Arthroscopy Combined with Hardware Removal for Chronic Pain after Ankle Fracture

Hyong Nyun Kim, MD, PhD*, Hee Jun Lim, MD
Ki Hoon Park, MD, Hyun Min Koo, MD
Il Woo Suh, MD, Yong Wook Park, MD, PhD

*Department of Orthopedic Surgery
Armed Forces Yangju Hospital,
Department of Orthopedic Surgery
Kangnam Sacred Heart Hospital,
Hallym University, College of Medicine
Arthroscopy Combined with Hardware Removal for Chronic Pain after Ankle Fractures

Hyong-Nyun Kim, M.D., Hee-joon Lim, M.D.
Ki-hoon Park, M.D., Hyun-min Koo, M.D.,
Il-woo Suh, M.D., Yong-Wook Park, M.D.

My disclosure is in the Final AOFAS Program Book and in the *Orthopaedic Surgeon’s Disclosure Program* database.

I have no potential conflicts with this presentation.
I have nothing to disclose
Introduction

Clinical results for the ORIF of unstable fractures are generally good.

However, poor results have been reported despite anatomic surgical realignment.

- **Localized**: intra-articular damage, hardware irritation, osteophytes
- **Generalized**: synovitis, arthrofibrosis

Brown OL et al. J Orthop Trauma 2001
Day GA et al. Foot Ankle Int 2001

The complaints

- **Localized**: intra-articular damage, hardware irritation, osteophytes
- **Generalized**: synovitis, arthrofibrosis

Thomas B et al. Foot Ankle Int 2005
Many patients with chronic pain after fracture healing request hardware removed and expect pain relief [6].


Brown et al. found that despite improvements after hardware removal, nearly half of the patients continued to experience pain.

Brown OL et al. J Orthop Trauma 2001

Hypothesis

Combining hardware removal with arthroscopic surgery for the intra-articular pathology would improve residual complaints more so than hardware removal alone.
Patients and Methods

We prospectively studied the outcomes of the 53 young male patients with chronic pain after fracture healing.

1 (Group 1)
conservative treatment after hardware removal

2 (Group 2)
arthroscopic intervention with hardware removal
### Patients and Methods

#### Inclusion Criteria

1. chronic pain after an anatomically realigned healed ankle fracture at least 9 months after initial injury without any deformity or axis deviation,
2. an ankle fracture that was neither a pilon or a plafond-variant injury, and
3. no associated injuries or fractures at the time of clinical presentation.

#### Exclusion Criteria

1. a history of complex regional pain syndrome (CRPS), or neurologic symptoms,
2. a suspicion of extra-articular problems, such as, peroneal tendon disorder, sinus tarsi syndrome, or subtalar injury,
3. degenerative joint disease or a systemic inflammatory joint disease, such as, rheumatoid arthritis,
4. chronic ankle instability,
5. only soft tissue irritation around hardware, and
6. an American Foot and Ankle Society (AOFAS) ankle-hindfoot score of higher than 80 points.
Patients and Methods

- Group baseline patient characteristics and demographic data were found to be comparable

<table>
<thead>
<tr>
<th>Baseline Variable</th>
<th>Group 1 (N=26)</th>
<th>Group 2 (N=27)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)*</td>
<td>21.4 (20-25)</td>
<td>21.7 (20-30)</td>
<td>p=0.54</td>
</tr>
<tr>
<td>Sex</td>
<td>All male</td>
<td>All male</td>
<td></td>
</tr>
<tr>
<td>Time after initial injury (months)*</td>
<td>11.2 (9-16)</td>
<td>10 (9-15)</td>
<td>p=0.62</td>
</tr>
<tr>
<td>Fracture Classification (Lauge-Hansen)†</td>
<td></td>
<td></td>
<td>p=0.76</td>
</tr>
<tr>
<td>SER</td>
<td>18 (69%)</td>
<td>19 (70%)</td>
<td></td>
</tr>
<tr>
<td>PER</td>
<td>8 (31%)</td>
<td>6 (22%)</td>
<td></td>
</tr>
<tr>
<td>SAD</td>
<td>0</td>
<td>2 (7%)</td>
<td></td>
</tr>
<tr>
<td>PAB</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Preoperative diagnosis for chronic pain†</td>
<td></td>
<td></td>
<td>p=0.27</td>
</tr>
<tr>
<td>Anterolateral soft tissue impingement</td>
<td>15 (58%)</td>
<td>16 (59%)</td>
<td></td>
</tr>
<tr>
<td>Anterior bony impingement</td>
<td>0</td>
<td>3 (11%)</td>
<td></td>
</tr>
<tr>
<td>Not definitive (diffuse pain and swelling)</td>
<td>11 (42%)</td>
<td>5 (19%)</td>
<td></td>
</tr>
<tr>
<td>Osteochondral lesion</td>
<td>0</td>
<td>2 (7%)</td>
<td></td>
</tr>
<tr>
<td>Loose body</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Soft tissue irritation over the hardware†</td>
<td>11 (42%)</td>
<td>15 (55%)</td>
<td>p=0.34</td>
</tr>
</tbody>
</table>
Patients and methods

