

Barbed Suture Repair of Deltoid Ligament Is an Effective Alternative to Suture Anchors

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Purpose: Deltoid ligament injury is frequently associated with ankle fractures, and repair techniques have varied. With this technique, we repair the deltoid ligament with multiple passes of single barbed suture (barbed PDS [polydioxanone] suture) and find the technique to be effective for joint reduction, as well as cost-effective compared to suture anchors. Barbed suture repair allows multiple passes of the suture with multiple limbs crossing the repair interval, ideal for the poor tissue condition that is often encountered. Proximally, periosteum provides reliable tissue strength. Compared to individual sutures or suture anchors, we have noted excellent strength and even tensioning of the repair construct. This suture repair effectively reduces and maintains the medial clear space (MCS) intraoperatively and during healing, and minimizes cost, need for specialized instrumentation, and adverse events associated with traditional approaches.

Methods: A single-institution retrospective review was performed on patients treated operatively with barbed suture repair for isolated deltoid ligament disruption between 2015 and 2019. Patients with ipsilateral extremity injuries, open fractures, and/or previous ankle injuries were excluded. Demographic data and fracture characteristics were recorded. Additionally, intraoperative reductions, additional plate fixation, and post-reduction MCS widening were assessed. 1:1 matching based on demographic and surgical technique of deltoid ligament repair with suture alone versus with suture anchor was conducted. Patient follow-up was evaluated including weight-bearing status and 6-week and 3-month radiographic healing in suture repair compared to suture anchor repair.

Results: 12 patients underwent deltoid repair from 2015 to 2019 with either barbed suture (6 patients) or suture anchor (6 patients). Mean age was 48 ± 23 versus 35 ± 9 years with a body mass index of 35.6 ± 6.3 versus 30.0 ± 6.72 kg/m² for barbed suture and suture anchor fixation, respectively. At 3-month evaluation, none of the suture group had MCS widening, compared to 1 (16%) in the suture anchor cohort. The barbed suture technique does not result in inferior radiographic outcomes at 3 months compared to deltoid ligament repair with suture anchor.

Conclusion: Deltoid repair with barbed PDS suture is a viable, cost-effective alternative to suture anchor repair, and in this pilot series resulted in no widening of the MCS on radiographs at 3 months after surgery.