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Functional weight-bearing mobilization after Achilles tendon rupture
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56 patients

Functional weight-bearing mobilization after Achilles tendon rupture enhances early healing response: a single-blinded randomized controlled trial

Background

- Functional weight-bearing mobilization may improve repair of Achilles tendon rupture (ATR), but the underlying mechanisms and outcome were unknown.

Hypothesis

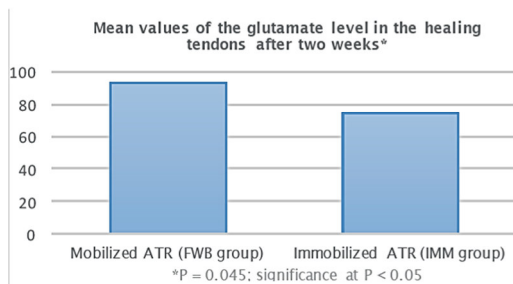
- Functional weight-bearing mobilization by means of increased metabolism (expression of the healing progress of the tissue) could improve both early and long-term healing.
- Main objective:** Investigation of the concentration of certain metabolites in the peritendineum of the Achilles tendon. The higher the concentration, e.g. off glutamate, the better the healing.

Method & Measurement

- Randomized controlled trial; comparison of two groups (56 patients) with acute ATR after operative treatment
 - Group with mobilization (FWB)** in the ankle joint using VACOPed with defined ROM for 15°-30° plantar flexion for 2 weeks, this was increased to 5°-30° for the remaining 4 weeks
 - Group with immobilization (IMM)** received plaster cast with ankle in 30° equinus position for 2 weeks, then treated in removable walker (AIRCASST) with three heel wedges for the remaining 4 weeks of immobilization (every consecutive week, a heel wedge was removed)
 - Full weight-bearing with crutches and range of motion exercises were allowed after application of the orthosis. One hour daily non-weight-bearing range of motion exercises without the orthosis was recommended.
- Measurement:** at 2 weeks examination of tendon healing using microdialysis; at 6 and 12 month assessment of functional outcome using heel-rise test

Main Results*

Significantly higher glutamate level in group with mobilization (FWB)



Superior functional outcome



After 2 weeks the ankle dorsiflexion of the injured side was significantly better in the FWB group when compared to the IMM group.

Conclusion

- Direct post-operative weight-bearing and functional mobilization resulted in an early improved healing response compared to non-weight-bearing and immobilization
- Early ankle range of motion was improved without the risk of Achilles tendon elongation and without altering long-term functional outcome

Full Text Link

- <https://pubmed.ncbi.nlm.nih.gov/27539402/>

* Further results: importance of glutamate: at 2 weeks healing AT of both groups exhibited elevated metabolite concentrations compared to intact contralateral AT; the upregulated glutamate levels were significantly correlated with concentrations of PINP and with improved functional outcome at 6 months; functional outcome: LSI for dorsal flexion was significantly better for FWB group compared to IMM group; total work and heel-rise height exhibited significant differences between injured and uninjured side (both groups); at 12 months, total work significantly different between injured and uninjured side of FWB group; at 6 and 12 months, both groups demonstrated similar outcome in the heel-rise test.