REHABILITATION POST ARTHROSCOPIC REPAIR OF LARGE ROTATOR CUFF TEAR WITH BICEP TENODESIS AND SUBACROMIAL DECOMPRESSION: A CASE REPORT OF A PROGNOSTICALLY COMPLEX PATIENT

By

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Abstract

Background and Purpose:

Due to lack of confident prognosis this case was studied to evaluate the impact therapy might have on the patient's wellbeing and beliefs.

Case Description:

Active 71 year old landscaper with chronic injuries.

Outcomes:

The patient did not complete therapy by the time of publication and so far had moderate improvements.

Discussion:

At risk patients need thorough education.

Key Words:

rotator cuff repair, comorbidities, recurrent tear, outcomes

Introduction

Literature shows that arthroscopic surgery is as effective as open surgery when conditions are equivalent.[1] Factors for recurrent tear have been debated and vary, but most frequently include specific features of the injury such as involved tendons[2] or fatty-infiltration of the involved muscles.[3]

The subject of this study had several general negative health factors, in addition numerous musculoskeletal conditions clustered in bilateral shoulders and other body regions. The patient had previously failed surgeries, with history of and present display of non-compliance. His prognosis was not a confident prediction, and his case was studied to evaluate the impact therapy might have on the patient's wellbeing and beliefs.[4]

Case Description

The patient – a 71-year-old male, left-handed, full-time landscaper, and military veteran – presented to the clinic 4 weeks after left arthroscopic rotator cuff repair as ordered by his surgeon with complaints of pain and reporting decreased function in activities of daily living and work duties. With pain ranging from 1-9 out of 10, patient had been managing with prescription pain medicine, rest, and heat prior to starting therapy.

He previously underwent four surgeries on his right shoulder for unspecified rotator cuff issues, denied any injuries to his left shoulder, but stated that he suffered some shoulder pain for 50 years. At the time of evaluation, patient had a fractured 4th digit of his right, non-surgical hand. Additionally, the patient stated "too many [surgeries] to list" on intake paperwork. His relevant co-morbidities include: cervical and lumbar DDD, discoid lupus erythematosus, asthma, diabetes, and bladder cancer (remission). These were under medical management independent of physical therapy.

Examination

Observation of the 4 incision sites revealed fully closed wounds, no weeping, and light-purple scarring without local tenderness or excessive warmth. Post-surgical diagnoses per the surgeon were: type II labrum tear, biceps tear and tendinitis, grade 1-2 chondromalacia of the glenoid and humeral head, shoulder impingement, a tear at the superior third of the subscapularis and a split tear on the posterior third of supraspinatus. Based on surgical precautions and the SINSS model, the vigor of examination was limited to the first onset of pain and differential testing was not performed. Cyriax classification of *weak and painful* was gleaned from manual muscle testing, confirmation of a thick major-muscle lesion. He was found to have significant impairments of shoulder: range of motion, strength, and pain (table 1). Due to the patient's numerous comorbidities and concurrent musculoskeletal factors, additional assessment methods were included for a holistic picture: Contant-Murley (CM) and Short Musculoskeletal Functional Assessment (SMFA).[5-6] The patient revealed that he volitionally stopped wearing his prescribed sling 2 weeks post-op and had returned to work with light duty where possible, and that he often over-extended himself to the point of needing bedrest. The patient's prognosis was deemed *fair* (table 2).[7]

Intervention

The patient's goal was simply to "keep moving," and since he was already one month post-op, and back to physically demanding work, it didn't seem beneficial to regress his activity in therapy. Sheps et. al. determined that guarded motion in the first four to six weeks is beneficial, if kept with a pain-free range.[8] As sessions continued, it became apparent the he also needed a challenge to keep his interest and minimize attrition. Interventions were an attempted blend of the surgeon group's general RCR protocol, one from a different orthopedic specialist group which accounted for the biceps tenodesis, and the "large" RCR protocol from Fowler Kennedy.[9] Protocols varied widely between sources, and research broadly supports that regardless of an eventual retear (symptomatic or not), surgical repair significantly improves clinical outcomes.[10] Randomized controlled trials comparing rehabilitation approaches rarely show scientifically significant differences beyond 6 months, with retears reported in nearly every study.

With knowledge that he was regularly exceeding precautionary weight and active range limits, rehabilitation frequently included education and suggestions for activity modification. Patient's weekly range of motion (ROM) goals were based on those suggested within the protocols, with a conservative edge and always to patient's tolerance. Patient was progressed with a variety of exercises and manual therapy for passive-ROM, to therapist or patient active-assist ROM, and finally active range of motion. Light isometrics were prescribed for all shoulder muscles. Elbow flexion exercise was delayed until week six post op.

