PATIENT CASE EXAMPLE

Arthroscopic Rotator Cuff Repair

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OVERVIEW/DISCUSSION

Rotator cuff tears have a reported failure rate of 13-94%.[1] Patient factors such as age, smoking, diabetes, NSAID use, hypercholesterolemia, and Vitamin D deficiency have been implicated in reduced healing. Tears occur primarily at the enthesis, and the healing process is divided into three stages: inflammation, repair, and remodeling. The complex interplay between molecular and cellular mechanisms ultimately leads to scar tissue formation and irreversible structural alterations of the rotator cuff.[2] This has led to the use of a variety of augments, broadly categorized as using growth factors, platelet rich concentrates, cell based augments, and scaffolds.[2]

Amniotic tissue is increasingly being used in a variety of clinical settings.[3] In vivo and in vitro studies have shown that biochemical properties of amniotic membrane help to modulate inflammation, reduce scar tissue formation and enhance soft tissue healing. Historically, most clinical reports on the use of placental tissues have discussed the use of amniotic membranes for an array of clinical applications since the 1920's.[4,5] These uses include general surgery,[6] corneal surgery,[7,8] plastic surgery,[9,10] burns,[11-15] tendon repair,[16,17] foot and ankle procedures,[18-23] osteoarthritis,[24,25] spine and dura repair,[26-29] genitourinary surgery,[30,31] and chronic wounds.[32-42] To our knowledge, it has not been studied in rotator cuff repairs. We present a case in which a patient appears to have had a very minimal amount of pain compared to that generally expected post-operatively for standard rotator cuff repair surgery.

CLINICAL HISTORY

A 60-year-old right hand dominant male with no significant medical history presented with right shoulder pain and weakness. Physical exam and magnetic resonance imaging (MRI) demonstrated a full-thickness tear of the supraspinatus and infraspinatus 20 mm in width, with signs of impingement syndrome. He had failed previous conservative treatment consisting of NSAIDs, physical therapy, and a suprascapular nerve block.

The patient underwent arthroscopic rotator cuff repair with three medial anchors and 2 lateral anchors. The tear was approximately 2 cm in width with 15 mm of medial retraction (Figures 1-3).

Figure 1
Intra-operative view of retracted rotator cuff tear in grasper.

Figure 2
Medial row of anchors placed with sutures passed through rotator cuff tissue for double-row repair.

Figure 3
Completed double-row repair viewed from lateral portal.

A 40 mg vial of micronized AmnioFix was reconstituted with normal saline, then injected with an 18-gauge spinal needle, along the footprint of the rotator cuff after the repair was completed (Figures 4 & 5).

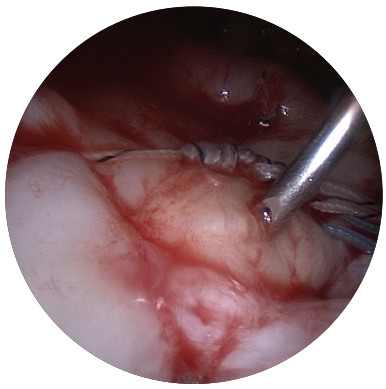

Figure 4
Arthroscopic view of AmnioFix being injected into completed repair via an 18-gauge spinal needle.

Figure 5
Arthroscopic view of AmnioFix being injected into completed repair via an 18-gauge spinal needle.

CLINICAL FOLLOW UP AND TREATMENT RATIONALE

The patient underwent a standard post-operative course with the exception of incorporation of application of an electromagnetic pulse machine to the shoulder. There were no wound complications. The patient was seen post-operatively in the normal fashion, and admitted to swimming 1 mile in open-water at 8.5 weeks due to lack of pain, an exercise level that was not recommended post-operatively. Because of this, we obtained an MRI to confirm that his repair was still intact. It demonstrated an intact rotator cuff repair, (Figures 6-8) in distinction to his pre-operative MRI.

By 3 months, the patient had resumed swimming and surfing without pain and was subsequently cleared for full activities.

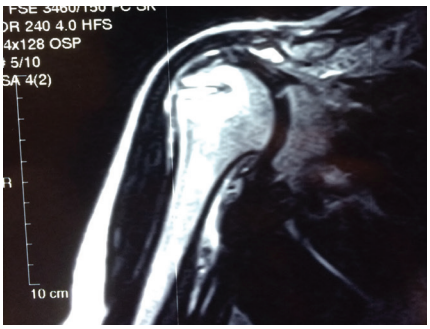

Figure 6
Post-op Coronal MRI at approximately 9 weeks demonstrating intact repair with lateral row anchor seen in humeral head.

Figure 7
Post-op Sagital MRI at approximately 9 weeks demonstrating an intact repair.

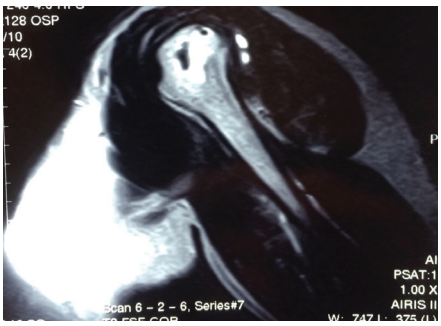

Figure 8
Post-op Sagittal MRI at approximately 9 weeks demonstrating an intact repair.

Traditionally, rotator cuff failure has been attributed to 4 categories: biologic, technical, anatomic, and mechanical.[43] Biologic factors such as diabetes, tobacco use, or vascular pathology can inhibit healing,[44,45] as can technical factors, though these are increasingly uncommon with continued surgical and product advances. Substantial research has been undertaken to mitigate biomechanical factors, such as the double row technique.[46-49]

Amniotic tissue has shown promise in flexor tendon repairs,[16,17] as well as foot and ankle chronic soft tissue problems.[18-23] AmnioFix has improved healing in chronic wounds and plantar fasciitis.[19,24,30-34,36-42] Potential repair mechanisms include the recruitment and engraftment of endogenous progenitor cells to the site of injury.[50] In this case, it is possible that its application strengthened and/or sped up the healing of our rotator cuff repair.

SUMMARY AND CONCLUSIONS

We feel that the use of AmnioFix in this case helped to diminish post-surgical pain, as well as enhance or speed up the recovery time of the repair. Standard recovery following rotator cuff repair includes 6 weeks of passive motion followed by 4-6 weeks of isometric strengthening, and then progressive strengthening as tolerated starting around weeks 10-12. Many patients do not resume any strenuous activity until at least 3 months, with most resuming full activity closer to 4 months after their procedure. In this case, the patient resumed activity with open water swimming at 6-8 weeks, with MRI confirmation of intact repair. Further studies will be required to confirm that this is the case, and to show the possible benefits of AmnioFix use as an adjunct to rotator cuff repair surgery to help reduce pain and advance healing.

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