2017

Conservative Treatment of Lumbar Disc Herniation: A Case Report

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Conservative Treatment of Lumbar Disc Herniation: A Case Report

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Associates of Science, Lake Region State College 2013

Doctor of Physical Therapy, University of North Dakota 2017

A Scholarly Project Submitted to the Graduate Faculty of the

Department of Physical Therapy

School of Medicine and Health Sciences

University of North Dakota

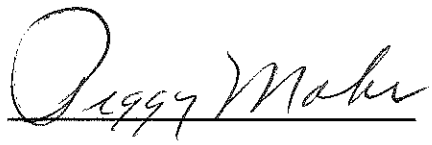
in partial fulfillment of the requirements for the degree of

Doctor of Physical Therapy

Grand Forks, North Dakota

May, 2017

This Scholarly Project, submitted by Benjamin A. Lofgren 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.



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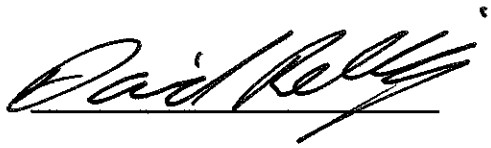

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Date June 20th, 2016

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ACKNOWLEDGEMENTS

I would like to thank my clinical instructor, UND Physical Therapy faculty, my patient, and colleagues for the help throughout my education which has enabled me to learn and succeed not only the classroom but also the clinic. I would also like to thank my friends and family for their encouragement throughout my education.

ABSTRACT

Purpose: This case study provides a description of the outpatient physical therapy management of a 55-year-old female with low back pain and sciatica.

Case Description: Initially, the patient was diagnosed with illiotibial band syndrome (ITB) syndrome. During physical therapy examination, the patient demonstrated signs and symptoms consistent with a lumbar disc pathology. Interventions were designed to address the lumbar disc pathology and included mechanical traction, therapeutic exercises, and patient education for posture, positioning and proper body mechanics.

Outcome: Following 4 weeks of conservative physical therapy treatment, the patient was referred to her primary care physician with a request for imaging. Imaging results confirmed a L5-S1 lumbar disc herniation. Surgical and conservative options were reviewed and the patient agreed to continue conservative treatment for 4 additional weeks. The patient was able to return to her prior level of activity, increase her quality of life, and tolerate work with minimal pain throughout the episode of care.

Discussion and Conclusion: Interventions were based upon evidence-based practice for lumbar disc pathology and upon patient responses. Primary care referral and imaging request were used to confirm her diagnosis due to continued intensity of symptoms. The MRI confirmed herniation of the left L5-S1 intervertebral disc which supported the physical therapy diagnosis. More research needs to be done to compare outcomes resulting from physical therapy interventions prior to surgical intervention used for this pathology.

CHAPTER I

BACKGROUND AND PURPOSE

The patient in this case was initially diagnosed with iliotibial band syndrome, while demonstrating signs of disc herniation. This case will describe the importance of appropriate physical therapy evaluation procedures to verify diagnoses when treating patients with low back pain which could potentially be due to disc herniation.

The herniation of an intervertebral disc occurs when the inner disc, which is composed of nucleus pulposus, displaces beyond the outer disc space. The mechanism of injury involves trauma to the low back such as lifting with poor body mechanics, twisting, bending, or any activity which involves lumbar flexion and promotes posterior displacement of an intervertebral disc and its contents. Disc herniation can occur laterally, anteriorly, or posteriorly; however, posterior displacement is most common. Disc herniation has its highest prevalence between ages 30-50 with a male to female ratio of 2:1.[1] Ninety-five percent of disc herniations occur at the lumbar spine in people ages 25-55 and are most commonly found at levels L4/5 and L5/S1. It is more common with patients over age 55 to have a disc herniation above this level. From a cohort study of 1,822 subjects, Tom and Elizabeth Hansson[2] concluded the direct cost of a single disc herniation treated conservatively was $2,068 and those treated surgically, the cost totaled $10,311. The indirect costs were lower in the surgical group ($32,807) than in the nonsurgical group ($42,570). Mean total cost for surgical

approaches were $43,118 and $44,638 for conservative approaches. At the 3 month and 2-year follow up a randomized controlled trial (RCT) composed by Jordan et al[1] with 56 patients found no significant differences between surgical (microdiscectomy) and conservative approaches in low back pain, Oswestry Disability Index, subjective ability to work, and quality of life scores.[1]

