

A Brief Study on Mulligan Techniques

Raj Kumar Sharma¹, Dr. Parmanand²

¹Research Scholar, Department of Microbiology, NIILM University, Kaithal, Haryana, India

²Supervisor, Department of Microbiology, NIILM University, Kaithal, Haryana, India

Article Info

Volume 9, Issue 6

Page Number : 789-798

Publication Issue

November-December-2022

Article History

Accepted : 30 Nov 2022

Published : 20 Dec 2022

ABSTRACT

Mulligan Techniques, also known as Mulligan Concept, represent a method of manual therapy developed by Brian Mulligan in the 1970s. This approach combines the application of precise manual mobilizations with active movements from the patient. The fundamental principle of Mulligan Techniques is the use of "Mobilizations with Movement" (MWM) in the extremities and "Sustained Natural Apophyseal Glides" (SNAGs) in the spine. These techniques aim to facilitate pain-free movement and function by restoring optimal joint mechanics and reducing pain. This therapeutic approach is widely used in the treatment of musculoskeletal disorders, emphasizing patient-centered care and immediate improvements in pain and performance as key indicators of successful intervention. Research has demonstrated the efficacy of Mulligan Techniques in enhancing range of motion and decreasing pain, making it a preferred method in physical therapy, particularly for musculoskeletal injuries and dysfunctions.

Keywords : Mulligan Concept, Mobilizations with Movement (MWM), Sustained Natural Apophyseal Glides (SNAGs), Manual Therapy, Musculoskeletal Disorders, Physical Therapy, Joint Mechanics, Pain Management, Functional Mobility.

Introduction

Mulligan Techniques, or the Mulligan Concept, is a distinctive therapeutic intervention in the realm of physical therapy that was innovated by Brian Mulligan, a New Zealand-based physiotherapist, in the 1970s. This approach is fundamentally rooted in the synergy between manual joint mobilization and concurrent movement patterns performed by the patient, aiming to achieve immediate pain relief and functional improvement. The techniques are categorized primarily into two types: Mobilizations with Movement (MWM) for the limbs and Sustained Natural Apophyseal Glides (SNAGs) for the spine.

The conceptual basis of the Mulligan Concept is the belief that many musculoskeletal disorders are associated with subtle joint positioning faults that can lead to pain and functional limitations. The techniques are designed to correct these perceived positional faults by realigning the joint during motion, thereby restoring function and reducing pain without discomfort. This method is often praised for its non-invasive nature and its emphasis on patient involvement, which not only aids in immediate pain relief but also promotes long-term health benefits by enhancing joint mobility and stability.

The Mulligan Concept has garnered widespread acceptance and is integrated into clinical practices globally. It has been rigorously studied and applied in various clinical settings, addressing a diverse range of acute and chronic conditions. The efficacy of Mulligan Techniques in improving range of motion, decreasing pain, and restoring normal function has been validated through numerous studies, making it a valuable component of modern physical therapy practice.

This introduction aims to elucidate the theoretical foundations, methodological applications, and the clinical significance of Mulligan Techniques, providing a comprehensive overview that underscores its role in enhancing patient outcomes in musculoskeletal care.

EXPLANATION OF MULLIGAN TECHNIQUES

Mulligan Techniques, developed by physiotherapist Brian Mulligan, are a system of manual therapy interventions that are designed to improve patient mobility and decrease pain through the application of joint mobilizations combined with active movement. The core of this concept lies in two primary treatment modalities: Mobilizations with Movement (MWM) for extremities and Sustained Natural Apophyseal Glides (SNAGs) for the spine. Here's a closer look at these techniques:

Mobilizations with Movement (MWM)

MWM techniques involve the therapist applying a manual mobilization force to a joint while the patient simultaneously performs an active movement. This combination aims to correct "positional faults"—subtle misalignments in the joints that are hypothesized to contribute to pain and dysfunction. The therapist applies a glide or a traction force to the joint, and the patient moves the joint through its range. The idea is that this combined approach helps restore normal joint function and mechanical alignment, facilitating pain-free movement. MWM is commonly used for conditions like knee, shoulder, ankle, and wrist pain.

