

**Treatment of a Bankart Lesion Repair with Adhesive Capsulitis:
A Modified Protocol**

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Abstract

Background and purpose: Bankart lesions are often associated with chronic dislocations.

Often times Bankart lesion repairs require long term immobilization. Long term immobilization can lead to the development of adhesive capsulitis. The presence of adhesive capsulitis can cause problems with treatment of a Bankart lesion due to conflicting treatment indications for Bankart lesion repair rehabilitation, as compared to adhesive capsulitis rehabilitation.

Case description: A 23 year old male pole vaulter and water polo player with history of chronic dislocations. **Exam/Evaluation:** Chief complaint of decreased range of motion (ROM). Initial passive ROM: shoulder flexion 0-60 degrees; abduction 0-35 degrees; internal rotation 0-30 degrees; external rotation 0-20 degrees. The patient reported 3/10 pain with movement. Interventions: ROM, therapeutic exercise, ultrasound, pain modalities

Outcomes: The patient demonstrated full ROM in all planes upon discharge. Pt reported no pain during discharge. **Discussion:** The modified protocol allowed more aggressive shoulder external rotation and flexion stretches to be performed. Aggressive passive ROM caused no injury to the surgical repair and allowed the patient to return to normal function within a standard time period for a Bankart lesion repair. **Conclusion:** The patient was able to reach all goals by time of discharge. There are many different standard protocols used for surgery. As surgical procedures advanced are important to periodically re-asses standard protocols in order to provide the best possible outcomes for patients.

Introduction

Shoulder dislocations are quite common among athletes in sports such as swimming, baseball, volleyball, pole vaulting and water polo. Water polo in particular has a high rate of shoulder injuries. This is due to the fact that not only are the athletes throwing the ball at all different angles, but they are swimming and treading water for long periods of time. These actions work to fatigue the rotator cuff muscles and can make an athlete more prone to injury.¹ Pole vaulting is another sport with a high rate of shoulder injuries. There are several factors contributing to the high rate of shoulder injuries. First there is a large amount of stress put on the shoulder when the athlete is pushing off the ground. Secondly, when the athlete lands they are at a risk for catching their arm under themselves.²

Due to the mobility of the shoulder joint, shoulder dislocations account for 50% of all joint dislocations.³ It has been found that men aged 18-25 years old are most susceptible to shoulder injuries.⁴ Anterior dislocations account for around 95% percent of shoulder dislocations.⁵ Arthroscopic examination has shown that in 80-89% of traumatic anterior dislocations there is an associated Bankart lesion. The usual mechanism of injury is extreme abduction, external rotation, extension, and a posterior directed force on the humerus.⁶

A Bankart lesion occurs when the anterior portion of the labrum is torn, in association with the inferior glenohumeral ligament. The labrum is a cup that helps to hold the shoulder into place. When the integrity of the labrum is compromised the shoulder becomes unstable. Instability of the capsule can lead to further dislocations. Bankart lesions can cause large amounts of pain with motion. There are several different tests used in order to diagnose a Bankart lesion. Manual testing is often done along with radiographs in order to insure a thorough screening.⁷ One of the most commonly used special tests to diagnosis shoulder

instability associated with a Bankart lesion is the apprehension test¹. The patient's affected shoulder is placed in external rotation, extension and abduction. If the patient has shoulder instability they often will feel as though their shoulder is about to dislocate.⁸ If a Bankart lesion is present there will often times be an audible pop when the apprehension test is administered.⁵ The sulcus sign is another common test used to test for shoulder instability. The patient is seated on the treatment table. An inferior force is applied to the UE. If there is a positive sulcus sign there will be a two finger gap between the acromion and humeral head.⁸

Conservative treatment is the method of choice for patients over 30. Treatment outcomes have not been as positive for patients under thirty. The younger the patient the longer the immobilization phase that is required to achieve positive outcomes. Patients over 40 may only require 3-5 days of immobilization as compared to patients under 20 who may require 3-4 weeks of immobilization.⁶ The goal of conservative treatment is to strengthen the shoulder stabilizers in order to prevent further dislocations.⁶ A recent study was performed observing 30 young athletes suffering from their first dislocation. The athletes were all treated with a conservative treatment plan. Twenty-six of the 30 the athletes were able to return to their sport by season's end, but 37% of the athletes experienced at least one more episode of instability.⁹

