Sensitivity and specificity of the clinical and radiographic parameters for prediction of syndesmosis injury in acute ankle fractures

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I have no potential conflicts with this presentation
Introduction

• 23% of ankle fractures involve syndesmosis injury

• Ankle instability and traumatic ankle arthritis are the common sequelae of undetectable syndesmosis injury

• Early and accurate diagnosis of syndesmosis injury is essential to facilitate timely, effective and safe treatment

• There remain clear gaps in knowledge about the accuracy of diagnostic tests
Introduction

- To investigate the accuracy of common clinical diagnostic parameters compared with cotton test

- Specificity of 98% for intraoperative cotton test

Patients and methods

- Cross-sectional diagnostic accuracy study
- Between August 2012 and August 2013
- Male 72% (42/58) Female 28% (16/58)
- Aged 26.6±6.5 years
- Approved by ethical committee and obtained the informed consent
Patients and methods

• 58 patients with acute ankle fracture
  – Danis-Weber B: 79% (46/58)
  – Danis-Weber C: 21% (12/58)

• Exclusion criteria:
  – Open ankle fracture
  – Preexisting ankle injury
  – Multiple injuries
  – Pure syndesmosis injury without fracture
Patients and methods

Two clinical parameters

*Squeeze test*

*External rotation test*
Patients and methods

Two radiographic parameters

- Tibiofibular overlap (A)
- Medial clear space (C)
Patients and methods

• Compared with cotton test using analog force puller traction
  – Force of 100N*
  – > 2 mm displacement
  – Assessed under fluoroscopy

Clinical diagnostic tests: diagnostic accuracy, sensitivity, specificity, positive and negative likelihood ratios (95% CI), χ² and p value

<table>
<thead>
<tr>
<th>Test</th>
<th>Accuracy</th>
<th>Sensitivity</th>
<th>Specificity</th>
<th>LR+</th>
<th>LR−</th>
<th>χ²</th>
<th>pValue</th>
</tr>
</thead>
<tbody>
<tr>
<td>External rotation test</td>
<td>60.9</td>
<td>0.26</td>
<td>0.88</td>
<td>2.15</td>
<td>0.84</td>
<td>1.96</td>
<td>0.16</td>
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<tr>
<td>Squeeze test</td>
<td>53.7</td>
<td>0.69</td>
<td>0.41</td>
<td>1.18</td>
<td>0.74</td>
<td>0.60</td>
<td>0.44</td>
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<tr>
<td>Tibiofibular overlap</td>
<td>56.3</td>
<td>0.92</td>
<td>0.29</td>
<td>1.29</td>
<td>0.28</td>
<td>4.58</td>
<td>0.03*</td>
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<tr>
<td>Medial clear space</td>
<td>66.7</td>
<td>0.71</td>
<td>0.63</td>
<td>1.93</td>
<td>0.46</td>
<td>8.77</td>
<td>0.00*</td>
</tr>
</tbody>
</table>

*Significant at p≤0.05 level
Discussion

- No single test is sufficiently accurate for diagnosis.
- We recommend for a combination of sensitive and specific parameters to confirm the syndesmosis injury in acute ankle fractures.
Discussion

- When the tibiofibular overlap and medial clear space are negative, it is less likely to involve syndesmosis.
- We recommend to perform the external rotation test if they are positive.
- If the specific test is also positive, it is more likely to be the syndesmosis injury.