

Title: Simplifying postoperative rehabilitation protocol after ankle fracture operative fixation to improve postoperative range of motion and patient reported outcomes

Authors: Seth Yarboro MD. Monica Arney MD. Ian Backlund MD. Carson Staples.

Abstract

Background: Ankle fractures of some of the most common injuries encountered by orthopedic traumatologists and generalists. They can have long term mobility impacts for our patients after recovery from surgical fixation often in the form of anterior ankle pain and/or impingement. Oftentimes postoperative rehabilitation protocols are employed in an attempt to avoid posttraumatic ROM limitations. Protocols can be lengthy, leading to decreased compliance and possibly poorer patient outcomes. Choosing a single targeted exercise for ankle dorsiflexion to perform as postoperative rehab may be a simple and cost-effective change to implement in comparison to formal postoperative PT protocols. Our goal is to investigate the comparison in pain, PROMIS, and measurable ankle dorsiflexion to the contralateral uninjured ankle after an ankle fracture with these two postoperative therapy protocols. We hypothesize noninferiority of a simplified ankle block stretch as compared to standard PT protocols for the above metrics.

Methods: This study is a randomized controlled trial which was reviewed and approved by our Institutional Review Board. Patients were eligible for selection if they were between the ages of 18-65 after sustaining an operative bimalleolar/trimalleolar ankle fracture, pilon fracture, or fracture dislocation and after operative fixation with one of our three fellowship trained orthopedic traumatologists. Patients will be excluded if they had contralateral lower extremity injuries, prior ipsilateral ankle injury/hardware, baseline neurologic deficits, severe injury requiring vascular/soft tissue reconstruction, baseline non ambulatory status, BMI >50, and prisoners. The mode of operative fixation was at the discretion of the treating surgeon and was unaltered by participation in the study. These patients were electronically randomized to either arm of the study - AAOS home exercise protocol (AAOS HEP) or a simplified ankle block stretch HEP (AB HEP) at their 2 week surgical follow-up. Primary outcomes of the study were ankle dorsiflexion as measured by an inclinometer, PROMIS 8b scores, and pain scores. The contralateral ankle was also measured for comparison as the control. Patients were assessed at 2 (+/-1 week), 6 (+/- 2 weeks), and 12 (+/- 2 weeks) weeks and 6 (+/- 3 weeks) months post surgery per standard follow-up timeframes.

Results: Preliminary data has been run on our recruited patient database of 36 patients. 17 patients were randomized to AAOS HEP group and 19 to the AB HEP. Of our randomized patients, 21 patients have complete 6 and 12 weeks follow-up. The AAOS HEP had an average

age of 40.9 (+/- 10.8) and BMI 32.6 (+/- 8.1). The AB HEP had an average age 44 (+/- 14) and average BMI 31.2 (+/- 5.8). The AB HEP demonstrated a 10.8 (+/- 15.7) degree improvement in ADF from 6 to 12 week follow-up, while the AAOS HEP demonstrated a 6.6 (+/- 9.6) degrees improvement. Subgroup analysis of the two study arms is ongoing, with the goal to demonstrate the percent improvement compared to the control extremity (baseline ROM) at 12 weeks and 6 month follow-up.

Conclusions: Anterior ankle pain and/or impingement is a well documented post-operative complaint in patients who have required surgical fixation of their ankle/pilon fractures. This study is a prospective randomized controlled trial including patients who have undergone ankle/pilon fracture fixation and evaluate the efficacy of two physical therapy protocols to determine if a simplified focused exercise protocol can have comparable outcomes in postoperative ankle ROM and PROs. Data analysis is ongoing, but thus far has shown a trend for our simplified ankle block stretch HEP as noninferior to the current standard of practice.