive statistics, independent t test, ANOVA to compare means, odds ratio to assess probability
• Statistical significance p<0.05

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RETURN TO SPORT TESTING (6 MOS)
Methods: Strength Testing

• Goal = 90% contralateral

• Isokinetic IR and ER
  – Biodex Peak Torque
    » 60° per second
    » 180° per second

• External Rotation Endurance Test
  – External Rotation (ER) Reps to failure with 5% body weight
    » 0º Abduction (sidelying)
    » 90º Abduction (prone)

Reinold et al. (2004).
Methods: Functional Testing

• **#1 Closed Kinetic Chain Upper Extremity (CKCUES) Test**
  - Alternating touch in Push-up position
  - Average of 3 rounds of 15 sec
    - 45 sec break
  - Scored in touches/15 seconds
    - 1 touch = Move one hand from the floor to contralateral hand and back
      - **PASS = >/= 21 touches**
        - Reference value
          - 75% active female
          - 85% active male

• **#2 Unilateral Seated Shot Put Test**
  - Distance of throw for 6-lb medicine ball
  - Back flat against wall, knees 90 degrees
  - Mean distance of 3 trials, 30 second rest
  - **PASS = 90% distance of nonop extremity**
    - 10% adjustment for dominance
Methods: Functional Testing

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  - Patients who completed failed the test, redid test (2)
  - Patient who were able to complete test, but failed partially, continue specific PT for 4 weeks before RTS

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## Results - Demographics

<table>
<thead>
<tr>
<th></th>
<th>RTS Case Group</th>
<th>Control Group</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>20(14-29)</td>
<td>19(15-36)</td>
<td>0.15</td>
</tr>
<tr>
<td>Male</td>
<td>30/36(83%)</td>
<td>23/36(64%)</td>
<td>0.11</td>
</tr>
<tr>
<td>Dominant side involved</td>
<td>19/36(52%)</td>
<td>18/30(60%)</td>
<td>0.56</td>
</tr>
<tr>
<td>Isolated anterior labrum</td>
<td>26/36(72%)</td>
<td>26/36(72%)</td>
<td>1.0</td>
</tr>
<tr>
<td>Anterior + Posterior labrum</td>
<td>10/36(28%)</td>
<td>10/36(28%)</td>
<td>1.0</td>
</tr>
<tr>
<td>&gt;3 anchors</td>
<td>36(100%)</td>
<td>36(100%)</td>
<td>1.0</td>
</tr>
<tr>
<td>Sports</td>
<td></td>
<td>0.78</td>
<td></td>
</tr>
<tr>
<td>Football</td>
<td>16</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>Basketball</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Wrestling</td>
<td>2</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Soccer</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Hockey</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Lacrosse</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>9</td>
<td>9</td>
<td></td>
</tr>
</tbody>
</table>
## Results – Recurrence Rate

<table>
<thead>
<tr>
<th></th>
<th>RTS Case Group</th>
<th>Control Group</th>
<th>P-value</th>
<th>Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recurrence rate</td>
<td>2/36 (5%)</td>
<td>8/36 (22%)</td>
<td>0.04</td>
<td>4.85</td>
</tr>
<tr>
<td>Time from Surgery (months)</td>
<td>12</td>
<td>13.6</td>
<td>0.43</td>
<td></td>
</tr>
<tr>
<td>Sports</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Football</td>
<td>2</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wrestling</td>
<td>-</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basketball</td>
<td>-</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment</td>
<td>Latarjet (2)</td>
<td>Arthroscopic Bankart (6) Open Bankart (1) Latarjet (1)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Discussion

- **Discussion:**
  - Patients who underwent a criteria based RTS test before RTS had a significant, more than 4x lower rate of recurrence when compared with those who did not.
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- Patients who underwent a criteria based RTS test before RTS had a significant, more than 4x lower rate of recurrence when compared with those who did not.
- Loss of isokinetic muscle strength has been shown to be a risk factor for recurrent instability in the preoperative state\(^5,6\)
- This suggests proper restoration of dynamic stabilizers might be just as important as other risk factors.
**Discussion:**

- Patients who underwent a criteria based RTS test before RTS had a **significant**, more than 4x lower rate of **recurrence** when compared with those who did not.
- Loss of isokinetic muscle strength has been shown to be a risk factor for recurrent instability in the preoperative state\(^5,6\)
- This suggests proper restoration of dynamic stabilizers might be just as important as other risk factors.
- Objective measurements may unravel hidden strength and functional deficits that can guide rehabilitation and decision making for RTS.
- Criteria based RTS testing is a **modifiable factor** in the episode of care.
Limitations

- Prospective randomized control group was not readily available
- Retrospective study design – PROs and determination of return to play at preinjury level not available
• Athletes who did not undergo criteria based RTS testing following arthroscopic shoulder stabilization had 4.85 times increased likelihood of developing recurrent instability after return to sports.
Conclusion

• Athletes who did not undergo criteria based RTS testing following arthroscopic shoulder stabilization had 4.85 times increased likelihood of developing recurrent instability after return to sports.

• Criteria based RTS testing can detect hidden deficits that may guide rehabilitation and help to lower recurrence rates.

2. Return to Sport Testing at 6 Months after Arthroscopic Shoulder Stabilization Reveals Residual Strength and Functional Deficits; Kevin Wilson, MD, Ryan T. Li, MD, Gillian Kane, BS, Adam Popchak, PT, PhD, SCS, Albert Lin, MD. Accepted for publication in JSES.


Thank you