Tendo-Achille’s Lengthening: Myth or Reality?

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Time and force may result in a forefoot ulcer.
Achilles Tendon Lengthening

- Ankle joint ROM effected by tissue glycosylation
  - Decreased ankle DF
  - Increased plantar pressure
- Percutaneous TAL to ↑ ankle DF and reduce forefoot pressure
The purpose of this study was to determine:

Rate of ulcer recurrence in a large population of patients whose ulcerations had healed in a total contact cast

Reason ulcerations had recurred

Arch Phys Med Rehabil. 1991 Nov;72(12):967-70. Helm PA, Walker SC, Pullium GF. Department of Physical Medicine and Rehabilitation, University of Texas Health Science Center, Dallas
102 patients all who had healed in a TCC
There were 54 men and 48 women, all diabetics
Average wound size 2.6cm by 1.9cm
Average healing time of 33.9 days
An average of 25 months since casting
Twenty of the 102 patients had ulcer recurrences since initially healing in a cast
Causes of ulcer recurrence

- Failure to comply with follow-up foot-wear/foot-care protocol (n = 8)
- Biomechanical faults (n = 5)
- Osteophyte or bone fragment (n = 4),
  - Osteomyelitis (n = 5)
  - Charcot joint (n = 4).

Some patients had multiple etiologies.
But were all of the forces that led to the ulceration being offloaded?
Consider the power of equinus

Limited ankle dorsiflexion has been implicated as a contributing factor to plantar ulceration of the forefoot.
## Two Methods of Lengthening

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<tr>
<th>Percutaneous TAL</th>
<th>Gastroc Recession</th>
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Reduction in Peak Forefoot Pressure with TAL:

27% reduction in peak plantar forefoot pressure

The Equation:

Neuropathy + Elevated forefoot pressure + Achilles tendon structural/functional pathology = *Midfoot Breakdown/ulcer*  

Making the Correct Decision

Performing the Silfverskiold Test determines Gastroc Recession versus Percutaneous TAL

If equinus improves with knee flexion, the soleus is tighter than the gastrocnemius
A Gold-Standard Study

Effect of Achilles Tendon Lengthening on Neuropathic Plantar Ulcers: A Randomized Clinical Trial

Michel J. Mueller, PT PhD, David Sinacore PT PHd, Mary Kent Hastings, MS/PT ATC, Michael Strube PHd, Jeffrey Johnson, MD

Investigation performed at the Washington University School of Medicine, St. Louis, Missouri
A comparison of outcomes for patients with diabetes mellitus and neuropathic plantar ulcers treated with total-contact casting with and without an Achilles tendon lengthening.
Sixty-four subjects were randomized into two treatment groups:

- Immobilization in a total-contact cast alone
- Immobilization in a total-contact cast/TAL

No significant differences in age, body-mass index, or duration of diabetes
Plantar flexor peak torque also decreased after Achilles tendon lengthening ($p < 0.004$), but it returned to base-line after seven months.

Peak plantar pressures on the forefoot during barefoot walking were reduced ($p < 0.0002$) following Achilles tendon lengthening yet returned to baseline values within seven months after treatment.
Results:

Healing in 88% of TCC group and 100% in TCC/TAL group

Ulcer recurrence in sixteen (59%) of the twenty-seven patients in the total-contact cast group who were available for follow-up and four (15%) of the twenty-seven patients in the Achilles tendon lengthening group who were available for follow-up had an ulcer recurrence \((p = 0.001)\).
Two-year follow-up:

Twenty-one (81%) of the twenty-six patients in the total-contact cast group and ten (38%) of the twenty-six patients in the Achilles tendon lengthening group had ulcer recurrence (p = 0.002).
Conclusions

All ulcers healed in the Achilles tendon lengthening group
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The risk for ulcer recurrence was 75% less at seven months and 52% less at two years than that in the total-contact cast group.
Conclusions

Achilles tendon lengthening should be considered an effective strategy to reduce recurrence of neuropathic ulceration.
Case Study: HA

Perc. TAL

CADAVER Model
Percutaneous TAL
Possible Complication: CALCANEOUS Position