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A Case Study of a Patient with Low Back Pain and Radicular Symptoms Treated with the McKenzie Method

by
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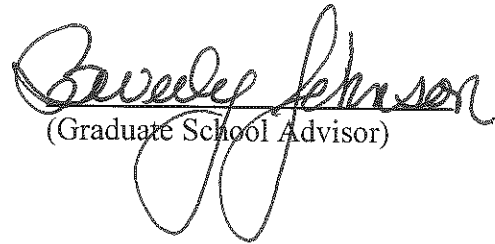
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Department of Physical Therapy
School of Medicine
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in partial fulfillment of the requirements for the degree of

Doctor of Physical Therapy

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This Scholarly Project, submitted by Reyn A. Hata 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.


(Graduate School Advisor)


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Symptoms Treated with the McKenzie Method

Department Physical Therapy

Degree Doctor of Physical Therapy

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TABLE OF CONTENTS

LIST OF TABLES	vi
ACKNOWLEDGEMENTS.....	vii
ABSTRACT	viii
CHAPTER	
I. INTRODUCTION.....	1
II. CASE DESCRIPTION.....	3
III. DISCUSSION.....	8
APPENDIX A.....	11
REFERENCES	12

LIST OF TABLES

1. INITIAL LUMBAR RANGE OF MOTION.....4
2. REPEATED MOVEMENT TEST RESULTS..... 4
3. DISCHARGE LUMBAR RANGE OF MOTION.....7

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ABSTRACT

Objective: The objective of this case study is to describe the use of the McKenzie Method (MM) with a patient with low back pain (LBP) with radicular symptoms.

History: The patient is a 26 year-old, male with complaints of low back pain with radicular symptoms down his right lower extremity to his ankle. The patient presented with decreased range of motion to lumbar spine, a flexed and left laterally shifted posture, decreased strength of right lower extremity, and peripheralizing symptoms of pain.

Description: The treatment for this patient involved repeated flexion and extension movements, stretching, posture education, instruction in body mechanics, and strengthening exercises for lumbar paraspinals, abdominals, and bilateral lower extremities. **Outcomes:** Following intervention, the patient was able to achieve full lumbar range of motion, abolished symptoms of pain, increased lower extremity strength, and improved level of function. **Discussion:** This case varied from traditional protocol of the MM due to the inability to correct the lateral shift initially. The combination of first flexion biased exercise and later extension biased exercises were utilized. Use of the MM requires consistency with the repeated movements. The MM proved to be an effective and quick treatment for LBP with radicular symptoms.

Key words: McKenzie method, disc herniation, disc bulge, radicular symptoms, peripheralization, centralization

CHAPTER I

Introduction:

Through the years, treatment of LBP with radicular symptoms has evolved significantly. Earlier treatments in the '60s-'80s involved passive treatment through the application of heat using hot packs, massage, or ultrasound. Also, in the early '80s active exercise utilizing various stretching and strengthening techniques such as cat-camel, single knee or double knee to chest, hamstring stretches, or pelvic tilt exercises involving musculature of the low back and abdominals became more common practice. Now, the MM has gained popularity¹.

The MM involves the use of repeated movements of the spine to test for a directional preference of the spine. Repeated movements of the spine include flexion, extension, sideglide, quadrant or diagonal movement in the loaded (weightbear) or unloaded positions (non-weightbear). Directional preference could be defined as symptoms decreasing in pain, centralizing or moving towards the spine or midline, increased deep tendon reflex or muscle strength, or increased range of motion of the lumbar spine.^{2,3,4}

Busanich and Verscheure⁵ found that the MM to be more effective in decreasing short term (< 3 months) pain, as well as disability than other common treatments for LBP, such as non-steroidal anti-inflammatory drugs, educational booklet, back massage with back care advice, strength training with therapist supervision, and spinal mobilization. A

systematic review with a meta-analysis approach was performed by Machado et al⁶ which demonstrated evidence that the MM is more effective than passive therapy for acute LBP. Another systematic review conducted by Hettinga et al⁷ supported the use of strengthening exercises, organized aerobic exercise, general exercises, hydrotherapy, and MM for individuals with back pain of at least six weeks duration. In another systematic review, unloaded exercise facilitating lumbar spine movement were compared to a no treatment control group or other treatment for patients with chronic low back pain. The reviewers found strong evidence that the MM's unloaded exercise improved pain and function when compared to no exercise.⁸ Lastly, Clare, Adams, and Maher⁹ performed a systematic review which explored the efficacy of McKenzie Therapy for spinal pain. The study confirmed that MM does result in a greater decrease in pain and disability of short term (less than 3 months) LBP than other standard therapies. The review of long term (3-12 months) LBP was inconclusive. The purpose of this study was to explore the MM as an effective treatment of LBP with radicular symptoms.