Surgery is often necessary in young athletes who want to return to their sports as soon as possible. The debate rages as to whether there should be immediate surgery after the initial dislocation. Although re-occurrence rates are significantly lower with surgery often the first course of treatment is often a conservative course.¹⁰ There is also a debate as to whether the patients should undergo arthroscopic surgery as compared open stabilization. A study done in

Sweden showed the arthroscopic failure rate at 15% as compared to the open failure rate which was at 10%. It was found that patients who underwent arthroscopic surgery had slightly more external rotation at the end of their course of treatment.¹¹ Open surgery is more invasive and expensive but at this time it is more successful. As arthroscopic technology steadily improves, so does the success rate of the operation. This particular repair involved a stitch tied to an anchor at the 6:30 position of the labrum. A second anchor was placed at the 10:30 position of the labrum. Another anchor was placed at the 9:00 position of the labrum. It was decided that no biceps anchor was needed.

Rehabilitation outcomes rely heavily on the time between when the initial dislocation occurs and the time when treatment and immobilization is started. There is a much higher reoccurrence rate with athletes as compared to non-athletes. Non athletes have a 30% chance of dislocating as opposed to athletes which have an 82% risk of recurrence.⁶ Athletes may miss entire seasons due to shoulder dislocations. Many athletes with chronic shoulder dislocations are unable to participate in their sport.

Rehabilitation from a surgical Bankart lesion repair is typically broken down into 5 separate phases.¹² The first phase is known as the maximal protection phase. This phase consists of rest, immobilization and modalities such as ice, in order to control the pain. The length of this phase is a heavily debated topic and varies between research studies. During the immobilization phase there is to be no active external rotation(ER) or Abduction (ABD). The sling is to be kept on at all times for the first week. The sling is to be used progressively less until week 3-4. Passive ER is allowed from 0-20 degrees for the first four weeks. 0-90 degrees of flexion is allowed. Phase 2 is known as the moderate protection phase. This phase lasts from week 7-14. It is characterized by a gradual increase in ROM, and progressive

strengthening. Towards the end of this phase the patient may begin a progression towards more functional rehabilitation. In order to move from phase 2 to phase 3 the pt must have full pain free motion in all planes. Phase 3 is known as the minimal protection phase. This phase is typically between weeks 15-21. This phase is characterized by a return to restricted sporting activities. Emphasis is put on continued stretching and strengthening. In order to progress to phase 4 the pts muscular strength must be 75%-80% of the contra lateral side.¹² Phase four consists of an increase in job or sport related rehabilitation. Rehabilitation normally takes 3-4 months before the patient can return to their normal activities. The time that the patient is in each phase varies between individuals. It is based mostly on the progression of strengthening and their pain level.¹³

Another common shoulder injury is known as adhesive capsulitis, or as it is commonly known as “frozen shoulder”. Frozen shoulder is present in 2-3 % of the population and is one of the most common causes of shoulder pain and loss of shoulder ROM.¹⁴ Adhesive capsulitis usually develops in patients between the ages of 40-70 and has a higher incidence in females. The exact pathology of a frozen shoulder is widely debated. Some researchers believe it is caused by an autoimmune phenomenon. Others believe it may be a variant of reflex sympathetic dystrophy.¹⁵ The most likely explanation is a combination of several factors including age and overuse.

Frozen shoulder is usually broken down into three distinct phase. The first phase is known as the freezing phase. This phase is characterized by diffuse pain beginning insidiously. The pain is usually increases at night and while in side lying on the affected side. All movements of the shoulder cause pain. This phase can last as long as 2-9 months.¹⁴ The second stage is characterized by a loss of ROM. This phase is known as the “frozen stage”.