Conservative treatment for a potential disc herniation was selected for the patient in this case based on the patient's preferences, the severity of her condition, and anticipated costs. The interventions implemented addressed spinal alignment, core strength, flexibility and functional skill, which are described in the case description.

CHAPTER II

CASE DESCRIPTION

The patient was a 55 year old, Caucasian female, whose primary language was English, with a medical diagnosis of iliotibial band syndrome. The patient had a post-secondary education and her occupation was an accountant. Patient lived in a house with her husband and had 12 stairs in her home. The patient enjoyed being at the lake, spending time with family, staying active, and instructing water-aerobics classes. The patient had a past medical history of breast cancer, osteopenia, and glaucoma. She stated about 2 months prior to this episode of care; she injured her hamstring while walking which has resolved.

The patient had an insidious onset of low back pain with radiating pain into the lower extremities (LEs), which began about 3 months prior to seeking medical attention. Prompting her visit to her physician was the fact that radicular pain symptoms had increased in intensity over a 3 week period. The pain originated in the left lumbar region, radiated into the buttock and traveled down her left lower extremity to the calf. The pain resulted in the patient having difficulty bending, lifting, sitting, sleeping, and also had increased pain with coughing and/or sneezing. Being an accountant, the patient had long days of sitting which increased her pain. Pain with long-duration sitting is consistent with

the common characteristics of a disc herniation. Pain decreased with walking, standing, stretching, and medication. The patient reported she had been taking ibuprofen for pain management over the past few months. Patient had no prior medical treatment for this issue.

Examination, Evaluation and Diagnosis

Prior to the examination, a chart review was completed. Her past medical history was noted and did not appear to contribute to her current status. The physician's diagnosis of iliotibial band syndrome was reviewed and appeared to be based on the location of the patient's pain. An Ober's test for ITB syndrome had been administered on the left and reported as positive.

During the physical therapy examination, the patient was pleasant and cooperative, with no acute distress noted. Patient was orientated to person, place, time, and situation with no concerns or precautions with mental, social or cognitive health. The patient's chief complaint consisted of low back pain and left LE pain extending from buttock to knee and occasionally to the calf. Her pain was sharp in nature with moments of "lightning" like pain down leg. Pain was 5/10 on a Visual Analog Scale (VAS) 10 point scale (0 = lowest, 10 = highest) at the lowest and 8-9/10 at the highest level.

During a gait analysis, the patient displayed a mild antalgic compensated gait on left LE. Range of motion (ROM) assessment revealed limitations in active range of motion including lumbar flexion (25% loss), extension (50% loss), left lateral flexion (25% loss), and right rotation (25% loss). All of these motions increased the patient's pain. Right lateral flexion and left rotation were within normal limits and without pain during movement. Passive range of motion produced the same limitations as noted as with active range of motion.

Table 1

Lumbar Range of Motion Measurements

Lumbar Movement	Percent Limited
Flexion	25% moderately painful
Extension	50% moderately painful
Left Lateral Flexion	25% mild pain
Right Lateral Flexion	No limitation, no pain
Left Rotation	No limitation, no pain
Right Rotation	25% mild pain

Right lower extremity strength was within normal limits and without pain. Although the patient had complained of radiating pain in the left lower extremity, during the examination strength in her left lower extremity was within normal limits with no increase in pain during testing. Hip and knee were cleared for peripheral joint scan testing.