CHAPTER II

Case Description:

History

The patient was a 36 year-old male with complaints of LBP and pain from right gluteal down to his right lower extremity (LE) to lateral ankle. Patient is currently working full-time as a flooring salesman which involves computer work (approximately 33% of day) and a lot of walking (approximately 66% of day). He was formerly employed as a carpet installer which entailed primarily bending and lifting. Patient was previously treated by physical therapy for sciatica in May of 2004. According to the patient, he was prescribed various extension exercises utilizing the MM which resolved his symptoms, at the time. In May of 2004, patient was injured while lifting and moving storage boxes at home. Most recently, on November 12, 2005, his symptoms were initiated by standing and bending to type on a keyboard at work. Patient's chief complaint was the pain down his right lower extremity. Prolonged standing, ambulation greater than 5 minutes, and sit-to-stand following prolonged sitting seem to make his symptoms worse. He noted that trunk flexion in sitting, sometimes decreases his pain levels. Patient reports trying to perform extension exercises previously provided, but he is unable to tolerate them secondary to pain. Patient had denied any significant medical history other than what was previously stated.

Examination/Evaluation

Magee's Orthopedic Evaluation of the lumbar spine was utilized for evaluation¹⁰. Upon observation, patient is of mesomorphic body type who presented with a combined flexion

and left lateral shift posture in standing¹. The patient was seated in waiting area, as well as on the examination table with poor slumped posture. Patient seemed to be in considerable distress prior to evaluation. During palpation of lumbar spine reduced lumbar lordosis was noted. Patient elicited limited range of motion in all planes, especially flexion and extension. Lumbar range of motion (ROM) was measured with a goniometer, listed in Table 1:

Table 1. Initial Lumbar Range of Motion (in degrees)

		Right	Left
Flexion	20		
Extension	15, pain		
Sidebend		10, pain	25

Bilateral lower extremity strength was tested using resisted isometrics for hip flexion, knee extension, and ankle dorsiflexion which were all 4/5 on R. As for the left, all movements were 5/5. Special Tests performed were straight leg raise and slump test which were both positive for back pain. The last special tests performed were the MM movement tests, results are listed in Table 2. Reflexes and sensation to light touch were both within normal limits (WNL).

Table 2. Repeated Movement Test Results

L side glide	increase//worse	Repeated Flexion in Lying	Decrease//better
Static L side glide in sidelying with pillow	increase//worse	Repeated Extension in lying	Increase//worse
Repeated Flexion in Standing	decrease//better	Repeated Prone on elbows	Increase//worse
Repeated Extension in Standing	Increase//worse		

Evaluation results indicated that the cause of this patient's symptoms were discogenic in nature. Corrections to fix the lateral shift to the left and extension to neutral proved to increase or peripheralize his symptoms. At this time, a possible large herniation or bulge posterior-laterally was suspected due to the patient's inability to correct the lateral shift or even return to a neutral lumbar spine position sagittally. Goals for the patient were to increase lumbar ROM, increase LE strength, decrease pain, and abolish symptoms to right lower extremity.

Intervention

Patient was treated for 30 minute sessions 2 times per week for 4 weeks. During the first week, the patient was instructed to perform repeated flexion in standing (RFIS) or repeated flexion in lying (RFIL) 10 times per hour as his home exercise program. Due to the patient being able to centralize his symptoms to the lumbar region, flexion exercises were prescribed¹¹. The patient was educated regarding stopping exercise should symptoms peripheralize or increase distally. Upon return after first visit, the patient reported that pain was intermittent and decreased, in addition he was also able to walk about 15 minutes without pain which he had been unable to accomplish for about a month. His home exercise program for the first week also included supine abdominal bracing with knee flexion, crunches with knee flexion, and standing hip extensor stretch with right lower extremity supported by a stool.

