Secondary Procedures in Third Generation Total Ankle Arthroplasties

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NO CONFLICTS TO DISCLOSE

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We have no potential conflicts with this presentation.
Introduction

• Incidence of TAAs performed in the United States increased by 57%, from 0.63 per 10,000 patients in 2004 to 0.99 per 10,000 patients in 2009 (Terrell, 2013).

• Most of the reoperations discussed in outcome studies on TAA pertain to revision procedures to address TAA failure or impending TAA failure.
Most common reasons for revision

- Aseptic loosening
- Osteolysis
- Subsidence
- Infection

Other reasons for surgery:
- impingement, tarsal tunnel syndrome, hindfoot or forefoot malalignment, and adjacent joint arthritis.
Differential Diagnosis for a Painful Total Ankle Arthroplasty

<table>
<thead>
<tr>
<th>Infection</th>
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<tbody>
<tr>
<td>Progressive hindfoot deformity</td>
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<tr>
<td>Stress reaction</td>
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<tr>
<td>Peroneal Pathology</td>
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<tr>
<td>Impingement, Arthrofibrosis</td>
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<tr>
<td>Posterior tibialis tendon dysfunction</td>
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<tr>
<td>Painful osteolysis</td>
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<tr>
<td>Aseptic loosening, subsidence</td>
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Purpose

To investigate the incidence of secondary procedures, both revision and non-revision, following total ankle arthroplasty, and to determine the time to such procedures for three commonly used implant systems currently available in the United States.

Hypothesis

Secondary procedures occur with different rates and frequency in each implant system.
Methods

• 761 primary TARs performed between 1999 and 2014
• Identified patients who required a secondary surgery to other ankle pathology
• Analyzed if there were differences between the implants in terms of time to secondary surgery or types of procedures performed.
Statistical analysis

- Analysis of variance: used to compare normally distributed demographic data
- Kruskal-Wallis test: used for skewed data
- Categorical variables were compared using either a chi-squared test or Fisher’s exact test
- Significance level for all tests was $p<0.05$.
- SAS version 9.4 (Cary, NC; United States).
Results

- 193 patients (25.3%) required a secondary procedure.
- Average time to a secondary procedure: 24.5 months.
- The most common secondary procedure was debridement for impingement (80, 7.5%) followed by bone grafting for cyst formation (31, 3.1%).
- Rate of secondary surgery:
  - Salto (25/113, HR=0.64 with 95%CI=0.408-0.996; p=0.048)
  - STAR (81/333, HR=0.694 with 95%CI=0.507-0.949; p=0.022)
  - less when compared to the INBONE group (87/315).
Results

• STAR had a significantly longer time to secondary procedure (33.8 months) versus a Salto-Talaris (12.8 months) or an INBONE (19.2 months, p=001)

• The number of secondary procedures (p<.001), polyethylene exchanges (p<.001), cyst grafting (p=.036) were similar in INBONE and STAR, but significantly more than the Salto

• The INBONE prosthesis had a significantly higher talar component failure rate (p=.038), but similar rate of subtalar arthrodesis and ankle and TTC fusion
Limitations

- Retrospective
- Selection bias: collective efforts of three surgeons spanning 15 years
- As confidence in performing TAR improved with time and experience, patients with larger deformities and pre-existing pathologies were offered TAR.
  - may have an increased rate of secondary procedures for pre-existing pathologies.
Conclusion

- Knowledge of the rates and types of secondary surgeries is useful information on the natural history of third generation ankle implants.
- While there are differences in the rate of failure or revisions between implants, no implant has proven superior to one another.
• Haytmanek, C; Gross, C; Easley, M; Nunley, J: Radiographic Outcomes of a Mobile-Bearing Total Ankle Replacement. FAI. 2015.