Swanson implant arthroplasty of the first MTP joint accompanied by open-wedge osteotomy for hallux valgus in rheumatoid arthritis

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My disclosure is in the Final AOFAS Mobile App.
I have no potential conflicts with this presentation.
Double-stem silicone implant, Overall OK

- 97%, excellent or good.
  - Cracchiolo A, JBJS-A 1992 ¹)
- 92%, excellent or good.
  - Hanyu T, J Orthop Sci 2001 ²)

However.....
High Incidence of Breakage!
- 29%/3 yrs.
  - Granberry WM, JBJS-A 1991 ⁴)
- 21%/8.2 yrs.
  - Kampner SL, Foot Ankle 1984 ⁵)

Implant failure is often!, even though clinically asymptomatic
What Causes the Breakage?

- Residual widening of intermetatarsal angle; had better to be corrected.
  - Swanson AB, CORR 1979
  - Gould N, Foot Ankle 1982
  - Kampner SL, Foot Ankle 1984
  - Swanson AB, CORR 1997

- Grommet can reduce the breakage as well as the sinking.
  - Ishikawa H, CORR 1995
  - Swanson AB, CORR 1997
  - Hanyu T, J Orhop Sci 2001
Our Solution

Shi K. Mod Rheumatol. 2007 10)
Patients

- 30 foot in 19 patients with RA
  - 2 men and 16 women
- Average age, 65 y.o.
- Average duration of RA, 24 yrs
- Average FU, 45 mos (min, >1y)
- Preoperative Larsen Grade,
  - III, 11; IV, 18; V, 1 (Hallux MTP joint)
- Lesser toes; resection arthroplasty
Evaluation

- Clinical;
  - AOFAS Hallux Metatarsophalangeal–Interphalangeal Scale

- Radiographic;
  - Hallux valgus angle (HVA)
  - Intermetatarsal angle (IMA)
  - Sesamoid position (Hardy’s grading system)
  - Implant breakage (Granberry’s grading system, ≥ grade 2)
  - Implant sinking (positive, >2mm)
  - Clear zone around implant

- Complications
Result --- AOFAS Score

Preoperative  | Last FU
--- | ---
44.3 | 82.6

Alignment | Callus | MTP-IP Stability | IP joint motion | MTP joint motion | Footwear | Activity | Pain
Preoperative (Preope) to 3 months postoperative (3 months PO) and last follow-up (Last FU) changes in HVA and IMA are shown. Hardy’s Grading System is also depicted.
Result --- Implant Failure & Complications

- Implant Failure
  - Implant breakage, 0
  - Implant sinking, 2
  - Clear zone around implant, 0

- Complications
  - Psuedoarthrosis at bone graft, 0
  - Infection, 2
  - Delayed wound healing, 3
  - Recurrence of hallux valgus (≥25), 4
## Discussion ---
## Factors assoc. HV Recurrence?

<table>
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<th>No recurrence (n=26)</th>
<th>Recurrence (n=4)</th>
<th>P value</th>
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<tr>
<td>Preop. HVA</td>
<td>47.9</td>
<td>62.5</td>
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<td>3mos p.o. HVA</td>
<td>11.6</td>
<td>23.8</td>
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<td>Preop. IMA</td>
<td>15.7</td>
<td>20.3</td>
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<tr>
<td>3mos p.o. IMA</td>
<td>3.7</td>
<td>7.0</td>
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<tr>
<td>Preop. Hardy</td>
<td>6.4</td>
<td>6.8</td>
<td>0.27</td>
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<tr>
<td>3mos p.o. Hardy</td>
<td>3.3</td>
<td>4.8</td>
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</tbody>
</table>
Conclusion

- Excellent mid-term results of Swanson implant arthroplasty of the #1 MTP joint with grommets accompanied by open-wedge osteotomy of #1 MT bone for HV in RA were demonstrated.

- Recurrence of HV were few, but observed in severe preop. HV with splayfoot and undercorrection of sesamoid.
1) Cracchiolo A, Cimino WR, Lian G.  
Arthrodesis of the ankle in patients who have rheumatoid arthritis.  

2) Hanyu T, Yamazaki H, Ishikawa H, Arai K, Tohyama CT, Nakazono K, Murasawa A.  
Flexible hinge toe implant arthroplasty for rheumatoid arthritis of the first metatarsophalangeal joint: long-term results.  

3) Papagelopoulos PJ, Kitaoka HB, Ilstrup DM.  
Survivorship analysis of implant arthroplasty for the first metatarsophalangeal joint.  

4) Granberry WM, Noble PC, Bishop JO, Tullos HS.  
Use of a hinged silicone prosthesis for replacement arthroplasty of the first metatarsophalangeal joint.  

5) Kampner SL.  
Total joint prosthetic arthroplasty of the great toe—a 12-year experience.  

6) Swanson AB, Lumsden RM, Swanson GD.  
Silicone implant arthroplasty of the great toe. A review of single stem and flexible hinge implants.  

7) Gould N.  
Surgery of the forepart of the foot in rheumatoid arthritis.

8) Swanson AB, de Groot Swanson G, Ishikawa H.  
Use of grommets for flexible implant resection arthroplasty of the metacarpophalangeal joint.  

9) Ishikawa H, Hanyu T, Murasawa A.  
The use of grommets for flexible hinge toe implants. A case report.  

10) Shi K, Hayashida K, Owaki H, Kawai H.  
Replacement of the first metatarsophalangeal joint with a Swanson implant accompanied by open-wedge osteotomy  
of the first metatarsal bone for hallux valgus in rheumatoid arthritis.  