

Effects of Mulligan technique in knee tendinopathy in basketball players

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KEYWORDS

Patellar tendon injuries, basketball, mulligan, knee injuries.

ABSTRACT

Introduction: Tendinopathy considered as a problem present in sports, like in basketball players. Patellar tendon injuries in the sport of basketball are widespread bigger compared to other sported nearly (21,5%) of injuries. The purpose of our study is to evaluate the effect of the Mulligan technique on tendinopathy of the knee in basketball players.

Objectives: The objectives of this study is to evaluate the effect of the mulligan technique in the case of tendinopathy. How does the mulligan technique affect the improvement of the articular amplitudes for the knee joint and how does this technique affect the improvement of the pain level.

Methods: This a case report. professional basketball in Gega basketball team 19-year-old male. During the routine assessment, the basketball player complains of pain while palpating the patellar tendon. Several tests were applied like the one-leg stand test SLDS and the Royal London Hospital test.

Results: This study evaluates positive values for the pain scale; NPRS test from grade 6 pain pre -treatment in 2 and 0 scale of pain after first session e third session of mulligan technique. Also, regarding the articular amplitude, especially the flexion, we noticed its improvement from the first day after the treatment to reaching the final flexion amplitudes in the second treatment.

Conclusions: The Mulligan technique in this case report of the basketball player of the Gega basketball team were effective in two important variables, range of motion of knee joint, especially for the flexion movement, and the absolute improvement of pain.

1. Introduction

Tendinopathy considered as a problem present in sports that are based on jumping as in basketball player (Zellmer, M., et al, 2019)¹ (Nutarelli, S., et al 2023)⁶. The immediate activation of muscles during jumping and standing in basketball players activates them eccentric and concentric way, showing acute injuries such as tendinopathy at the knee level (Mirjana Milić., et al 2023)². The incidence at the athlete level for tendinopathy is 7% (Nutarelli, S., et al 2023)⁶. In the sport of basketball, pain is asymptomatic (Hannington, M., et al 2022)³, only if the patellar tendon is palpated they have pain. There is a close report between the sport of basketball and tendinopathy pain and the effect that BMI and years of playing basketball (de Vries., et al 2015)⁴. To identify tendinopathy in addition to palpation, valid napping pain and clinical functional tests. SLDS is a provocative test for identifying tendinopathy in basketball players (Hannington, M., et al 2022)³ (Florit, D., 2019)⁵. Patellar tendon injuries in the sport of basketball are widespread bigger compared to other sported nearly (21.5%) of injuries (Florit, D., 2019)⁵. The gender most affected by tendinopathy are women who are affected during exercises but not during the activity of daily life (Mirjana Milić., et al 2023)² (Hannington, M., et al 2022)³. The prevalence of pain localization is usually in the inferior border of the patella in men with right leg dominance (Hannington, M., et al 2022)³. Regardless of the fact that the pain of the patellar tendon is different, it can be located in the medial, lateral, backside of the knee, pain around and behind the patella, pain of the patella tendon and pain above the patella (de Vries., et al 2015)⁴. In the treatment of this injury, different forms of physiotherapeutic rehabilitation are used. The use of the program through exercises significantly reduces the risk of installing the patellar tendon in athletes (Bittencourt, N. F. N., 2022)⁷. On the other hand, reduced hamstring muscle flexibility, increased foot pronation and reduced ankle dorsiflexion range influenced the reduction of the risk of developing patellar tendinitis in basketball players (Aiyegbusi, A., 2019)⁸. The use of shockwave therapy is also effective in patellar tendinopathy in basketball players (Zhang, Z. J., 2020)⁹. In the study of (Rehman, M., & Riaz, H. 2021)¹⁰ gave importance the effect that the Mulligan Technique had in improving pain and functionality in the case of tendinopathy. The purpose of our study is to evaluate the effect of the Mulligan technique on tendinopathy of the knee in basketball players.

