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Unraveling the Mystery of Knee Pain: A Case Report

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ABSTRACT

BACKGROUND AND PURPOSE

Evaluation and treatment of patients referred from physicians with a diagnosis of "knee pain" is commonplace in an outpatient physical therapy (PT) setting. Patients coming to PT through direct access without a physician referral may not have had diagnostic imaging performed to aid in identification of the cause of their knee pain. These situations require physical therapists to be skilled in PT differential diagnosis. The purpose of this case report is to describe the differential diagnosis and clinical decision making used to determine a PT diagnosis based on medical history, patient presentation, and examination findings and secondarily to describe the interventions and rationale used in the patient's rehabilitation.

CASE DESCRIPTION

The patient was a 38-year-old male with an eight month history of knee pain. The patient sought medical treatment and was subsequently referred to PT for treatment of "knee pain". Several tests and measures performed on the patient were negative, effectively ruling out potential PT diagnoses. The patient's subjective report of global knee pain, positive patellofemoral pain syndrome test findings, and negative test findings for other potential diagnoses led to a PT diagnosis of *Guide to Physical Therapist Practice* preferred practice pattern 4E: Impaired Joint Mobility, Motor Function, Muscle Performance, and Range of Motion Associated with Localized Inflammation. A regimen of progressive knee, hip, and core strengthening exercises addressed the patient's functional limitations.

OUTCOMES

The patient demonstrated consistent improvement in knee functional strength and mobility throughout his PT treatment. His knee pain decreased from 3/10 at the initial examination to 0/10 at his last visit. His Lower Extremity Functional Scale Score improved from 50/80 to 74/80. He also reported increased ability to participate in his responsibilities at work and at home.

DISCUSSION

Physical therapists need to be skilled at PT differential diagnosis. This skill is increasingly important when considering the American Physical Therapy Association Vision 2020 and the goals of attaining direct access and autonomous practice. The profession's core values of excellence and professional duty also promote the provision of optimal care which begins with skilled physical therapy differential diagnosis.

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The undersigned certify that they have read, and recommended approval of the research project entitled

Unraveling the Mystery of Knee Pain: A Case Report

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INTRODUCTION

Evaluation and treatment of a patient with knee pain is commonplace in an outpatient physical therapy setting.[1,2] Many of these patients will come into physical therapy with a referral from their primary care physician which simply states "knee pain". With the advancement of direct access in the physical therapy profession, some patients may not have a physician referral nor have had any diagnostic imaging performed to aide in the identification of the cause of the knee pain. Situations such as these require physical therapists to be highly skilled in physical therapy diagnosis of orthopedic injuries, including knee injuries and pain. The description of "knee pain" could encompass any number of injuries or syndromes, including fat pad syndrome, plica syndrome, pes anserine bursitis, a baker's cyst, a hamstring strain, an anterior cruciate ligament (ACL) or posterior cruciate ligament (PCL) tear, medial collateral ligament (MCL) or lateral collateral ligament (PCL) tear, meniscal injury, or patellofemoral pain syndrome (PFPS).

Up to 40% of patients who present with knee pain are suffering from patellofemoral pain syndrome (PFPS), making it the most common knee injury treated by physical therapists .[3-6] PFPS is also the most common lower extremity (LE) overuse injury and is especially common in the physically active, athletic population.[2,6] PFPS is characterized by retropatellar or peripatellar pain which is often associated with activities of the lower extremity which involve loading and weight bearing. [3,6] These activities include walking, running, jumping, climbing stairs, prolonged sitting, and kneeling.

There are many factors that contribute to the development of PFPS. Increased Q angle, patella alta, abnormal or excessive foot pronation, quadriceps femoris muscle weakness, diminished flexibility of the hamstring and rectus femoris muscles, mal-alignment of the femur, and weakness of the hip musculature can all contribute to patellofemoral pain syndrome.[7] Several authors have investigated what causes pain in this condition.[8] In these studies, patients who show degenerative changes (patellofemoral chondromalacia) in their knee joint via radiographic imaging, do not always experience pain. The reverse is also true; patients without visible degenerative changes in their knee joint do occasionally experience and complain of pain.[9-11] These studies suggest that it is the soft tissue structures surrounding the knee joint, and not the osseous structures that are the causes of the retropatellar or peripatellar pain that is felt in PFPS. Soft tissue structures may include the lateral or medial retinaculum, ligaments, tendons, or fat pads.