For the second week, exercises included were continued RFIS and RFIL, with the addition of prone on elbows. Both flexion exercises were prescribed 10 times per hour,

but patient was instructed to perform prone on elbows 3-4 times per day. In addition, a hamstring and a single knee to chest stretch along with a progression to abdominal bracing w/ marching were supplemented into the flexion bias home exercise program. Repeated midrange prone press ups were attempted, but not prescribed due to return of right lower extremity symptoms.

During the third week, repeated prone on elbows exercise was discontinued due to symptoms returning to right lower extremity down to thigh. Patient was to perform RFIS, RFIL, supine crunches with knee flexion, oblique crunches, abdominal bracing w/ marching, hamstring stretch, and the single knee to chest stretch.

The fourth and final week of treatment, patient was pain free and full range of motion was achieved. Patient was weened off of flexion biased exercise and advised to progress to extension exercises from prone on elbows to prone press-ups. Patient was able to progress from alternating arm and leg lifts to simultaneous arm and leg lifts, prone bridging from knees to prone bridging from toes. Crunches, oblique crunches, abdominal bracing, and stretching were also continued. Lower extremity strengthening included leg press and theraband exercise. An intervention algorithm is listed in Appendix A which provides exercises prescribed according to the week. Patient was discharged having met all goals.

Outcomes:

At discharge, patient's lumbar ROM was as listed in Table 3. Bilateral lower extremity strength was tested at 5/5. Patient was 0/10 pain level for the past week without complaints of intermittent symptoms. Overall, patient responded well to treatment. Patient was able to show steady progress in lumbar range of motion, pain, and strength. He was also able to perform all activities of daily living and return to full function at his job symptom free. Patient's adherence to intervention was, overall, very good. The only exception was the first week where the patient had to be advised regarding the frequency of completion of flexion repeated movements 10 times per hour.

Table 3. Discharge Lumbar Range of Motion (in degrees)

		Right	Left
Flexion	60		
Extension	35		
Sidebend		20	18

CHAPTER III

Discussion:

In accordance with other previous studies conducted in the past, this case study proved the MM to be an effective treatment for LBP with radicular symptoms. The patient was able to return to full function without pain.

Upon initial evaluation, the patients flexed and shifted posture was believed to be caused by a significant posterolateral herniation or bulge of a lumbar disc. Although McKenzie would suggest first correcting the lateral shift, the patient was unable to tolerate any type of sideglide movement secondary to increase or peripheralization of pain. Repeated movements in flexion were believed to have created a “vacuum effect” to reduce the bulge enough to allow repeated movements in extension. This “vacuum effect” is not well documented and further research is required to fully examine this phenomenon.

Although the patient was advised to perform repeated movements in flexion 10 times per hour, after the first visit the patient reported only performing the movement 5-6 times per day which was insufficient. Frequency of the repeated movements must be stressed to consistently keep the bulge or herniation reduced to relieve pressure off of the nerve root. Compliance to frequency, quality of movement (end range movement), and number of repetitions of the repeated movement program is of utmost importance.³ Return to

function and abolished symptoms may be achieved in a shorter time period, if the patient is compliant with repeated movements.

This case varied from traditional MM treatment due to not correcting the lateral shift initially.² Treatment also varied due to the addition of stretching and strengthening in conjunction with repeated movements. Traditional MM treatment would only utilize the use of repeated movement to centralize the patient's symptoms until the patient was pain free for a period of at least 48-72 hours.³ According to traditional MM treatment, only after this 48-72 hour pain free period would the patient progress to stretching and strengthening. The rationale to the addition of stretching and strengthening prior to the 48-72 hour period was that since a flexion bias had already been established, flexion biased exercise would only complement the bias. Hence, the addition of stretching and strengthening program which could be incorporated into a flexion biased program. A definite plus of the MM is that, quite often, results can be seen in just a few days or sometimes immediately which builds patient confidence in the therapist¹². Of course, compliancy to the program as mentioned above is critical to patient outcomes.