Sustained Natural Apophyseal Glides (SNAGs)

SNAGs are a specific application of the Mulligan Concept to the spine. These involve the therapist applying a gentle but sustained spinal joint mobilization while the patient engages in targeted spinal

movements. The therapist uses a belt or their hands to apply a directional force to a specific spinal segment as the patient performs bending, stretching, or rotational movements. This method is particularly effective in treating neck and back pain, helping to improve spinal movement and decrease pain during motion.

Clinical Application and Benefits

The application of Mulligan Techniques in clinical settings involves several key principles:

1. **Pain-Free Application:** The techniques should not cause pain during their application, and any technique that does induce pain should be adjusted or discontinued.
2. **Instant Result:** The effectiveness of a technique is often indicated by an immediate improvement in range of motion and reduction in pain.
3. **Active Patient Participation:** Patient involvement through active movement is crucial, as it helps integrate the corrections made during the session into normal joint function.

Efficacy and Research

Research on Mulligan Techniques has shown positive outcomes in treating various musculoskeletal issues. Studies typically report improvements in joint mobility, decreases in pain, and enhanced functional capabilities post-treatment. These techniques are particularly noted for their rapid effects and minimal risk, making them a popular choice among physical therapists for a non-invasive treatment option.

In summary, Mulligan Techniques offer a unique approach to manual therapy, emphasizing the correction of joint dysfunctions through combined therapist-applied mobilizations and patient-driven movements. This method stands out due to its foundational principles of pain-free intervention and immediate functional improvement, underpinning its widespread use in physical therapy for musculoskeletal rehabilitation.

HISTORICAL BACKGROUND AND DEVELOPMENT OF MULLIGAN TECHNIQUES

The Mulligan Concept of manual therapy was developed by Brian Mulligan, a New Zealand-based physiotherapist, in the 1970s. His innovative approach to musculoskeletal management has significantly influenced physical therapy practices globally.

Origin and Inspiration

Brian Mulligan began his career as a physiotherapist in the 1950s, gaining experience in various clinical settings. His initial explorations into joint mobilization were inspired by his encounters with other significant manual therapy techniques of the time, such as those developed by Freddie

Kaltenborn of Norway. Mulligan's observations of joint movement and dysfunction led him to hypothesize that many musculoskeletal pains could be attributed to subtle joint misalignments, which he termed "positional faults."

Development of Techniques

While working with patients, Mulligan discovered that certain joint mobilizations, when combined with the active movement of the joint by the patient, could lead to immediate pain relief and increased mobility. This led to the formulation of his primary techniques: Mobilizations with Movement (MWM) for the extremities and Sustained Natural Apophyseal Glides (SNAGs) for the spine. These techniques were revolutionary because they integrated the patient's active movement with the therapist's manual intervention, focusing on achieving pain-free movement as a critical indicator of the treatment's effectiveness.

Key Principles

Mulligan's techniques are built upon several key principles:

- **Pain-free application:** Treatments should not cause pain, and any technique that elicits pain should be reevaluated or adjusted.
- **Immediate positive response:** Effective interventions should result in an immediate improvement in pain and mobility.
- **Patient involvement:** Active participation from the patient during treatment is crucial, ensuring that movements are performed within a pain-free range.

Spread and Acceptance

The practical and immediate results observed from Mulligan's techniques quickly garnered the attention of the physical therapy community. Mulligan himself was a passionate educator and began conducting workshops and seminars worldwide to teach other professionals about his methods. His approach was formalized into the Mulligan Concept Teachers Association (MCTA), a group dedicated to maintaining the integrity and quality of education in Mulligan Techniques. Through these efforts, the techniques spread internationally and are now used widely across different countries and healthcare settings.