Many different treatment approaches for patients with patellofemoral pain syndrome have been outlined in the literature. The aspects addressed by most treatment approaches include: reduction of swelling around the knee joint, reduction of pain, restoration of volitional muscle control with an emphasis on the quadriceps muscle, control of the knee through hip musculature strengthening, enhancement of knee soft tissue flexibility and mobility, improved proprioception and neuromuscular control, normalization of gait, and progression back to the patient's normal activities.[3,8] In addition, core strengthening has also been shown to be beneficial in helping to restore function and prevent further injury in patients with LE injuries.[12,13] This finding is based

on the idea that adequate postural support must be present before the initiation of voluntary extremity movements; both for the lower and upper extremities.[13]

The primary purpose of this case report is to describe the differential diagnosis and clinical decision making processes used to determine a physical therapy diagnosis for a 38-year-old male patient with knee pain based on his medical history, patient presentation, and examination findings. The secondary purpose of this case report is to describe the interventions and rationale used in the patient's rehabilitation.

CASE DESCRIPTION

Information regarding the patient's current condition and past medical history were obtained through direct patient interview and review of the patient's medical chart. The patient read and signed an informed consent statement prior to discharge from outpatient physical therapy providing permission to report his case.

The patient was a 38-year-old male who had suffered from left knee pain for approximately eight months. The patient stated that his knee pain began when he stepped into a hole in the middle of the winter and felt his knee hyperextend. Approximately nine months prior to stepping into the hole, the patient had undergone surgery on his left knee after tearing his medial meniscus while snowboarding. A partial medial menisectomy was performed arthroscopically at that time. The patient did not receive physical therapy immediately following the surgery, rather it was an additional three months before he was referred to physical therapy for left patellofemoral pain syndrome and bilateral hamstring tightness. The patient was seen for a total of eight physical therapy visits which focused on increasing knee range of motion (ROM) and muscle strength. The patient was

discharged upon reaching his goals with a home exercise program for continued self-management of his condition. When asked if he had continued to participate in his home exercise program, he indicated that he had not kept up with the exercises. This timeline is summarized in the Figure.

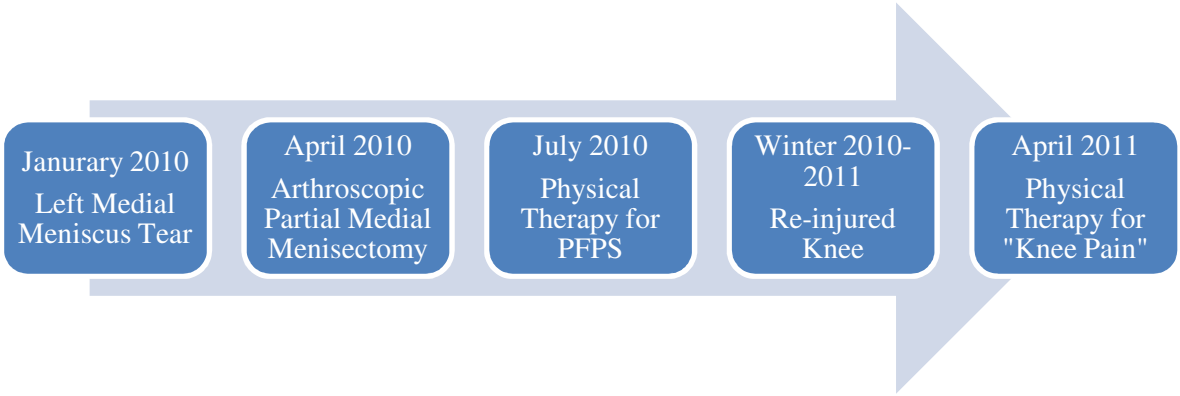

Figure. Timeline of patient's knee pain and treatments

The patient sought medical treatment for his left knee condition after stepping into the hole because he was experiencing pain that was interfering with his daily life and he was concerned that he may have caused damage to his surgical site. The patient owned a pizza restaurant requiring him to be on his feet for at least three hours at a time on a concrete surface. This requirement had become increasingly difficult to do because of the pain he was experiencing in his left knee. He also had two young children who kept him very active and he found it increasingly difficult to keep up with his children. The patient's goal for physical therapy was to be able to participate in his regular activities with decreased pain. These activities included playing with his children, bicycling, and working.