There is still pain in the end ranges of all movement but the patient's chief complaint is loss of motion. This phase has a large effect on the patient's functional activity. They often have a hard time getting dressed and performing simple tasks such as brushing their hair. Due to lack of movement this phase can cause diffuse muscle loss, especially of the deltoid. The last phase is known as the thawing stage. This stage is characterized by a gradual return of ROM. The pain also subsides in this stage. This phase can last weeks or even months.¹⁴

Treatment of frozen shoulder often involves end range mobilization techniques. There are also several non-physical therapy related techniques frequently used including local and oral steroid use. A recent study done by Bulgen found that there was no significant differences between long-term outcomes between treatment strategies.¹⁵ Physical therapy is often recommended in combination with other types of therapy such as steroidal injections. Often end range mobilization techniques are performed by physical therapist in order to help maintain and regain some of the range of motion lost during the freezing phase. Putting as patient in the end range of movements helps to break up adhesions. A recent case study involving 7 patients looked at the effectiveness of end range mobilization techniques. The study found that all 7 patients maintained their range of motion throughout the treatment session. Four out of the 7 patients rated their improvement in function as excellent.¹⁶ Many times these end range mobilization techniques are very painful for the patient. It is important for the therapist to inform the patient that pain is expected with these mobilization techniques. Communication between the therapist and the patient is essential for effective treatment.

Sustained stretching is defined as a stretch sustained in a static position for a certain length of time. The length of time varies depending on the amount of stretch desired and the

muscle that is being stretched. Sustained stretching is often used in patients with severe hypertonia of the ankle.¹⁷ Sustained stretching allows for the stretching of the muscle while allowing the muscle time to accommodate to the stretch. An extensive search was done on the use of sustained stretching for treatment of adhesive capsulitis. Pub-med, CINAHL, and Proquest were all searched. The key word adhesive capsulitis and sustained stretching were entered. No results were found. Frozen shoulder and sustained stretching were also used. There were no results for any of these searches. The reason for the lack of research may be because there is no need for sustained stretching when treating adhesive capsulitis. Patients are able to be stretched through the entire range of motion. It is only when there is a secondary pathology that this technique may become useful.

While Bankart lesion repairs and adhesive capsulitis are quite commonly seen in outpatient clinics, they are rarely seen in combination. A thorough literature search was done to find research on the combination of pathologies. A search was done on CINAHL and PUB-MED using adhesive capsulitis and Bankart lesion repair, and frozen shoulder and Bankart lesion repair. Both searches came up with no results. The lack of literature is likely because of the mechanism of each pathology. Bankart lesions cause a laxity in the capsule, while adhesive capsulitis causes a stiffening of the capsule. This causes a unique problem when it comes to rehabilitation. The physical therapy treatment for adhesive capsulitis is end range mobilization techniques. While the treatment for an arthroscopic Bankart lesion repair is protection of the surgical site. Modifications to the traditional Bankart lesion repair protocol were to take in account the adhesive capsulitis. Traditional protocols for Bankart lesion repair only allow for up to 20 degrees of external rotation for the first four weeks.¹² The modified protocol allows for up to 50 degrees of external rotation in order to halt the

onset of adhesive capsulitis. The purpose of this paper is to examine whether a modified protocol is appropriate for a patient with a Bankart lesion repair, who developed secondary adhesive capsulitis. This research was approved by the Institutional Review Board at The Sage Colleges in Troy, NY.

Case Description

The patient in this case was a 23 year old with a history of chronic left shoulder dislocations. He lived with his mother in a sub-urban area at the time of his surgery. He worked at a data entry position 40 hours a week. He first dislocated his left shoulder in high school while pole vaulting. Although recent research suggests that the best outcomes occur if surgery is performed after the first dislocation, the patient opted for conservative treatment. He attended physical therapy for a short time but reported discontinuing therapy after the pain subsided. This is common among young athletes who want to immediately return to their sport. Young athletes often believe if there is no pain there is no problem. The latest dislocation occurred during a water polo game. The patient reported his shoulder came out of socket and felt as though it did not return to its proper position. He went immediately to the emergency room where his shoulder was re-located. He was seen by an orthopedist shortly after who confirmed by MRI, the presence of a Bankart lesion of his left labrum. It was decided that an arthroscopic approach would be the best choice. The surgery was performed shortly afterwards and went without incident. Two weeks later the patient began physical therapy at an outpatient physical therapy clinic.

