A Review of 399 Total Ankle Replacements: Analysis of Ipsilateral Subtalar Joint Arthrodesis and Associated Talar Component Subsidence

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Analysis of Ipsilateral Subtalar Joint Arthrodesis
and Associated Talar Component Subsidence

Our disclosures are in the Final AOFAS Mobile App.
There is a potential conflict with this presentation due to:
Consultant, Wright Medical Technologies, Inc. (GCB, CFH)
Statement of Purpose

• Total ankle replacement (TAR) and subtalar joint arthrodesis (STJA) may be performed concomitantly or in sequence when clinically appropriate.

• Limited data exist regarding the relationship of STJA and talar component subsidence (1,2).
Study Methods

• All operative patients undergoing TAR from a single institution evaluated via retrospective chart and radiographic review.
  – Orthopedic Foot & Ankle Center, Columbus, OH

• Minimum 1-year follow-up after TAR.

• Study group (with STJA) matched 1:1 with control group (TAR with no STJA) for:
  – Age (+/- 5-years)
  – Sex
  – Implanted prosthesis

• STJA defined as isolated STJA, double (talonavicular & STJA) or triple arthrodesis.
Included Patients

- 399 modern generation primary TAR from 2004 – 2012 identified.
  - 41 TAR w/ STJA identified (41 of 399, 10.3%)

- Only 1 mobile bearing TAR (STAR™) identified with STJA, thus excluded and only evaluated modern generation fixed bearing TAR for study inclusion.

- 40 fixed bearing TAR w/ STJA with 33 (study group, n=33) meeting inclusion criteria with an identifiable control group match (7 excluded for lack of identifiable match).
  - 13 INBONE I® (39.4%)
  - 14 INBONE II® (42.4%)
  - 6 Salto Talaris™ (18.2%)
Clinical Comparison

<table>
<thead>
<tr>
<th>Study Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>n=33</td>
<td>n=33</td>
</tr>
<tr>
<td>Mean Age: 62.8</td>
<td>Mean Age: 63.0</td>
</tr>
<tr>
<td>Median f/u 740 days</td>
<td>Median f/u 1167 days</td>
</tr>
<tr>
<td>Mean BMI: 32.4</td>
<td>Mean BMI: 30.0</td>
</tr>
<tr>
<td>8 pts return to OR</td>
<td>9 pts return to OR</td>
</tr>
<tr>
<td>4 revisions</td>
<td>4 revisions</td>
</tr>
<tr>
<td>4 reoperations</td>
<td>5 reoperations</td>
</tr>
</tbody>
</table>

NO statistical difference in BMI ($p=0.140$), tobacco use ($p=0.564$) or median length of follow-up time ($p=0.090$).
Study Group (n=33)

• STJ arthrodesis
  – Prior to TAR (n=26, 78.8%)
    • 1 STJ nonunion, 2 STJ malunion
  – Simultaneous (n=4, 12.1%)
    • 1 STJ nonunion, 0 STJ malunion
  – Subsequent to TAR (n=3, 9.1%)
    • 1 STJ nonunion, 0 STJ malunion

• Etiology of Ankle Arthritis
  – Primary DJD (n=14, 42.4%)
    • Control (n=7, 21.2%)
  – Post-traumatic (n=10, 30.3%)
    • Control (n=19, 57.6%)
  – Chronic instability (n=6, 18.2%)
  – Inflammatory (n=3, 9.1%)
Revisions

- Study Group (n=4)
  - 3 INBONE I® (talar component exchange x 3)
  - 1 Salto Talaris™ (explant w/ antibiotic spacer)

- Control Group (n=4)
  - 2 INBONE I® (talar component exchange x 2)
  - 1 INBONE II® (talar component exchange)
  - 1 Salto Talaris™ (conversion to INBONE I)
Radiographic Analysis

**Coronal Plane Talar Component Position (3)**

**Talar Implant Slope (3)**

**Sagittal Plane Talar Component Position (3)**

<table>
<thead>
<tr>
<th>Talar subsidence from initial WB radiograph to most recent follow-up (mm)</th>
<th>Overall (n=66)</th>
<th>Study Group (n=33)</th>
<th>Control Group (n=33)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coronal Plane “X”</td>
<td>0.05 (SD=1.37, p=0.503)</td>
<td>-0.06 (SD=1.41)</td>
<td>0.15 (SD=1.35)</td>
</tr>
<tr>
<td>Coronal Plane “Y”</td>
<td>-0.05 (SD=1.85, p=0.847)</td>
<td>0.00 (SD=1.70)</td>
<td>-0.09 (SD=2.02)</td>
</tr>
<tr>
<td>Talar Implant Slope “b”</td>
<td>-0.59 (SD=2.58, p=0.212)</td>
<td>-0.18 (SD=2.27)</td>
<td>-1.00 (SD=2.83)</td>
</tr>
<tr>
<td>Sagittal Plane “c”</td>
<td>-1.74 (SD=2.57, p=0.520)</td>
<td>-1.93 (SD=2.63)</td>
<td>-1.54 (SD=2.54)</td>
</tr>
<tr>
<td>Sagittal Plane “e”</td>
<td>-1.30 (SD=2.93, p=0.806)</td>
<td>-1.39 (SD=3.01)</td>
<td>-1.21 (SD=2.89)</td>
</tr>
</tbody>
</table>

**NO statistically significant differences between groups**
Conclusions

• Number of revisions similar between study and control groups and similar to previous studies (1,2).

• Previously suggested susceptibility of talar blood supply with INBONE® system, doesn’t correlate to our results as more revision occurred with INBONE I®, despite the same instrumentation and insertion technique for INBONE II® (1,4).

• No statistically significant radiographic differences between groups.
Conclusions

• TAR and ipsilateral STJA are not frequently required – (41 of 399, 10.3%).

• At early term follow-up STJA does not demonstrate decreased survivorship when performed with ipsilateral TAR. Continued longitudinal study is warranted.

• Further study is required to determine differences in previous, simultaneous or subsequent STJA with ipsilateral TAR, as our patient volume was limited in this regard. However, inherent thought suggests simultaneous procedures pose increased insult and associated risk to the talus.
References