During examination special testing, a number of special tests were used to rule out confounding diagnoses and to attempt to identify the cause of her pain. Included in the testing, the Ober's test for ITB syndrome, the straight leg raise, slump test, FABER's, prone knee bend, and hip scour were implemented. Ober's test was unable to be completed due to pain and, therefore, inconclusive in confirming ITB syndrome. The Faber's test was administered to rule out

sacroiliac dysfunction. Hip scour to rule out osteoarthritis, prone knee bend for upper lumbar spinal involvement, and Faber's test were negative bilaterally.

The patient's history, pain characteristics, and the negative special tests results prompted special tests for disc involvement. A bilateral manual lower extremity distraction resulted in reduction of pain in left lower extremity. Slump test and straight leg raise (SLR) tests were positive on the left LE and negative on the right LE. Majlesi and Togay[3] concluded that the slump test was more sensitive (0.84) than the straight leg raise (SLR) (0.52) in patients' with lumbar disc herniations. However, the SLR was found to be a slightly more specific test (0.89) than the Slump test (0.83).[3] Windt and Riphagen [4] proclaimed sensitivity of the slump test was poor (0.44) and specificity slightly better (0.58), and for the SLR, sensitivity was better (.92) when compared to specificity (.28). Based on this evidence, the positive slump and SLR tests supported a potential disc involvement.

Table 2

Examination Special Tests

Slump test:	(+) on left, (-) on right.
Straight leg raise:	(+) on left, (-) on right.
Ober's test:	unable to test due to pain.
Hip Scour test:	(-) bilaterally.
Prone knee bend:	(-) bilaterally.
Faber's test:	(-) bilaterally.

Additional testing included nerve root testing (myotome and dermatomal testing), which were negative bilaterally for LE and abdomen. Lumbar spine joint play with posterior-anterior glides displayed hypo-mobility and pain located in L5-S1 region with radicular pain into left lower extremity. The patient had no notifiable areas of aggravation over the left IT band. Functionally, the patient scored 46 out of 100 on the Quebec Back Pain Disability functional assessment with a score of 0 indicating no disability. Higher scores correlate to greater disability. Fifteen points is the minimal detectable change (90% confidence).[5]

The findings of the examination indicated that the patient had a potential posterior disc bulge/herniation affecting the lower lumbar spine. The examination findings did not support the diagnosis of ITB syndrome. The pain experienced with the Ober's test could have resulted from a disc issue. Hip range of motion was found to be within normal limits but the patient experienced some pain during hip motions. However, it was not possible to conclude that the pain experienced during hip motions was due to a tight ITB. The patient's history and positive special tests (SLR and Slump tests) provided supporting evidence for disc pathology.

Prognosis & Plan of Care

With the patient's active participation in physical therapy and HEP, awareness of her pathology, and willingness to strive towards functional goals, the patient's prognosis was good. The main contributors to her pathology were her job (prolonged sitting) and her poor body mechanics when lifting objects and during activities of daily living. Physical therapy goals were independence in her progressive home exercise program, decrease pain, and improve range of motion and strength. These goals were to be met with therapeutic exercise, patient education, manual therapy, and traction.

The initial plan was to try conservative efforts before considering surgical options. The patient was scheduled to have therapy 2 times per week for 6 weeks. After 6 weeks, the goals were reviewed and the next plan of action was designed. The patient and the student physical therapist hoped that, with this plan of care, symptoms would decrease and surgery. It was assumed that the patient would be able to notice if conservative efforts were helping within 4-6 weeks. By the end physical therapy, our goal was for the patient to return to full participation in her daily living and recreation.

Intervention

Following the initial evaluation, interventions consisted of therapeutic exercise, patient education about the pathology, movement precautions, and helpful tips to decrease pain and increase function. The patient was educated about how to complete movements during daily activities and lifting biomechanics to minimize exacerbation of pain. Specific education was provided regarding adaptations to her work environment and activities. Her home and activities of daily living were also reviewed with education regarding injury prevention.

