Value of ultrasound for stability assessment of isolated lateral malleolar fractures compared to stress radiography and arthroscopy: Preliminary report

Young Uk Park, M.D., Ph.D., Young Wook Seo, M.D., Hyuk, Jegal, M.D.,* Kyung Tai Lee, M.D., Ph.D.

Department of Orthopedic Surgery, Ajou University Hospital, Ajou University School of Medicine, Suwon, Gyeonggi-do, Korea

KT Lee’s Orthopedic Hospital, Seoul, Korea*

*Corresponding author, human nervous system, 4, 2-2, Yeongheung-dong, Youngsan-gu, Suwon, Gyeonggi-do, Korea.
Disclosure

We have no potential conflicts with this presentation
Introduction

Isolated LM fx

CTX vs OP

Assessment of stability is very important for proper treatment

SER II

SER IV
# Introduction

## Tools for stability assessment

<table>
<thead>
<tr>
<th>Test Type</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stress X-ray</td>
<td>Pain provocation</td>
<td></td>
</tr>
<tr>
<td>MRI</td>
<td>High cost</td>
<td>Dynamic?</td>
</tr>
<tr>
<td>Arthroscopy</td>
<td>Invasive</td>
<td>High cost</td>
</tr>
<tr>
<td>Ultrasound</td>
<td>Low cost</td>
<td>Dynamic</td>
</tr>
</tbody>
</table>
To evaluate the value of ultrasound for **stability assessment** of isolated lateral malleolar fractures, compared to simple x-ray, stress radiography and arthroscopy.
Material and Methods

- From May 2016 to Nov 2016
- 4/19 : CTx
- 15/19 : ORIF and AS exam (2 deny)
- Male : Female = 7:6
- Mean age : 32.4(17-55) years
Material and Methods

Flow chart

1. LM fx
   - Simple X-ray
     - Not positive
     - Stress X-ray
       - Not positive
         - Conservative treatment - Cast
       - Positive
         - Medial clear space > 5mm or TF overlap < 5mm or TF clear space > 10mm
         - Ultrasound exam
           - Positive
             - Surgery - ORIF
           - Negative
             - Arthroscopy
   - Positive
     - Medial clear space > 5mm or TF overlap < 5mm or TF clear space > 10mm

### Results

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Number of Positive results (n=13)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simple X-ray</td>
<td>11/13</td>
</tr>
<tr>
<td>Stress X-ray</td>
<td>2/2</td>
</tr>
<tr>
<td>Ultrasound (AITFL)</td>
<td>12/13</td>
</tr>
<tr>
<td>Ultrasound (Deltoid)</td>
<td>10/13</td>
</tr>
<tr>
<td>Arthroscopy (AITFL)</td>
<td>11/13</td>
</tr>
<tr>
<td>Arthroscopy (IOM)</td>
<td>11/13</td>
</tr>
<tr>
<td>Arthroscopy (PITFL)</td>
<td>0/13</td>
</tr>
<tr>
<td>Arthroscopy (Deltoid)</td>
<td>9/13</td>
</tr>
</tbody>
</table>
Discussion

US finding is similar to Arthroscopic findings

Deltoid
76.9% for tear
100% for complete tear

AITFL
92.3% for tear
100% for complete tear
Discussion

Not all fracture have Deltoid ligament injury
Conclusion

- Ultrasound could be helpful for assessment of stability of isolated LM fracture.
- Even in stage II SER ankle fracture, could be unstable
References