Outcomes

The patient's rehab course spanned seven weeks, and he attended 11 sessions. By this eleventh week post-surgery, all protocols expected the patient to have pain-free, near to full active range of motion at which point strengthening could begin. The patient had only minimally achieved tolerance of functional range in some directions, requiring external assistance. His active and passive range were limited by notable pain, which should have decreased over this time. Some PROM and AAROM activities had to be modified for this patient as his right shoulder could not tolerate the load of the surgical limb past 80° of flexion. It was discovered that the patient's right and left serratus anterior were severely deconditioned, as he could not perform more than 10 repetitions of a serratus punch in supine against gravity; the exercise resulted in a tremor-like shaking of the shoulder and arm. The patient was quite inconsistent in his attendance. There were two weeks he was absent, and other times he canceled therapy due to pain.

Discussion

While not ideal, the patient's limited ROM at this stage may not be indicative of his final outcome. Kim et. al found that pre-existing and interim shoulder stiffness does not prevent full rehabilitation given time, and in fact was correlated with better repair integrity in their study which performed final follow-ups at about 33 months.[2] In this study it was also shown that even at six months strength may have only reached 80%. Though behind, the patient is still on track to succeed if he maintains an appropriate loading program.

With the patient's limited and varied interest in therapy, a unique visit schedule could have improved outcomes. Participation may have also been improved by an emphasis on autonomy and empowerment, with a more independent rehab schedule that better fit the patient's time.[11]

A weakness of this case outcome may foundationally lie in lack of sincere and critical education of the patient.[12] This could have started with the consulting MD, the performing surgeon by their direct education, or by sending the patient for pre-habilitation. Education about precautions and successful outcomes during physical therapy sessions may have encouraged the patient to practice more care of his shoulder while at work, and perhaps negotiate a strategy for compliance with the abduction brace.

Unfortunately, the founding question of this case study could not be answered at this time due to lack of therapy attendance. The patient has yet to complete the final questionnaire (SMFA), which was selected to measure the potential influence physical therapy could have on the patient's global quality of life, with only one body region being treated.

This case study may support evidence for a discussion on the necessity of a surgeon's obligation to gather more information about evidence-based patient risk factors, to determine the intensity or timing of therapy and prescription of surgical precautions, and generally be more involved in the post-operative care and rehabilitation of their complex and at-risk patients. Conversely this may be a keen example of how discerning and informed a physical therapist needs to be regarding the exact surgical procedures performed, and a need for discovery of musculoskeletal risk factors to properly gauge the rehab pace. This case also supports the practice that early, unguarded movement is not beneficial.[13]

Ultimately, this case study supports the need for postoperative individualized and adaptive treatment by a skilled physical therapist, working closely with the patient to provide education and endure understanding. There are many approaches to rehabilitation, any of which must fit the patient's life in order to have meaningful impact.

Patient Perspective

The patient claims the surgeon did more work in surgery that was ever implied, such as the subacromial decompression and bursectomy. This likely contributed to a decreased locus of control and feeling defeated and frustrated, establishing low expectations from the beginning.

Patient was not educated on the purpose and benefits of those procedures performed on him even when he inquired; the patient was so upset that he talked about possible intent to sue. Additionally the patient was told that his suture was a very secure type and the surgeon implied less risk of retear, but these extra measures may have only raised the patient to a baseline or average level of risk. The patient, while upset about his shoulder, was making decisions and acting on this perceived extra secure repair while under occupational pressure due to summer being a busy season.

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Tables and Figures

Table 1. Tests and Measures:

Test & Score	Initial (6/28)	Mid-Point (8/15)	Discharge (Sept)
Self-Assessment			
UEFI, 80 is best	21	41	
SMFA* 0 is best / 100	43, 20, 80, 56, 51, 37	NT	unavailable
Performance-Based			
Shoulder MMT (#/5) flx, abd, ER, IR	NT at this time due to surgery	3+, 2+, 4-, 4	unavailable
Goniometric ROM flx, abd, ER, IR	PROM: 39, NT, 16, 37	PROM: 124,69,19,65	unavailable
	AROM: NT	AROM: 104, 54, 44, to belt line	unavailable
Grip Strength	*NT due to R digit fracture*	*L 59lbs; R 29lbs*	unavailable
Mixed			
Constant-Murley 100% is best	20%	31%	unavailable
SINSS *(Severity, Irritability, Nature, Stage, Stability)*	S-moderate, I-severe, N-musculoskeletal, S-subacute on chronic, S-not changing	NT	unavailable

**SMFA listed in order of subcategories, respectively: daily activities, emotional status, arm and hand dysfunction, mobility category, and bother index.*

Table 2. Prognostic Characteristics:

	Negative	**Positive**
Demographic	age 71, occupation	access to resources and therapy
Medical Comorbidities	diabetes, obesity, inflammatory diseases (arthritis, DLE)	
Disease-Specific	chronic recurrent bilateral shoulder injuries, cluster of concurrent diagnoses of involved shoulder, size of tear, dominant hand	repair technique (not SR)
Bio-Behavioral	mild depression, self-discontinued use of sling, reduced expectations of recovery after previous re-tears, financial pressure to keep working, limited social support	incentive for recovery, no fear-avoidance

SR, single-row sutures[14]