Physical therapy intervention in a patient with open reduction internal fixation of a left scapula fracture

Amber Saienga

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Physical Therapy Intervention in a Patient with Open Reduction Internal Fixation

Of a Left Scapula Fracture

by

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A Scholarly Project Submitted to the Graduate Faculty of the
Department of Physical Therapy
School of Medicine and Health Sciences
University of North Dakota
in partial fulfillment of the requirements for the degree of
Doctor of Physical Therapy

Grand Forks, North Dakota
December 2007
This Scholarly Project, submitted by Amber Saienga in partial fulfillment of the requirements for the Degree of Doctor of Physical Therapy from the University of North Dakota, has been read by the Advisor and Chairperson of Physical Therapy under whom the work has been done and is hereby approved.

(Chairperson, Physical Therapy)

(Graduate School Advisor)
PERMISSION

Title Physical Therapy Intervention in a Patient with ORIF Left Scapula Fracture

Department Physical Therapy

Degree Doctor of Physical Therapy

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Signature(s) Amber Garcia

Date 11/27/07
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The love and support of a family is important in so many ways through many years of education, which leads me to thank my parents for their emotional and financial support of my endeavors.

The biggest thank you goes to my husband and best friend. He has been supportive through the highs and lows of many projects, papers, and tests. He has believed in me when I doubted myself and provided encouragement when I needed it most. This paper is dedicated to our first child, to be born in March.
ABSTRACT

Background and Purpose. This case report describes the physical therapy intervention for a patient with an open reduction and internal fixation of a scapula fracture with decreased shoulder strength. Description. A 53-year-old-man with decreased left shoulder strength resulting from a 9-week period of inactivity following his surgery received physical therapy services for 4 sessions consisting of therapeutic exercise and manual therapy techniques. Active range of motion and manual muscle testing were completed at the initial evaluation and at discharge. Outcomes. Following the physical therapy intervention, improvements were noted in shoulder strength and patient was able to return to most work duties and recreational activities. Discussion. An intervention of therapeutic exercise and manual therapy may be an effective method to improve shoulder strength following a scapula fracture and surgery.
The shoulder is the most mobile joint in the body, which makes the shoulder prone to injury. The shoulder region includes the glenohumeral joint, acromioclavicular joint, sternoclavicular joint, and scapulothoracic articulation. Scapular stability involves the following muscles: the trapezius, serratus anterior, and rhomboid muscles.

Fractures of the scapula comprise 1% of all fractures. The rate of scapula fracture increases in polytraumatized patients, due to the magnitude of force that is required to fracture the scapula. Scapula fractures are rare because of both the muscle tissue that protects the scapula and the mobility of the scapula on the thoracic rib cage. The average age of a patient who fractures their scapula is 35 years old, with males more likely than females to suffer this type of fracture at a rate reported to be between 64% and 90%. The most common mechanisms of injury are motor vehicle accidents, motorcycle accidents, auto pedestrian accidents, fall from a height, and crush injuries. In the patient with multiple injuries, often times the other injuries take precedence and treatment for them will occur prior to the treatment of the scapula fracture. When a scapular fracture is present, there are often associated injuries in the ipsilateral shoulder girdle, and thorax.

The patient in this case study had decreased shoulder ROM and strength secondary to an ipsilateral scapula fracture. The patient presented to physical therapy (PT) with a diagnosis of status post open reduction internal fixation (ORIF) of a left scapula fracture. ORIF has been accepted as the treatment of choice for displaced intra-articular fractures in many anatomical regions. Displaced fractures create an incongruinity of the glenoid fossa and therefore are best treated with operative intervention. Functionally, the patient had decreased shoulder strength.
following his fracture and surgery which required PT intervention to help this patient achieve his goal of improving strength to be able to complete tasks at work and to return to golfing. His prognosis for a return to normal function was good.

The purpose of this case report is to outline the PT intervention for a scapular fracture with ORIF. The current literature lacks information on the PT evaluation and treatment of this type of disorder in regards to all levels of literature, ranging from case reports to meta-analysis.

