



# Clinical Case Report Competition

Okanagan Valley College of Massage Therapy

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Second Place Winner

## Stephanie Schmaltz

Effectiveness of massage therapy for symptomatic relief in a chronic femoral fracture

## ABSTRACT

**Objective:** This study is to determine if massage therapy can help to restore range of motion and decrease symptoms after a femoral fracture. **Methods:** A protocol of six treatments of forty-five minute over the period of six weeks was followed. Techniques used were myofascial trigger point release, Swedish massage and neuromuscular inhibition to stretch shortened muscle. The focus was on the muscles surrounding the fracture including gluteal area anterior thigh and posterior thigh. **Results:** Subject experienced a decrease in pain when walking up stairs and noticeable decrease in nocturnal pain. Client felt a 2/10 on the pain scale at the beginning of the sixth massage and post massage treatment client felt a 1/10 comparable to an 8/10 on initial assessment. She stopped having referral pain down the lateral and posterior leg and showed no limp when walking. Range of motion showed increase in flexion by 30°, external rotation by 15°, adduction by 10° and abduction by 15°. There was increased strength of gluteus medius by 15% and an increased length of the hamstrings by 6.3 cm. **Conclusion:** Massage to area surrounding fracture can help to increase range of motion at the hip and decrease symptoms from the fracture. To increase the benefits of the massage treatment inclusion of treatment of the lateral and medial thigh, use of joint mobilizations and frictions to decrease soft tissue adhesions and further increase restricted ranges of motion.

## INTRODUCTION

A spiral fracture occurs from a twisting or torsional force to the bone. Union almost always occurs in a spiral fracture because of a large surface area for contact (Goodman, 2003). There are approximately 60,000 midshaft femoral fractures each year in the United States (Paterno, 2005). Femoral fractures occur from high velocity accidents such as car accidents and sports (Goodman, 2003; Paterno, 2005). Due to the severity of this injury a period of immobilization is required. Complications that can arise from the fracture are: soft tissue injury, soft tissue adhesions and myositis ossificans (Goodman, 2003). Prolonged immobilization can lead to: changes in muscle mass and strength, shortening of muscles and connective tissue, fibrous adhesion formation, degeneration of articular cartilage, and extra-articular adhesions that can cause pain and restrict range of motion (Bloomfield, 1997; Paterno, 2005; Rattray, 2000; Visser, 2000). It takes six weeks or more for the bones to unite, eight to twelve weeks for consolidation and anywhere from four to twelve months to return to activity (Paterno, 2005; Rattray, 2000).

The medical treatment for a femoral fracture can be treated in two ways: (1) Closed reduction done by tractioning the bone until its ends realign then it is casted or an external fixation to hold it in place. (2) Open reduction is when the bone or bone fragments are stabilized by screws, nails, metal plates, and long intermedullary nails which are of choice for majority of femoral shaft fractures in older adults. (Rattary, 2000; Aukerman, 2006). When the bone has united physical therapy rehabilitation is started, with the goal of regaining weightbearing ability. This will generally begin with range of motion, followed by progressive strengthening exercises to

the muscle around the fracture. Most commonly affected muscles are quadriceps and hip abductors (Henrikus, 1993; Mitchell, 2001; Paterno, 2005; Sports Science Orthopaedic Clinic, 2008).

According to Travell a myofascial trigger point is a hyperirritable spot in skeletal muscle caused by mechanical stress. The spot is painful on compression and can cause referred pain, tenderness, motor dysfunction and distorted posture. Symptoms caused by myofascial trigger points range from the excruciating debilitating pain to painless restricted range of motion. A muscle with a trigger point can be prevented from reaching its full stretch range of motion or full strength because of pain. It is important to correct the cause of the trigger point because not correcting it will cause reactivation and relapse of the trigger point. (Travell and Simons, 1999)

The objective of this case study is to determine if myofascial trigger point release along with Swedish massage and neuromuscular inhibition will help to increase range of motion at the hip joint, and decrease the patients presenting symptoms. This is a general treatment of the larger groups of muscles affected by the fracture with the idea that it can be built on and incorporated in the rehabilitation of femoral fractures.

