



Comparative Study of Efficacy of Muscle Energy Technique and Positional Release Therapy in Post ACL Reconstruction in Young Adults: A Randomised Clinical Trial

Gunjan D. Ingale^{1*}, Deepali S. Patil¹ and Om Wadhokar¹

¹Ravi Nair Physiotherapy College, Datta Meghe Institute of Medical Sciences, Sawangi(M), Wardha, Maharashtra-442001, India.

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/JPRI/2021/v33i46B32928

Editor(s):

(1) Dr. S. Prabhu, Sri Venkateswara College of Engineering, India.

Reviewers:

(1) Faryal Zaidi, The University of Lahore, Pakistan.

(2) Ramy Raafat Mourad Hasaballah, Egypt.

Complete Peer review History: <https://www.sdiarticle4.com/review-history/74884>

Pre-protocol Article

Received 05 August 2021

Accepted 10 October 2021

Published 21 October 2021

ABSTRACT

The anterior cruciate ligament (ACL), it is a dense connective tissue band originating from the medial wall of the lateral femoral condyl and inserts into the middle of the intercondylar region on the tibia. It is regarded as a crucial component in the knee joint because it resists anterior tibial translation and rotational load. Young athletes who participate in sports that demand turning, decelerating, and jumping are at high risk for ACL injury. People who participate in Pivoting sports are likely to have them (e.g. football, basketball, netball, soccer, European team handball, gymnastics, downhill skiing). Environmental (e.g., high friction between shoes and the playing surface) and anatomical variables are also risk factors for ACL injury (e.g. narrow femoral intercondylar notch). Knee instability causes a reduction in activity, which can result in a decrease in knee-related quality of life. ACL injury risk factors have been classified as either internal or external to a person. Type of competition, footwear and surface, and environmental conditions are all external risk factors. Anatomical, hormonal, and neuromuscular risk factors are all internal risk factors.

Aim and Objective: to compare the efficacy of Myofascial Release Technique versus Positional Release Therapy on range of motion post ACL reconstruction.

Methodology: In this study total 45 patients with post ACL reconstruction will be divided into two groups, one group will receive muscle energy technique and other group will received positional release therapy. The treatment will be given for 5 sessions per week for six weeks. The assessment will be done at day one of treatment at the end of treatment at the end of first week and at the end of six week.

Discussion: This study will find the better technique for improving Range of motion Post ACL reconstruction.

Conclusion: Conclusion of the study will be drawn after the statistical analysis of the data gathered from the individuals enrolled in the study.

Keywords: Muscle energy technique; positional release therapy; post ACL reconstruction.

1. INTRODUCTION

The human knee is the body's largest joint, with a complex anatomy. It's a movable a pivotal hinge joint that can stretch and rotate medially and laterally. The knee bears nearly all of the body's weight, it is vulnerable to both acute injury and osteoarthritis. The anterior cruciate ligament (ACL) is a ligament that connects the two halves of the knee [1] To avoid ACL injuries, it's important to identify risk factors and to investigate the most common causes [2]. Women have a higher rate of anterior cruciate ligament injury to the contralateral knee following surgery than men [3].

Restoring ROM post surgery is an important aspect of normal human function. A variety of range of motion strategies can be used to increase ROM, although little work has been done to compare these techniques. The objective of this study is to compare the efficacy of muscle energy technique (MET) and positional release technique (PRT) in post ACL reconstruction patients in young adults [4].

Muscle energy technique is an osteopathic technique that utilizes a muscle's own energy in the form of moderate isometric contractions to relax and stretch it through autogenic or reciprocal inhibition[5].

Positional release therapy, also known as strain counterstrain, is a clinical procedure in which the body, its appendages, and tissues are placed in a comfortable position to resolve somatic dysfunction. Somatic dysfunction is characterised as a disruption in the sensory or proprioceptive system that causes facilitation and inhibition of spinal segmental tissue. The tissues become kinked or knotted as a result of somatic dysfunction, resulting in discomfort, spasm, and

a loss of range of motion.PRT untangles tissues in the same way as a knotted necklace is untangled: by gently twisting and pressing the tissues together to relieve tension. When one link in the chain is untangled, it causes those nearby to untangle as well, resulting in significant pain relief, More than 200,000 ACL injures occur each year, with 100,000 of these knees requiring reconstruction. The majority of ACL occurrences are caused by non-contact processes, with direct contact accounting for the remaining 30% [6].

1.1 Aim and Objective

The aim of this study is to compare the efficacy of muscle energy technique and positional release technique in improving range of motion in post-ACL reconstruction patients.

2. MATERIALS AND METHODOLOGY

2.1 Material Required

1. Goniometer.
2. Low couch of convenient height.

2.2 Methodology

2.2.1 Study design

After getting approval from Institutional Ethics Committee of Datta Meghe Institute of Medical Sciences, Deemed to be university, the participants will be recruited from physiotherapy OPD of Acharya Vinoba Bhave Rural Hospital, Sawangi Meghe, Wardha, Maharashtra. Before inclusion, participants will be explained about the objectives and approaches of the study. written consent form will be signed by them.

