Mulligan Mobilization Techniques to Restore Knee Flexion in a Post-ACLR Handball Player: A Case Report

Keywords: ACLR, meniscus repair, Mulligan technique, manual therapy, knee flexion, sports rehabilitation, case report

Abstract

Background: Persistent limitations in knee flexion after anterior cruciate ligament reconstruction (ACLR) with meniscus repair can hinder athletic performance, delay return to sport, and reduce overall quality of life.

Purpose: This case report explores the application of Mulligan mobilization techniques to address chronic knee flexion restriction in a competitive handball player one year post-ACLR.

Case Description: A 24-year-old male handball player, one year post-ACLR using a patellar tendon bone (PTB) graft with concurrent medial meniscus repair, presented with knee flexion limited to 125°, pain during quadriceps stretching, and difficulty in functional positions such as cross-legged sitting.

Intervention: An 8-week program incorporating weekly Mulligan mobilization with movement (MWM) techniques—lateral tibial glide in prone and internal tibial rotation in supine—was implemented alongside home-based active flexion drills.

Outcomes: Knee flexion improved to >135° with resolution of pain during functional positions and quadriceps stretching. The patient returned to full handball training without restrictions.

Conclusion: Mulligan mobilization techniques may offer an effective, non-invasive solution for post-operative flexion deficits in athletes, supporting both functional recovery and return-to-sport readiness.

Introduction

Anterior cruciate ligament injuries are among the most common and debilitating sports-related knee injuries, particularly in pivoting and contact sports such as handball. Surgical reconstruction, often accompanied by meniscus repair, aims to restore stability, preserve joint integrity, and enable athletes to return to high-level activity (Logerstedt et al., 2013).

Despite advances in surgical technique and rehabilitation, some patients experience persistent range of motion (ROM) deficits, notably in flexion, which can impair biomechanical efficiency and athletic performance (Shelbourne et al., 1996; Wellsandt et al., 2017).

Post-operative stiffness—frequently linked to arthrofibrosis—can be challenging to manage and may necessitate targeted manual therapy to restore joint mechanics (Hing et al., 2019). The Mulligan Concept, integrating mobilization with movement (MWM) principles, utilizes sustained accessory glides or rotations while the patient actively moves the joint through the restricted range (Hall et al., 2007). This approach can reduce pain, normalize arthrokinematics, and promote neurophysiological facilitation of movement (Vicenzino et al., 2009).

This case report details the successful use of Mulligan mobilization techniques to restore knee flexion in a competitive athlete one year after ACLR, highlighting its potential role in sports rehabilitation protocols.

Case Presentation

A 24-year-old male professional handball player presented to the physiotherapy department with ongoing difficulty achieving full knee flexion during functional activities. He reported pain during quadriceps stretching, inability to sit cross-legged without discomfort, and limitations in deep squatting—movements critical for handball agility and defensive play.

He had undergone right ACLR with PTB graft and medial meniscus repair 12 months prior. His post-surgical course was uneventful, with no episodes of graft failure, infection, or significant effusion. Despite completing a standard physiotherapy program, he remained restricted in high-flexion activities, prompting further intervention.

Clinical Findings

- Active knee flexion: 125°, with end-range discomfort
- Functional pain: During quadriceps stretching and prayer-position sitting
- Knee stability: Normal on Lachman and pivot-shift tests
- Strength: Full isometric quadriceps and hamstrings strength
- Primary deficit: Arthrokinematics-related mobility restriction

Therapeutic Intervention

Two specific Mulligan techniques were employed over an 8-week period, with one supervised session per week and daily home exercises:

1. Lateral Glide of Tibia in Prone Position: With the femur stabilized, the therapist applied a

sustained lateral glide to the tibia while the patient actively flexed the knee.
2. Internal Tibial Rotation in Supine: The tibia was mobilized into internal rotation relative to the femur while the patient actively moved into flexion.

These were complemented by:
- Active-assisted knee flexion exercises
- Functional mobility drills (deep squatting progression)
- Gentle soft tissue mobilization for quadriceps flexibility

The patient was subjected to Mulligan Technique three sessions per week for a period of three weeks, performing three sets of ten repetitions during each session. A home program was demonstrated, incorporating self-mobilization techniques using a towel once a day throughout the intervention period.

Outcomes

At 8 weeks:
- Knee flexion ROM: Increased from 125° to >135°
- Functional activities: Cross-legged sitting and quadriceps stretching were pain-free
- Sport participation: Full return to competitive handball without limitations
- Sustainability: Gains maintained at 2-month follow-up without regression

Discussion

This case supports the integration of Mulligan mobilization into late-stage post-ACLR rehabilitation, particularly when standard physiotherapy fails to resolve residual motion deficits. MWM techniques likely improved tibiofemoral glide mechanics, reduced joint stiffness, and facilitated neuromuscular control, aligning with findings from Hing et al. (2019) and Vicenzino et al. (2009).

Persistent flexion deficits, if unaddressed, can compromise kinetic chain efficiency, increase compensatory loading on adjacent joints, and predispose athletes to overuse injuries (Wellsandt et al., 2017). Given its safety, non-invasiveness, and adaptability to functional positions, the Mulligan Concept offers a viable adjunct in sports-specific rehabilitation.

Patient Perspective

The athlete described the treatment as “transformative,” reporting increased comfort, restored confidence in knee function, and the ability to perform high-demand maneuvers without apprehension.

Conclusion

Mulligan mobilization techniques may be a valuable adjunct for resolving chronic knee flexion deficits post-ACLR. Their inclusion in sports rehabilitation programs could expedite functional recovery and support a safe return to competitive play.

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