The patient sustained the scapula fracture from a fall down a set of steps. The fracture was through the intraarticular component of the glenoid, which indicated a need for an ORIF. An intraarticular fracture occurs through the articular surface into the joint. If not fixated, this can lead to early onset of osteoarthritis. With proper fixation, the indications for a positive outcome are very favorable.

In a review of the literature, many of the previous studies are focused on recommendations for fixation of a scapula fracture vs. non-fixation. Many of the studies reviewed what portion of the scapula was fractured, the degree of displacement, and comminution as well as other pertinent medical history, in order to make a decision in regards to whether or not surgery is indicated. There is no theoretical framework and little information is currently present in regards to PT evaluation and treatment recommendations for this diagnosis. A retrospective study of operative treatment for patients with displaced scapular fractures revealed that more than 70% achieved very good or good results.
CHAPTER II

CASE DESCRIPTION

Examination, Evaluation, and Diagnosis

The patient was a 53-year-old male self-employed farmer/rancher who sustained an intra-articular fracture of the left scapula on April 22, 2006; he underwent an ORIF of the left scapula on May 5, 2006. His PT initial evaluation occurred on June 26, 2006. At the time of the evaluation, the doctor had given him instructions that he could not complete any heavy lifting. The patient was able to complete activities of daily living without difficulty; however, he was unable to complete needed repairs that required heavy lifting or prolonged activities with his shoulder in an overhead position.

Patients past medical history included: prostate cancer and surgery, multiple surgeries to the right knee, elbow surgery to remove bone chips, and hypertension. Prior to starting PT, he had multiple x-rays of his shoulder/scapula as well as an ORIF, the patient was not immobilized at any time following the fracture or surgery. He lived at home with his wife, and as a leisure activity he enjoyed golfing, his goals for PT were to improve his ability to use his left arm and increase the strength.

Patient’s medications included metoprolol, no pain or anti-inflammatory medications were prescribed for this patient. Metoprolol is a beta-blocker used to treat chest pain (angina), heart failure, and high blood pressure. This drug works by blocking the action of certain natural chemicals in your body (such as epinephrine) that affect the heart and blood vessels, which results in a lowering of heart rate, blood pressure, and strain on the heart. Side effects may include: dizziness, lightheadedness, drowsiness, and tiredness, which could impact the PT evaluation and intervention process. Additional side effects include: diarrhea, unusual dreams,
trouble sleeping, or vision problems as your body adjusts to the medication. Research of this medication does not reveal any issues related to the healing or strength of the tissues that would affect PT examination or treatment. The physical therapist should be aware of side effects of this medication that could interfere with the rehabilitation process.

At the initial evaluation, patient had minimal complaints of pain; his biggest complaint was decreased strength. Paresthesia of the shoulder over the surgical incision was present, with the patient noting that it did not quite feel the same as the right. Physical therapist discussed with patient that this could possibly be due to sensory nerves that were cut during surgery. Patient did not present with any distal neurological signs or symptoms and sensation testing was intact to light touch throughout the bilateral upper extremities. On observation, patient’s posture included a forward head, rounded shoulders with ears in front of shoulders, no other abnormalities of posture were noted. The patient had a well healed 3 inch scar from his surgical incision, which was located inferior to the scapular spine.

The patient’s left shoulder active range of motion (AROM) was within functional limits for his age and equal to the right, except for internal rotation. Left shoulder internal rotation was to the upper lumbar vertebrae, right was to the mid-scapula level. Upon observation, the patient had bilaterally decreased cervical AROM and passive range of motion (PROM) into side bending and rotation. Two possibilities for the decrease in cervical range of motion (ROM) could be a decrease in his overall level of activity as compared to his prior level of function. Another potential reason for the decrease in cervical ROM could include a shortening of the muscle between the origins and attachments of the muscle from the cervical spine to the scapula. Refer to Table 1 for manual muscle testing (MMT) strength assessment for the bilateral shoulders at patient’s initial evaluation.
Table 1.
Shoulder strength with manual muscle testing at initial evaluation

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A systems review was completed to assess for edema, skin conditions/color, assessment of ROM and strength. This was also completed to assess the patients communication ability and learning style to provide the best PT care for the patient to return to his prior level of function. The patient had an appointment with his referring orthopedic surgeon; the physical therapist made no other appointments or referrals to outside sources.