Examination

Upon initial evaluation at the outpatient clinic he reported that his symptoms were improving. The patient was in a sling which he reported using all day except for when he was

showering. He reported that after the surgery he was having trouble at work. He worked as a data entry firm. His job required 8 hours of typing a day. With his left arm immobilized in a sling he was having difficulty typing at an adequate rate. He also reported feeling unsafe driving since he only had the use of one arm. He was dependent on family members to get him to and from work. The injury was also preventing him from participating in the activities he enjoyed doing. The patient was an avid golfer. One of his major concerns was how having his arm immobilized for so long would affect his golf swing. The surgery was also affecting his sleeping habits. The patient reported that pre-surgery he tossed and turned often in his sleep. Post surgery he reported, often turning to his left side which caused large amounts of pain, often waking him up. The patient's goals for treatment were to return to work, return to his hobbies and increase his functional range of motion.

Upon inspection of the wound site it was noted that there was three portals covered by steri-strips. The sites appeared to be healing well. There was no sign of edema or infection around the portals. Sensation was measured by light touch. The patient showed no loss of sensation across any dermatome of his bi-lateral upper extremities. He reported no paresthesias or numbness throughout any dermatome of his left upper extremity or into his hand.

The subject was next asked to describe his pain. He reported having an achy pain that intensified throughout the day. The subject was asked to quantify his pain using the visual analog scale. The Visual Analog Scale has the patient rate his pain from a scale ranging from 0-10, 0 being no pain, 10 being the worst pain imaginable.¹⁸ The patient reported his pain to be intermittent between 0-3. He reported pain with movement and when he rolled over on it while he was sleeping.

His range of motion was assessed by goniometric measurement.¹⁹ Flexion was measured in a scapular plain. The patient was placed in a supine position. Only passive range of motion was measured (PROM) secondary to the protocol. The patient had 0-60 degrees of passive shoulder flexion. Shoulder abduction was measured in the supine position. The patient's arm was supported by the therapist and brought to the end of his pain free motion. The patient had 0-35 degrees of passive abduction. Internal and external rotations (ER) were both measured in supine. The arm was left in neutral since the subject could only obtain 0-35 degrees of abduction. The patient had 0-30 degrees of internal rotation (IR), and 0-20 degrees of external rotation. In a standard Bankart repair protocol in phase one the patient is only allowed to passively move into 20 degrees of external rotation .¹²

Manual muscle testing was unable to be performed on this patient at the time of the initial examination. Through phase I (0-4 weeks) of the treatment protocol given to us by the doctor, active range of motion is contra-indicated in order to protect the surgery sight. This prevents any type of manual muscle testing from being performed until the therapist feels it is appropriate.²⁰ No special tests were necessary due to the fact that it was a surgical repair. Tests to diagnose adhesive capsulitis were contra-indicated secondary to immobilization.

Evaluation

Evaluation of the examination revealed that his primary impairment was a lack of ROM. The lack of ROM was affecting his ADLs. He also was experiencing frequent pain which affected his sleeping patterns. Strength was not able to be assessed secondary to active ROM restrictions. Due to the immobilization, it expected that the patient would have significant muscle weakness. The patient had many functional loses affecting the performance of his ADL's. The patient was unable to reach over head which affected not

only reaching into cabinets but getting dressed. He was also unable to reach behind his back.

The lack of active movement made it unsafe for him to drive.

Diagnosis

The physical therapy diagnosis was decreased range of motion and strength as well as increased pain. The Guide to Physical Therapy Practice Preferred Practice Pattern for this diagnosis falls under 4E impaired joint mobility, motor function, muscle performance, and range of motion associated with localized inflammation. Also 4D impaired joint mobility, motor function, muscle performance, and range of motion associated with connective tissue dysfunction.²¹

Prognosis

The prognosis for this patient was good to return to his normal functions. The patient was young and athletic and very motivated to return to water polo and golf. His personal goals were to regain function. He needed to return to work as soon as possible. The initial plan of care called for the patient to be seen 3 times a week for a half an hour each session for 6 weeks. Sessions often lasted closer to 45 minutes due to hot pack application. The therapist's goals were as follows

Short term goals (STG)

1. STG: Patient will increase passive shoulder external rotation from 20 degrees to 35 degrees within two weeks.
2. STG: Patient will increase passive shoulder flexion from 60 degrees to 85 degrees within 2 weeks.
3. STG: Patient will increase passive shoulder abduction from 35 degrees to 60 degrees within 2 weeks.