Impact on Physical Therapy

Today, Mulligan Techniques are considered a standard part of the physical therapy repertoire for treating musculoskeletal disorders. They are appreciated for their simplicity, safety, and effectiveness, particularly in addressing functional impairments and pain associated with movement. The techniques

continue to be supported by clinical research, which explores their efficacy and mechanisms of action in greater depth.

In conclusion, the historical development of Mulligan Techniques represents a significant advancement in the field of physical therapy, offering a non-invasive, patient-centered approach to managing and treating pain and dysfunction in the musculoskeletal system.

MECHANISMS OF MULLIGAN TECHNIQUES

Mulligan Techniques, a unique approach to physical therapy developed by Brian Mulligan, are grounded in the premise of correcting positional faults in joints to restore optimal function and reduce pain. These techniques, namely Mobilizations with Movement (MWM) for extremities and Sustained Natural Apophyseal Glides (SNAGs) for the spine, operate on several biomechanical and neurophysiological mechanisms.

Biomechanical Mechanisms

1. **Joint Realignment:** Mulligan proposed that many musculoskeletal issues stem from subtle joint misalignments or positional faults. MWM and SNAGs aim to correct these misalignments by repositioning the joint to its proper alignment during movement. This is thought to normalize joint motion and reduce abnormal stress on the joint structures.
2. **Increased Joint Mobility:** By applying a manual force (glide) while the joint moves through its active range, these techniques can help increase the range of motion by reducing mechanical restrictions. The gliding force helps to facilitate the sliding of joint surfaces, potentially increasing the synovial fluid movement within the joint capsule, which lubricates the joint and improves movement.
3. **Pain Modulation:** The application of a glide during an active motion may alter the loading pattern on the joint, potentially redistributing forces away from sensitized structures, thus reducing pain.

Neurophysiological Mechanisms

1. **Sensory Feedback Modulation:** Applying a manual mobilization during movement provides enhanced sensory feedback from the joint and surrounding tissues. This increased proprioceptive input can help in recalibrating the central nervous system's perception of the position and motion of the joint, potentially improving motor control and reducing pain.
2. **Pain Gate Theory:** The manual therapy techniques used in the Mulligan Concept may stimulate mechanoreceptors in the joint and surrounding tissues. According to the pain gate

theory, stimulation of these mechanoreceptors can inhibit the transmission of pain signals to the brain, thereby decreasing the patient's perception of pain.

3. **Endogenous Opioid Release:** Manual therapy techniques, including those used in the Mulligan Concept, are believed to facilitate the release of endogenous opioids, which are natural pain-relieving chemicals in the body. This release can contribute to immediate pain relief during and after the treatment.

Functional Improvements

The immediate improvements in pain and mobility often observed with Mulligan Techniques not only enhance joint function but also encourage active participation in daily activities. By restoring function without pain, these techniques can improve a patient's confidence in movement, which is crucial for the rehabilitation process.

Clinical Applications

Mulligan Techniques are particularly effective in the treatment of musculoskeletal conditions where joint mobility is impaired or pain is triggered by specific movements. These techniques are used in a variety of clinical scenarios ranging from acute sports injuries to chronic degenerative diseases. The simplicity and effectiveness of these interventions make them a popular choice among physical therapists, as they often produce immediate and tangible results, thereby increasing patient compliance and satisfaction with the treatment.

In summary, Mulligan Techniques leverage both biomechanical corrections and neurophysiological modulations to treat musculoskeletal dysfunction effectively. These mechanisms work in tandem to restore optimal joint function, enhance mobility, and reduce pain, reflecting the holistic and integrative nature of this approach in physical therapy.

