

Max Hoggard – 2021 – RRD - Suture repair of the deltoid ligament is an effective alternative to traditional suture anchor repair: a clinical and biomechanical analysis

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Background: The deltoid ligament is a critical stabilizer of the ankle and an important determinant of tibiotalar kinematics. Approximately 40% of ankle fractures have a concomitant deltoid ligament injury and repair of these injuries has been shown to aid in fracture reduction and overall ankle stability. Multiple repair options have been described, with direct suture-only repair and suture anchor techniques being common. The purpose of this investigation is to compare the clinical and radiographic outcomes of these techniques, as well as their biomechanical implications. It is hypothesized that suture-only deltoid ligament repair reliably accomplishes ankle stability and does not result in inferior radiographic or biomechanical results compared to repair with the suture anchor repair.

Methods: A retrospective review was performed of 12 patients treated operatively for isolated deltoid ligament disruption. Patients were matched 1:1 based on demographic and surgical technique of deltoid ligament repair with barbed PDS suture alone versus with suture anchor. Patients were evaluated clinically and radiographically at 6-weeks and 3-months postoperatively. Additionally, 4 cadaveric specimens were obtained and prepared to simulate deltoid ligament injury. The specimens were tested to simulate both weightbearing and external rotation stresses using a hydraulic material testing apparatus. Relative rotational and translational changes were compared between specimens repaired with suture only and those repaired with suture anchors.

Results: At 6-week and 3-month evaluation, patients in the suture-only group did not demonstrate radiographic evidence of medial clear space widening and had not undergone repeat surgery. One patient (16%) in the suture anchor group demonstrated medial clear space widening at 6 weeks. Also, 1 patient (16%) in the suture anchor group had undergone repeat surgery at 3-month evaluation. Two patients in the suture group endorsed intermittent pain with prolonged standing (33%) at 3 months, but all had returned to work (n=6, 100%).

Conclusions: Deltoid suture repair with barbed PDS suture effectively reduces and maintains the medial clear space and is not inferior to traditional fixation in radiographic outcomes at 3 months following initial surgical intervention. It is a viable alternative to suture anchor repair while minimizing adverse events, sequelae, and cost of traditional approaches.