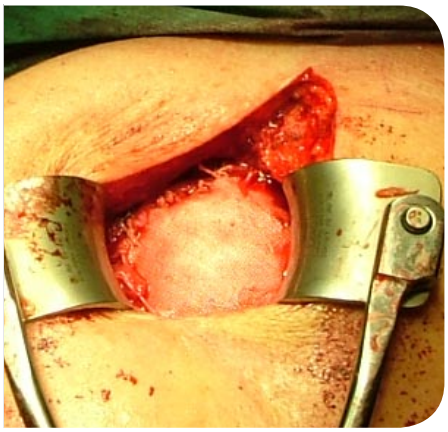
Artelon® Tissue Reinforcement
Rotator cuff injury repair
Case report



Surgery performed on September 16, 2008 by Thomas A. Marberry, MD,
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Introduction

Although surgical techniques for rotator cuff repair have progressed, factors such as poor tissue quality, large and massive tears, and the age of the patient have a significant impact on the outcome.

In an attempt to improve the clinical outcome and avoid the incidence of re-ruptures and other complications in these complicated rotator cuff repairs, a reinforcement patch is sought that will create a stronger repair compared to when sutures alone are used. The reinforcement should relieve the load during the sensitive initial healing period and provide long-term support for remodeling the maturing tissue. Scaffold properties is also desired in order to support tissue ingrowth, revascularization and nutrition supply.

Case presentation

The patient is a hypertensive 90-year old female diabetic who complained of pain in her right shoulder when raising her arm, possibly caused by strain as a result of in physically assisting and lifting an invalid husband. She had experienced increasing pain for several months, which was seriously compromising her quality of life.

The patient found virtually all reaching activities painful. She had previously received physiotherapy and had been prescribed both analgesic and anti-inflammatory medication.

Physical examination

On her first presentation at the clinic, the patient experienced pain when resisting applied pressure in a rotator cuff test. She was nevertheless advised not to undergo surgery on account of her age and medical condition.

She re-presented on two subsequent occasions after falls and experienced increased pain even at rest. The patient also had more pain and weakness with cuff testing resistance. A magnetic resonance imaging (MRI) scan revealed full thickness disruption of the supraspinatus and infraspinatus with retraction off the footprint of well over 1 cm and almost 3 cm in the anteroposterior (AP) dimension. The patient requested surgery as she was experiencing unacceptable discomfort.

Surgical procedure

Surgery revealed a very sharp type II-III acromion with a rotator cuff tear measuring 3 cm medial to lateral and 2 cm of retraction. The tissue was macerated and of very poor quality.

The weak tendon was meticulously mobilized to the footprint after release of adhesion. Interosseous bone tunnels were created at the footprint and non-absorbable sutures were passed through the tunnels to be used in the repair. Once the tendon was repaired, including reattachment to the footprint, a 3 cm x 4 cm Artelon® Tissue Reinforcement implant was cut to shape, and tightly sutured over and on the periphery of the tendon. The Artelon® Tissue Reinforcement implant near the footprint was also tethered with some of the previously placed bone tunnel sutures. The patient tolerated the procedure satisfactorily. She remained in hospital overnight for observation and was discharged the following day.

Postoperative

For the first six weeks after surgery, the patient was required to wear a sling and was advised to follow a course of exercises. Elbow range of motion exercises, Codman's pendulum and passive external rotation with a stick were started initially. These exercises were extended to include passive forward elevation and passive internal rotation. At six weeks, the sling was removed and she was encouraged to use her arm, but only at waist level.

The patient fell eight days after her surgery and broke her nose, but assured the physician she had kept her arm in the sling and close to her side.

The patient returned approximately seven weeks post-op after yet another fall in which she landed on the shoulder in question and same side hip. X-rays showed no obvious fractures and a MRI scan showed a moderate amount of subacromial fluid, and some persistent cuff defect of 4-8 mm and 13 mm of retraction. The patient was placed back on passive exercises and gradually returned to active waist level usage.

At three months post–op, she could raise her arm to the top of her head and perform normal daily activities.

Approximately four months post-op, the patient reported pain in her shoulder after trying to throw a bed sheet onto an elevated shelf. Although she had crepitus in her shoulder with rotation and experienced discomfort, she could still raise her arm with the same ability she had demonstrated one month previously. In fact she could do her hair. Her external rotators seemed to be strong but she demonstrated weakness in conjuction with isolated supraspinatus testing. Image 1 shows less subacromical fluid and no worsening of the persistent cuff defect.

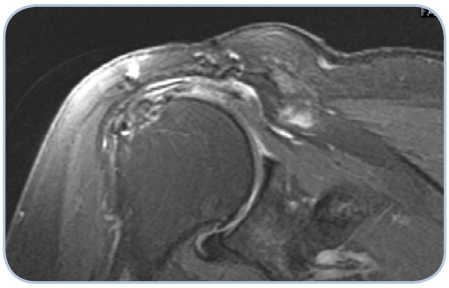

Image 1. Four months post-op

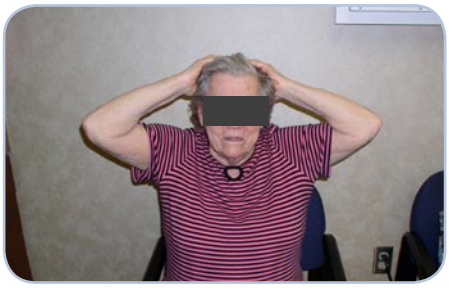

Image 2. Six months post-op

Image 3. Six months post-op

At six months post-op she could easily touch the top of her head, and she could make her bed at home and perform virtually all of her daily activities. She has discomfort above 90 degrees in the forward flexion plane but would abduct her shoulder 90 degrees to put her sweater on with very little obvious discomfort. This is even after yet another fall when her walker caught on the escalator at a shopping mall. X-rays again revealed no fractures.

At nine months post-op, there was no change in her functional level.

A one-year MRI scan revealed the tendon/graft complex to have a heterogeneous appearance with the mid-distal portion of the graft suggesting tendon graft complex maturation. There is still some appearance of a 3-5 mm AP and 14 mm medial/lateral potential defect which does not appear to have worsened since her MRI six months previously.

Summary

An elderly, hypertensive femal diabetic presented with a large to massive rotator cuff tear, resulting in significant weakness and who had experienced multiple falls and injuries, even post-op. She was operated on and treated with Artelon® Tissue Reinforcement. Nine months after surgery, she continue to perform her normal daily activities and is comfortable using her arm at or below shoulder height.

It would appear that the augmentation construct has continued to hold to the footprint and also to a significant portion of the cuff. Otherwise, a complete disruption of the cuff repair following all the post-op injuries sustained by this patient would be expected.