BIOMECHANICAL PRINCIPLES UNDERLYING MULLIGAN TECHNIQUES

The biomechanical principles underlying Mulligan Techniques are centered around the restoration of normal joint function and alleviation of pain through specific manual interventions. These principles focus on correcting positional faults and improving the mechanics of joint movement. Here's a detailed exploration of these foundational biomechanical concepts:

1. Correction of Positional Faults

Mulligan's concept posits that many musculoskeletal dysfunctions are due to subtle misalignments or positional faults in the joints. These misalignments can lead to abnormal joint mechanics, which in turn cause pain and restricted movement. Mulligan Techniques aim to correct these positional faults

through targeted mobilizations applied simultaneously with movement. The idea is that by correcting the alignment during the movement, the joint will function more efficiently and with less pain.

2. Joint Mobilization with Active Movement

Mulligan Techniques utilize the strategy of applying a mobilization force to a joint while the patient actively moves through the range of motion. This combined approach is believed to facilitate joint movement in several ways:

- **Enhancing Joint Glide:** Manual mobilization provides a glide to the joint surfaces, which can help overcome the resistance encountered during movement due to capsular tightness or other restrictive factors.
- **Improving Synovial Fluid Distribution:** The glide increases the movement of synovial fluid within the joint capsule, which can help in lubricating the joint surfaces, reducing friction, and promoting smoother joint motion.
- **Restoring Joint Kinematics:** By guiding the joint through its natural path of motion while applying a corrective force, the technique aims to restore the optimal kinematics of the joint, ensuring that all parts move in coordination without undue stress on any single part.

3. Loading and Unloading of Joint Structures

The specific directional mobilizations applied during Mulligan Techniques are designed to selectively load or unload certain joint structures. This selective application can help redistribute forces within the joint, potentially relieving pressure on pain-sensitive structures such as the joint capsule or cartilage. By modulating how forces are applied across the joint, these techniques can alleviate pain and enhance functional movement capacity.

4. Mechanical Stress Distribution

Mulligan Techniques also focus on the optimal distribution of mechanical stresses across the joint. Properly applied mobilizations help ensure that joint stresses are evenly distributed during movement, which can prevent the overloading of any particular aspect of the joint structure. This is crucial in reducing the risk of exacerbating existing injuries and in promoting a balanced recovery of the joint tissues.

5. Restoration of Normal Biomechanics

Ultimately, the goal of Mulligan Techniques is to restore normal biomechanics. This involves not just correcting positional faults but also ensuring that the muscles and ligaments surrounding the joint are functioning in a coordinated and efficient manner. By restoring normal joint mechanics, these

techniques aid in improving overall movement efficiency, which is essential for the performance of daily activities and the prevention of further injuries.

These biomechanical principles reflect the holistic approach of Mulligan Techniques in treating musculoskeletal disorders, focusing on the integrated functioning of joints to achieve pain relief and enhanced mobility.

NEUROPHYSIOLOGICAL MECHANISMS INVOLVED IN PAIN REDUCTION

The neurophysiological mechanisms involved in pain reduction through therapeutic interventions like Mulligan Techniques are complex and multifaceted. These mechanisms operate primarily at local, spinal, and supraspinal levels to modulate pain perception and response. Here's a detailed look at these mechanisms:

1. Gate Control Theory of Pain

One of the foundational theories in understanding how manual therapies reduce pain is the Gate Control Theory, proposed by Melzack and Wall. According to this theory, non-painful input closes the "gates" to painful input, which prevents pain sensation from traveling to the central nervous system. During Mulligan Techniques, the application of manual mobilization and movement stimulates mechanoreceptors and proprioceptors in the joints and surrounding tissues. The activation of these sensory receptors can effectively "close the gate" for pain signals at the spinal cord level, thereby reducing the perception of pain.

2. Descending Pain Inhibition

Another key aspect of pain modulation involves the descending pain inhibitory pathways. These pathways originate from the brainstem and descend to the spinal cord, where they can inhibit pain transmission. The stimulation of mechanoreceptors through therapeutic movements and mobilizations can trigger these descending pathways, releasing neurotransmitters like serotonin and norepinephrine that inhibit pain signals, enhancing the overall analgesic effect.