## **CASE HISTORY**

Subject was a 46 year old female, mortgage broker who had a double spiral fracture of her right femur in 2002 while wakeboarding. The fracture was treated with internal fixation of a titanium rod through the femur and screws at the lateral supracondylar ridge and another one-third way down lateral femur. Six months after fracture client could put some weight on the broken leg. At eight months the client attended physiotherapy appointments for six weeks to which the details of each appointment cannot be remembered. Symptoms were noticed in 2003 around her lateral greater trochanter and radiating pain down the posterior and lateral leg to the ankle. Client's symptoms were exacerbated after walking up stairs, skiing and prolonged sitting or standing. Subject experienced disturbed sleep through the night due to pain which was more noticeable after a long day of activity. The client noticed a limp in the right leg as she walked and moved up and down stairs. Subject could not cross legs and rest foot on opposite knee due to decreased range of motion at the hip. Client would have a more restful sleep after soaking in the hot tub for 20-25 minutes in the evening. There were no other injuries or health concerns apart from symptoms already mentioned. The client's expectations were to have decreased pain around the hip and leg, as well as increase the range of motion at the hip joint and to help restore proper gait.

## **ASSESSMENT**

Assessment followed the Cyriax Model. At the beginning and end of each treatment a scale of one to ten was used to measure subject's pain, 0 being no pain and 10 being excruciating pain. At the beginning of the first and last of the six treatments range of motion of the hip was assessed as well as muscle testing of the gluteus medius and external rotators of the hip where some weakness and pain was found. The following muscles were also tested and proved to be strong: quadriceps, hamstring, gluteus maximus gluteus minimus, and internal rotators. At the beginning of every treatment the following special tests were performed: Trendelenburg sign, Patrick, Hamstring Contracture Test, and Ely's.

To rule out sacroiliac joint pathology and sacroiliac ligament sprain the special tests utilized were sacroiliac motion palpation, forward flexion, gap and squish. Scouring was used to rule out hip joint pathology and osteoarthritis. Kemp's, quadrant and slump were performed to rule out lumbar facet irritation or nerve pathology.

A follow up assessment was performed five weeks after sixth treatment on May 3, 2008. The assessment consisted of measuring client's pain on the pain scale, range of motion and special tests including: Ely's, Trendelenburg sign, Hamstring Contracture Test and Patrick.

