
Abstract: BACKGROUND: Several techniques and procedures have been described to treat long head of the biceps pathology; however, tenodesis and tenotomy are the 2 most common procedures performed. This study evaluated the initial fixation strength of the biceps tenodesis triple loop suture (TLS) technique and compared it with that of the simple suture technique (SST). METHODS: Twenty fresh frozen cadaveric human shoulders (humeral head and neck with attached biceps tendons) were harvested. The biceps tendon was tenotomized proximally before reattachment to the bicipital groove of the matching humerus using suture anchors. Tenodesis was performed using the SST or the TLS technique. Specimens were tested biomechanically for load to failure, stress, and stiffness. The mechanism of failure was evaluated and compared between the 2 suture techniques. RESULTS: Maximal load to failure was significantly greater using the TLS technique (122.2 +/- 26.73 N) than the SST (46.12 +/- 14.37 N, P < .001). There was no difference in the mean stiffness (SST: 7.33 +/- 4.41 N/mm, TLS: 7.46 N/mm +/- 2.67, P = .94). The failure mechanism in all SST samples occurred by suture cutout through the longitudinal fibers of the tendon. In all TLS samples, the failure occurred by suture slippage. CONCLUSION: This study demonstrated superior load to failure of the TLS compared with the SST technique for biceps tenodesis. Furthermore, this study provides the first description of the TLS technique as a possible application in biceps tenodesis. Clinical application of the TLS must be carefully considered, because although it achieved a superior biomechanical profile, experience with this stitch is limited.