The PT evaluation was completed to synthesize information obtained during the examination process. At the time of the initial PT evaluation, the condition would have been classified as sub-acute. The patient understood the severity of this problem, as he needed to regain functional strength to improve his ability to make a living for his family in his self-employed career.

The impairments related to this condition included posture and decreased shoulder strength/ROM, and cervical ROM. The functional limitations included that he did not have the functional strength that was required for lifting on the farm/ranch. The patient’s problem list included: decreased shoulder strength; decreased cervical/shoulder ROM. The patient had subjective complaints of neck pain, stiffness, and tightness. A collection of these problems led to the patient’s difficulty with completing work related activities.

According to the Guide to Physical Therapist Practice, the practice pattern is 41: Impaired Joint Mobility, Motor Function, Muscle Performance, and Range of Motion Associated with Bony or Soft Tissue Surgery. The ICD-9 code is 811 (Fracture of scapula).
Prognosis and plan of care

In agreement with the Guide to Physical Therapist Practice, over the course of 1 to 18 months (6 to 70 visits), the patient will demonstrate optimal joint mobility, motor function, muscle performance, and ROM.\textsuperscript{11} This will ensure his ability to perform at the highest functional level at home, work, community, and leisure activities.

Due to the time frame on the PT referral (for 2-3 visits), only short-term goals were set at the initial evaluation. These included: 1) Pt will have 4/5 strength of left shoulder flexion, external rotation to increase ability to lift on the farm (this goal was set to allow patient to resume his normal activities once he received clearance for heavy lifting from his doctor) 2) Pt will have internal rotation to the inferior angle of the scapula to increase ease with activities of daily living (ex: Dressing) 3) Pt will have improved posture with ears aligned over shoulders without verbal cues 4) Pt will be independent and compliant with home exercise program (HEP). When physical therapist received orders to continue therapy 1 time per week for 4 weeks, the goals were readdressed in the patients SOAP note. The patient had met goal #3, so he was to continue to work towards all remaining goals, as these were deemed appropriate.

Intervention

An article by Kavanagh, et al.\textsuperscript{12} describes the methods used for operative procedure and outlines the PT intervention used to treat scapula fractures. The operative procedures were fixated by either an anterior or posterior operative approach. The PT intervention described in this article started at 8 weeks post operatively with gentle active-assistive range of motion (AAROM) exercises, often including cane exercises. Isometric strengthening was also started at this time. At 2 to 3 months after surgery, more vigorous stretching and the use of elastic bands
were added to the rehabilitation program. Isotonic strengthening followed the use of elastic bands for the final phase of strengthening.

A recent study of subjects at least 21 years of age with shoulder pain of 10 or more days were divided into customized and standardized exercise groups. The results of this study revealed that both groups made significant improvements with a decrease in pain intensity, increased strength and function. Many of the exercises were selected to strengthen rotator cuff/scapular stabilizer muscles and to restore proper shoulder biomechanics. Both groups revealed that eight weeks of time were needed to have an effect on shoulder pain and function. This study demonstrates the need for exercise to increase strength and to improve function in patients with shoulder impairments.

An exercise program consisting of strengthening rotator cuff muscles and scapular stabilizing muscles were a part of this patient’s PT sessions aimed at improving functional strength of the left shoulder. At patient’s initial PT evaluation, therapeutic exercise techniques were started with AAROM exercises including wall crawls into flexion and abduction. The patient felt an end-range stretch with both of these exercises and thought they would be beneficial, especially for stretching in the morning prior to exercises and starting his workday. Strengthening exercises were also started on the 1st visit: supine flexion; sidelying abduction, external rotation; prone extension, horizontal abduction, and rows. Ten repetitions of these exercises were completed with a 1-pound hand weight for shoulder and scapular strengthening. The exercises that were completed by the patient in this case study were similar to the exercises completed in the customized exercise group in a study described by Wang and Trudelle-Jackson. The patient was also instructed in cervical AROM exercises for bilateral side bending and rotation motions, and performed 5 repetitions in the supine position. The physical therapist
completed PROM for all motions of the cervical spine in the supine position for 5 total minutes. This was completed to allow gentle stretching, relaxation, and to ultimately improve cervical spine AROM and PROM. The patient was given pictorial descriptions of his HEP. He was also encouraged to use heat prior to exercise and a cold pack after exercise if he noticed increased soreness.

The physical therapist educated the patient on proper posture and suggested the use of a lumbar roll to improve posture and to decrease strain on cervical muscles due to posture/positioning. Spinal alignment is believed to control scapular position and overall shoulder girdle function. There are many muscle attachments between the bony segments, including the spine, scapula, clavicle, and humerus. If scapular position is altered, it appears that the normal pattern of movement is affected. This normal pattern of movement is known as scapulohumeral rhythm, with a ratio of 2:1 glenohumeral to scapulothoracic movement. With slouched posture, there is significantly less active shoulder abduction ROM and decreased muscle force with the arm in a horizontal position. Good posture involves training your body to stand, walk, sit, and lie in positions where there is the least strain on supporting muscles and ligaments during movement or weight bearing activities.

At the patient’s second PT session, he was progressed to seated antigravity strengthening for flexion and abduction with a 1-pound hand weight. He completed sidelying external rotation and prone scapular exercises with a 2-pound hand weight, 10 repetitions completed for each exercise. The following exercises were added at this visit: towel internal rotation stretch, door external rotation stretch, corner pectoral stretch, and seated cervical side bending stretch, all with 10 second holds for 3 repetitions. These stretches were added to increase internal rotation ROM, to improve posture, and to decrease anterior chest/internal rotator tightness. Passive range of
motion for the cervical spine was also completed at this visit. His initial PT orders were for 2-3 visits. Following this appointment, the physical therapist called the physician’s office to request addition therapy visits as it was going to be 1 month until he saw the doctor. Patient also stated that his neck was very stiff and somewhat painful. The PT department received new orders to continue therapy 1 time per week for 4 weeks.

Due to the patient’s continued complaints of neck pain and stiffness, manual therapy was added to the plan of care with soft tissue mobilizations to the cervical/scapular region at the third PT visit. Physical therapist reviewed previous exercises that patient had received and added shoulder strengthening exercises with red theraband for flexion, extension, external rotation, internal rotation, and abduction.

At the patient’s discharge from PT, he noted occasional episodes of neck stiffness. His wife would give him a massage and he felt that this helped to decrease his neck pain/stiffness. The patient’s left shoulder AROM was within functional limits and equal to the right for all motions, except internal rotation, which is to approximately the T10 vertebral level. This was measured with the hand behind the back (HBB) method, and increased from the upper lumbar vertebrae at the initial evaluation to the T10 vertebral level at discharge. Patients left shoulder strength for flexion, abduction, and external rotation was 4+/5 with MMT. Strength for internal rotation and extension were 5/5 with MMT. All exercises were reviewed with patient and green theraband was added for progressive resistive strengthening. He was leaving for vacation following this visit and he felt comfortable continuing with his exercises independently at this time.

Functionally, he noted many improvements with activities such as grooming, dressing, and reaching. He continued to have difficulty with golfing and heavy lifting, noting that he did
not feel that he was to his prior level of function with these activities. Patient understood the need to continue with strengthening exercises following discharge from PT as it would continue to take time to regain full strength to allow him to complete all activities that were part of his prior level of function.

The equipment used for PT intervention included a 1, 2, and 3 pound hand weight. The patient did not have hand weights, so he was instructed to use a soup can or other small item with weight equal to what he needed for the specific exercise. The patient needed a towel for stretching. He was able to use the wall, door, and a corner of his house for the stretching exercises. He was also given theraband from the PT department to attach to a door in his home for completing this set of strengthening exercises.