**Group 1**
- 26 patients
- average age 21.4 years (range, 20 to 25 years).

Hardware removal and conservative management
- 2 weeks of non-weightbearing
- followed by progressive weight-bearing on the third postoperative week.
- Nonsteroid anti-inflammatory drugs (NSAID)
- Rest and avoidance of all sports and other strenuous activities

**Group 2**
- 27 patients
- average age 21.7 years (range, 20 to 30 years).

Hardware removal and arthroscopy
- 2 weeks of non-weightbearing
- followed by progressive weight-bearing on the third postoperative week.
- Nonsteroid anti-inflammatory drugs (NSAID)
- Rest and avoidance of all sports and other strenuous activities
Group 1

- Of the 26 patients in group 1, 19 patients completed the 6 months follow-up. Four patients were lost to follow-up and three patients requested to stop conservative treatment and took arthroscopy.

<table>
<thead>
<tr>
<th>Group 1</th>
<th>Patients’ Self-assessment</th>
<th>AOFAS scores</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Normal</td>
<td>Greatly improved</td>
</tr>
<tr>
<td>Preop diagnosis (N=19)</td>
<td>Anterolateral soft tissue impingment (N=11)</td>
<td>0</td>
</tr>
<tr>
<td>Not definitive (N=8)</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Total (N=19)</td>
<td>0</td>
<td>2</td>
</tr>
</tbody>
</table>
Of the 27 patients in group 2, **22 patients** completed the 6 months follow-up. Five patients were lost to follow-up.

<table>
<thead>
<tr>
<th>Preop diagnosis (N=22)</th>
<th>Patients’ self-assessment</th>
<th>AOFAS score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Normal</td>
<td>Greatly improved</td>
</tr>
<tr>
<td>Anterolateral soft tissue impingement (N=12)</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Anterior bony impingement (N=3)</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Not definitive (N=5)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Osteochondral lesion (N=1)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Loose body (N=1)</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total (N=22)</strong></td>
<td>3</td>
<td>9</td>
</tr>
</tbody>
</table>
Results

AOFAS score improvement

Group 1 VS Group 2

Group 1: 4.3
Group 2: 14.0

p = 0.001
Results

Subjective Self-assessment

Group 1

- Improved: 58%
- Unchanged or Worsened: 42%

Group 2

- Improved: 82%
- Unchanged or Worsened: 18%

VS
Results

Arthroscopic Findings

Arthroscopic findings of the 27 patients in group 2

- chondral damage, such as, chondral scuffs, flaps or fragmentation in 20 (74%) patients
- osteochondral lesion extending to subchondral bone in 2 (3%) patients
- synovitis in 18 (67%) patients
- synovial hypertrophy with scarring or inflammation causing anterolateral impingement in 17 (63%) patients
- osteophytes causing bony impingement in 3 (11%) patients, arthrofibrosis in 5 (19%) patients, and
- loose bodies in 4 (15%) patients
Conclusions

This study supports the notion that arthroscopy combined with hardware removal for patients with chronic pain after healed ankle fracture is a better treatment option than hardware removal and conservative treatment.
References


Thomas, B; Yeo, JM; Slater, GL: Chronic pain after ankle fracture: An arthroscopic assessment case series. Foot Ankle Int 26:1012-1016, 2005.