The patient's past medical history included Type I Diabetes Mellitus and hypertension. The patient reported that his diabetes was well controlled and that he was taking medication to control his hypertension.

EXAMINATION

The patient was seen in an outpatient physical therapy clinic. The physical therapy examination was performed by a student physical therapist under the supervision of a licensed physical therapist.

Pain

The patient was asked to rate his pain on a 0-10 scale, with zero representing no pain and ten representing excruciating pain. At the time of the examination, the patient rated his current pain to be a 3/10. He reported that, at best, his pain could be 1-2/10, and at its worst it could be 6/10. He described his pain as an ache located on the posterior aspect of the left knee in the popliteal space. He reported that the pain seemed to "move around" the entire knee joint, depending on the day. The pain did not cause him to wake up at night, but he did sleep with a pillow propped under the left knee for comfort. Sitting or lying down helped to relieve his pain, but moving around, ascending stairs, and putting weight on the left leg increased his pain. The patient reported that he frequently placed an ice pack on his knee and took an over-the-counter anti-inflammatory medicine to help relieve his pain.

Palpation

Palpable structures around the knee joint including the patellar tendon, quadriceps tendon, medial collateral ligament (MCL), lateral collateral ligament (LCL), medial and

lateral joint lines, and hamstrings tendons were assessed. The patient's pain was not reproduced upon palpation.

Strength

Manual muscle testing of the lower extremities was performed and rated as described by Reese[14] to assess lower extremity strength. Strength of the knee extensors and flexors and hip internal and external rotators, flexors, and adductors were all determined to be a 5/5 muscle grade bilaterally. The patient's left hip abductors were rated 4/5, while the right hip abductors were 5/5. Pain was only reproduced during testing of the left knee flexors.

Range of Motion

Range of motion measurements for knee flexion and extension were taken using a standard goniometer with the patient supine.[15] Active right knee ROM was measured to be 3-0-138°. Active left knee ROM was measured to be 2-135°. The patient's hamstring length was also measured bilaterally, with the patient supine and his hip and knee flexed to 90°. He demonstrated a 25° lag on his right side, and a 33° lag on his left side.

Circumferential Measurement

Circumferential measurements of the patient's knees were taken using a plastic tape measure to assess the presence of swelling. Measurements were taken at mid-patella, five inches superior to the middle of the patella and five inches inferior to the middle of the patella. These measurements are displayed in Table 1.

Table 1. Bilateral knee girth measurements (in centimeters)

Location to Patella	Right	Left
5 inches superior	47.3	47.0
Mid-patellar	37.0	37.0
5 inches inferior	40.5	38.0

Patellar Mobility

Patellar mobility was tested bilaterally to assess for tightness in the soft tissue surrounding the knee joint. No significant findings were noted on the right. The left patella was positioned with a lateral tilt while the patient was supine with knee extended and while he was seated at the edge of the table with his knee flexed to approximately 90°.

Gait

The patient demonstrated an antalgic gait pattern with decreased step and stride length on the right. He reported experiencing pain located in the posterior aspect of his knee while ambulating.

Functional Tests

The patient was able to perform a double leg squat past 90° of knee flexion without report of pain. When performing a lateral step down using a six-inch step height while standing on his left leg, the patient demonstrated moderate left knee instability and valgus movement. He did not report experiencing pain with the step down activity. The patient was able to stand on his left leg without an increase in pain and without evidence of knee instability.

Special Tests

Dysfunction surrounding the patellofemoral joint was tested for, with the patellar apprehension test and the patellar grind test. The patellar apprehension test was negative for this patient, while the patellar grind test was positive for pain and crepitus. He also reported experiencing global knee pain and difficulty and pain while using the stairs. The patellar apprehension test has a positive likelihood ratio (LR) of 2.26 and a negative LR of 0.79.[16]

One possible cause for knee pain is inflammation or irritation of the plica. Common subjective patient reports would include pain medial to the patella and pain with squatting, prolonged sitting or kneeling, and pain while descending the stairs. The patient reported pain and difficulty with the stairs and exhibited instability with step tests, but the plica "stutter" test and Hughston's plica test were both negative when performed on this patient, ruling out this condition.