4. STG: Patient will report a decrease in left shoulder from 3/10 to 1/10 as measured by the visual analog scale within 2 weeks.

Long Term goals (LTG)

1. Patient will demonstrate 4+/5 muscle strength in all planes of movement of left shoulder by discharge
2. Patient will be within normal limits for all planes of left shoulder movement by discharge.
3. Patient will be pain free at time of discharge.

Intervention

Session one began on the 10/19. The patient was 2 weeks post op at the time of the first treatment session. The first treatment session consisted mostly of passive stretching.²² The therapist used a sustained stretch in the beginning of the treatment.¹⁷ The patient was placed in supine. His left shoulder was placed in a neutral externally rotated position in the scapular plane. His shoulder was only slightly abducted due to range restrictions. An elastic wrap was wrapped around his hand and strapped to the leg of the table. This left the patient in slight external rotation and a slightly abducted position. A hot pack was placed over the anterior capsule to allow for loosening of the capsule during the stretch.²³ The stretch was sustained for 10 minutes. The patient was asked frequently if he felt any sharp pains in his shoulder. Isometrics of the rotator cuff muscles were also indicated in the protocol. Isometrics were performed in a standing position.²⁴ The patient performed isometrics in internal/external rotation and flexion/extension. Passive range of motion (PROM) was performed on the patient in flexion, external rotation, and abduction. The original doctor's protocol called for no more than 20 degrees of external rotation and no more than 90 degrees of flexion for the

first 4 weeks. The protocol was modified to allow for up to 50 degrees of external rotation. The protocol only stated specific guidelines for ER but it called for more aggressive PROM in all planes in order to help combat the affects of the adhesive capsulitis. The patient also performed a cane stretch into external rotation describe. Cane stretches are considered an active assistive range of motion (AAROM) stretch. AAROM is allowed for in the protocol but the patient will not be allowed to stretch past the allotted 50 degrees. AAROM stretches are beneficial because they allow the patient to push themselves to the threshold of pain but they have the power to stop the stretch if necessary.²⁵ The patient also performed active range of motion with his forearm. It is important when a patient is in a sling to keep the elbow in mind because it is also immobilized. Along the same lines it is important to keep hand and wrist strength while immobilized so a blue Gripmaster® was used 30 times. The Gripmaster® is a device that allows the patient to independently flex each of his fingers.²⁶ Blue is equivalent to a medium resistance. Thirty repetitions were performed with each finger. At the end of the session an ice pack was applied for 10 minutes to the left shoulder while the patient was in a seated position.²⁷ The patient wore no sling throughout the entire session. After the first session the patient reported being a little sore. Ultrasound was performed using a 1 MHz sound head pulsed at 1.2 w/cm^2 for 8 minutes in order to reduce inflammation caused by the first session.²⁸

On 10/22 the second session, the same interventions were performed. Two pound weights were added to his active elbow movements but the patient reported some shooting pain in his shoulder capsule so this was discontinued. On 10/24 the patient reported less soreness. Side lying scapular retractions were added in right side lying 10 times. This is the beginning of retraining the scapular muscles. When the scapular muscles are not used they tend to tighten

and atrophy. The patient reported some pain in the end ranges of PROM. On 10/26,10/29, 10/31, and 11/3 there were no new interventions performed. Throughout this time frame the patient reported frequently being sore after sessions, but was noting increased function of the injured shoulder. He reported he had been using the sling much less, only when he was going out in public for long periods of time.

