11 Year Follow-Up of the Scandinavian Total Ankle Replacement (STAR™): A Single Surgeon Experience

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• My disclosure is in the Final AOFAS Program Book. I have no potential conflicts with this presentation.
Purpose

• 10 year Outcome Data and Survival of the STAR™ total ankle replacement

Methods

• Prospective Consecutive Case Series

• First 30 STAR™ TAR, Single surgeon
Data Collected at Recent Follow-Up

SURVIVAL
  - Calculated based on the outcomes of all 30 STAR™ total ankle replacements
  - Failure = removal of primary implant

Outcomes
  - <10 years follow-up excluded
  - Unpaired t-test, alpha <0.05
  - Pain, Satisfaction, Motion
  - Disability Scores
    - SF-36
    - AOFAS
    - Maryland Foot & Ankle Score
    - AOS Pain & Disability Scores
  - Complications, Additional surgeries
  - Weightbearing X-Rays
  - Radiographic Analysis of Range of Motion
    - Lateral weightbearing foot X-Rays in forced plantar and dorsiflexion
    - Adjacent Joint Disease Progression
      - Kellgren and Moore 1957
30 STAR™ Implants  
(29 pts, mean age 57 y.  
(range 34-75), Feb ‘99 – Sept ‘00)

24 Survivors

16 Primary STAR™

4 Native STAR™
Revisions

4 Deaths

2 Revision
Buechel
Pappas™

6 Failures

1 Ankle
Fusion

3 Extended
Ankle
HFF

1 BKA

11.1 year survival 80%
Successful Revisions

Varus Malalignment (n=1)
- Tibial Osteotomy (closing wedge) @ 39 months
- No pain, “Very Satisfied”

Fractured Polyethylene Glide Cores (n=2)
- Revision Poly @ 65 and 94 months
- No pain, “Very Satisfied”

Talar Subsidence (n=1)
- Talar Bone grafting @ 71 months
- 5/10 pain, “Somewhat Satisfied”

Failures

Talar subsidence (n=2)
- KA pt, STJ fusion @ 49 mo
- Extended Ankle/HF Fusion w/Fem. Head Allograft @ 71 mo
- 2/10 pain, “Very Satisfied”
- Stage IV flatfoot, previous triple arthrodesis
- Extended Ankle/HF Fusion w/Fem. Head Allo @ 105 mo
- 4/10 pain, “Not Satisfied”

Septic ankle (n=1)
- Abx spacer @ 6 mo.
- Revision Buechel Pappas @ 13 mo.
- 3/10 pain, “very satisfied”

Varus instability (n=1)
- Contralateral AF
- Buechel Pappas @ 29 mo.

Deltoid insufficiency (n=1)
- Stage IV flatfoot, triple 6 yrs. before STAR.
- Deltoid Reconstruction w/ FDL @ 4 mo
- Medial Mall fx/dislocated poly @ 6 mo
- Extended Ankle/HF Fusion @ 7 mo
- BKA @ 129 mo.
- 0/10 pain, “Very Happy with BKA”

Painful TAR, no mechanical explanation (n=1)
- Revision STAR (exchange poly) @ 10 mo
- AF @ 18 mo
- Revision AF for nonunion @ 23mo
- Wound infection with I&D’s @ 24 mo
- STSG @ 29 mo
- 10/10 pain, “somewhat satisfied”, CRPS
10 Year Minimum Follow Up Data: 11.4 yrs (range 10-12.3 yrs)
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<td>50.8 +/- 16.3 (range 23-68)</td>
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<td>50.8 +/- 20 (range 21-63)</td>
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RADIOGRAPHIC ANALYSIS OF ROM

TAR ROM comes from: 53% Ankle, 47% Midfoot

61% loss Overall Motion with Ankle Fusion: 27% Loss of Dorsiflexion, 76% Loss of Plantarflexion

OUTCOMES: TAR vs. Fusion

93% vs. 60% Patient Satisfaction
83% vs. 20% “Normal” Gait
17% vs. 60% Adjacent Joint Arthritis
Conclusions

• Overall survival of STAR™ Total Ankle Replacement 80% at a mean of 11.1 years
• STAR™ arthroplasties have greater motion
• STAR™ arthroplasties appear to be protective against progression of arthritis
  – 17% TAR vs. 60% fusions
• Better pain, satisfaction and function in STAR arthroplasty vs. revision arthroplasty/fusion
• Revision surgery with attempt to maintain original prosthesis is recommended as outcome scores are superior to fusion.
• When there is insufficient talar bone stock, conversion to fusion or bulk allograft HFF is successful at managing pain with potential for progressive arthritis.
• BKA is a reasonable salvage procedure