Value of Stress ultrasound for diagnosis of chronic ankle instability compared to other methods: manual anterior drawer test, stress radiography, MRI, arthroscopic findings.

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My disclosure is in the Final AOFAS Mobile App.
I have no potential conflicts with this presentation.
Introduction

Manual ADT
- Most commonly used test
- Poor reliability and sensitivity

Stress X ray
- High false negativity: Muscle contraction due to pain
- Require high stress (150 N)

MRI
- Accurate for ligament injury but not dynamic study
- Expensive and time consuming

Stress ultrasound was reported for new method of diagnosis for chronic ankle instability.
To assess the Value of Stress ultrasound for patients with arthroscopically evident grade III ankle instability comparing

1. Manual anterior drawer test
2. Stress radiography
3. MRI
From June 2013 to April 2014
- AS followed by MBO for CAI
- 28 cases
- Male : Female = 19:9
- Mean age : 32.4 (15-55) years

1. Manual Anterior drawer test : 1/2/3 (stable, moderate unstable, unstable)
2. Stress x-ray : Anterior translation 5mm / Talar tilt angle 15°
3. MRI : Partial tear / Complete tear
4. Stress ultrasound : ATFL length (stressed condition, resting condition)
5. Arthroscopy : Arthroscopic grading of instability
Result

1. Arthroscopy
   1. Ligament inspection and palpation 100%

2. Arthroscopic grading of instability
   All cases: Grade III

2. Manual anterior drawer test
   I/II/III = 0/6/22 (78.6%)
3. Stress radiographs (using Telos device)

Anterior translation: $8.19 \pm 3.03$ (4.58-12.7)
Less than 5mm/ more than 5mm: $4 / 24$ (86%)

TTA: $9.13 \pm 5.94$ (1.00-30.65)
Less than 15°/ More than 15°: $25 / 3$ (11%)
4. MRI

Partial tear/ complete tear : 19 / 9 cases 100%

5. Stress US

- All were lax and wavy or disappeared
- Length ratio $1.29 \pm 0.07 (1.20-1.53)$
Result

6. Side to side comparison
   1. Stress x-ray
      - Difference of anterior translation:
        \[ 68 \pm 1.95 \ (\text{-2.05-6.02}) \]
      - \(< 3\,\text{mm} / \geq 3\,\text{mm 이상} : 7 / 12\)
      - Difference of talar tilt angle:
        \[ 5.72 \pm 6.12 \ (-0.55-25.57) \]
      - \(< 3^\circ / \geq 3^\circ : 15 / 4\)
6. Side to side comparison
1. Stress Ultrasound

**Result**

<table>
<thead>
<tr>
<th>Side</th>
<th>Measurement</th>
<th>Wilcoxon Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Left ATFL</td>
<td>2.12 ± 0.23 (1.69-2.55)</td>
<td>P = 0.777</td>
</tr>
<tr>
<td>Right ATFL</td>
<td>2.76 ± 0.27 (2.24-3.37)</td>
<td>P &lt; 0.001</td>
</tr>
<tr>
<td>Left ATFL stress</td>
<td>2.25 ± 0.22 (1.71-2.67)</td>
<td></td>
</tr>
<tr>
<td>Right ATFL stress</td>
<td>2.13 ± 0.24 (1.72-2.67)</td>
<td></td>
</tr>
</tbody>
</table>
Conclusion

Manual stress ultrasound

1. Identify and quantify changes of the ATFL.

2. As precise as MRI and Arthroscopy to detect ligament injury and ankle instability.

3. The change of ATFL length of manual stress US could be used for diagnosis of chronic ankle instability in addition to other methods.