



Effect Of Positional Release with Active Knee Mobilization Therapy in Combination with Balance Proprioception Rehabilitation in Knee Osteoarthritis: A Novel Physiotherapy Protocol

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Type of Publication: Original Research Paper

Conflicts of Interest: Nil

Abstract

Background: Osteoarthritis is a most common musculoskeletal condition affecting knee joint. It is an inflammatory condition which causes the articular cartilage and synovium to degenerate over time, resulting in joint stiffness.

Case Information: A 62-year-old female was diagnosed with right knee osteoarthritis since 6 months. Patient was having symptoms of knee pain on the anterior side and associated difficulty in bending knee. Patient was treated with knee mobilization, 3 sets of 30-s bouts twice a week for 4 weeks. Additionally, positional release with movement was given to the patient along with balance proprioception, moist pack and stretching exercises. Outcome measures of Numerical Pain Rating Scale (NPRS) and Knee Injury and Osteoarthritis Outcome Score (KOOS) were taken both pre- and post-interventions.

Result: The pre-intervention score for knee pain and disability of the patient was 6 on NPRS and 48 on KOOS and post-intervention scores were 2 on NPRS and 20 on KOOS respectively.

Conclusion: This study concluded knee mobilization and positional release with movement in combination with balance proprioception rehabilitation were effective in reducing knee pain and disability.

Keywords: Positional release with movement, Active Knee mobilization, Osteoarthritis, knee pain

INTRODUCTION

In people over the age of 60, the knee joint is the most often affected by osteoarthritis (OA). Knee pain affects approximately 10%–20% of the population worldwide⁽¹⁾. Osteoarthritis (OA) is one of the most common musculoskeletal diseases, affecting 2693 women and 1770 men in every 100,000 people. In India, the overall prevalence of knee OA was found to be (22 percent–39 percent) 28.7%⁽²⁾. The most common form of arthritis, osteoarthritis (OA), causes pain and functional impairment, especially in the elderly. OA of the knee causes more disability and clinical complications than OA of other joints⁽³⁾. It is a

chronic inflammatory condition associated with age, obesity, mechanical stress, drugs, and injury. It is thought to be caused by mechanical wear and tear, and it develops slowly over time. As a result, it's known as degenerative joint disease⁽⁴⁾. Pain and physical weakness are the most common signs of osteoarthritis. The knee is the most common site for osteoarthritis, with symptoms such as discomfort, stiffness, tenderness, swelling, crepitus, and loss of motion, valgus or varus deformity, locking of the knee, scraping, crepitus, and later a loud crackling sound on auscultation of the joint. They also have a plethora of

functions. They still have a lot of physical limitations when it comes to sitting and standing, as well as going up and down stairs⁽⁵⁾. In comparison to the control group, patients with knee osteoarthritis have more disability and decreased proprioception. Knee osteoarthritis is associated with general muscle fatigue, diminished muscle fiber activity, and decreased proprioception⁽⁶⁾. Recent research has indicated that impaired knee proprioception can be linked to pathologic changes in the early stages of knee OA. Proprioceptive sensation can deteriorate as the knee muscles, tendons, ligaments, and joint capsules become weakened and damaged in patients with knee OA. Furthermore, patients with knee OA may be predisposed to pain or disability due to proprioceptive impairments⁽⁷⁾. Based on good evidence for their efficacy, OA treatment recommendations consistently suggest both exercise plans and physical therapy (PT) as key components of treating knee pain⁽⁸⁾. Exercise is crucial in the treatment of this chronic and debilitating condition. There is high-quality evidence that exercise decreases pain and enhances physical function in patients with osteoarthritis of the knee, according to a study of systematic studies⁽⁹⁾. The goal of this report is to evaluate effects of positional release with movement with mobilization in combination with balance proprioception rehabilitation in knee pain associated with osteoarthritis of knee.

Patient Description: The 62-year-old female patient was a 6-month history of right-side knee pain and difficulty in bending right knee along with pain on palpation on anterior side knee and trigger pain. Her pain was intermittent in nature and gradual in onset which aggravated during knee bending movements as a result, patient's pain response was radically different. Rehabilitation is focused on positional release with movement with knee mobilization in combination with balance proprioception rehabilitation. In this research we concentrate on knee mobilization techniques and positional release with movement and balance proprioception exercises in a patient with osteoarthritis of knee.

Case History: The 62-year-old female patient was a house wife and a home maker in profession and spent over 80% of her day seated at home. The patient had no medical history that was compelling. The patient reported a 6-month history of chronic right side knee pain more at anterior side along with difficulty in bending knee and ROM restriction.

