Does Ankle Aspiration for Acute Ankle Fractures Result in Pain Relief? A Prospective Randomized Double-Blinded Placebo-Controlled Trial

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Purpose: Aspiration of fracture hemarthrosis has been previously recommended as a method of pain control following certain intraarticular fractures. This study is designed to determine if aspiration of the fracture hemarthrosis in the setting of an acute ankle fracture results in pain relief and diminished need for narcotic pain medications.

Methods: After IRB approval, the investigators randomized 109 patients with an ankle fracture (OTA classification 44) who presented within 24 hours of injury to undergo either an ankle aspiration to remove the hemarthrosis, or to receive a sham procedure where the needle was advanced to the level of the subcutaneous tissue above the capsule, but no fluid was removed. Both the patient and the investigators were blinded. No differences were seen between these study groups. Patients recorded their Numeric Rating Scale (NRS) pain scores and narcotic usage (oral morphine equivalents [OMEs]) for the first 72 hours or until a surgical procedure occurred, whichever was first. Secondary outcomes included limb volumes (as measured by the technique of fluid displacement), 6-month Olerud-Molander (OM) and SMFA (Short Musculoskeletal Function Assessment) scores, and complications.

Results: A total of 109 subjects (37 males, 72 females) were enrolled with an average age of 52 years. 56 patients were randomized to aspiration, removing an average of 5 mL of hemarthrosis. 53 patients were randomized to and received the sham procedure (control). There were 9 OTA 44A, 78 OTA 44B, and 22 OTA 44C, occurring in even distribution between the aspiration and sham procedure groups. The NRS pain score between emergency department arrival and dismissal improved 2.9 in the aspiration group and 2.5 in the sham group ($P = 0.4$). The highest pain scores in the first 24 hours after injury were 7.3 in the aspiration group and 7.4 in the sham group ($P = 0.88$); hours 24-48 maximum scores were 5.7 in each group ($P = 0.97$); hours 48-72 maximum scores were 4.6 and 5.2 ($P = 0.33$). Pain medicine usage in the first 72 hours following injury showed a total of 89 mg OMEs in the aspiration group and 103 mg OMEs in the sham group ($P = 0.43$). Volumetric measurements at initial follow-up showed that the aspiration group had an average limb volume of 2296 mL on the injured side and 2032 mL on the uninjured side (13% difference), while the control group had volumes of 2248 mL on the injured side and 2012 mL on the uninjured side (12% difference, $P = 0.6$ between groups). OM scores at 6 months were 71.7 in the aspiration group and 78.4 in the sham group ($P = 0.67$). SMFA dysfunction index at 6 months was 15 in the aspiration group and 10.8 in the sham group ($P = 0.12$); bother index was 16.7 in the aspiration group and 10.7 in the sham group ($P = 0.09$). Two post-ORIF (open reduction and internal fixation) infections were seen in the aspiration group and none in the sham group ($P = 0.5$). There were no significant differences in any outcome measure between the aspiration group and the sham group.

Conclusion: Aspiration of acute ankle fractures did not result in decreased NRS pain scores or opioid usage following aspiration. No differences in secondary outcomes, including limb volume, 6-month SMFA and OM scores, or complications were seen. Aspiration of acute ankle fractures does not provide measurable clinical benefit.

See pages 99 - 147 for financial disclosure information.