2. Objectives

Evaluation of the effects of the Mulligan technique in this case study regarding the level of pain and the impact

or not on the articular amplitude (ROM) for the knee joint

3. Methods

Case report

A 19-year-old basketball player who plays with the Gega Basketball team with BMI=24, height and weight 187cm/ 84 kg. During the routine assessment, the basketball player complains of pain while palpating the patellar tendon. The one-leg stand test SLDS and the Royal London Hospital test were applied to the basketball player (Maffulli, N., et al 2017)¹¹. The test result was positive for both clinical test. During the napping pain test performed on the basketball player, pain was referred to the inferior pole of the patella. During the napping pain test performed on the basketball player, pain was referred to the inferior pole of the patella. Our case of the basketball player accept voluntary participation in our study, by filling out a preliminary consent and intervention form. At the same time ethical principles were followed according to the declaration of Helsinki.

Outcome measures

Several outcomes were used on this clinical case. First the SLDS test was applied, the basketball player asked to stay in a half-squat with the right leg for 30 seconds and then alternated with the left leg. The basketball player reports pain during the SLDS test when performed with the left leg. Second test was performed the Royal London Hospital test on the basketball player (Maffulli, N., et al 2017)¹¹, the basketball player positioned on the supine and the physiotherapist palpates the patellar tendon 1cm away from distal insertion, with the knee joint positioned in extension. Then perform 90 degree knee flexion. Test was positive when we went from extension to flexion of the knee joint on the basketball player. Another outcome that was used was the NPRS test-numerical pain scale. To localize the pain, napping pain was used to determine if the pain present was focal/diffuse. Finally, the goniometer was used to assess the articular amplitude of the knee joint.

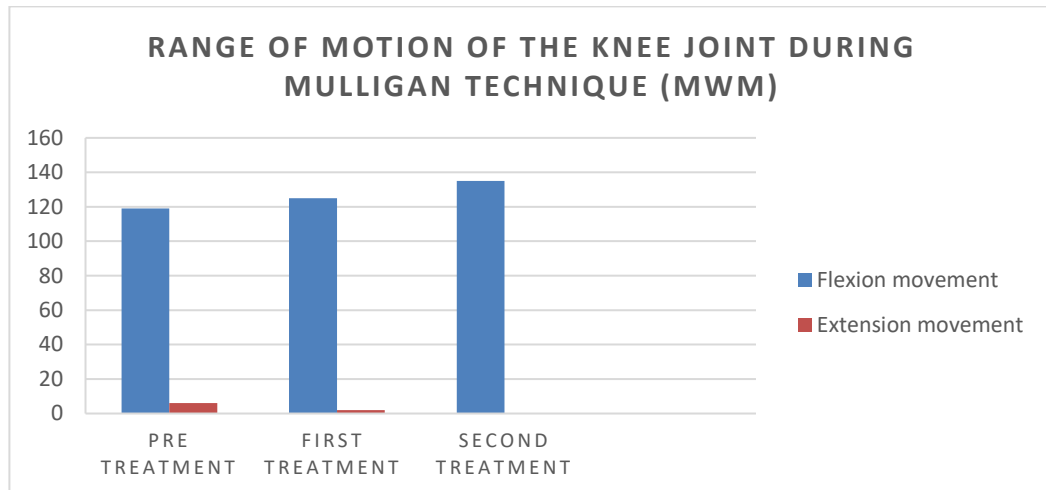
Intervention

The Mulligan MWM technique was applied to the basketball player by a physiotherapist who is certified to use the Mulligan technique and with experience in the clinical field over 14 years. The treatment and assessment of the basketball player is performed at the Physiotherapy Clinic at Aleksander Moisiu University, Durrës. During the application of the Mulligan Technique, we positioned the basketball player on weight bearing, since the beginning of the technique, referring to pain only during the palpation and test on the patellar tendon. The basketball player stands with one leg resting on the bed, easily positioning it in flexion, the basketball player also stands static and the physiotherapist performs the medial glide. Meanwhile it is required to increase the degree of flexion on the left knee, the medial glide mobilization is maintained by the physiotherapist throughout the time the basketball player goes from light flexion to maximal flexion and is performed with 10/3 sets. In the following, we continue the application of the Mulligan MWM technique during the bilateral squat, increasing the degree of load for the left knee. We continue with the same glide medial mobilization and repeat it for 10 mobilizations with 3 sets each.