To test for an anterior cruciate ligament tear the anterior drawer test and the Lachman tests were performed. The Lachman test has been shown to have a sensitivity of 0.65-0.99 and a specificity of 0.42-0.97, with a negative LR of 0.19-0.93 and a positive LR of 1.12-27.3.[17] The anterior drawer test has been shown to have a sensitivity of 0.41-0.91 and a specificity of 0.86-1.0, with a negative LR of 0.09-0.62 and a positive LR of 5.4-8.2.[17] Both of these tests were negative when performed on the patient, therefore an ACL tear was effectively ruled out of possible diagnoses for this patient.

Likewise, a posterior cruciate ligament tear was also ruled out by performing the posterior drawer test on the patient. It has been shown to have a sensitivity of 0.90 and a

specificity of 0.99, with a negative LR of 0.10 and a positive LR of 90.[17] This test was also negative for this patient.

A tear of the medial or lateral meniscal ligaments was ruled out by performing the varus/valgus stress test on the patient, with negative findings, despite the fact that he exhibited some instability with the lateral step test which can often occur with pathology to the collateral ligaments. The valgus stress test has a sensitivity of 0.86-0.96.[17] The varus stress test has a sensitivity of 0.25.[17]

A meniscal injury was also possible with this patient, as he had a history of a meniscal tear. However, a tear was ruled out, with a negative McMurray's test. The McMurray test has a sensitivity of 0.16-0.95 and a specificity of 0.25-1.0.[17] It has a negative LR of 0.4-2.84 and a positive LR of 0.39-11.6.[17] The patient also did not report experiencing locking or catching with extension of the knee and he did not complain of any joint line tenderness. Joint line tenderness has a sensitivity of 0.28-0.92 and a specificity of 0.29-0.97.[17] The negative LR for this test is 0.08-2.53 and the positive LR is 0.69-30.7.[17] In addition, the mechanism of injury in this patient did not coincide with the common mechanism of injury for meniscal tears, which is rotation, flexion, and valgus stress.

A posterolateral corner injury was also ruled out with a negative result on the posterolateral drawer test. In addition, the patient did not report joint line pain, which is a common symptom with this type of injury.[18] Additionally, a possible hamstring strain was ruled out due to the fact that resisted isometrics were not weak or painful for this patient, as well as he did not report tenderness upon palpation.

Table 2 outlines the physical therapy differential diagnostic testing and clinical decision making for the physical therapy diagnosis of the patient's knee pain.

Table 2. Physical therapy differential diagnosis and clinical decision making for knee pain

Possible Condition/Syndrome	Patient's Subjective Report	Supporting Evidence	Negative Evidence
PFPS	-Global knee pain -Pain/difficulty with stairs[16]	-Instability with step tests -Positive patellar grind test[16]	-Negative patellar apprehension test[16]
Plica Syndrome	-Pain/difficulty with stairs[16]	-Instability with step tests	-Negative "Stutter" Test and Hughston's Test[16]
ACL Tear	-Pain/difficulty with stairs[16]	-Non-contact trauma	-Negative Anterior Drawer Test and Lachman Test[16] -Did not hear a "pop" at time of injury
PCL Tear	-Pain/difficulty with stairs[16]		-Negative Posterior Drawer Test[16]
MCL/LCL Tears/Instability	-Pain/difficulty with stairs[16]	-Instability with step tests[16]	-Negative varus/valgus stress tests[16] -No pain with squatting[16]
Meniscal Injuries	-Pain/difficulty with stairs[16]		-Negative McMurray's Test[16] -No locking or catching[16] -No joint line tenderness[16]
Posterolateral Corner Injuries	-Pain/difficulty with stairs[18]	-Antalgic gait[18]	-Negative Posterolateral Drawer Test[18]
Hamstring Strain		-Antalgic gait	-Isometric testing not weak or painful -No palpation tenderness

Functional Outcome Measure

The Lower Extremity Functional Scale (LEFS) is an outcome measure that assesses the patient's ability to perform a variety of tasks, including walking, running, sitting, squatting, and hopping. This scale has been recommended for use in the PFPS population.[19] The LEFS has been shown to have a test-retest intraclass correlation coefficient (ICC) of 0.98.[3,16,19] It has a total of 80 possible points and requires an eight point change in score to reflect true change.[16] The patient's score on the LEFS at initial examination was 50.

