The Diagnostic Usefulness and Validity of Stress Radiography in Chronic Lateral Ankle Instability

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Byung-Ki Cho

My disclosure is in the Final Program Book and in the AOFAS database

I have no potential conflicts with this presentation
Controversies on Diagnostic values of ankle stress radiography

- Ankle instability = Rotational instability of talus
- Various methods of measurement & normal range
- Only mechanical instability, not functional instability
- Correlation between mechanical instability & functional instability?
Stress radiographs using **Telos**

- Evaluation under promised stress loads
- More objective measurement tool of instability
Demographics (case group)

- 38 patients (42 cases) of chronic lateral ankle instability treated with Modified Brostrom op.
- Complete rupture of ant. talofibular ligament (ATF)
- Scar tissue undifferentiated with joint capsule

- Age: mean 32.9yr (17~44)
- Sex (M/F): 32 / 10
Demographics (control group)

- 60 people (120 cases) of normal Korean ankles treated for disease or trauma in hand

Inclusion criteria of normal ankles (Questionnaire)
- no obvious trauma (sprain) Hx.
- no sprain Hx. in the last 5 years
- no ankle symptoms such as pain, LOM, giving way...

- No instability on stress test

- Age: mean 34.6 yr (20~48)
- Sex (M/F): 30 / 30

- 20~29 years man: 10
- 20~29 years woman: 10
- 30~39 years man: 10
- 30~39 years woman: 10
- 40~49 years man: 10
- 40~49 years woman: 10
## Analysis on stress radiography

<table>
<thead>
<tr>
<th></th>
<th>Case group (n=42)</th>
<th>Mean ± SD</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Talar tilt angle</td>
<td></td>
<td>10.8 ± 4.5°</td>
<td>0.014</td>
</tr>
<tr>
<td>Ant. talar translation</td>
<td></td>
<td>8.2 ± 3.9mm</td>
<td>0.005</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Control group (n=120)</th>
<th>Mean ± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Talar tilt angle</td>
<td></td>
<td>4.2 ± 2.1°</td>
</tr>
<tr>
<td>Ant. talar translation</td>
<td></td>
<td>3.9 ± 1.9mm</td>
</tr>
</tbody>
</table>

### Normal range in Korean ankle

(Standard value for judgement of mechanical instability)

- **Talar tilt angle ≤ 8.3°**
- **Ant. talar translation ≤ 7.6mm**
## Validity of ankle stress radiograph

<table>
<thead>
<tr>
<th></th>
<th>Talar tilt</th>
<th>Talar translation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitivity</td>
<td>57 %</td>
<td>69 %</td>
</tr>
<tr>
<td>Specificity</td>
<td>97 %</td>
<td>97 %</td>
</tr>
<tr>
<td>Positive prediction value</td>
<td>89 %</td>
<td>91 %</td>
</tr>
<tr>
<td>Negative prediction value</td>
<td>86 %</td>
<td>90 %</td>
</tr>
</tbody>
</table>

- False negative rate: high
- Positive prediction value > negative prediction value
Conclusion

Ankle stress radiographs with Telos device

- High specificity, positive & negative prediction value
- Low sensitivity (less useful)
- Good validity & poor accuracy
- Underestimation of the mechanical instability

Useful, but normal stress radiographs can’t exclude Lateral Ankle Instability
< References >