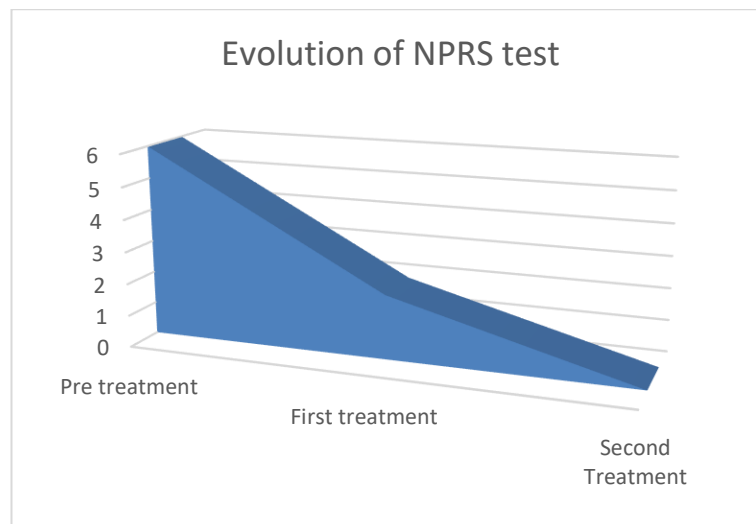
4. Results

On the basketball player, was evaluated the articular amplitude of the knee joint in the pre-treatment period, first treatment with Mulligan technique and second treatment with Mulligan Technique (MWM). Pain was also assessed through the NPRS test and at the same time was combined with the one-leg stand test SLDS. After we evaluated the basketball player with the palpation test of the patellar tendon, he referred to grade 6 pain, but this pain was not at rest. We applied the Mulligan technique (MWM) in the weight bearing position and in the bilateral squat. Performing 10 mobilizations with 3 sets for 2 weeks. In the first week, we performed two interventions with the Mulligan technique and 1 in the second week. in graph number 1 and 2, we can see the visible improvement of the NPRS pain level from 6 before treatment, to 2 in the first treatment and to 0 in the final treatment. Also, regarding the articular amplitude, especially the flexion, we noticed its improvement from the first day after the treatment to reaching the final flexion amplitudes in the second treatment. Also in the napping test, in our case, the basketball player refers to pain in the inferior pole of the knee during the

SLDS test and the Royal London Hospital test.



Graph 1 range of motion for knee joint during Mulligan technique (MWM)



Graph 2 Evolution of NPRS test

5. Discussion

In this case reported of a basketball player who plays in the elite team was evaluated regarding the impact of the Mulligan technique (MWM) on his tendinopathy present in the left knee. In the study findings it was verified that the basketball player had tendinopathy during the palpation of the tendon and the application of the SLDS test and the Royal London Hospital test. In the study by (Hannington, M., et al 2022)³, through the SLDS test was evaluated that tendinopathy in athletes were more spread unilaterally (60%), while it was bilateral in the values (26%), the prevalence in the left knee prevailed with the values (47%) as in our case and 91 (42%) on the right knee. The Mulligan technique is effective in improving joint flexibility and pain in our case report for three sessions of the Mulligan technique. In the study of (Jayaseelan, D. J., et al 2020)¹² regardless of the fact that patellofemoral pain was treated, the same mulligan technique was used, medial patellofemoral joint mobilization with movement during unilateral and mobilization during bilateral squat. Result efficient in eliminating pain as in our study, but at the same time the motor deficit in athletes was improved. In the study by (Judge KS, et al 2018)¹³ in which anterior knee pain in basketball players was evaluated, the Mulligan Technique was effective both in the study in terms of pain and knee flexibility, regardless of the fact that tibial internal rotation was used in this case and Mulligan's tapin. Meanwhile, in the study of Rehman, M., & Riaz, H. (2021)¹⁴, patellar pain syndrome was treated, the treatment was 2 weeks as in our study and it was estimated that the mulligan technique gave effects in terms of improving pain, articular flexibility but at the same time functionality regardless of whether MWM Mobilization and Mulligan's taping were applied. Even in the study of (Konstantinos Zemadanis., et al 2015)¹⁵, the Mulligan Technique was evaluated as effective in patellofemoral syndrome in improving pain and functionality, as in our study. In all these studies is emphasized improvement of pain and articular flexibility of the knee, through the Mulligan technique and its sub-techniques, as well as in our case report.

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