Patient-Centered Outcomes Following Total Ankle Arthroplasty vs. Total Ankle Arthrodesis: A Comparative Cohort Study

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Disclosures

Thomas. O. Clanton, MD has the following disclosures:

- Receives royalties for any biomaterial or orthopaedic product or device: Arthrex, Inc., Stryker, Inc.
- Served on a speaker’s bureau or have been paid an honorarium to present by any biomaterial or orthopaedic product or device company: Arthrex, Inc., Stryker, Inc., Wright Medical Technology
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- Board member/committee appointment for a society: American Orthopaedic Foot and Ankle Society – IFFAS Council
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Background

• Ankle arthritis is a debilitating disorder that significantly limits activities of daily living → reduced quality of life

• The two most common treatments for ankle arthritis, based on patient needs include:
  – Total ankle arthroplasty (TAA)
  – Ankle Arthrodesis

• Few studies compare patient-centered outcomes following these two procedures
Purpose

The purpose of this study was to compare patient-centered outcomes following total ankle arthroplasty and arthrodesis for the treatment of ankle arthritis.
Methods

• Approved by an IRB

• Patients between 1/2009 – 11/2013 who underwent TAA (3rd generation implant) or ankle arthrodesis by single surgeon for treatment of ankle arthritis included

• Patients completed subjective questionnaire at minimum 2 years following index surgery
Methods

Outcomes Measures:
- Foot and Ankle Disability Index (FADI)
- Foot and Ankle Ability Measure (FAAM)
- Lysholm score
- Western Ontario and McMaster Universities Arthritis Index (WOMAC)
- SF-12 physical component summary (PCS) and mental component summary (MCS)
- Tegner activity scale
- Patient satisfaction with outcome
Patient Selection

2009 to 2013 Ankle Arthroplasty and Arthrodesis Surgery
N = 86 Ankles

- 3 Refused to Participate
- 2 Deceased
- 3 Revision TAA prior to study
- 1 Below knee amputation

Ankles Included in Study
N = 77

Arthrodesis Cohort
N = 22
- 7 lost to follow-up
  - Follow-Up N = 13
    - 2nd Surgery N = 2
  - Failures N = 2

Arthroplasty Cohort
N = 55
- 4 lost to follow-up
  - Follow-Up N = 48
    - 2nd Surgery N = 1
  - Failures N = 3

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Results

- 77 patients
  - 46 males, 31 females
  - Mean age = 60.2 years (range 30.2 - 78.4)
  - Mean BMI = 27.7 (range 17.0 - 39.1)
- 85% follow-up at mean 3.5 years (range 2.0 - 6.6)
- Arthrodesis cohort significantly younger than TAA cohort (54.1 vs. 62.7 years) ($P=.002$)
- 5 (7.8%) patients required revision surgery
- No significant difference in failure rate between cohorts
- Tegner only significant difference in outcome measures
## Cohort Demographics

<table>
<thead>
<tr>
<th></th>
<th>Total Ankle Arthroplasty</th>
<th>Ankle Arthrodesis</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Age</td>
<td>62.7 years (range 39.5 – 78.4)</td>
<td>54.1 years (range 30.2 – 75.9)</td>
<td>0.002</td>
</tr>
<tr>
<td>Gender</td>
<td>26 females, 29 males</td>
<td>5 females, 17 males</td>
<td>0.071</td>
</tr>
<tr>
<td>BMI</td>
<td>27.8 (18.6 – 39.1)</td>
<td>27.5 (range 17.0 – 37.6)</td>
<td>0.857</td>
</tr>
<tr>
<td>Failures</td>
<td>3</td>
<td>2</td>
<td>0.593</td>
</tr>
<tr>
<td>Mean time to</td>
<td>2.0 years (range 0.7 – 3.5 years)</td>
<td>0.3 years (range 0.2 – 0.4 years)</td>
<td>0.149</td>
</tr>
<tr>
<td>failure</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Comparison of Postoperative Outcomes Measures

<table>
<thead>
<tr>
<th></th>
<th>Ankle Arthrodesis (n = 22)</th>
<th>Total Ankle Arthroplasty (n = 55)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FADI Total</strong></td>
<td>76 (range 38 – 94)</td>
<td>74 (range 28 – 96)</td>
<td>0.660</td>
</tr>
<tr>
<td><strong>FADI ADL</strong></td>
<td>83 (range 45 – 97)</td>
<td>82 (range 32 – 100)</td>
<td>0.826</td>
</tr>
<tr>
<td><strong>FADI Sport</strong></td>
<td>53 (range 16 – 84)</td>
<td>46 (range 0 – 88)</td>
<td>0.336</td>
</tr>
<tr>
<td><strong>FAAM Total</strong></td>
<td>73 (range 36 – 96)</td>
<td>72 (range 25 – 96)</td>
<td>0.830</td>
</tr>
<tr>
<td><strong>FAAM ADL</strong></td>
<td>80 (range 44 – 99)</td>
<td>82 (range 32 – 100)</td>
<td>0.799</td>
</tr>
<tr>
<td><strong>FAAM Sport</strong></td>
<td>53 (range 0 – 88)</td>
<td>45 (range 0 – 84)</td>
<td>0.336</td>
</tr>
<tr>
<td><strong>Lysholm</strong></td>
<td>75 (range 24 – 100)</td>
<td>78 (range 24 – 100)</td>
<td>0.591</td>
</tr>
<tr>
<td><strong>WOMAC Total</strong></td>
<td>14 (range 2 – 46)</td>
<td>15 (range 0 – 83)</td>
<td>0.958</td>
</tr>
<tr>
<td><strong>SF-12 PCS</strong></td>
<td>48.5 (range 21.3 – 57.2)</td>
<td>47.1 (range 18.5 – 60.4)</td>
<td>0.944</td>
</tr>
<tr>
<td><strong>SF-12 MCS</strong></td>
<td>55.8 (range 41.1 – 63.8)</td>
<td>55.2 (range 34.4 – 71.8)</td>
<td>0.844</td>
</tr>
<tr>
<td><strong>Tegner Activity Scale</strong></td>
<td>4 (range 1 – 6)</td>
<td>3 (range 0 – 8)</td>
<td>0.007</td>
</tr>
<tr>
<td><strong>Satisfaction with Outcome</strong></td>
<td>9 (range 1 – 10)</td>
<td>9 (range 1 – 10)</td>
<td>0.465</td>
</tr>
</tbody>
</table>

*Denotes median values
Conclusions

- Patients in both cohorts (TAA & arthrodesis) had similar low failure rates, function and satisfaction with outcome at final follow-up
- Significantly lower activity level in TAA cohort which may be due to age difference between cohorts as previously described

*Since good outcomes may be achieved with both TAA and arthrodesis, operative procedure should be matched based on patient expectations of activity and function*
References