Manual therapy with posterior-anterior glides to lumbar spine were initiated with light pressure (grades I-II) and progressed to moderate pressure (grades III-IV). Mechanical traction was applied, initially using static traction and lower level forces. Traction was progressed to intermittent with 55 pounds on a 3 to 1 on/off time (45 seconds on 15 seconds off) for a total of 15 minutes per session. The patient tolerated both of these interventions well.

Therapeutic exercise began slowly with activities the patient could tolerate without pain. The patient had reduced pain and a directional preference (DP) for trunk extension. Evidence for using DP exercises was reported by Dunsford, Kumar et al,[5] concluding that immediately post intervention DP exercises were significantly better for decreasing pain and improving functional outcomes as compared to joint mobilizations, educational control groups, and multidirectional exercises. The study also stated that DP in conjunction with other manual therapy treatments such as mobilization, manipulation, or traction along with general exercise may be a time-efficient and cost effective way to approach LBP.

Based on this evidence, DP trunk extension was first initiated in low ranges of motion in prone and progressing to larger ranges. The patient began by lying prone as she was able to tolerate this easily and progressed to prone on elbows and, eventually, prone press ups. When the patient was in the "prone on elbows" position, she had complete relief from low back pain and sciatica. In addition to these positional exercises, a lumbar stabilization program was implemented and began with exercises that did not cause the patient any pain. The stabilization program consisted of prone hip extension, prone alternating upper extremity and lower extremity raises, supine bridging, supine stabilization exercises with UE and LE movements (dead bugs), and modified planks. The goal was for the patient to become comfortable enough completing these exercises during therapy that she could complete them at home. Each exercise was progressed as the patient was able to tolerate.

Outcomes

The patient came to PT with the initial diagnosis of ITB syndrome. After examining the patient, her diagnosis was determined to be a L4-S1 disc bulge/herniation. This patient was treated for approximately 4 weeks, in which time she was able to make her pain levels manageable with patient education and interventions. The patient was able to return to activities which had caused her difficulty before physical therapy, such as work tolerance, and achieved pain-free ADLs.

Toward about the 4th week of treatment, she began to plateau. At this point, the patient began to contemplate surgical options. The patient requested information about surgical outcomes for her pathology and my brief literature review did not yield significant supporting results. The patient decided to hold on surgery and continue with conservative physical therapy approaches which included physical therapy, exercise, and postural awareness. By the end of her experience with physical therapy, she was able to return to full participation in her daily living and recreation.

CHAPTER III

DISCUSSION

The severity of the pathology is also a component in determining if surgical procedures are appropriate. The patient, in this case study, did not have a severe disc herniation and had continued progress with physical therapy, which influenced her decision to continue conservative physical therapy. The fact that there was insufficient research found to support excellent outcomes following surgery for disc herniation was also an influential factor in decision making.

Jordan Konstaninou, et al[1] completed a systemic review of randomized – controlled trials consisting of varying sample sizes and strength of evidence. For most conservative treatments of a diagnostic disc herniation, the evidence was variable. Conservative treatments mainly included exercise, cryotherapy/thermotherapy, massage, and acupuncture.

Jordan Konstaninou, et al,[1] reported significant positive results in lowering pain, improving function, and a lower reoccurrence at 6 months to 3 years with the use of exercise, patient education, and conventional non-surgical interventions (cryotherapy, acupuncture, massage, etc.). With conventional non-surgical treatment alone, results were only significant until 6 months post initiation of intervention.

