Intermediated-term Results of Salvage Procedure using Tibiocalcaneal Fusion and Strut-fibular Graft for Ankle Arthropathy with Severe Bone Defect

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My disclosure is in the Final Program Book and in the AOFAS database

I have no potential conflicts with presentation
End-stage ankle arthropathy
Severe bone defect

- Difficulty of rigid fixation
- High failure (non-union) rate
- **Shortening of limb length** (Herscovici, CORR, 2014)
  → changes in gait, pelvic tilt, spinal problem
- Challenging problem to surgeon
Solution against bone defect

- **Structural allo-raft** (femoral head) → slow incorporation, potential for late collapse (Jeng, FAI, 2013)

- **Structural BG substitute**

- **Shortening arthrodesis** → higher fusion rate, but many functional problems

- **Structural fibular auto-raft**
  - greater healing (union) potential
  - restoration of limb length
  - no immune reaction
  - donor site morbidity
Demographics

- May, 2008 ~ August, 2013 retrospective study
- 28 cases (28 patients) with end-stage arthropathy treated by TTC fusion & auto-fibular strut graft
- Severe periarticular bone defect
- Follow-up > 3 years after operation by one surgeon
- Age / Sex: mean 57.6 yrs, M / F (13 / 15)
- Follow-up: mean 50.4 months
Causes of arthropathy

- DM charcot arthropathy: 10 cases
- Failed TAR: 5 cases
- Septic arthritis and OM: 6 cases
- Talus AVN: 3 cases
- Rheumatoid arthritis: 2 cases
- Sequelae of childhood injury: 2 cases
Surgical procedure (TTC fusion & Auto-fibular graft)

- Anterior approach
- Removal of necrotic bone and cartilages
- Auto-fibular graft (10-15 cm) BG substitute
- Graft (5-6 struts) implantation and temporary fixation
- DLA (dynamic locking ankle) retrograde IM nail
- Additional anterior plate fixation (charcot arthropathy)
Surgical procedure

(TTC fusion & Auto-fibular graft)
Surgical procedure

(TTC fusion & Auto-fibular graft)
Clinical & Functional results

- AOFAS ankle score: 28.8 → 80.4 points
- Foot and Ankle Ability Measure: 24.5 → 74.1 points
- Walking for longer than 30 minutes: 22 / 28 pts (79%)
- Walking on uneven ground: 15 / 28 pts (54%)

Radiological results

- Fusion rate: 26 / 28 pts (92.8%)
- Period to union of tibia-fibular graft: 18.2 wks
- Period to union of calcaneus-fibular graft: 19.5 wks
- The degree of limb shortening: 12.8 → 14.5 mm
TTC fusion with retrograde nail and fibular graft for severe ankle arthropathy with large bone defect

- Satisfactory intermediate-term clinical outcomes
- Improvement of gait ability & reliable pain relief
- More Cx, but high fusion rate & minimize shortening
- Considerable limb salvage procedure