Influence of Age on Outcome in Total Ankle Arthroplasty
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My disclosure is in the Final AOFAS Program Book. I have no potential conflicts with this presentation.
Background

Studies have suggested that implant survivorship and outcomes are worse in younger patients after total ankle arthroplasty.\textsuperscript{1,2,4}

- Spirt et al. JBJS 2004\textsuperscript{4}
  - Patients \( \leq 54 \) yrs
    - \textbf{1.45x} greater risk for re-operation
    - \textbf{2.65x} greater risk of implant failure
- Kofoed et al. FAI 1999\textsuperscript{3}
  - Equivalent survivorship in patients under and over the age of 50.

The effect of age on outcome in TAA with \textbf{current generation implants/techniques is unknown.}
Purpose

To determine the effect of age on the clinical, radiographic, and patient reported outcomes of patients with end-stage ankle arthritis treated with TAA.
Methods

All consecutive TAAs June 2007 – December 2010

N=395

Mean f/u of 3.7 years (range, 2.3 - 5.4 years).

< 55 yrs
N=81

68% Post-traumatic
14% Rheumatoid Arthritis
18% Osteoarthritis

63% Fixed-bearing TAA
37% Mobile-bearing TAA

55 – 70 yrs
N=221

72% Post-traumatic
4% Rheumatoid Arthritis
18% Osteoarthritis

76% Fixed-bearing TAA
24% Mobile-bearing TAA

> 70 yrs
N=93

63% Post-traumatic
4% Rheumatoid Arthritis
26% Osteoarthritis

77% Fixed-bearing TAA
23% Mobile-bearing TAA
Methods

Clinical Outcomes

– **Wound Complications**
  - Delayed wound healing
  - Wound dehiscence
  - Infection
  - Need for soft tissue coverage

– **Re-operation**
  - Gutter debridement
  - Bone grafting adjacent cysts
  - Polyethylene exchange

– **Revision**
  - Revision of metallic components
  - TTC arthrodesis
Methods

Patient Reported Outcomes
- VAS Pain scale
- SF-36
- SMFA
- AOFAS

Radiographic Outcomes
- Coronal alignment assessed by Tibiotalar Angle
  - (+) = Varus
  - (-) = Valgus

Statistical Analysis

Clinical scores, comorbidities, concomitant surgical procedures, and tibiotalar angles were analyzed using a series of repeated measures ANOVAs with post-hoc testing to assess differences between the three groups. The Pearson Chi-Square test served to determine differences in wound complications, re-operation, and revision (alpha<0.05).
## Results

### Clinical Outcomes

<table>
<thead>
<tr>
<th>Outcome</th>
<th>&lt;55 yrs (N = 81)</th>
<th>55 – 70 yrs (N = 221)</th>
<th>&gt; 70 yrs (N = 93)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (yr)</td>
<td>47 ± 7.8</td>
<td>64 ± 4.4</td>
<td>76 ± 4.2</td>
<td>.001</td>
</tr>
<tr>
<td>Follow-up (yr)</td>
<td>3.3 ± 0.9</td>
<td>3.5 ± 1.0</td>
<td>3.6 ± 0.9</td>
<td>.207</td>
</tr>
<tr>
<td>Comorbidities</td>
<td>2.6</td>
<td>3.0</td>
<td>3.2</td>
<td>.144</td>
</tr>
<tr>
<td>Concomitant Procedures</td>
<td>1.6</td>
<td>1.3</td>
<td>1.4</td>
<td>.260</td>
</tr>
<tr>
<td>Wound Complications</td>
<td>8 (9.8%)</td>
<td>30 (13.5%)</td>
<td>10 (12.0%)</td>
<td>.612</td>
</tr>
<tr>
<td>Re-operation</td>
<td>9 (11.1%)</td>
<td>22 (9.9%)</td>
<td>7 (8.1%)</td>
<td>.703</td>
</tr>
<tr>
<td>Revision</td>
<td>6 (7.4%)</td>
<td>12 (5.4%)</td>
<td>2 (2.1%)</td>
<td>.269</td>
</tr>
</tbody>
</table>