It was decided on 11/5 the patient move into phase 2 of his rehabilitation as specified by the protocol.¹² This meant that the patient discontinued the use of the sling from this point on. Table slides were added. Table slides are another form of self stretching. The patient sat on a chair and placed his arms on a table. He then slid his arms forward on a bolster. This allows for stretching of the scapular stabilizers. It also helps to stretch the patient into flexion. Doorway stretches were also added. Doorway stretches help to loosen the entire shoulder girdle, mainly focusing on the pectoral muscles. The pectoral muscles often become tight during immobilization. Doorway stretches are performed by having the patient put a hand on each side of the doorway the patient slowly moves his trunk forward until the patient felt a stretch across their chest.

Through the next session more progressive active assistive range of motion were implemented in. On 11/7 wall climbs were added. Wall climbs were performed in the scapular plain 6 times. Wall climbs are performed by having the patient walk their fingers up the wall until they are either limited by range of motion or pain. This allows the patient to activate their muscles but does not put all the force of gravity on them. It also gives them something to progress. The therapist can mark a spot on the wall and have them try to progress past this point during the next session. The plan of care was kept consistent on 11/12 to see how the patient reacted to the addition of the AAROM exercise. A passive

internal rotation stretch was added to the plan of care on. The stretch was performed 5 times for a duration of 10 seconds. The plan of care was kept the same for the treatments performed on 11/17 and 11/19.

On 11/23 it was decided to move the patient into phase 3 of his rehabilitation as specified by the protocol.¹² Flexion exercises with a cane was added along with the external rotation cane stretches. Flexion with a cane was performed in supine in order to stabilize the scapula along with eliminating gravity throughout the range of motion. The upper body ergometer (UBE) was also added on this date. The UBE is an effective way to strengthen the shoulder along with providing a full circular range of motion in the shoulder. It is also an effective way to work the cardiovascular system. The patient was encouraged to use the right arm to move the handles if his left arm started to feel fatigued. The patient performed the UBE for 4 minutes forward and 4 minutes backward.

On 11/26 active strengthening began standing mid trap exercises were performed while the patient was standing against the wall the patient place his arm was against the wall with his elbows bent at 90 degree angles. The patient then slowly raised his arms up and lowered them back down to the resting position. The patient also performed standing scaption. The patient began with his arms at his sides and slowly raised them to the point where he was limited by strength and range of motion. Both exercises were performed 3x10. Scapular mobilizations were also performed. Scapular mobilizations are performed by moving the scapula in either a clock wise or counter clock wise motion. This is done by placing the base of the palm on the lateral border for counter clockwise movement, and the medial border for clockwise movement. Both counterclockwise mobilizations and clockwise mobilizations were performed.²⁹ Between 11/28 and 12/10 a period that consisted of 6 treatment sessions

the plan of care remained unchanged. This allowed for the patient to adjust to the new active exercises and allow for the therapist to evaluate his response to active exercise.

Beginning the tenth week Thera-Band ® exercises were added. Shoulder flexion and extension were added first. The patient's strength appeared to be very good in these directions so it was decided to start the patient with a red Thera-Band ® which is moderate to heavy resistance.³⁰ The patient performed each exercise 20 times with the left arm. Frequently throughout the exercise the patient was asked if there was any pain in his arm. He reported none so progressive strengthening was continued. The cold pack was discontinued after this treatment session. The patient stated he would rather do it after he got home if he felt it necessary. This left more time for strengthening and stretching. On 12/20 ultrasound to the left shoulder was discharged. It was felt that the ultrasound was no longer providing a therapeutic benefit to the patient. The inferior glides and posterior glides were then increased to grade 3 on the Maitland scale. Grade 3 Maitland mobilizations are characterized by large amplitude motions up to the end of the range.³¹

On 12/26 internal and external rotation exercises were added with the red Thera-band®.³⁰ As with previous exercises the patient's pain level was carefully noted. The patient performed 20 of each exercise within pain free range of motion. Bicep curls were also added on that date. Bicep curls were avoided until this time because the biceps tendon can put a strain on the shoulder capsule thus damaging the surgery site. A one pound weight was added to the side lying external rotation. Up until this point the patient had used only the force of gravity as resistance. Prone scapular retractions were also added. A one pound weight was also added to the patient's standing scaption exercise. Some soreness was expected after this session since several exercises were added. The patient's soreness was assessed on 12/29. He

reported no increased soreness after the addition of the exercises. Side lying abduction was added on 1/7. The patient was placed on his right side much like with side lying external rotation. The patient held a 1 pound weight in his hand and moved his shoulder in the abduction plane. All interventions performed listed in the Table.

