

Conservative Management of Possible Meniscal Derangement Using the Mulligan Concept: A Case Report



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ABSTRACT

Objective: The purpose of this case study was to report on the immediate effects of the combined use of mobilizations with movement and the “squeeze” technique on a patient with knee stiffness, popping, and swelling.

Clinical Features: The patient presented with right knee stiffness, swelling, and a popping sensation of insidious onset. Clinical examination revealed pain with terminal knee extension and flexion, joint line tenderness, a positive Apley’s compression test, and a positive Thessaly’s test at 20° of knee flexion. A working diagnosis was established of a meniscal pathology with the differential diagnoses of meniscal derangement and synovial plica.

Intervention and Outcome: The patient received 3 total treatments using the Mulligan concept over the course of 11 days. The treatments included the application of a tibia internal rotation mobilization with movement and the “squeeze” technique to the affected knee. Patient outcomes, including the Disablement in the Physically Active Scale, the Patient-Specific Functional Scale, and the Numeric Rating Scale for pain, were collected throughout the course of treatment. The patient reported a minimal clinically important difference on the Numeric Rating Scale for pain after each treatment and on all outcomes after the third treatment. The patient reported improvement on her follow-up visit 4 days after the third treatment; the results of a clinical exam and patient outcomes supported a complete discharge after 3 treatments.

Conclusion: This patient responded favorably to use of the Mulligan concept as a manual therapy technique for the treatment of symptoms related to possible meniscal derangement. (*J Chiropr Med* 2017;16:308-315)

Key Indexing Terms: *Musculoskeletal Manipulations; Knee Injuries; Osteoarthritis*

INTRODUCTION

Meniscal tears are a common pathology among adolescents, athletes, and the general population and are the most common knee injury in adults.^{1,2} Depending on the onset, tears are classified as either acute/traumatic or chronic/degenerative.^{3,4} Acute tears caused by a specific mechanism of injury occur more often in young active individuals,⁵ whereas the prevalence of degenerative tears with a gradual onset increases with age.⁴ The most common risk factor for sustaining an acute meniscal tear is participation in sports.⁶ In contrast, chronic

tears often occur as a result of persistent kneeling, repetitive squatting, or climbing stairs.^{6,7} Classic signs and symptoms of all meniscal tears include catching, locking, and clicking; joint line tenderness (JLT); and a feeling of “giving out” or instability.⁸ Patients also commonly report pain with squatting, the inability to perform a full squat, and a gradual onset of swelling over the first 24 hours following an injury.⁴

The current practice in the diagnosis and treatment of meniscal tears involves reliance on diagnostic imaging and surgery.⁹⁻¹² Arthroscopy is the gold standard for diagnosis; however magnetic resonance imaging (MRI) is more commonly utilized for a variety of reasons (eg, less invasive).¹³ Despite the prevalence of MRI confirmation, experienced clinicians are encouraged to rely on a detailed patient history combined with battery of special tests to accurately diagnose meniscal tears.^{8,13-15} Several researchers conclude that a thorough clinical exam may be as accurate or better than MRI in detecting meniscal tears.^{8,13,14,16,17} In fact, Lowery et al⁸ have presented a clinical composite exam for the identification of meniscal tears that has a diagnostic accuracy similar to that of an MRI. The exam is focused on

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assessing for a history of clicking/popping, JLT, pain with terminal knee extension, pain with terminal knee flexion, and a positive McMurray's test. The presence of all 5 symptoms results in 99% specificity, 11% sensitivity, and a 92.3% positive predictive value (PPV) for detecting a meniscal tear. The specificity and PPV drop to 96.1% and 81.8%, respectively, when only 4 symptoms are present, and to 90.2 and 76.7% with 3 symptoms, whereas sensitivity increases to 17% and 31%, respectively.⁸ The accuracy of the clinical composite exam is comparable to that of MRI; researchers have reported specificity to be between 71% and 93%, sensitivity between 64% and 96%, PPV 84%, and clinical accuracy 73%-88%, depending on the location and type of tear.^{4,18,19} Combined use of the Thessaly and JLT tests alone also offers 93% and 92% diagnostic sensitivity and specificity, respectively.²⁰