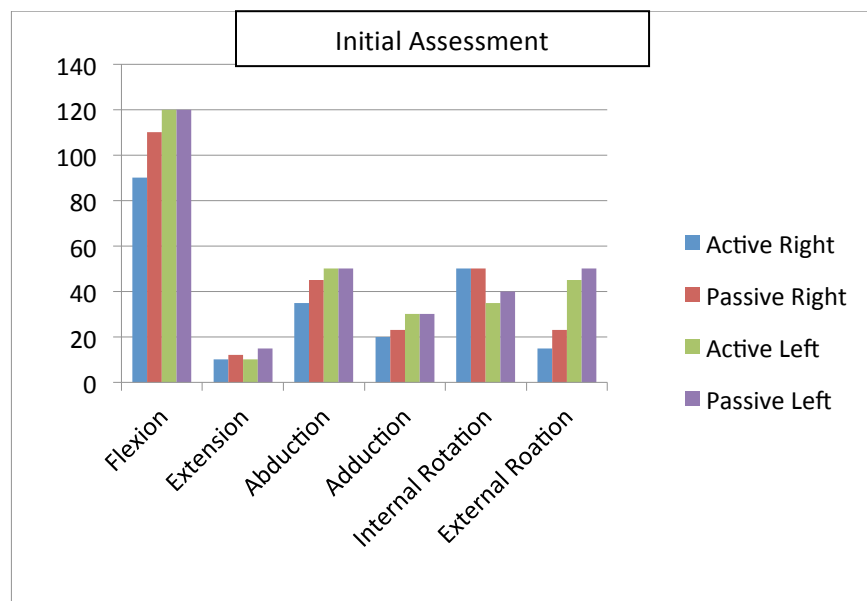


Figure 1. Range of Motion on initial assessment

## TREATMENT PLAN

Each of the six treatments was forty-five minutes and applied to the right hip and thigh. Starting prone the massage began with three diaphragmatic breaths and five compressions along the gluteus maximus from the greater trochanter to the sacrum in three lines: superior, middle, and inferior. Muscle stripping was applied along the same lines while addressing any trigger point by

keeping ischemic compression on it until it decreases to a zero out of ten on the pain scale. Effleurage was done up from knee to iliac crest three times. Muscle stripping was then performed on the hamstrings from the knee up to the ischial tuberosity in three lines from lateral to medial, addressing any trigger point the same way as the gluteal area. Muscle stripping was followed by palmar kneading to the gluteus maximus and the hamstrings then applied effleurage two times up from the knee over to the top of the gluteus maximus.

In supine, compressions were done along the quadriceps from anterior superior iliac spine (ASIS) to the patella in three lines: lateral, middle and medial. Effleurage was performed up quadriceps three times, followed by palmar kneading in three lines: lateral, middle and medial from ASIS to patella. Next, deep stroking was done up the quadriceps in the same three lines addressing trigger points. Trigger points were also released in a shortened iliacus muscle. This was done by having the knee and hip flexed to ninety degrees and applying ischemic compression. A final effleurage up the quadriceps three times finished the anterior thigh.

Quadricep stretch was performed by doing neuromuscular inhibition (contract-relax). This was done by client in prone and having the knee bent as close to gluteus maximus as possible until a stretch was felt in the quadriceps and then backing off just enough so no pain was felt. Subject then extended their knee with resistance and held for six seconds then fully relaxed the muscle. This was repeated three times each time taking the stretch into the newly gained range.

Homecare consisted of quadricep stretching and strengthening of gluteus medius. The quadricep stretch was performed by lying prone and using a large towel held in each hand around ankle and pull toward gluteus maximus until a pain free stretch was felt. This was held for 45 seconds and done twice daily. Gluteus medius was strengthened by tying a blue theraband to a table and with the leg internally rotated the client abducted the leg away from the table 10 times. This was repeated 3 times once a day.