Outcomes

Upon initial evaluation the patient demonstrated limited range of motion. The patient had 0-60 degrees of flexion passively in the scapular plane, 0-35 degrees of abduction passively, 0-30 degrees of internal rotation passively and 0-20 degrees of external rotation passively. On 10/31 a progress note was sent to the doctor. Forward flexion was measured at 0-95 degrees passively, abduction was measured at 0-80 degrees passively, internal rotation was measured at 0-35 degrees passively, and external rotation was measured at 0-25 degrees passively. It was noted that semi-aggressive range of motion was being performed as specified by the MD. The protocol allowed for up to 50 degrees of ER but the patient had not progressed to this point yet. On 12/12 a second progress note was sent to the MD. At this point the pt was able to actively flex his shoulder to 90 degrees in a scapular plane. Passive abduction was measured at 130 degrees while active abduction was measured at 90 degrees. External rotation was measured at 45 degrees passively, as well as internal rotation which was measured at 60 degrees passively. On 1/9 a discharge note was written. The patient was able to actively flex his shoulder to 140 degrees. He had full passive range of motion in flexion. He was able to actively abduct his shoulder to 160 degrees actively with full passive range of motion. His internal rotation was 70 degrees passively with 60 degrees of abduction. His external rotation was 65 degrees. Although he was not back to full range of motion in all

planes he had enough range of motion to perform functional tasks. The patient reached all range of motion goals by the time of discharge.

The patient reported a slight increase in pain once treatment began. This was to be expected secondary to the prolonged immobilization. He reported frequent soreness after sessions. The pain was intermittent. He reported it never rose above 5/10 on the VAS. During the re-evaluation he rated his pain at the pain was still 3/10 but he reported it was becoming much less frequent. A second re-evaluation was performed on 12/12. At this time the pt reported that he only had pain at the end range of passive and active assisted stretching. He reported little to no pain with functional activities. At the time of discharge the patient reported his pain at a 0/10 at all times.

Upon initial the therapist was unable to take measurements of MMT. MMT was not performed until the second re-evaluation on 12/12 at this time his strength was measured as 4-/5 in all planes including abduction, forward flexion, external rotation, and internal rotation. Upon discharge the internal rotation and abduction were measured at a 4+/5 while external rotation and forward flexion were 4/5. The patient did not reach the long term goal of 4+/5 strength in ER and forward flexion. The patient due to insurance was only able to attend physical therapy for 15 weeks. The patient may have been able to reach this goal with further strengthening.

Discussion

Adhesive capsulitis commonly affects people with a mean age of 52 years.¹⁴ The patient in this case was only 23 but it is possible that the disease process was brought on by trauma or prolonged immobilization. Adhesive capsulitis is often found after a prolonged immobilization. The normal course of adhesive capsulitis treatment is 12-24 months before

complete resolution of symptoms. The normal course of treatment for a Bankart lesion repair is 12-22 weeks.¹² It is possible that due to the patient's young age and motivation to return to his sport that he was able to go through the rehabilitation process faster. His course of treatment lasted 15 weeks.

The patient completed the treatment in a normal amount of time even though he had secondary adhesive capsulitis. It is commonly believed that the patient should not be passively moved outside of 20 degrees of external rotation for the first 4 weeks of the treatment session.¹² In this case the patient was allowed to move into 50 degrees of external rotation and more aggressive PROM was allowed throughout the entire left shoulder. The pt was unable to reach the 50 degree mark until further on in the treatment. The patient was closely monitored during stretches for any increased pain in the capsule.

With more aggressive PROM in the beginning of the treatment, the patient showed no signs of damage to the repair sites. This leads us to believe that maybe the standard protocol used by many doctors today may be able to be modified to allow for more range of motion in the initial phase of treatment. This may prevent atrophy of the shoulder girdle muscles and perhaps decrease the time needed for rehabilitation. This could play a large role in the rehabilitation of athletes in which 1 to 2 weeks could mean the difference of playing in their season. In professional athletes this difference could mean financial gains.

