PATIENT CASE EXAMPLE

BridgeFix in Arthroscopic Rotator Cuff Repair

Doctor/Practitioner Information
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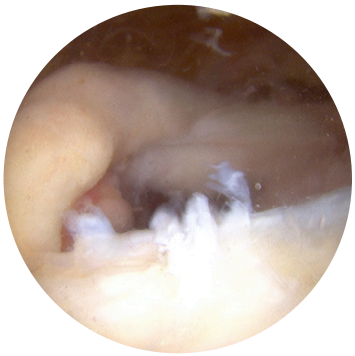
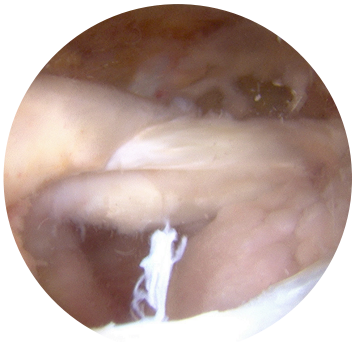
OVERVIEW/DISCUSSION

Arthroscopic rotator cuff repair has increasingly become the standard for rotator cuff surgery. It has the benefits of less invasive technique, minimal scarring, less potential for deltoid injury (deltoid detachment or atony), and faster recovery. Despite all of the benefits of this technique, healing of the tendon-bone interface remains the difficult challenge in rotator cuff repair, regardless of technique. Recent advances in surgical instrumentation allowing a better recreation of the anatomic footprint have increased healing rates (double-row repair), but high rates of non-healing still exist. The addition of biologics has become an important adjunct in the collagen healing of repaired rotator cuff tissue. Below is a case presentation of a patient with a large rotator cuff tear with significant medical comorbidities who had a double-row repair with biologic supplementation (AmnioFix®). The technique described, BridgeFix, incorporates maximal firm footprint recreation with single donor allogenous amniotic growth factors.

CLINICAL HISTORY

Patient is a 61-year-old obese male (BMI 53.2) with a past medical history significant for hypertension, coronary artery disease, non-insulin dependent diabetes, and asthma, who fell onto his right shoulder. He was seen in the emergency room and the office and diagnosed with a non-displaced proximal humerus fracture and a ruptured supraspinatus tendon with four centimeters of retraction. He was treated with short-term sling immobilization, physical therapy, serial exams, and radiographs. At four week follow up, he had mild tenderness, diminished motion (150 active forward flexion, 45 degrees external rotation, internal rotation to L5 vertebral body), weakness (4/5 strength testing), and positive impingement signs. At this point, a plan for BridgeFix arthroscopic rotator cuff repair was made. The patient underwent medical clearance and subsequent surgery as an outpatient.





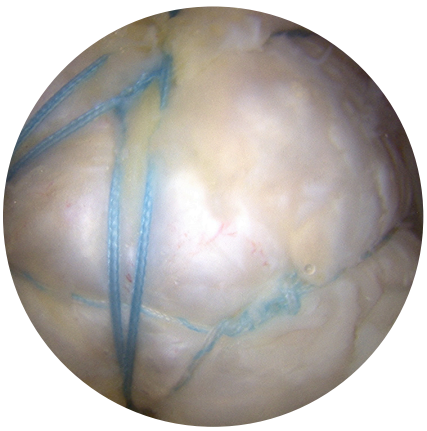
Figures 1 & 2
Ruptured and retracted supraspinatus tendon

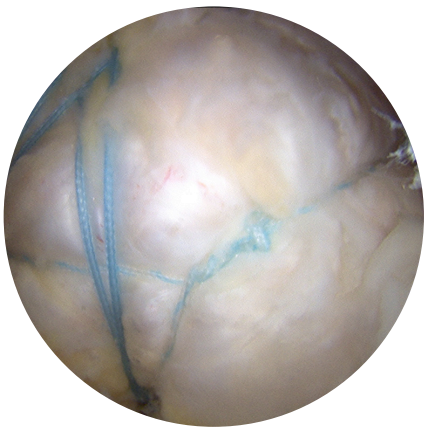
SURGICAL TECHNIQUE

The patient was brought to the OR and placed under general anesthesia. He was positioned in the left-lateral decubitus position on a bean bag and the surgical arm was held in 15 pounds of arm-holder traction. After sterile prep and drape, 20cc of lidocaine with epinephrine was introduced into the subacromial space for hemostasis. The arthroscope was introduced into the glenohumeral joint. Full thickness, large supraspinatus tear was noted. Tendon was retracted and of poor quality (Figures 1 & 2). Tissue was dysvascular. Mild tearing of subscapularis was noted, as well as partial tearing of the biceps tendon. An anterior portal was made in an outside-in technique. Synovectomy, biceps and subscapularis debridement, and supraspinatus debridement was undertaken. Hemostasis was achieved with a radiofrequency ablator, and attention was directed to the subacromial space. Bleeding, bursitis, and subacromial inflammation was noted. A lateral working portal was created in an outside-in technique, and complete subacromial bursectomy was carried out. A large anterior acromial osteophyte was noted. Using a 5.5 millimeter barrel bur, an anterior acromioplasty was performed, smoothing the acromion back to the posterior

