Considerations in Deltoid Ligament Reconstruction

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Our disclosures are in the Final AOFAS Mobile App. There is a potential conflict with this presentation due to: This cadaveric study was funded by DJO Global.
Valgus Ankle

• Stage IV AAFD
• Joint-sparing surgery
  – Reconstruction of Deltoid Ligament\textsuperscript{1-8}
    • Autograft
    • Allograft
Reconstruction of Deltoid Ligament

• Deland et al\textsuperscript{3}
  – Peroneus longus autograft
  – 2 year follow-up: average talar tilt corrected was from $10^\circ$ pre op to $3.6^\circ$ post op

• Ellis et al\textsuperscript{4}
  – Follow-up of same patients at a mean 8.9 years revealed talar tilt of $2^\circ$ postoperatively.
Reconstruction of Deltoid Ligament

• Bluman et al$^1$
  – Forked hamstring allograft

• Jeng et al$^6$
  – 8 patients, 36 month follow-up with forked hamstring allograft
  – 5 of 8 patients had a successful outcome with a reduction of tibiotalar valgus tilt from a mean 6.4° pre op to 2.0° post op
  – Tibiotalar valgus greater than 10° pre op had poorer outcomes
Statement of Purpose

• Describe a deltoid ligament reconstruction technique with allograft tendon.
• Provide data of the average allograft tendon length needed for reconstruction.
• Identify anatomic structures at risk.
Methodology

- 10 below knee cadavers
- Flexible string to mimic a tendon allograft
  - tibiotalar and tibiocalcaneal portions reconstructed
- The length of the string was measured with a ruler (cm)
  - insertion points in the talus and calcaneus
  - transosseous tunnel through the medial malleolus
- Measurement also compared to the height of each cadaver
- Anatomic structures at risk
  - PTT, FDL, FHL, posterior tibial nerve and artery
Procedures

Guidewire #1: Insertion point into talus

Guidewire #2: Insertion point into calcaneus

Guidewire #3: Transosseus tunnel through tibia
Results

• The average height of the cadavers was 66.40 inches (range 60-74, ±4.12).
• The average length needed for reconstruction=13.15 ± 1.27 cm
  – Minimum length= 10.5 cm
  – Maximum= 15 cm
• As our cadaver height increased, the graft length generally increased (p=0.12).
• The anatomic structures at risk during guidewire insertion included the PT and FDL tendons.
  – no direct violations encountered to the medial flexor tendons or the neurovascular bundle during guidewire insertion.
Discussion

• We present a unique allograft tendon reconstruction of both the superficial and deep deltoid ligament complex.
• The average allograft tendon length needed for this deltoid reconstruction technique is 13 cm.
• This will aid in pre-operative planning as well as operating room efficiency during the procedure.
• This deltoid reconstruction technique is relatively safe with few anatomical structures at risk.
• Long-term data with patient outcomes is warranted for future studies.
REFERENCES: