COFAS Multicenter Study Comparing Ankle Replacement and Ankle Fusion: 
The effect of Ipsilateral peri-articular deformity and arthritis on Mid-term outcome

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    • Wright
Introduction

- Ankle fusion (AF) and Replacement (TAR) are accepted treatments for end stage ankle arthritis (ESAA).

- While AF is reliable, TAR is often preferred by patients.

- Recently, COFAS presented the largest mid- to long-term prospective comparison of AF and TAR:
  - Outcomes were comparable at 5.5 yrs mF/U
  - But not stratified for any patient factors.
Introduction

• Potentially important factors include ipsilateral:
  – Intra-articular deformity
  – Significant foot deformity
  – Hindfoot arthritis (or prior fusion)

• When present, increasingly complex reconstruction techniques are required

• But the effect of increasingly complex arthritis and reconstruction, as stratified by the COFAS Classification*, on outcome is unknown

Purpose & Hypotheses

Determine if:

1. Outcomes for TAR & AF differ between COFAS ankle types

2. Outcomes differ between TAR & AF for ankles of the same COFAS type
Methods

• Prospective non-randomized multicenter data (5 sites, 7 surgeons) from the COFAS database

• Study received ethics approval at all sites

• Inclusion criteria:
  – Informed study consent
  – Skeletal maturity
  – 1° TAR (mobile bearing) or AF
  – Completed pre-op data set
  – Completed post-op data set, minimum 2 year FU

• Exclusion criteria:
  – Hx of active or prior infection
  – Charcot arthropathy
  – Significant talar osteonecrosis
Methods

• Primary Outcome:
  – Ankle Osteoarthritis Scale (AOS)
    • Total of Pain & Disability Sections

• Secondary Outcome:
  – COFAS Complication Rate
## Methods

Stratify by COFAS Post-op Classification

<table>
<thead>
<tr>
<th>COFAS Type</th>
<th>Non-Complex Types</th>
<th>Complex Types</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td><strong>PRE-OP Classification</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Isolated ESAA</td>
<td>ESAA with: Ankle varus/valgus &gt;10°, instability, or equinus</td>
<td>ESAA with: Tibial or HF or MF deformity</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td><strong>POST-OP Classification</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Isolated AF or TAR</td>
<td>AF or TAR with: ST procedure requiring 2nd incision</td>
<td>AF or TAR with: Osteotomoy or MF fusion</td>
</tr>
<tr>
<td>Ligament recon or release, TAL, GSR,</td>
<td>Ligament recon or release, TAL, GSR,</td>
<td>Ligament recon or release, TAL, GSR,</td>
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<tr>
<td><strong>Adjunct Procedures</strong></td>
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<tr>
<td>Ligament recon or release, TAL, GSR,</td>
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<td>Ligament recon or release, TAL, GSR,</td>
</tr>
<tr>
<td>Calc, or tibial osteotomy; MF fusion</td>
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<td>Calc, or tibial osteotomy; MF fusion</td>
</tr>
<tr>
<td>ST, TN, CC or Triple fusion</td>
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</tr>
</tbody>
</table>
Results

535 Cases
4.0 Yr FU

- Trend for TAR 3&4 slightly better Post-op than AF 3&4 (p=0.10)
- Trend for TAR 1-4 slightly better Post-op than AF 1-4 (p=0.10)
Results

<table>
<thead>
<tr>
<th></th>
<th>Fusion 1&amp;2</th>
<th>TAR 1&amp;2</th>
<th>Fusion 3&amp;4</th>
<th>TAR 3&amp;4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (yrs)</td>
<td>55.8</td>
<td>&lt;&lt; 66.2</td>
<td>51.9</td>
<td>&lt;&lt; 63.0</td>
</tr>
<tr>
<td>Diabetes %</td>
<td>10.9</td>
<td>&gt; 6.6</td>
<td>11.1</td>
<td>&gt; 4.7</td>
</tr>
<tr>
<td>Inflam Arthritis %</td>
<td>8.8</td>
<td>&lt; 15.4</td>
<td>13.0</td>
<td>&lt; 27.1</td>
</tr>
<tr>
<td>Revision %</td>
<td>1.5</td>
<td>&lt;&lt; 8.1</td>
<td>0</td>
<td>&lt;&lt; 4.7</td>
</tr>
<tr>
<td>Amputation %</td>
<td>0</td>
<td>0.4</td>
<td>3.7</td>
<td>&gt;&gt; 0.9</td>
</tr>
<tr>
<td>Tot complic cases %</td>
<td>1.5</td>
<td>&lt;&lt; 10.3</td>
<td>5.6</td>
<td>&lt; 11.2</td>
</tr>
</tbody>
</table>

- TAR pts:
  - were a decade older (p<0.05)
  - Had diabetes less frequently
  - Had inflammatory arthritis much more commonly

- Complications requiring reoperation were more common in TAR and Types 3&4
  - Aseptic revision more common in TAR
  - BUT, Amputation more common in Fusion, particularly Types 3&4 (non-septic)
Conclusion

• At mean 4 yr FU, both TAR and AF result in significant outcome improvement for all types of arthritis

• Complex (Types 3&4) Fusions have somewhat worse outcomes than Non-Complex (Types 1&2) Fusions (NS), while this difference is not present with TARs

• TAR outcomes slightly better (NS) than AF in both Complex and Non-Complex arthritis despite:
  – Pt age greater by a decade
  – a much higher incidence of inflammatory arthritis

• TAR has a higher complication rate, but notably lower amputation rate in Types 3&4
References