margin of the acromioclavicular joint. Attention was directed to the rotator cuff. There was a 2-tendon rotator cuff tear noted, off the anterior interval in an L shape with significant retraction. Tendon was freed of adhesions with arthroscopic elevators on both the joint and bursal surfaces. Tendon was diseased, but was able to be reduced back to its anatomic footprint on the greater tuberosity without tension. Bony bed was scarified laterally, and a fourth and final stab portal was created superiorly for anchor insertion. Two double-loaded HEALICOIL® Suture Anchors (Smith and Nephew, Andover, MA) were placed medially for medial row fixation, each loaded with two number 2 non-absorbent sutures. Tear geometry was addressed. Sutures were shuttled through the tendons using suture passers for mattress repair to bone. Sutures were stored out the anterior portal for later retrieval and tying. Additionally, 3 side-to-side sutures (number 2 FiberWire®, Arthrex, Naples, FL) were placed for margin convergence. Sutures were then retrieved from posterior to anterior, tied with a Tennessee Slider Knot, backed up with half-hitches.

Sutures were then criss-crossed, retrieved laterally, and placed through two 4.5mm Footprint anchors (Smith and Nephew, Andover, MA) for lateral row compression. Anchor was deployed locking the sutures laterally, and then suture tails were cut. Excellent loop and knot security was present, as well as coverage and tissue indentation (Figures 3 & 4). No further visualization of the intra-articular contents was noted. Irrigation was undertaken. A spinal needle was introduced into the repaired tendon at the midpoint of the medial and lateral rows (Figure 5). Suction of the subacromial space was undertaken, and AmnioFix was injected into the repair site. Wounds were closed and patient was awakened, placed in a sling, and transferred to recovery room and then home.





Figures 3 & 4
BridgeFix double-row rotator cuff repair

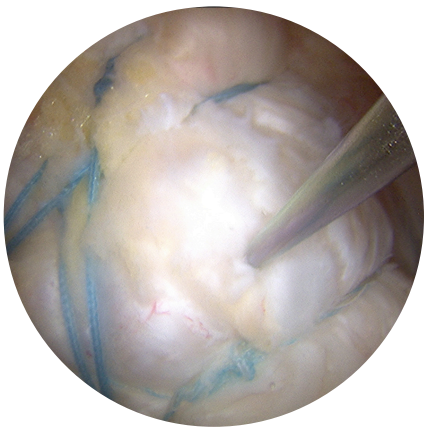


Figure 5
Injection of AmnioFix into rotator cuff repair

CLINICAL FOLLOW UP

Patient was placed in a sling for two weeks with instructions to work on elbow, wrist, and hand range of motion. Gentle pendulum and Codman exercises were instructed for home. Patient followed up at two weeks for sutures out, discontinuation of sling, and sent for formal physical therapy per a progressive motion and strength protocol. At first post-operative visit, excellent, near normal passive range of motion was noted with a VAS pain scale rating of 2/10. Patient returned to clinic seven weeks post-op for follow up visit with pain scale rating of 0/10. Examination of the shoulder revealed 170 forward elevation, 60 degrees external rotation with the arm at the side, and internal rotation to L1, symmetric measurements with contralateral uninjured shoulder. Rotator cuff strength testing was normal at 5/5. Patient was very satisfied with his results.

CONCLUSION

This case example is one of many that I have observed with accelerated rotator cuff healing and clinical success when augmenting my repairs with injection of AmnioFix at the repair site in a BridgeFix technique. AmnioFix adds less than 5 minutes to the surgical procedure and requires no extra exposure or incision. This BridgeFix technique appears to offer increased healing rates and improved clinical outcomes. Further long-term studies are being conducted, but very promising observations are being made in patients with full-thickness rotator cuff tears of all sizes. In this case example, the patient had poor tissue and a large retracted tear, two variables associated with significantly poorer outcomes. The addition of AmnioFix to the bridge repair appears to have greatly assisted in tendon attachment and regrowth.

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