ANKLE INSTABILITY AND ROTATORY DRAWER TESTING

Gregory P. Guyton, MD
Adam G. Miller, MD
Stuart Myers, MD
Brent G. Parks, MSc

MedStar Union Memorial Hospital
Baltimore, Maryland
Ankle Instability and Rotatory Drawer Testing

Gregory P Guyton, MD

My disclosure is in the Final AOFAS Mobile App.

I have no potential conflicts with this presentation.
Ankle Instability Testing

- **Anterior Drawer Test**¹
  - Plantarflex ankle 20° degrees
  - Stabilize leg with opposite hand
  - Apply anterior force to heel

- Detect medial or lateral instability
The Anterior Drawer

- Poor correlation between manual testing and sectioned ligaments\(^3\)
- Most common injury pattern is isolated to lateral ligaments
- Medial instability less common but also in isolation\(^4\)
HOWEVER:
The most common ankle instability pattern involves *isolated* failure of the lateral ankle ligament complex:

“The centre of rotation is the intact deltoid ligament” – van Dijk, 1996

5
Anterolateral Rotatory Drawer

- Allow the ankle to freely rotate internally on the intact deep deltoid during testing

- Phisitkul 2009:\(^6\):
  - high accuracy in clinical instability detection
  - A subjective cadaveric study with small numbers of specimens and testers
Hypothesis:

The Anterolateral Rotatory Drawer Test allows greater displacement of the talus than a straight Anterior Drawer Test for isolated lateral ankle ligament instability patterns.
Methods: Testing

- Cadaveric legs, 10 pairs with serial sectioning of the lateral ligaments
- Custom Apparatus allowing for free or locked rotation of the foot
- 25 N, 50 N forces applied
  - Constrained: Anterior drawer
  - Unconstrained: Rotatory Drawer
## Results: Anterolateral Rotatory Drawer Testing

<table>
<thead>
<tr>
<th>Force</th>
<th>Lateral DVRT displacement (mm ± SD)</th>
<th>Significant difference?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Constrained</td>
<td>Unconstrained</td>
</tr>
<tr>
<td>ATFL Intact</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25 N</td>
<td>0.05 ± 0.1</td>
<td>-0.03 ± 0.2</td>
</tr>
<tr>
<td>50 N</td>
<td>0.1 ± 0.1</td>
<td>0.2 ± 0.4</td>
</tr>
<tr>
<td>ATFL Resected</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25 N</td>
<td>3.78 ± 2.4</td>
<td>6.5 ± 1.7</td>
</tr>
<tr>
<td>50 N</td>
<td>4.5 ± 2.5</td>
<td>8.7 ± 0.9</td>
</tr>
</tbody>
</table>
Anterolateral Rotatory
Conclusions:

- Both anterior drawer and anterolateral rotatory drawer testing detect ATFL instability

- Allowing internal rotation (the rotatory drawer test) *nearly doubles* the amount of lateral talar displacement achieved for the same injury pattern compared to a direct anterior pull
Clinical Implications

- ATFL insufficiency results in a largely rotational rather than translational instability pattern

- Anterolateral rotatory drawer testing is likely dramatically more sensitive to lateral instability than anterior drawer testing