2.2.2 Study setting

Department of Musculoskeletal Physiotherapy OPD, Ravi Nair Physiotherapy College, Datta

Meghe Institute of Medical Sciences, Sawangi, Wardha, Maharashtra, India.

2.2.3 Study duration

2 weeks

2.2.4 Study population

Individuals undergone ACL reconstruction.

2.2.5 Sample size calculation

The sample size was calculated by using Cochran formula. There will be 22 individuals in one group and 23 individuals in the other group.

2.2.6 Sample size

n= 45 patients will be needed in the study [7].

2.2.7 Study design

Randomised Clinical Trial.

2.2.8 Study type

Interventional Study.

2.2.9 Randomization

Simple Random Sampling.

2.2.10 Sample Size Calculation

The sample size was calculated by using Cochran formula. There will be 22 individuals in one group and 23 individuals in the other group.

2.2.11 Sample Size

n= 45 patients will be needed in the study [7].

2.2.12 Inclusion criteria

The individuals within 18-30 years, male and female, diagnosed with ACL injury and have undergone ACL reconstruction surgery.

2.2.13 Exclusion criteria

The individuals above 30 years of age and those who have not underwent surgery.

2.3 Participant Timeline

Each patient will be required to complete 2 weeks of rehabilitation after enrolment in the study. The evaluations will be performed at baseline and at last session.

2.3.1 Implementation

Research coordinator and principal investigator will supervise randomization. Participants will be asked to select from the envelope, sealed group allocation for the recruitment into either group.

2.3.2 Blinding

Tester(s) will be blinded to assign the subjects to the group. To ensure blinding, subjects will be mandated not to reveal any details of their treatment to the tester.

2.3.3 Dependent variables

Range of motion, pain, muscle strength.

2.3.4 Independent variables

Muscle energy technique, positional release therapy.

2.4 Study Procedure

2.4.1 Intervention for group A

2.4.1.1 Positional release therapy (PRT)

PRT Performance Care focuses on reducing constraints that limit full range of motion and restoring complete function and performance to soft tissues that have been compromised. This approach can lead to considerable improvements in power, strength, range of motion and flexibility [8].

- Position the patient in comfortable position, most often in lying down.
- Palpate the affected areas that may be associated due to referred pain.
- Palpate the selected tender points (TP) _ instruct the patient to relax the area. Passively move the appropriate body part to release tension at the tender point. Stop movement when the pain stops and patient only feels pressure.
- Release the pressure- but maintain light contact over the TP to monitor response.
- Maintain the position for 90 seconds. Hold longer if patient feels a therapeutic pulse, change in tissue tension or movement [6].
- Encourage patient to relax- slowly return to neutral position.
- Active and passive mobilization will be performed. It includes multidirectional

mobilizations for patella once a day for at least 2 weeks. Passive extension of knee and active and passive mobilization towards flexion should be done in first 4 weeks.

- Calf, hamstring, and quadriceps (vastusmedialis) strengthening exercises can all be done for 2-3 times a day to improve the strength of the muscles [9].

2.4.2 Intervention for group B

2.4.2.1 Muscle energy technique (MET)

The Reciprocal Inhibition MET technique is performed as follows:

- The affected muscle is placed in a mid-range position.
- The patient pushes towards the restriction/barrier whereas the therapist completely resists this effort (isometric) or allows a movement towards it (isotonic).
- This is followed by relaxation of the patient along with exhalation, and the therapist applies a passive stretch to the new barrier [5].
- The individual performed a moderate about (35-40% of maximum contraction) knee flexion isometric contraction against the examiner's shoulder for 7-10 seconds. This will be followed by 2-3 seconds of relaxation[10].
- Then the leg will be passively stretched to the palpated barrier or tolerance to stretch and held for 30 seconds.
- This will be given 1-2 repetitions per day for 2 weeks.
- Active and passive mobilization will be performed. It includes multidirectional mobilizations for patella once a day for atleast 8 weeks. Passive extension of knee and active and passive mobilization towards flexion should be done in first 4 weeks.
- Calf, hamstring, and quadriceps (vastusmedialis) strengthening exercises can all be done for 2-3 times per day to improve the muscle strength.

2.4.3 Outcome Measures

2.4.3.1 Primary outcome measures

1. Goniometer: A goniometer is an instrument that measures the available range of motion at a joint. The art and science of measuring the joint ranges in each plane of the joint are called goniometry [1]. If a patient or client is suffering from decreased

range of motion in a particular joint, the therapist can use a goniometer to assess what the range of motion is at the initial assessment, and then make sure the intervention is working by using the goniometer in subsequent sessions [11].

2. Manual Muscle Testing also known as Medical Research Council Manual Muscle Testing scale : The function of muscle strength testing is to evaluate the complaint of weakness, often when there is a suspected neurologic disease or muscle imbalance/weakness. It is an important part of the assessment in many client groups [12].