According to Jordan, Konstaninou, et al[1] limited evidence supported the use of medication to effectively treat a herniated disc. The use of drug treatment may temporarily inhibit the sciatic pain and discomfort exacerbated by a

herniated disc, but medications do not address the issue at a structural level. The use of epidural corticosteroid injections did not have supportive evidence as an effective treatment option over time. The authors found that when corticosteroid injections were compared with discectomy, there was significant evidence that epidural corticosteroid injections had significantly higher outcomes on the VAS (Visual Analog Scale) and ODI (Oswestry Disability Index) than discectomies. However, these results were not sustained at the 2-3 year follow-up.

According to Jordan, Konstaninou et al,[1] spinal manipulation has moderate strength evidence as an intervention for herniated disc symptoms at a structural level by relieving acute low-back pain and radiating symptoms. However, there were concerns that spinal manipulation may cause further damage to chronic herniation.

There are several different surgical approaches for disc herniation. Jordan, Konstantinou et al[1] reported that "10% of people who undergo surgical treatment for disc herniation report considerable pain exacerbation and return of symptoms 6 months post-operative." The authors concluded that a microdiscectomy (less invasive) can be just as effective as a standard discectomy in patients rating their recovery as "good" or "completely recovered" at 1 year. Microdiscectomy did relieve radiating leg pain at 6 weeks as compared to conservative treatments; however, there was no significant difference in low back pain at 6 weeks to 2 years.

Microdiscectomy[1] and standard discectomy had better outcomes with perceived patient recovery, health status, functional outcomes, and pain, at 8

weeks; however, at approximately 6 months to 1-2 year follow-up, conservative approaches were comparable. Another surgical approach reviewed was the automated percutaneous microdiscectomy. This approach has significantly better results by proposing a lower-success rate, as compared to microdiscectomy or standard discectomy, but a faster recovery rate. This information was pertinent to my case study, due to my patient being unsure about which approach to consider. The patient decided to continue with conservative measures involving physical therapy and exercise which gave the patient pain relieving and functional restoration. While she achieved full return to function, she would continue to have pain with exacerbating movements and activities.

According to Gagne, and Hasson,[6] results from initial evaluation to discharge provided evidence that the combination of lumbar extension exercises with mechanical traction may be beneficial in reducing pain and improving function. However it was evident that further research was needed with larger populations and randomized control designs to produce stronger supporting evidence.

A study, conducted by Vroomen, Krom et al,[7] involved 274 patients with lumbosacral nerve root compression symptoms. The authors analyzed patient characteristics, clinical findings, and imaging. They found that diagnostic information gathered during physical examination had already been revealed as items in the history. The authors concluded that obtaining a thorough history during physical therapy evaluation can be just as important as objective findings.

They also concluded that asking pertinent questions about a suspected pathology can lead to an accurate diagnosis.

Reflective Practice

The experience with this patient was an ongoing, daily learning process requiring constant self-evaluation. Reflecting on my efforts with this patient, I would have increased my emphasis on patient education to make sure the patient knew the significant influences of body awareness; posture and positioning may have on creating her pathology.

By the time my clinical affiliation was completed, the patient had yet to be discharged. Due to confidentially protections, I was not able to obtain any further information when my clinical affiliation was over. In reflection, I would have arranged a follow-up meeting with the patient, after the clinical, to investigate her discharge from physical therapy and her current status.

I have also had the opportunity to further my education and understanding with musculoskeletal examination techniques proposed by Saurmann. This knowledge would have been beneficial at the time I was providing interventions for this patient. My additional study of these techniques would have allowed a greater understanding of muscular recruitment patterns, directional preferences of movement, and muscular skeletal abnormalities which were contributing to the patient's pathology.

In conclusion, it is my recommendation that more research be done with larger populations to examine results for different interventions and outcomes for various disc pathologies. Long duration, randomized, controlled trials would

provide the best evidence to support optimal intervention for patients with low back pain.

The importance of a thorough examination, regardless of the original diagnosis, was evident with this case study. Consequently, it is also recommended that physical therapists complete a diagnostic evaluation and communicate with other healthcare professionals to ensure the patient received appropriate care.

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