Upon discharge the patient was within normal limited for all range of motion measurements. He was able to return back to his job and many of his leisure activities, which was one of his main goals. It was recommended that he avoid water polo or any high impact sports for a few more months in order to continue strengthening his shoulder. He was able to perform all of his ADL's and was able to drive safely with no pain and no range of

motion issues. If more time was permitted functional activities such as swinging a golf club, and assessing strength and range of motion deficits in his swing may have been implemented into his rehabilitation program.

There were several short-comings to this study. One was the lack of research regarding sustained stretching as a treatment technique for adhesive capsulitis. Searches were performed in PUB-MED, CINAHL, and Proquest using the words sustained stretching and shoulder tightness, sustained stretching and adhesive capsulitis, and sustained stretching. No relevant articles were found. Another problem with this study was the lack of information in the initial evaluation. Very little could be done in the initial evaluation due to the immobilization. This made it hard to get a baseline of comparison from the beginning to the end.

This study lacked a standardized shoulder outcome. One outcome measure that could have been used was the Rowe score. The Rowe score was specially developed in order to assess shoulder stability. The Rowe score uses a hundred point scale. The score looks at stability, motion, and function. Critics of the Rowe score say it gives too much emphasis to stability. This score is used mainly for athletes. A modified ROWE score can be used with more emphasis on function.³²

Another shortcoming to the study was the fact that the patient was only able to attend physical therapy into the beginning of the minimal protection phase. The patient's insurance only gave him a certain amount of visits which he had reached. Since he had reached his goals he would not receive any more physical therapy. If the patient had continued an emphasis would have been put on functional rehabilitation such as swinging a golf club. The latter Phases of the rehabilitation protocol is when the patient can begin doing functional

tasks. Due to the patient's motivation and his progression through the program it is believed he could have made large functional gains such as swinging a golf club lightly and beginning to go through the motions of throwing.

Conclusion

Although it is rarely diagnosed associated adhesive capsulitis secondary to a Bankart lesion may be fairly common due to the fact that adhesive capsulitis is often brought on by a prolonged immobilization. It has been shown that end range mobilizations are effective in treating adhesive capsulitis but with a surgical repair it is important to protect the surgical site. It is possible that standard protocols used these days may be able to be modified. Further research may show that patients can go beyond the recommended 20 degrees of external rotation without doing harm to the surgical site. In the sports market today a difference in a few weeks could mean thousands of dollars for athletes. There are several operations done in which there is a standard protocol. Periodically these protocols should be researched in order to make sure they are the most beneficial to patients. As surgical procedures become more effective, certain protocols may become outdated. Research needs be done in order to make sure these protocols are up to date.

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Table. Physical Therapy Plan of Care

Table. Physical Therapy Plan of Care	weeks														
<u>Interventions</u>	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
<i>Stretching/mobilizations</i>															
Sustained stretch in flex/ ER w/ hot pack	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
AROM of elbow	x	x	x												
Cane Stretch ER	x	x	x	x	x										
Doorway stretch	x	x	x	x	x	x									
PROM flex/ER/ABD	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
Table slide				x	x	x	x	x	x	x	x	x	x	x	
Pulleys in scaption		x	x	x	x	x	x	x	x	x					
Mobilizations															
Scapular mobilizations in side lying				x	x	x	x	x	x	x	x				
Inferior glide				x	x	x	x	x	x	x	x	x	x	x	
Therapeutic exercise															
Isometric IR/ER/Flex/ext			x	x	x	x	x	x							
Blue Grip Master ®	x	x	x	x			x	x	x						
Side lying scapular retraction	x	x	x	x	x		x	x	x	x					
Wall climb				x	x		x	x	x						
Upper Body Ergometer							x	x	x	x	x	x	x	x	
Side lying ER							x	x	x	x	x	x	x	x	
Thera-band® flex/ext										x	x	x	x	x	
Biceps curl										x	x	x	x	x	
Modalities															
Cold pack	x	x	x	x	x		x	x	x	x					
Ultra sound left shoulder	x	x	x	x	x		x	x	x	x					