The pain had begun insidiously but gradually increased in severity. The patient then sought medical attention from her primary care physician. The patient's primary care physician diagnosed the knee pain as osteoarthritis of knee.

She was then prescribed with medications and calcium supplements. The patient then reported that the medications provided minimal pain relief. Patient was referred to physiotherapist for further treatment for which she then visited MGM School of Physiotherapy Rehabilitation and Fitness Centre Aurangabad for further investigations and treatment. The patient rated her right-side knee pain 6/10 on movement (0, no pain; 10, worst pain imaginable) in intensity on a numeric pain rating (NPR) scale at the time of the physical examination. She reported that the pain was more on anterior side of right knee. The patient also reported that she had difficulty in bending right knee. The patient described that the quality of pain was dull and had morning specific pain. Her socio-economic status was that she belonged to lower middle class.

Clinical Findings: -

Objective Examination:

The pain evaluation of current symptoms of patient was gradual onset of right-side and anterior side knee pain that was 6 on NPRS at any movement. The pain continued to increase. Although the flexion movement was exacerbated on palpation trigger points were present over anterior aspect of right knee.

On examination, the range of motion [ROM] was restricted to right knee, flexion and extension were painful and incomplete. Tightness was present in the hamstrings and gastrocnemius muscles. The muscle strength was grade 3+ for knee flexors and grade 4 for extensors. The patellar grind test and Clarke's sign was positive.

MRI diagnostic test revealed 1) Osteophytes formation, 2) Loss of hyaline cartilage and 3) Formation of subchondral marrow lesions

Diagnosis: Based on subjective and objective examination and investigations, patient had a confirmed diagnosis of osteoarthritis of knee.

Outcome Measures: Several tests were used to monitor the patient's progress from visit to visit. The patient reported her intensity of pain through NPR

scale, functional ability through Knee Injury and Osteoarthritis Outcome Score and ROM.

	Movement	Pre-Range of motion	Pre-Range of motion
1)	Knee flexion	0-90 degrees	0-120 degrees
2)	Knee extension	0-2 degrees	0-4 degrees

Table 1.1. Pre and post-intervention ROM

Physiotherapy Treatment Plan: The physiotherapy treatment concentrated on positional release with movement with mobilisation and balance proprioception rehabilitation which further improved the status of patient's condition.

Expected outcome of physiotherapy treatment plan:

We gathered information from the patient about her experience and awareness about her discomfort and current condition before beginning the physiotherapy care. Her expectations and feedback were noted to help us plan a treatment strategy for her. Patient was treated for 4 weeks, and physiotherapy management was planned according to patient's problem list, which included patient education, pain relief, trigger point release and to increase joint mobility. In the first and second week, positional release of hamstrings and gastrocnemius muscles and knee mobilisation 3 sets 30-s bouts, calf muscle stretching was incorporated.

Thereafter, balance proprioception exercises were added to the treatment which was continued till 4th week. The patient attended treatment 2 times weekly for 4 weeks, for a total of 8 sessions. The mobilizations were performed on the patient in the crook lying position, with her hands resting on the couch. The mobilization was done in three sets of 30-second bouts. Balance proprioception exercises were performed on the patient in standing position. Balance training was on unstable surface. Rocker board exercises, cone pickups and cross over walks were performed. In 3rd and 4th week, pain reduced from 6 to 3 on NPR scale. In the 3rd and 4th week, along with knee mobilization, positional release with movement and balance proprioception exercises ergonomic advice was given to the patient and do's and don'ts were explained. Patient was also taught self-stretching and strengthening exercises

Discussion: In the case, primary objective of reducing pain and increasing range of motion through positional release with active knee mobilization in combination with balance proprioception exercises was inculcated. In a recent study patient with knee OA, MWM outperformed sham MWM in terms of local and widespread pain, physical function (walking), knee flexion and extension muscle strength, and knee flexion range of motion for at least 2 days⁽¹⁰⁾ the present study used similar principle to achieve the positive psychology. Mobilization with movement could be a treatment choice for people with knee osteoarthritis, according to the results of systematic studies mobilization with movement decreases pain, increases knee range of motion, and improves physical functioning in subjects with knee osteoarthritis⁽¹¹⁾. In Osteoarthritis knee patients, myofascial release on the quadriceps muscle is more effective in reducing pain and improving functional activities.

Conclusion:

Positional release with active knee mobilisation in combination with balance proprioception rehabilitation is beneficial in reducing pain and improving knee range of motion.

Patient's Perspective: The patient shared her perspective that compared to Day-, she had found that her knee pain was significantly reduced by the end of 4th week and her quality of life was improved.

Competing Interest: Authors have declared no competing interests exists.

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