Arthroscopic meniscal repair and arthroscopic partial meniscectomy (APM) remain the current standard of practice,²¹ with APM being the most common orthopedic surgical procedure performed in the United States.^{9,22} Surgical repair is the most frequently advised method because of the preservation of the meniscus²³; however, meniscal repair surgery is limited to the presentation of the tear and is most successful when the tear is located in the vascular portion of the meniscus.¹² Surgical failure leading to follow-up compensatory surgeries (eg, APM) is associated with meniscal repair surgeries.^{12,24} A concern with the prevalence of APM is its correlation with osteoarthritis (OA), and some have suggested APM is the leading cause of OA of the knee.^{23,25}

To break the cycle between APM and OA and prevent unnecessary surgery, researchers overwhelmingly advise clinicians to exhaust conservative therapy options, which include range of motion and strengthening exercises, before encouraging patients to explore surgical treatment for meniscal tears.²⁶⁻²⁹ Unfortunately, like meniscal repair and APM, conservative treatment of meniscal tears has also produced less than optimal patient outcomes for various reasons, such as lengthy rehabilitation time frames and inconsistent patient compliance.^{10,12,26,27}

In pursuit of improved patient outcomes and a decreased patient burden, the Mulligan concept has been proposed as a potential alternative method for conservative management of meniscal tear symptoms.³⁰⁻³² The Mulligan concept is a form of manual therapy designed to immediately restore or improve normal physiological movement. Mobilizations with movement (MWMs), a component of the Mulligan concept, are designed to increase functional mobility and decrease pain. To perform an MWM, the clinician applies a passive joint mobilization while the patient simultaneously performs the previously provocative motion. Mobilizations with movement can be applied to acute, subacute, or chronic conditions. If indicated, the MWM will produce an immediate reduction or complete elimination of symptoms with lasting results.³³ If a pain-free mobilization cannot be achieved after multiple attempts, a MWM may not be indicated for the patient.

In addition to MWMs, the Mulligan concept also includes the "squeeze" technique designed to treat 2 common symptoms of meniscal tears: JLT and painful or limited range of motion at the knee.³³ To apply the technique, the clinician provides direct manual pressure at the site of maximal JLT while the patient moves into the previously limited or painful range of motion (ie, flexion or extension).³³ The maneuver is often uncomfortable for the patient, but if indicated, it will produce an increase in range of motion and a decrease in localized JLT after treatment. Few researchers have examined the effects of application of the Mulligan concept for the treatment of meniscal tears,³⁰⁻³² and more evidence is needed to assess the effect of combined Mulligan concept interventions when utilized in clinical practice. The purpose of this case study was to report on the immediate effects of the combined use of MWMs and the "squeeze" technique on a patient who presented with an insidious onset of symptoms for meniscal derangement meeting the clinical diagnostic criteria of a meniscal tear.

CASE REPORT

A 26-year-old physically active woman presented with insidious right knee stiffness and swelling that had developed over the previous 4 days. The patient recalled periods of momentary locking of her knee after the initial onset, as well as a popping sensation whenever ascending stairs. She did not report any previous history of right knee pathology. The initial orthopedic exam revealed joint effusion, painful end range of motion pain in knee flexion, and pain with squatting that she rated 3 of 10 on the numeric rating scale (NRS) for pain.

The presence of pain with squatting without any other obvious findings led to diagnostic application of MWMs (ie, various attempts to identify a pain-free mobilization) of the tibia while the patient performed an active weight-bearing squat (Figs 1 and 2). A tibia internal rotation MWM resolved the patient's pain while squatting, so the MWM was applied further as an intervention (Table 1). A compression wrap was applied to the patient's knee, in a spiral fashion distal to proximal, to address the joint effusion. The patient was then scheduled for follow-up assessment and implementation of a full rehabilitation protocol assuming her presentation did not change. Because of the insidious onset, absence of red flags for injury/illness, normal findings on all strength and orthopedic special tests (ie, Thessaly's test, anterior and posterior drawers, varus and valgus stress tests), and improvement with MWM application, the patient was provisionally classified with inflammation and irritation of the synovial capsule secondary to a suspected synovial plica.

At the reexamination, the patient reported decreased knee joint stiffness, but continued pain with biking and descending stairs (4/10 on the NRS). The joint effusion had not improved, and the anterior medial tenderness to palpation was more isolated to the joint line. Pain was present with terminal knee extension and flexion; when her history of popping/locking

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