The rationale for use of this intervention included determining the patient’s impairments, which led to the therapeutic exercises that were prescribed for this patient. The active assistive exercises were used as the patient felt this was a good stretch and it helped to loosen up his shoulder. Information obtained from the history in conjunction with the physical examination stressed the need for appropriate strengthening exercises. These exercises were deemed important and appropriate to improve his ROM and strength.

In a recent study, a treatment intervention consisted of a target exercise treatment that was directed toward the restoration of normal shoulder muscle function in order to restore dynamic stability and muscle coordination at the shoulder region. The exercise treatment was administered as a home-based, daily exercise program with supervision by the physical therapist once per week, to correct and upgrade the intensity and complexity of the exercises. The results showed that exercise-based treatment should enable motivated patients to take full responsibility for the management of their shoulder problem once formal treatment has ceased. The home-
based exercise treatment with an expected attendance at 4 PT treatment sessions, together with the corticosteroid injection treatment requiring a single visit to a specialist medical practitioner, were less costly to deliver than the multiple physical modalities treatment, which required twice weekly attendance for PT treatment.¹⁵

The exercises that were indicated for this patient were to improve his functional ROM and strength to allow him to return to his prior level of function. These demands include heavy lifting and manual labor on his farm/ranch. The patient’s instruction included pictorial descriptions of home exercise program, progression of exercises with regards to increasing sets and repetitions, and the use of ice/heat as needed for pain relief. The frequency of therapy was 1 time per week for 4 weeks. Communication with the physician occurred by contacting the office to get additional orders for PT and a progress report was sent for his follow up appointment with his surgeon after he had been discharged from PT. The procedure for re-examination and evaluation included subjective assessment of pain, reassessment of ROM/strength as patient progressed.

Outcomes at Discharge

At the PT discharge, patient noted that he only had pain with increased activity levels, such as golfing or heavy lifting. Improved posture was noted and patient was more conscious of his posture, which kept his scapular/upper back muscles in proper alignment. With left shoulder AROM for internal rotation, he was able to reach to approximately the T10 vertebral with the HBB method for assessing internal rotation. Shoulder strength assessment with manual muscle testing is summarized in Table 2.
Table 2.
Shoulder strength with manual muscle testing at discharge

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A study by Bohannon\textsuperscript{16} revealed that if MMT scores of $\leq 3/5$ are recorded, greater sensitivity may be detected, however the sensitivity is not as good with scores in a higher range. The sensitivity of MMT ranged from 62.9 to 72.3% and the specificity of MMT ranged from 76.7 to 89.2% in this study. As reimbursement is dependent on therapy progress, MMT may not provide the solid evidence that is needed to show strength improvements for payment. In cases where it is important to identify differences in muscle strength, dynamometry may be a useful tool to identify strength changes or impairments.

The functional limitations at discharge included: continued pain that the patient subjectively noted was decreased as compared to his initial evaluation. The patient specifically noted that his pain increased with activity. The patient continued to have decreased strength and ROM when compared to his right upper extremity. Overall, the patient made great improvements in all areas, evidenced by his progress towards the goals that were set for him at his initial PT evaluation. He continued to have deficits after 4 PT appointments, however he understood that it would also take time for him to return to his prior level of function.

The patient’s response to the PT intervention was positive, subjectively he noted decreased pain and increased functional use of his left arm. Objectively, patient made improvements with strength and ROM. At the final therapy appointment, he filled out the Simple Shoulder Test (SST), which is a clinimetric scale that reflects the extremes in ROM and strength required in daily activities (pain, function, and motion).\textsuperscript{17,18} A higher score indicates
less disability, the patient scored a 91.6%. This assessment was not completed at the initial evaluation; this would have been a beneficial tool to use prior to the last visit. The SST has good group-level reliability but questionable precision for documenting the status of individual patients.¹⁹

At discharge from PT, the patient met three-quarters of the set goals. He did not meet goal #2, which was to have internal rotation to the inferior angle of the scapula. The patient’s strengths included that he was motivated and eager to learn the proper exercises. He was independent and hard working with a desire to return to his career and golfing. The patient was compliant with HEP, as he knew this was a key factor in his recovery. He was satisfied with his progress and what he had learned during his PT appointments, thus allowing him to regain function and return to most work duties.
CHAPTER III

Discussion

The patient, who had decreased shoulder strength following a surgical repair of a scapula fracture, made positive improvements with physical therapy intervention to allow him to improve the functional strength of shoulder musculature. The combination of strengthening and ROM/stretching exercises allowed this patient to make improvements with grading of MMT for strength at discharge from PT.