DIAGNOSIS

The examination findings for this patient were consistent with the *Guide to Physical Therapist Practice* preferred practice pattern 4E: Impaired Joint Mobility, Motor Function, Muscle Performance, and Range of Motion Associated with Localized Inflammation.[20] These findings were also consistent with the medical diagnosis of patellofemoral pain syndrome.

PROGNOSIS

Based on the nature of the patient's condition and supporting evidence from the literature, it was determined that his prognosis for decreased pain during his normal daily activities was good. Despite experiencing pain, the patient remained functional in his everyday life. He was motivated to get better and was willing to participate in a home exercise program. Review of documentation from his previous physical therapy experience showed that the patient was compliant with therapy and that he attained gains in strength, ROM, and functional activities. Frequency of treatments was set at 1-2 sessions per week for approximately four to six weeks, dependent upon the patient's schedule and the need for continued treatment.

INTERVENTION

The patient was seen for five physical therapy sessions, including the initial examination, over a five-week period. Table 3 details the sequence of interventions implemented at each treatment session along with the set and repetition parameters, and specific information regarding how the intervention was performed.

Table 3. Physical therapy interventions during each treatment session

Exercise	Initial Exam	Session One	Session Two	Session Three	Session Four
Prone Plank		1 minute (test)	30 seconds 1 x 3*	45 seconds 1 x 3*	45 seconds 1 x 3*
Left Side Plank		1 minute (test)	30 seconds 1 x 3		
Right Side Plank		1 minute (test)	20 seconds 1 x 3		
Stairmaster "small steps"		6 minutes	6 minutes	8 minutes	8 minutes
Supine Hamstring Stretch		Bilateral Contract/Relax 5 second hold 1 x 3	Bilateral Contract/Relax 5 second hold 1 x 3	Bilateral Contract/Relax 5 second hold 1 x 3	Bilateral Contract/Relax 5 second hold 1 x 3
Kneeling Quadriceps Stretch		Bilateral 30 second hold 1 x 3	Bilateral 30 second hold 1 x 3	Bilateral 30 second hold 1 x 3	
Inverted Hamstring Exercise	Left leg stance To the floor 2 x 10	Left leg stance To the floor 1 x 10	Left leg stance To the floor 1 x 10	Left leg stance To the floor 2 x 10	Left leg stance To the floor 2 x 10
Lateral Step Down	Left leg stance 6 inch step 2 x 10	Left leg stance 6 inch step 1 x 10	Left leg stance 8 inch step 3 x 10	Left leg stance 8 inch step 3 x 10	
Forward Step Down					Left leg stance 8 inch step 3 x 10
Single Leg Stance, Isometric Hip Abduction		Bilateral Against wall 10 second hold 1 x 5	Bilateral Against wall 10 second hold 1 x 5	Bilateral Against wall 10 second hold 1 x 5	
Lateral Stepping					Resistance band around ankles 15 feet 1 x 4
Wall Squats with Ball Between Knees			75° Knee flexion 20 second hold 1 x 5	90° Knee flexion 20 second hold 1 x 5	
Leg Press with Resisted Hip Abduction					110 pounds Theraband around thighs 70° Knee flexion 2 x 10

*Sets and repetitions are listed on the last line of each entry. Number of sets is listed first, followed by an 'x', with number of repetitions listed last.

On the day of the initial examination, the patient performed an inverted hamstring exercise in response to the examination findings of tight left leg hamstrings. A lateral step down exercise using a 6-inch step was initiated to help increase left knee quadriceps muscle strength and left knee stability. The patient was instructed to do these exercises at home as well. When he came back for his first follow-up treatment session, he demonstrated moderate difficulty and mild pain while performing the inverted hamstring exercise and the lateral step down exercise. For this reason the number of sets for each exercise was reduced to just one set of 10 repetitions. As the treatment sessions continued, the number of sets for these two exercises was increased as the patient was able to demonstrate correct technique with each exercise as well as no increase in pain while completing the exercises.