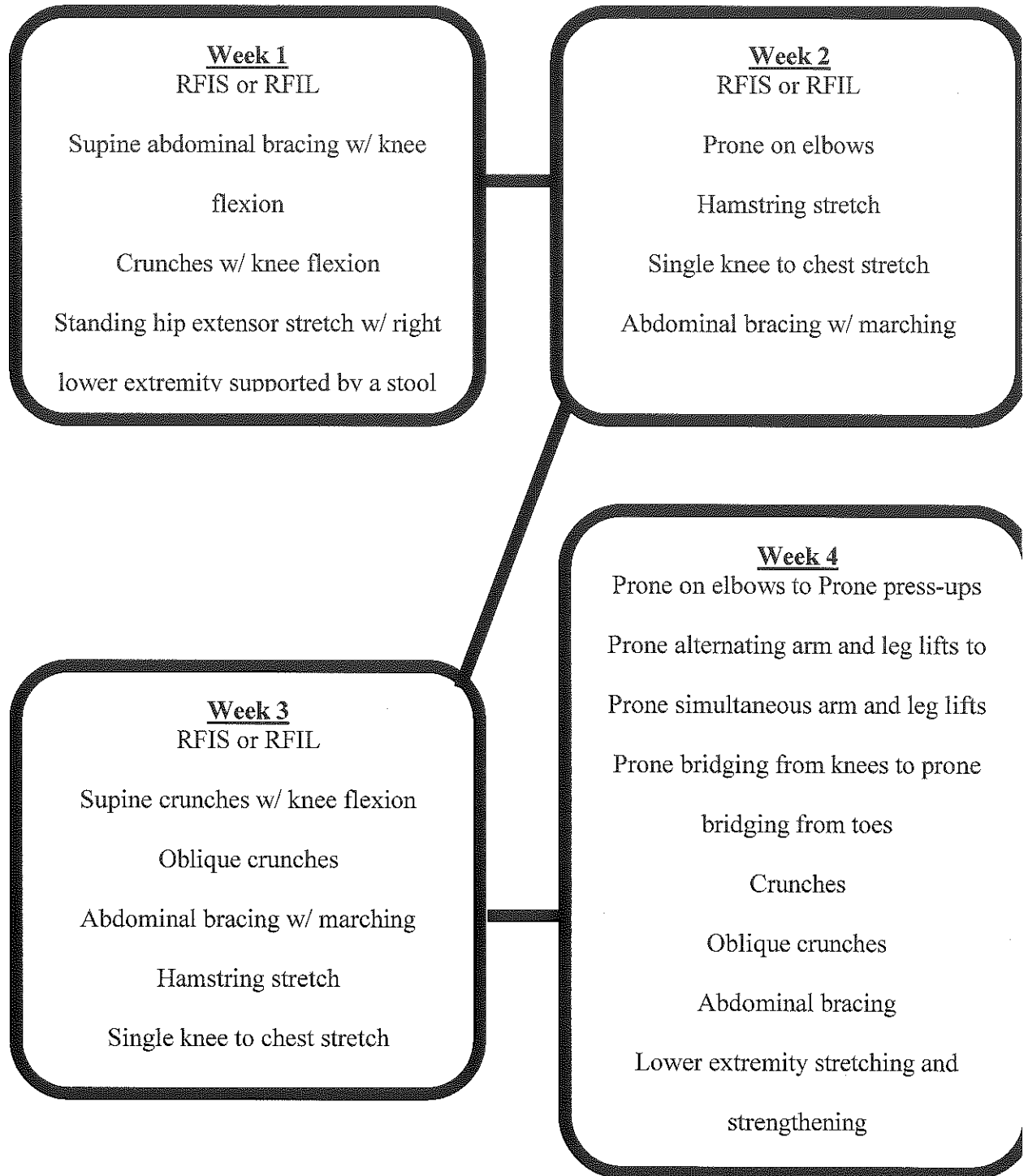
Unfortunately, no functional tool was utilized during this case. Use of a functional tool at initial evaluation, mid-treatment, and at discharge would have been able to further display the efficacy of the MM. The functional tool could also provide an objective progression to the patients return to function. A recommended functional tool would be the Oswestry Back Pain Questionnaire due to its objectivity and ease of application. Another good idea would be to provide the patient or provide a source to obtain a copy of Robin

McKenzie's book, *Treat Your Own Back*. The book was written with the intent of the patient learning about their problem, basic treatment, and avoiding reoccurrence. In the book, the patient will learn that their problem may change or be altered, so a directional preference which helped them previously may not be effective and require professional assistance.

In conclusion, the MM is an effective and quick treatment for LBP with radicular symptoms. More research is necessary to fully explore the possibilities of the MM.

Appendix A

Intervention Algorithm



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