Arthroscopically Assisted Versus Standard Open Reduction and Internal Fixation Techniques for Acute Ankle Fractures: Is There a Difference?

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NO CONFLICT TO DISCLOSE

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Tyler Gonzalez

My disclosure is in the Final AOFAS Mobile App

I have no potential conflicts with this presentation
Introduction

• Malleolar fractures represent one of the most common orthopaedic injuries requiring surgical treatment.
• While open reduction and internal fixation (ORIF) remains the gold standard, poor functional outcomes continue to be reported in at least some patients for whom anatomic reduction was achieved.
• It has been theorized that these inferior outcomes may in part be due to a component of missed intra-articular injury, although to date the true explanation for this subset of lower functional outcomes remains unknown.
A New Movement: Arthroscopically Assisted ORIF

• Recently, such concerns have spawned novel arthroscopically assisted techniques of ankle fracture assessment, reduction, and fixation (AAORIF), in hopes of enabling better detection and treatment of concomitant intra-articular ankle injuries.

• Advocates of this new approach for ankle fractures tout the goals of reduced chronic ankle pain, better reduction, and improved functional outcome in comparison to standard ORIF.
The purpose of this study was to compare the available literature on outcomes, complications, and total operative time between standard ORIF and AAORIF of ankle fractures—as a means of providing a more evidence-based approach to this patient population.
Hypotheses

• Available outcomes data would suggest that:
  1. Use of traditional ORIF for ankle fracture management results in outcome levels, complication rates, and average total operative times at least as good if not better than those associated with AAORIF.
  2. AAORIF offers greater diagnostic sensitivity for intra-articular ankle injury at the time of index surgery, but this increased accuracy does not translate into any tangible improved clinical benefit during patient recovery.
Methods

- Systematic review of the English literature
- PubMed data base used covering last 50 years
- Inclusion Criteria: documented functional outcomes of acute ankle fracture management using either a traditional ORIF, AAORIF, or both.
- Exclusion Criteria: pilon fractures, pediatric fractures, combined ankle and other tarsal bone fractures, Maisonneuve fractures
- Publications accepted for review were then also analyzed for outcomes, complications, and average operative times for each relevant procedure.
- Respective **Levels of Evidence** were recorded.
Results

A total of **14 ORIF** and **4 AAORIF** papers were considered amenable to review.

<table>
<thead>
<tr>
<th>Grade B Evidence (Fair) supporting:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Good to excellent outcomes following traditional ORIF of ankle fractures</td>
</tr>
<tr>
<td>• Ankle arthroscopy being successfully employed for identification and treatment of intra-articular injuries associated with acute ankle fractures</td>
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<table>
<thead>
<tr>
<th>Grade I Evidence (Insufficient) supporting:</th>
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<tbody>
<tr>
<td>• Examination of the functional outcomes and complication rates after treatment of intra-articular injuries associated with acute ankle fractures with AAORIF</td>
</tr>
<tr>
<td>• AAORIF portending any improvement in patient outcomes over standard ORIF for acute ankle fractures</td>
</tr>
<tr>
<td>• Any direct comparative data on functional outcomes, complication rates, or total operative time between AAORIF and ORIF for the treatment of acute ankle fractures</td>
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<tr>
<td>Author / Year</td>
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<tr>
<td>---------------------</td>
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<tr>
<td>Belcher et al (1997)</td>
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<td>Egol et al (2006)</td>
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<tr>
<td>Lash et al (2002)</td>
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<td>Ponzer et al (1999)</td>
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**COMPARISON STUDIES**

<table>
<thead>
<tr>
<th>Author / Year</th>
<th>Type of Study</th>
<th>Number of Patients</th>
<th>Number of Patients</th>
<th>Fracture Type / Classification Used</th>
<th>Follow-Up Time (Mean)</th>
<th>Complication Rate</th>
<th>Outcome Measurement Tools</th>
</tr>
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<tbody>
<tr>
<td>Takao et al (2004)</td>
<td>Prospective</td>
<td></td>
<td>41</td>
<td>31</td>
<td>AAORIF: 40 months ORIF: 41 months</td>
<td>AAORIF: 0% ORIF: 6.5% (2 superficial wound infections)</td>
<td>AOFAS Ankle Hindfoot Score</td>
</tr>
<tr>
<td>Thordarson et al (2001)</td>
<td>Prospective</td>
<td></td>
<td>9</td>
<td>10</td>
<td>21 months</td>
<td>AAORIF: 0% ORIF: 0%</td>
<td>SF-36, Lower Extremity Scores, AAOS Foot and Ankle MODEMS Questionnaire</td>
</tr>
<tr>
<td>Turhan et al (2013)</td>
<td>Case Control</td>
<td>Level III</td>
<td>21</td>
<td>26</td>
<td>AAORIF: 26 months ORIF: 38 months</td>
<td>AAORIF: 0% ORIF: 11.5% (3 wound complications)</td>
<td>Median Olerud Scores, van Dijk Classification System</td>
</tr>
</tbody>
</table>
Discussion

• Ankle arthroscopy appears to be a valuable tool in identifying intra-articular lesions associated with ankle fractures, which enables earlier management of these injuries.

• Available evidence, however, does not support that using AAORIF for acute ankle fractures has the ability to change outcomes in these patients compared to standard ORIF management.

• Available evidence also does not show any differences between complication rates or total operative time for these patients.
Clinical Relevance

• To date, few prospective randomized controlled studies have been performed comparing these two operative techniques.
• Outcome after traditional ORIF as well as AAORIF appear to be excellent, and currently there is insufficient evidence to suggest that one leads to a higher outcome or satisfaction rate than the other.
• Improved analysis through prospective randomized trials would more accurately assess any promise AAORIF might offer over standard ORIF in improving patient outcome. When such information becomes available, it will have the capacity to change our standard of care for foot/ankle fracture management.
References

- http://www.aofas.org/footcaremd/treatments/Pages/Ankle-Fracture-Surgery.aspx