Converting Failed Arthroplasty to Arthrodesis
William C. McGarvey MD

A. General Considerations
   a. Why is this important?
      i. Over 20,000 Agility implants performed in late 80’s thru early 2000’s
      ii. Published longevity suggests these do well for 12-14 years but then...some evidence for gradual decline in survivorship
      iii. This puts an increasing number of implanted TAA’s in a time frame for deterioration
      iv. FDA considers the appropriate treatment for failed TAA in 2015 to be arthrodesis
   b. Differs from standard or primary ankle arthrodesis – must be considered salvage procedure
      i. Some overlapping issues
         1. Create ideal functional position
         2. Maximize apposing surfaces
         3. Preserve vascularity
         4. Provide maximum stability
         5. Soft tissue concerns
      ii. Some distinctly different issues
         1. Large bone voids
         2. Dysvascular bone
         3. Fixation challenges due to bone loss

B. Evaluation of the Failed Arthroplasty
   a. Reason for failure
      i. Infection
         1. General principles parallel those of other arthroplasties
         2. Aspiration, serologic studies, nuclear scans
            a. May require staged explantation
      ii. Subsidence
         1. Classic with undersized components not resting on cortical bone
         2. Also in face of avascular bony bed
      iii. Mechanical
         1. Poly wear
         2. Poly fracture
         3. Component breakage
      iv. Aseptic loosening
   b. Candidate for revision?
      i. Retained bonestock, good soft tissue envelope, no sepsis
   c. Candidate for amputation?
i. Infection, soft tissue defects, massive bone loss, chronic pain
d. Surgeon experience
  i. If not skilled/experienced at arthroplasty, revision is probably not the best choice for you or your patient
e. Any doubt about any of the above, fusion is likely best alternative

C. Principles for Treatment
a. Approach
  i. Midline (except Zimmer TM)
  ii. Consider Plastic surgery consult pre-operatively to assess potential problems and introduce patient to concept that there could be a problem

b. Vascularity
  i. Check pulses
  ii. Check Doppler
  iii. Consider vascular studies/consult
    1. Prior unrecognized vascular insult could result in disastrous outcome

c. Void
  i. General rule
    1. 0-2cm an likely be treated by shortening and grafting with local autograft or bone substitutes for crevices, etc.
    2. >2cm requires structural intercalary substitute
  ii. Void fillers
    1. Iliac crest autograft
    2. Femoral head allograft
    3. Fibular strut graft auto or allo-
    4. Mesh cages with supplemental graft auto- or allo-
    5. Trabecular metal blocks –custom request and experimental

d. Fixation
  i. Screws alone
  ii. Rod through structural void filler
  iii. Plate traversing defect
  iv. External fixation
    1. Mostly in septic situations

e. Subtalar joint
  i. Typically involved and sacrificed in larger talar bone loss scenarios

f. Post-op(anecdotal and personal experience)
  i. Prolonged elevation
  ii. Consider supplemental O2 for peri-op to enhance wound healing
  iii. Drains to reduce wound tension
  iv. Incisional wound vac?
v. Cast and NWB for minimum 6 weeks
vi. Begin WB with standing only for another month minimum
vii. No walking for 10-12 weeks and only on heel at that point
viii. Liberal post-op CT use for assessment of healing progress

D. Outcomes
   a. Overall success of conversion from TAA to arthrodesis is 58-89%
   b. Isolated ankle fusions reported to do better than hindfoot fusions following failed TAA
      i. 42% nonunion rate in hindfoot fusion after TAA
      ii. Majority are at subtalar portion of attempted arthrodesis site

References
Walsh S: Ankle arthrodesis following bone loss: crossing the void. JBJS Br 90, 2008.