2.4.4 Secondary outcome measures

2.4.4.1 Numerical pain rating scale

The Numeric Pain Rating Scale (NPRS) is a single dimensional measure of pain intensity in adults. The 11-point numeric scale ranges from '0' representing one pain extreme (e.g. "no pain") to '10' representing the other pain extreme (e.g. "pain as bad as you can imagine" or "worst pain imaginable"[13].

2.5 Data Management

2.5.1 Data collection

Data collection and reporting will be performed under the guidance of the chief investigators. Documentation for the analysis will be carefully scrutinised for accuracy. The excel spreadsheet will be issued to an allocation blinded statistician at the end of the study to perform the required analysis, after which the groups will be unblended. The trial's data will be stored in a safe, locked storage area with restricted access for later analysis by a biostatistician and the lead researcher. Checklists are used to avoid data from being lost due to inadequate personnel procedures.

3. DISCUSSION

The protocol will be conducted to see the effect of muscle energy technique versus positional release therapy on increasing range of motion in post ACL reconstruction patients in young adults.

4. CONCLUSION

The study will be carried out to see the efficacy of muscle energy technique and positional release therapy on increasing range of motion in patients will post ACL reconstruction in young adults. The conclusion will be drawn after analysis of the data

CONSENT

Principal investigator will obtain the written informed consent from the participant on a printed form (local language) with signatures and give the proof of confidentiality.

ETHICAL APPROVAL AND DISSEMINATION

The participant individuals of the study and DMIMSU who will fund it will be able to retrieve findings of study. After completion of study and publication of results data will be stored in the DMIMSU data repository.

CONFIDENTIALITY

The study program will be explained to the participant, the principal investigator will take subjective information. The consent form will include the confidentiality statement and signatures of the principal investigator, patient and a witnesses. If required to disclose some information for the study, consent will be taken from the patient with complete assurance of his confidentiality.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Kochhal N, Thakur R, Gawande V. Incidence of anterior cruciate ligament injury in a rural tertiary care hospital. *J Fam Med Prim Care*. 2019;8(12):4032–5.
2. Ristić V, Ninković S, Harhaji V, Milankov M. Causes of anterior cruciate ligament injuries. *Med Pregl*. 2010;63(7–8):541–5.
3. Shelbourne KD, Gray T, Haro M. Incidence of Subsequent Injury to Either Knee within 5 Years after Anterior Cruciate Ligament Reconstruction with Patellar Tendon Autograft. *Am J Sports Med*. 2009;37(2):246–51.
4. Sailor S, Mehta Y, Shah N, Trivedi A. A comparative study of muscle energy technique and positional release technique on hamstring flexibility in healthy individuals. *J Integr Health Sci*. 2018;6(2):64–64.
5. Muscle Energy Technique [Internet]. Physiopedia. [cited 2021 May 19]. Available: https://www.physio-pedia.com/Muscle_Energy_Technique
6. What is positional release therapy? [Internet]. Human Kinetics. [cited 2021 May 19]. Available: <https://us.humankinetics.com/blogs/excerpt/what-is-positional-release-therapy>
7. Eckenrode BJ, Carey JL, Sennett BJ, Zgonis MH. Prevention and Management of Post-operative Complications Following ACL Reconstruction. *Curr Rev Musculoskelet Med*. 2017;10(3):315–21.
8. Active Release Techniques [Internet]. Physiopedia. [cited 2021 Jun 4]. Available: https://www.physio-pedia.com/Active_Release_Techniques
9. Anterior Cruciate Ligament (ACL) Rehabilitation [Internet]. Physiopedia. [cited 2021 Jun 5]. Available: [https://www.physio-pedia.com/Anterior_Cruciate_Ligament_\(ACL\)_Rehabilitation](https://www.physio-pedia.com/Anterior_Cruciate_Ligament_(ACL)_Rehabilitation)
10. Gaur V, Kapoor A, Phansopkar P. Short Term Effects of Muscle Energy Technique vs. Active Release Technique in Improving Hamstring Flexibility and Pain in Patients with Acute Anterior Cruciate Ligament (ACL) Tear - A Randomized Control Trial. *J Evol Med Dent Sci*. 2021;10:137–42.
11. Goniometer - Physiopedia [Internet]. [cited 2021 Jun 3]. Available: <https://www.physio-pedia.com/Goniometer>
12. Muscle Strength Testing [Internet]. Physiopedia. [cited 2021 Jun 3]. Available: https://www.physio-pedia.com/Muscle_Strength_Testing
13. Numeric Pain Rating Scale [Internet]. Physiopedia. [cited 2021 Jun 3]. Available: https://www.physio-pedia.com/Numeric_Pain_Rating_Scale

© 2021 Ingale et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:

The peer review history for this paper can be accessed here:
<https://www.sdiarticle4.com/review-history/74884>