These changes may be attributed to several factors. They could reflect improvement in strength and ROM through instruction in and follow through of his HEP. It could also be due to the increased use of his left upper extremity with daily activities following surgery. He was constantly using his arm for lightweight tasks during the day which overall could lead to increased strength through repetitive use.

Currently, there is more research on the physical outcome following a scapula fracture that was treated conservatively compared to operative treatment. When treated conservatively, the recommendations are for immobilization, symptom relief, early active motion, rehabilitation of the rotator cuff, and strengthening of the periscapular musculature. Many of these patients experienced good or excellent results.\textsuperscript{3,5}

Eighty percent of all fractures with glenoid involvement are being treated operatively. In 82\% of the cases, excellent or good results can be achieved with operative treatment of isolated glenoid fractures. When glenoid fractures were treated nonoperatively, 67\% of the patients received a good or excellent rating.\textsuperscript{20} These ratings were determined by using a variety of measures; clinimetric scales, pain, ROM, strength, and the surgeon’s radiographic assessment. Although no long term follow up was completed for this patient, it appeared that he was on his
way to achieving good or excellent results following the ORIF of his scapula fracture, which is consistent with the research in terms of conservative versus operative treatment with glenoid incongruity.

Internal rotation of the shoulder is commonly measured by assessing the point reached on the back by the tip of the extended thumb. This motion has been criticized because it does not measure pure internal rotation of the glenohumeral joint. Clinical implications of the findings of this case report reveal that HBB method combines motions from other joints in combination with the shoulder. In a study by Edwards, et al, inter-observer reliability and intra-observer reliability were calculated with the use of intra-class correlation coefficients. The range of error across examiners was calculated by comparing the actual level obtained radiographically with the level recorded by each observer. The inter-observer reliability was found to be poor, and intra-observer reliability was found to be reasonable. This study demonstrates limitations of the measurement of internal rotation of the shoulder joint by vertebral level.

When comparing the reliability of five methods for assessing shoulder ROM, whether tested passively or as an active reach, HBB was found to be the least reliable measurement technique. The intra-class correlation coefficient (Rho score) is an index of reliability for measurements of the same material. An instrument with a Rho score of 1 will produce the same measurement each time it is used, a score of 0 will indicate markedly different measurements. The inter-rater reliability for the movement of HBB was poor, Rho=0.26 passively, Rho=0.39 actively. The intra-rater reliability was also poor, Rho=0.14 passively, Rho=0.39 actively. Another study by Ginn, et al, demonstrated that HBB ROM does not accurately reflect active shoulder internal rotation. This study found that shoulder internal rotation can be measured directly and reliably in the supine position.
Hand behind the back ROM is of functional importance and one that warrants further reliability testing. It is an important functional motion at the shoulder associated with toileting and dressing. Measuring HBB may be useful to monitor the course of a patient's shoulder condition. HBB incorporates shoulder extension, retraction, and downward rotation of the scapula, flexion of the elbow, and mobility of the forearm, wrist, and thumb joints. While this is a good functional measure, there may be better methods to assess glenohumeral ROM that are more reliable and valid.

Using a clinimetric tool can be beneficial to measure progress during the time of PT treatment, especially if completed at the beginning and the end of the PT sessions. Manual muscle testing is not sensitive above a 3/5 rating and a more objective measure of strength may be necessary, such as dynamometry.