### Coronal Alignment

#### Varus Ankles

<table>
<thead>
<tr>
<th>Outcome</th>
<th>&lt;55 yrs (N = 81)</th>
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<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-op TT angle (degrees)</td>
<td>10.9 ± 4.9</td>
<td>14.0 ± 6.7</td>
<td>17.1 ± 8.2*</td>
<td>.007</td>
</tr>
<tr>
<td>Post-op TT angle (degrees)</td>
<td>0.8 ± 1.6</td>
<td>0.9 ± 2.2</td>
<td>0.7 ± 3.2</td>
<td>.939</td>
</tr>
</tbody>
</table>

#### Valgus Ankles

<table>
<thead>
<tr>
<th>Outcome</th>
<th>&lt;55 yrs (N = 81)</th>
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<th>P value</th>
</tr>
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<tbody>
<tr>
<td>Pre-op TT angle (degrees)</td>
<td>-11.6 ± 4.4</td>
<td>-12.9 ± 6.0</td>
<td>-13.2 ± 6.6</td>
<td>.638</td>
</tr>
<tr>
<td>Post-op TT angle (degrees)</td>
<td>-2.0 ± 2.9</td>
<td>-0.8 ± 1.9</td>
<td>-0.5 ± 2.4</td>
<td>.065</td>
</tr>
</tbody>
</table>

* Denotes a value significantly greater than in patients <55 yrs of age, and between 55-70 yrs of age.
## Results

<table>
<thead>
<tr>
<th>Patient Reported Outcomes(^1)</th>
<th>&lt;55 yrs (N = 81)</th>
<th>55 – 70 yrs (N = 221)</th>
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<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>∆VAS Pain Scale (0 – 100)</td>
<td>52.6 ± 27.4</td>
<td>57.1 ± 27.0</td>
<td>55.5 ± 25.9</td>
<td>.581</td>
</tr>
<tr>
<td>∆SF-36</td>
<td>29.6 ± 20.0</td>
<td>26.1 ± 19.2</td>
<td>22.6 ± 18.0</td>
<td>.176</td>
</tr>
<tr>
<td>∆SF-36 Vitality Subscale</td>
<td>26.7 ± 17.8(^*)</td>
<td>21.6 ± 19.2</td>
<td>17.1 ± 16.6</td>
<td><strong>.026</strong></td>
</tr>
<tr>
<td>∆SMFA Function</td>
<td>21.2 ± 12.3</td>
<td>20.8 ± 11.4</td>
<td>18.6 ± 11.3</td>
<td>.398</td>
</tr>
<tr>
<td>∆SMFA Bother</td>
<td>27.1 ± 15.7</td>
<td>25.7 ± 15.5</td>
<td>21.1 ± 15.8</td>
<td>.098</td>
</tr>
<tr>
<td>∆AOFAS Hindfoot-Ankle Scale</td>
<td>41.8 ± 18.9</td>
<td>42.3 ± 20.6</td>
<td>34.6 ± 17.5</td>
<td>.057</td>
</tr>
<tr>
<td>∆AOFAS Function Subscale</td>
<td>18.1 ± 10.2(^*)</td>
<td>18.3 ± 10.3(^*)</td>
<td>12.2 ± 9.6</td>
<td><strong>.001</strong></td>
</tr>
</tbody>
</table>

\(^1\)Calculated by comparing pre-operative and final follow-up clinical outcome scores.

\(\*\)Denotes a value significantly greater than in patients > 70yrs of age.
Conclusions

• Patients under the age of 55 had a greater increase in SF-36 Vitality and AOFAS Function subscales post-operatively.
• No statistical difference in the incidence of wound complications, re-operation, and revision among the three age groups.
• Outcomes of TAA in younger patients are similar to outcomes in the older patient at early–to–intermediate follow-up.
• Groundwork for future study to determine the effect of age on the long-term outcomes of TAA with emphasis on need for re-operation and revision.

References