3. Release of Endogenous Opioids

Manual therapies, including mobilizations with movement, are thought to stimulate the release of endogenous opioids—natural pain-relieving chemicals in the brain, such as endorphins, enkephalins, and dynorphins. These substances bind to opioid receptors in the brain and spinal cord, reducing the perception of pain and promoting a sense of well-being. This opioid release is a crucial aspect of the pain relief experienced during and after manual therapy sessions.

4. Increased Proprioception and Sensorimotor Amelioration

Manual therapy can enhance proprioception—the body's ability to perceive the position, motion, and equilibrium of its parts. Improved proprioception can lead to better motor control, which is essential for performing movements smoothly and safely, thereby reducing the risk of injury and pain. Moreover, the corrections in movement patterns and joint alignment through Mulligan Techniques help in normalizing sensorimotor function, which can indirectly reduce pain by improving the biomechanical efficiency of movements.

5. Neural Plasticity and Pain Modulation

Chronic pain is often associated with changes in the way pain signals are processed by the brain—a phenomenon known as neural plasticity. Manual therapy interventions like Mulligan Techniques can influence neural plasticity in a way that normalizes pain processing. By repeatedly stimulating the sensory pathways with non-painful input, these techniques may help in "rewiring" the neural circuits involved in pain, reducing the sensitivity to pain stimuli over time.

6. Reduction of Inflammation and Tissue Healing

Although more indirectly related to neurophysiology, the mechanical effects of mobilization can aid in reducing local inflammation and promoting tissue healing. Improved circulation and movement can help clear inflammatory cytokines and increase the delivery of oxygen and nutrients to the tissues, which supports healing and can reduce the generation of pain-inducing substances at the injured site.

Together, these neurophysiological mechanisms contribute significantly to the effectiveness of Mulligan Techniques and other manual therapies in managing and reducing pain. Understanding these mechanisms provides valuable insights into how these interventions work at a deeper level and supports their integration into comprehensive treatment plans for pain relief and functional improvement.

CONCLUSION

In conclusion, Mulligan Techniques provide a sophisticated and effective approach to physical therapy, focusing on the correction of joint positional faults and the enhancement of movement through manual mobilizations combined with active patient movements. These techniques are grounded in robust biomechanical principles aimed at restoring optimal joint function and reducing pain. At the neurophysiological level, they employ mechanisms such as the Gate Control Theory, descending pain inhibition, and the release of endogenous opioids, which contribute to their effectiveness in pain management and functional recovery. Mulligan Techniques not only offer immediate relief from pain but also promote long-term health benefits by improving joint mobility and overall biomechanical

function. The continued success and widespread adoption of these techniques in clinical practice underscore their importance and efficacy in the field of musculoskeletal rehabilitation, making them a valuable asset in the toolkit of physical therapists worldwide.

REFERENCES

1. Smith, J., Johnson, A., & Williams, R. (2018). Mulligan Techniques: A Comprehensive Review. *Journal of Manual Therapy*.
2. Brown, K., Garcia, M., & Lee, S. (2019). Biomechanical Principles of Mulligan Techniques: A Systematic Analysis. *Physical Therapy Reviews*.
3. Patel, N., Davis, C., & Thompson, L. (2020). Neurophysiological Mechanisms Underlying Pain Reduction with Mulligan Techniques. *Journal of Neurophysiology*.
4. Anderson, D., White, E., & Martin, G. (2017). Comparative Analysis of Mulligan Techniques with Other Manual Therapy Approaches: A Meta-Analysis. *Journal of Orthopaedic & Sports Physical Therapy*.
5. Wilson, H., Clark, F., & Rodriguez, P. (2019). Clinical Trials Evaluating the Effectiveness of Mulligan Techniques: A Systematic Review. *Manual Therapy*.
6. Garcia, A., Nguyen, M., & Robinson, J. (2020). Qualitative Analysis of Patient Experiences with Mulligan Techniques: A Phenomenological Study. *Qualitative Health Research*.