In a study conducted by Earl and Hoch[12] 19 women with PFPS participated in a proximal strengthening program for eight weeks. The participants performed side planks and prone planks as part of their core strengthening program. After eight weeks, the participants showed improvements in pain, functional ability, and generalized strength.[12] In addition, a report by Arendt[13] discusses the importance of adequate postural support, which is needed before the initiation of voluntary extremity movements. Based on these findings, on the patient's first follow-up visit, he was tested to see how long he could correctly perform a prone plank, left side plank, and right side plank. The patient was instructed to hold the position until exhaustion, or until one minute passed. He was able to hold each position for one minute, but with signs of instability in all three positions. At subsequent follow-up visits, the time for each position was decreased to ensure that the

patient was able to perform each exercise correctly for the entire time. The right side plank exercise was decreased to a 20 second hold at the second follow-up treatment due to the patient's complaints of right shoulder pain. At the subsequent follow-up visits, both the left and right side planks were discontinued due to increased complaints of shoulder pain.

At the fourth follow-up treatment session, the lateral step-downs were advanced to forward step downs. A study by Chinkulprasert et al[2] demonstrated that lateral step-up and step-down exercises put the least amount of stress on the patellofemoral joint as compared to forward step-down exercises. This study found that the lateral step-up and step-down exercises resulted in less patellofemoral joint reaction forces than forward step-down exercises. For this reason, the authors stressed using caution when implementing forward step-downs into a rehabilitation program. This exercise was included in the patient's exercise plan due to the progress with his other exercises as well as his reports of decreased pain. The patient was able to perform a forward step-down using an 8-inch step without pain and without demonstrating any left knee instability.

OUTCOMES

The patient demonstrated consistent improvement in knee functional strength and mobility during his physical therapy treatment. His pain decreased from 3/10 at the initial examination to 0/10 at the fourth follow-up visit. His left knee flexion active ROM improved from 135° to 143° and his left knee extension ROM improved from 2° of flexion to 3° past neutral. The patient's LEFS score improved from 50 to 74; a change of 14 points, which is more than the eight required to show true change.[16]

The patient met four of five of the goals set for him by the clinician (Table 4). One goal that was ongoing upon the patient's discharge from physical therapy was ascending stairs without pain. The patient reported he continued to experience minimal pain while ascending the stairs. He did indicate, however, that he was able to play with his children and ride a bike with decreased pain; therefore meeting his personal goal.

Table 4. Goals, timeframe, and status

Impairment/Functional Limitation	Goal	Time Frame	Status
Constant pain of 3-4/10 in left knee	Reduce pain to < 3/10 in the left knee, 100% of the time	4 weeks	Met
Difficulty ascending the stairs secondary to pain	Ascend and descend stairs without pain	6 weeks	Ongoing
Difficulty standing longer than 2-3 hours	Increase standing tolerance to 3-4 hours in order to perform work duties without pain	5 weeks	Met
Lower Extremity Functional Scale score of 50	Improve Lower Extremity Functional Scale score to 65	4 weeks	Met
Patient not independent with a HEP	Patient independent with a HEP	1 week	Met

DISCUSSION

Physical therapists need to be skilled at physical therapy differential diagnosis when a patient presents to physical therapy with a non-specific orthopedic diagnosis. Physical therapists need to be familiar with numerous tests and measures and when they should be performed as well as what subjective information to gather in order to understand what may be causing the patient's pain, functional deficits, or disabilities. Some diagnoses can be excluded early in the process through information obtained in the patient's history; other diagnoses require objective measures to either rule in or out the physical therapy diagnosis. This case report outlined the physical therapy differential

diagnosis, clinical decision making, and rational for treatment interventions for a 38-year-old male with complaints of knee pain.

