

Case Report

The immediate effect of compression with active movements in pyogenic arthritis of the knee: a case report

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ABSTRACT

Mono articular knee septic arthritis classically presents with acute onset monoarticular joint pain, fever, swelling, and a reluctance or refusal to move the affected joint. While antibiotic therapy remains the cornerstone of treatment, adjunctive physiotherapy interventions play a pivotal role in optimizing outcomes, particularly in restoring joint function and minimizing disability. The purpose of this case report is to describe the use of compression with active movements (CAMs) in a patient with acute onset pain and stiffness of the right knee joint. A 13-year-old female, was referred to orthopedic physiotherapy OPD with left knee pain, stiffness, and difficulty in walking for 15 days due to septic arthritis. Her active knee flexion was 56 degrees and she felt pain of 7/10 on NPRS on bending her affected knee. Immediately after the application of CAMs at the knee, active knee flexion in sitting increased to 60 degrees and her pain was 3/10 on NPRS. After one week she could walk without a walking frame and her active knee flexion was 80 degrees in high sitting. This case report outlines the novel use of a manual therapy technique CAMs in the treatment of septic knee arthritis. Pain-free active knee flexion demonstrated an immediate improvement in range. The results warrant further research and exploration in clinical applicability. Categories were rheumatology, pain management, physical medicine and rehabilitation

Keywords: Manual therapy physiotherapy, Septic arthritis, Knee, Compression, Active movements

INTRODUCTION

Inflammation of the joint resulting from an infectious cause, such as a bacterial, fungal, mycobacterial, viral, or other infection, is known as septic arthritis. Septic arthritis affects 2 to 6 persons out of every 100,000, while the exact number depends on risk factors.¹ Compared to adults, children are more likely to develop septic arthritis. It typically affects only one joint, such as the knee, in the lower extremities. Even though septic arthritis is rare, it is an orthopedic emergency that can result in increased morbidity and death due to the invasion of infectious pathogens into the joint area, which can cause considerable joint destruction. Due to the possibility of rapid joint destruction and functional impairment, this presents considerable management issues. However, early identification and therapy are essential to maintaining joint function.¹⁻⁴

Compression combined with dynamic motions, a novel manual therapy approach, stands out among the many physiotherapy techniques used as a promising modality for addressing pyogenic arthritis of the knee. This method incorporates active motions meant to preserve or enhance active and passive joint range of motion, muscle strength, and proprioception with the advantages of compression therapy, which lessens discomfort, spasms, swelling, and inflammation. This method targets the inflammatory process within the joint as well as the corresponding functional limitations by combining controlled active movements with compression, leading to a more thorough recovery.^{5,6}

In this article, we examine the foundations, justification, and therapeutic uses of the compression with active motions approach for the management of pyogenic knee arthritis. We go into the condition's underlying

pathophysiology, the biomechanical implications of compression, and the active movement therapy's therapeutic benefits. We also go over the data demonstrating the technique's efficacy and safety as well as useful considerations for its application in clinical settings.

CASE REPORT

This case report followed a 13-year-old girl Miss. MDK is a school-going child who was admitted to a female orthopaedic ward with the diagnosis of left knee pyogenic arthritis with confirmed laboratory reports and with a CRP raised to 37. After the medical management including rest for one week, she was referred to physiotherapy for painful and restricted left knee movements.

History

Miss MDK is a 13-year-old girl who is a student in a rural area in the vicinity of Latur, Maharashtra, India 413 512 had a sudden onset of considerable left knee pain and difficulty in activities of daily living especially sleeping on the affected side for three days reported to the orthopedic department and with radiographs and lab investigation including pus examination she was diagnosed as septic arthritis of the left knee and was admitted for the orthopedic management.

Examination

The patient was keeping her left knee flexed to 15 degrees all the time since it was a position of comfort for her. She could perform active knee flexion to 56 degrees with pain of 7/19 on the numerical pain rating scale. On palpation, we found that there was an associated spasm of quadriceps as well as hamstrings.

Treatment

Since there was a spasm in the quadriceps as well as hamstrings, we decided to apply an innovative technique of CAMs since we realized that gradual, sustained comfortable pressure over both sides of the thigh (Figure 1) was easing her pain. So manual compression was applied with both the hands over anterior as well as posterior thigh and she was asked to perform active knee flexion and extension for ten repetitions and three sets. We took her consent for the study and the publication of the research findings.

Outcome

Immediately after the technique, her knee was almost full extension but she was keeping it flexed by five degrees her active knee flexion increased to 70 degrees, and pain on active movements was 2/10. We continued this treatment for three days and by this time she had full extension of the knee, active knee flexion was 90 degrees

and there was no pain in movements. After this, she was discharged from the hospital but did not come for a follow-up since she felt now, she could manage her therapeutic exercises at home.



Figure 1: Hand placements during CAMs.

DISCUSSION

This case provides information on the immediate effect of an innovative technique in the treatment of pyogenic arthritis of the knee a condition which is now rare since most of the patients get perfect antibiotic treatment on a timely basis. However, we came across a 13-year-old girl from a rural area with septic arthritis of her knee who was referred to physiotherapy after active orthopedic management for her pain and difficulty in performing knee movements. Since during examination, we found the spasm of both agonist and antagonist and the discomfort was getting reduced with sustained gradual compression with comfortable force, we decided to apply an innovative manual therapy technique CAM in this case. Immediately after the treatment, there was a favorable response in the form of pain relief, an increase in the active range of knee movements, and an increase in cadence. This shows that even a single session of CAMs may be useful in relieving the knee pain in pyogenic arthritis of the knee if it's due to the spasm of the hamstrings and quadriceps muscles in addition to the disease pathology itself. The authors feel that this could be due to the restoration of the patient's confidence that if I move, I won't get the pain, it may be due to the temporary splinting/supporting/taping or strapping effect over the spasmodic region, proprioceptive effect, neuro-physiological effect, shunting of the forces and creating so-called a temporary false insertion for hamstrings/quadriceps or simply relief of stretch or pressure from spasmodic muscles. This could also be due to muscle relaxation, relief of pain, placebo effect, removal of stretch from spasmodic muscles, reduction in

nociceptive stimuli, and improved circulation.⁷⁻⁹ However, the exact cause-and-effect relationship could not be studied. Since there is hardly any study with similar study designs and interventions, the results could not be interpreted with the preceding literature. The obvious limitation of this study is generalization to other individuals or situations is difficult. Also, single-subject participation in this study limits the conclusion of the study for a specific person.

CONCLUSION

The results of this study suggest that CAM can be used in the treatment of septic arthritis of the knee especially when it is associated with the quadriceps and hamstring spasm but further studies are needed to determine the clinical utility of this treatment approach in a larger population.

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