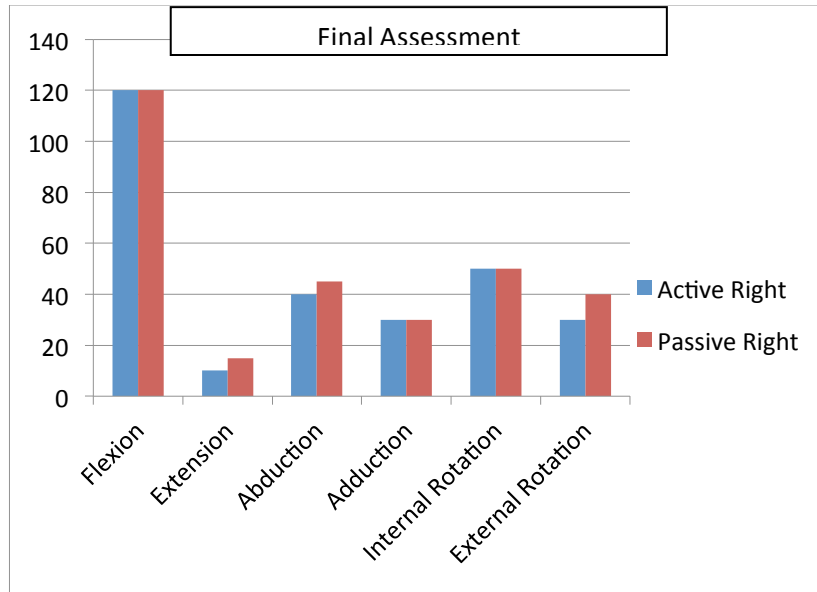


Figure 2. Range of Motion of right hip on final assessment

## OUTCOMES

Subject experienced a decrease in pain when walking up stairs for three days post massage treatments. On the pain scale at the beginning of the sixth massage subject felt a 2/10 and post massage treatment felt a 1/10. She stopped having pain referral down the lateral and posterior leg after the third massage treatment and on final assessment there was no visible limp when walking. The client noticed a decrease in nocturnal pain and had a full night sleep for 4-5 days post massage. Palpation revealed adhesions along lateral quadriceps where screws are in the femur. She had increased tissue pliability in gluteus maximus and decreased tenderness of the hamstrings. There were a few reoccurring trigger points in the muscle belly of rectus femoris and vastus lateralis. Contract-relax of quadriceps became easier with maximal stretch on quadriceps without pain. Active range of motion of the last treatment showed increase in flexion by 30°, external rotation by 15°, adduction by 10° and abduction by 15°. There was increased strength of gluteus medius by 15%. There was an increased length of the hamstrings by 6.3 cm. Home care was followed as indicated over the course of the six treatments and quadriceps stretch was discontinued after the last treatment due to fully regained length of quadriceps.

At five weeks after the sixth treatment client felt a 3/10 on the pain scale and noticed a dull ache around her hip joint which would come on in late afternoon one to two times a week and resolved within thirty minutes to an hour. There was a decrease in external rotation by 5°. Client continued doing strengthening of gluteus medius and strength increased by 1.5%. Length of hamstring and quadriceps remain the same.

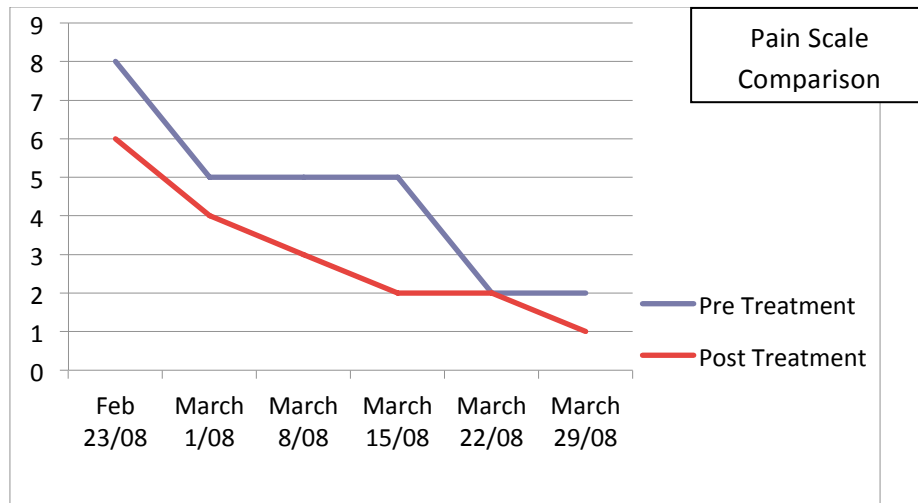


Figure 3. Pain Scale Comparison

## CONCLUSION

The treatment plan in this case study proved to be effective in restoring range of motion the hip and decreasing the subject's symptoms for a chronic femoral fracture. The outcome was more than expected, however, additional treatments focusing on the medial and lateral thigh, would have achieved a more significant improvement. Some adhesions and trigger points still remain in the soft tissue surrounding the fracture and could have been treated with cyriax friction or counterstrain techniques. Treating these adhesions more extensively could have lead to longer lasting results.

There is little previous knowledge of the effectiveness of massage therapy to treat the symptoms of femoral fractures. The treatment applied in this case study could be used as a building block for future studies.

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