Multiple tests and measures were performed with this patient in order to differentially diagnose his injury. The knee is a complex area of the human body due to the numerous soft tissue structures surrounding the joint; therefore a number of diagnoses could have been causing the patient's pain and functional limitations. The diagnostic process was further complicated by the patient's previous history of left knee pain and surgical intervention. The location of pain changed depending on the day and activity in which the patient was participating, further confounding the clinical picture. A physical therapy diagnosis of dysfunction surrounding the patellofemoral joint was reached based on a combination of subjective information and specific objective tests and measures, despite these associated complexities.

The patient was successful in his rehabilitation as he met all but one of the goals set for him by the student physical therapist (Table 4) and as documented by the change in his LEFS score. In addition to the goals set by the student physical therapist, the patient met his personal goal of being able to return to work, play with his children, and ride a bike without pain. The patient was extremely motivated to participate in physical therapy interventions and was faithful with his home exercise program, often performing exercises in excess to those prescribed to him by the student physical therapist. Multiple discussions were held with the patient regarding these additional exercises in order to ensure the safety and appropriateness of these exercises. The patient's motivation and

willingness to participate in physical therapy treatment likely contributed to his success in rehabilitation.

The inclusion of hip and core strengthening also contributed to the patient's successful knee rehabilitation. The importance of core strengthening in the rehabilitation of the knee has been highlighted in the literature.[12,13] This literature documentes that adequate postural support must be present before the initiation of voluntary extremity movements. This concept is especially important when there is any dysfunction of the extremities present, as was the case with this patient. The patient was able to increase the amount of time he held a prone plank without significant instability throughout the course of his rehabilitation. By strengthening his proximal musculature, the patient may have been able to participate in the other components of his rehabilitation more easily than if core strengthening had not been included in his plan of care.

A limitation to this case report is that the patient did not continue with physical therapy after his fourth follow-up visit. He was scheduled to have at least two more follow-up sessions, however he chose to cancel those sessions as he was feeling much better and thought he would be able to manage his symptoms and exercise program at home. Continued follow up with the patient may have been beneficial in determining if the physical therapy interventions had lasting effects.

Considering the future of the profession, physical therapists need to be skilled at physical therapy differential diagnosis. This skill has become increasingly important when one considers where the physical therapy profession is heading, as described in the American Physical Therapy Association (APTA) Vision 2020[21], which states:

> By 2020, physical therapy will be provided by physical therapists who are doctors of physical therapy, recognized by consumers and other health care professionals as the practitioners of choice to whom consumers have direct access for the diagnosis of, interventions for, and prevention of impairments, activity limitations, participation restrictions, and environmental barriers related to movement, function, and health.[21]

Note that physical therapy diagnosis is specifically mentioned in the Vision 2020[21] statement and is directly tied to the physical therapy profession's success in achieving autonomous practice.

The American Physical Therapy Association endorses and promotes the core values of accountability, altruism, compassion/caring, excellence, integrity, professional duty, and social responsibility.[22] The core values of excellence and professional duty are especially relevant when considering physical therapy differential diagnosis. The APTA describes excellence as "excellence in physical therapy practice that consistently uses current knowledge and theory while understanding personal limits, integrates judgment and the patient/client perspective, embraces advancement, challenges mediocrity, and works toward development of new knowledge."[22] This core value focuses on using evidence based practice in all aspects of physical therapy. Physical therapy differential diagnosis is one way in which physical therapists can implement evidence based practice into patient care. Differential diagnosis requires the physical therapist to be knowledgeable in current evidence for the tests and measures that are utilized in the examination of a patient.

Another core value that is particularly relevant to differential diagnosis is professional duty.[22] The APTA defines it as "the commitment to meeting one's

obligations to provide effective physical therapy services to patients/clients, to serve the profession, and to positively influence the health of society."[22]

The provision of "optimal care", which is a sample behavior for this core value, starts with effective differential diagnosis.[22] By effectively identifying what is causing the patient's symptoms or to experience deficits in their functional mobility, physical therapists can provide better, more effective care to their patient.

SUMMARY AND CONCLUSIONS

This case report provides an example of the importance of skilled physical therapy differential diagnosis. Accurately identifying what was causing the patient pain and decreased functional mobility allowed an appropriate plan of care to be implemented, the patient to participate in a rehabilitation program that focused on his impairments and functional limitations, and resulted in the patient's return to his normal activities.

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