**TITLE:** Outcomes and complications for intramedullary button fixation for open subpectoral biceps tenodesis

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**INTRODUCTION:** The proximal biceps and superior labral complex has been extensively studied and while it is still incompletely understood, it can be a significant source or anterior shoulder pain. While this pathology can often be managed non-operatively, surgical intervention is indicated when conservative methods have failed. Surgical treatments vary widely without clear benefit to any one method. Previous studies have shown similar results with regard to pain relief with tenotomy versus tenodesis. Tenodesis may have some advantages with regard to cosmesis and muscular cramping. Tenodesis methods include arthroscopic and open techniques, with open techniques having a variety of fixation methods including suspensory with unicortical versus bicortical bone tunnels, interference screw fixation, or suture anchor fixation. The purpose of this study is to evaluate the outcomes and complications of unicortical suspensory button fixation performed in the mini-open subpectoral fashion.

**METHODS:** A retrospective review was performed of all patients who underwent a mini-open subpectoral biceps tenodesis using suspensory button fixation at a single institution over a 3 year period. All procedures were performed by two board certified orthopedic surgeons in a similar fashion. Patients with concomitant shoulder procedures were included. Follow-up data was obtained from the institution’s electronic medical records system and postoperative radiographs. Incidence of pain relief and complications were calculated based on this data.

**RESULTS:** Over a three year period 89 patients were identified that underwent mini-open subpectoral biceps tenodesis with unicortical suspensory button fixation. 64 (71%) of the patients had a concomitant shoulder procedure. Post-operative radiographs were obtained in 81 patients at a mean time from surgery of 105 days (0-565 days). There was no radiographic evidence of dislodged buttons. There were 11 patients with broken inserter tips. All 89 patients had at least one postoperative visit with an average follow-up of 167 days (8-755 days). 70 patients had no complications. Complications included residual popeye deformity (11 patients, 12%), continue pain (3 patients, 3%), arthrofibrosis (3 patients, 3%), and wound complications (2 patients, 2%). There were no patients with neurovascular complications.

**DISCUSSION/CONCLUSION:** Our study demonstrated that suspensory button fixation for subpectoral biceps tenodesis is an effective method of relieving pain with minimal complications in proximal biceps pathology. Radiographic evaluation demonstrated no immediate failures or dislodged buttons. Broken inserter tips were the only noted radiographic complication. The most common clinical complication was a persistent popeye deformity in 12% of patients. Pain relief was achieved in 97% of patients. The majority of studies comparing fixation methods have been performed on cadaveric models. Some studies have shown lower load to failure with suspensory button fixation but this has not been demonstrated in clinical studies. One potential benefit of suspensory button over interference screw fixation is a smaller cortical defect. Previous studies have shown bicortical suspensory fixation has a potential risk of axillary nerve injury, which can be avoided with unicortical fixation without significant loss of strength. While our study demonstrates positive outcomes and minimal complications, further research is needed to compare clinical results of different fixation methods.