Is an Achilles Tendon Lengthening with a TMA Enough?

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INTRODUCTION

Transmetatarsal amputation (TMA) has been found to be a durable procedure that preserves limb length and function in patients with forefoot pathology requiring amputation. Recurrent ulceration secondary to equinovarus deformity of the foot has a reported incidence of up to 17%. LaFontaine et al reported on 28 patients who underwent a percutaneous TAL due to recurrent ulcerations following TMA. Five patients developed a plantar central heel ulcer related to iatrogenic over-lengthening and 1 developed a plantar lateral ulceration likely due to an unaddressed varus deformity. Roukis et al performed a TMA on 29 patients. Twenty-six patients had a percutaneous TAL or gastrocnemius recession and 17 had procedures performed to correct residual varus deformity of the foot. Three patients developed an ulceration on the plantar lateral aspect of the residual foot, none of which had tendon balancing procedures performed. While an adjunctive Achilles tendon lengthening procedure is commonly performed, little is done to combat the resultant varus deformity of the residual foot. Presented here are the results of adjunctive tendon balancing procedures to counter both equinus and varus deformity of the residual foot. The use of shoe gear, custom inserts, and/or bracing, barefoot walking, and development of ulceration were assessed.

METHODOLOGY

Retrospective review: May 2006 to November 2012

Inclusion criteria:

All patients who underwent a TMA

Equinus deformity addressed via:

• Percutaneous TAL
• Endoscopic gastrocnemius recession
• Open gastrocnemius recession
• Volpius type recession

Varus deformity addressed via:

• Peroneus brevis to longus tendon transfer
• STATT
• Flexor hallucis longus transfer
• Extensor digitorum longus transfer
• Posterior tibial recession
• Internal hardware

Exclusion criteria:

• Higher level amputation due to continued infection and/or necrosis.

CONCLUSION

• Varus deformity following TMA is not commonly addressed despite an up to 17% incidence of plantar lateral ulcerations
• Flexible equinovarus deformity occurs due to:
  1. Dorsiflexion overpowered by the gastrocsoleus complex
  2. Peroneus brevis overpowering the Anterior and Posterior tibial tendons
  3. Loss of the insertions of the intrinsic musculature and plantar fascia
  4. The transverse arch of the foot
• Addressing this deformity and use of custom inserts can prevent ulcerations
• Patients with residual flexible equinovarus deformity need to utilize an AFO

REFERENCES AVAILABLE UPON REQUEST: valerie.l.schade.civ@mail.mil

- patient with PVD prior to FHL: EDL and hardware balancing employed; **: extra-articular ankle pinning used

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<th>AG</th>
<th>E</th>
<th>F</th>
<th>M</th>
<th>L</th>
<th>R</th>
<th>Varus correction (Y/N)</th>
<th>Equinus correction (Y/N)</th>
<th>Custom insert (Y/N)</th>
<th>AFO (Y/N)</th>
<th>Barefoot ambulation (Y/N)</th>
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† patient with PVD prior to FHL; EDL and hardware balancing employed; **: extra-articular ankle pinning used

17 patients (11 male; 6 female)
17 feet (11 left; 6 right)
Mean age = 68.5 ± 28.4 years
Mean follow up = 50.2 ± 22.4 months.
5 patients (29.4%) did not use a custom insert
4 (23.5%) admitted to barefoot ambulation
3 patients (17.6%) – had an ulceration at follow up
1 – due to flexible equinovarus deformity; non-compliance with AFO use
1 – due to altered lower extremity biomechanical; non-compliance with AFO use
Both resolved with local wound care and transition back to AFO
1 – admitted to no use of a custom insert and barefoot ambulation
Currently being followed by another provider