Recommendations for future studies include researching the PT intervention of scapula fractures that are treated with operative fixation. It would be beneficial to have further development of a rehabilitation protocol or guidelines to follow to aide in the treatment of this dysfunction. Development of randomized clinical trials or meta-analysis would add further clarity to the PT evaluation and treatment of fixated scapula fractures. It would also be advantageous to have a longer follow up of treatment to better understand the long-term results to determine what type of therapy is beneficial. The literature varies in terms of the value of using MMT for an accurate detection of strength changes. Further research in this area will help to clarify whether another method would be better to detect strength changes to get properly reimbursed by third party payers.
Reflection

During the history portion of the evaluation, it is imperative to ask differential screening questions. This should be completed to make sure the patient is an appropriate candidate for PT with a neuromusculoskeletal impairment. Early detection and referral is key to recognizing co-morbidities or complications, and to recognize systemic disease signs and symptoms. These questions should have been asked during the initial evaluation.

In the examination procedure, assessment of strength by MMT of the scapular muscles would have been an important item to complete with this assessment as well as using the CROM to measure cervical spine AROM. A review of the literature has found that using HBB method to assess internal rotation incorporates other joints and motions, it is important to properly break down this motion at each joint for a more accurate assessment.

Changes that I would make to the plan of care would be joint mobilization by the physical therapist and self-mobilization by the patient to further improve internal rotation ROM. Areas in the case report where I would like to seek further evidence would be for PT recommendations for evaluation and treatment of ORIF of scapula fractures, however there is limited research on this topic at this time. No referrals were made to other disciplines regarding this case. The patient had a return appointment with his orthopedic surgeon. There were no issues that arose during his treatment that warranted other medical care.

This patient was seen for 4 PT visits. The direct costs included medical bills from the orthopedic surgeon and costs related to his surgery as well as his PT visits. The indirect costs included the time he was not able to complete work duties, drive time, and expenses incurred with driving to and from his appointments. The total cost for the 4 visits was $380, an average of $95 per visit. The patient had already met his Wellmark Blue Cross/Blue Shield deductible.
An approximate cost of PT visits to the patient was $95 for co-payment of outpatient services. This cost seems reasonable for the outcome.

The benefit of PT was that the patient was able to return to his self-employed career. The role of the physical therapist was that of an educator, as the patient took a very active role in his rehabilitation with follow through of HEP and recommendations from the therapist. The cost may have been reduced by instructing the patient how to progress with repetitions, weights, and resistance of theraband, however no follow-up with the patient would have occurred to determine if he was progressing towards his goals.

This case has influenced my professional development by seeking an interest to further my PT education on shoulder/scapular kinematics and for joint mobilization techniques of the shoulder and scapula. It has helped me to take an in depth review of the literature that is available to many shoulder diagnoses, such as tendonitis, impingement, or adhesive capsulitis. In the future, continued review of the literature will enhance the knowledge of orthopedic surgeons and physical therapist’s in the decision making process for treating scapula fractures with ORIF and for PT intervention.
Appendix A

Examination & Intervention Algorithm

Scapula fracture-is the fx through the intraarticular component of the glenoid?

No

Acute Phase
- Immobilization for 2-4 weeks or until pain subsides
- PT involvement for Elbow, wrist, hand AROM

Sub-Acute Phase (4-6 weeks)
- ROM exercises
- PT involvement, start with Pendulum exercises
- Progress as tolerated with exercises such as wall-crawls and pulleys

Return to full work duty (6-10 weeks)
- Strengthening, manual therapy, and modalities
- Work hardening if appropriate

Yes

Are there other serious medical injuries present?

No

Other life threatening medical issues may take precedence over the scapula fx

May require ORIF

Acute phase (0-6 weeks)
- Immobilization or rest
- PT involvement for PROM or AAROM
- Refer to MD for signs/symptoms of infection, persistent pain, neurologic deficits

Return to full work duty (10 weeks)
- PT involvement for work hardening if appropriate
- May possibly have lifting restrictions for heavy lifting

Sub-Acute phase (6-10 weeks)
- PT involvement for therapeutic exercise (ROM, strength), manual therapy, modalities for pain control
REFERENCES CITED


