International Journal of Research in Medical Sciences
Priya S et al. Int J Res Med Sci. 2025 Oct;13(10):4406-4412
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012

DOI: https://dx.doi.org/10.18203/2320-6012.ijrms20253199

Case Report

Post-operative rehabilitation following posterior cruciate ligament reconstruction on manual labourer

Priya S., Nimmy A., Kusuma G. J.*

Department of Physiotherapy, Laxmi Memorial College of Physiotherapy, Rajiv Gandhi University of Health Sciences, Mangalore, Karnataka, India

Received: 28 July 2025
Accepted: 05 September 2025

***Correspondence:**
Dr. Kusuma G. J.,
E-mail: Kusumagj2020@gmail.com

ABSTRACT

Injuries to the posterior cruciate ligament (PCL) are less common than injuries to the anterior cruciate ligament (ACL), but they make the knee much less stable and functional. Post-operative complications such as stiffness, muscle inhibition, and gait dysfunction often require an intensive and structured rehabilitation program. This case study highlights the role of comprehensive physiotherapy following delayed PCL reconstruction and medial meniscus repair. A 32-year-old male was done with imaging after his motorcycle accident, it revealed that a near-complete PCL tear, medial meniscus tear. He underwent arthroscopic PCL reconstruction and meniscus repair followed by 3 months immobilized in a brace at 30-degree flexion. After that the patient came with a complaint of a swelling, reduced range of motion (ROM), muscle wasting, inability to flex or extend his left knee. The patient went through a 12-week rehab program that included manual therapy, electrotherapy (faradic and Russian current), progressive strength training, gait training, and cryotherapy. Significant improvements were recorded over 12 weeks: pain reduced from 8/10 to 2/10 numerical pain rating scale (NPRS), active knee flexion improved from 40° to 128°, extensor lag resolved from 27° to 0°, and IKDC score increased from 40.2%/100% to 85.1%/100%. Muscle strength across the quadriceps, hamstrings, and gluteal muscles also showed notable gains while achieving all the short- and long-term goals. This case illustrates the importance of delayed referral, week-wise rehabilitation, and individualized physiotherapy for optimal recovery following PCL reconstruction. The integration of neuromuscular stimulation, targeted strengthening, and functional re-training proved effective in restoring joint mechanics and return to daily activities. Delayed mobilization and immobilization complications underscore the need for timely, evidence-based rehabilitation protocols.

Keywords: PCL reconstruction, Knee rehabilitation, Quadriceps strengthening, Knee stability, Gait training

INTRODUCTION

The knee joint is frequently injured in road traffic accident (RTA), with a large and increasing number of tears of the PCL and peripheral ligaments.[1] Although isolated PCL tear without associated knee ligament injury are less widespread, acute PCL injuries have been estimated to account for 1-44% of total acute knee injuries.[2] In India, PCL injuries account for 3-4% of all knee injuries and 38-40% of acute traumatic knee hemarthrosis, depending on the research location and demographic.[3] The most frequent and stressed of these is postoperative stiffness, the causes of which are varied and complex. Beyond the well- known and well-described intra-articular (intra-articular lump restricts both extension and flexion of the knee) and extra-articular causes of postoperative stiffness, the present study introduces the conception of a post-traumatic central kickback motor inhibition medium called arthrogenic muscle inhibition (AMI), which contributes vastly to postoperative stiffness. AMI is frequently encountered in knee sprains, where neural inhibition produces quadriceps activation failure, which is infrequently accompanied by extension deficit.

Motor inhibition of the quadriceps and vastus medialis oblique, in particular, is caused by arthrogenic inhibition, which may be associated with hamstring kickback hypertonia, causing flexion contracture and therefore severe biomechanical impairment in the knee. Similar to ACL, PCL has a dual role in knee joint stability. The PCL's main mechanical function is to prevent the tibia from moving too far posteriorly relative to the femur. Its role in the nervous system is to send information about the location and movement of joints to the central nervous system. Together, both roles function in controlling normal knee arthrokinematics.[1] Instability and persistent pain are common side effects after PCL restoration, even with positive functional outcomes. Common post-operative issues include pain, edema, limited mobility, fatigue of the muscles, joint laxity, and compromised proprioception. Quadriceps atrophy is a major concern, requiring immediate isometric exercises to prevent it. Pain and swelling further inhibit quadriceps activation.

The goal of rehabilitation for PCL injuries is to strengthen the quadriceps muscles to offset the stress of the hamstrings and gravity, which push the tibia posteriorly.[4] For PCL reconstruction (PCL-R), rehabilitation is just as important as surgery. In addition to safeguarding the surgical result, it attempts to regain the proprioception, coordination, and physical conditioning that were lost as a result of the injury. For young, active people hoping to resume high-level activities or sports, PCL rehabilitation is particularly important. Quadriceps strengthening, gluteal muscles strengthening, gait training, lumbar stability, and general lower limb alignment should all be prioritized in the rehabilitation regimen for PCL injuries. Although weight-bearing, ROM, and the start of exercise are all guided by defined procedures, current research indicates that post-treatment methods for PCL-R vary greatly. This indicates a need for more customized approaches in clinical practice and draws attention to the absence of universal standards.[5]

CASE REPORT

A 32-year-old man has been having discomfort, swelling, and trouble bending or straightening his left knee for a long time. He also has trouble walking, standing, and climbing stairs after having surgery to repair his medial meniscus and PCL. He has been wearing a brace for three months at a 30-degree angle. MRI revealed near-total PCL tear, a complete medial meniscus tear with a flipped fragment, and suprapatellar bursal effusion. Primary physiotherapy goals were to reduce swelling, reduce joint stiffness, increase ROM in the left lower limb, improve muscle strength, achieve pain-free walking without limping, and help him to return to work, which involves sitting, standing, walking, and stair climbing.

Examination-test and measures

At the time of the initial assessment, the patient reported significant pain in the left knee, which had been progressively affecting daily and occupational activities. Pain intensity was recorded using the NPRS-a valid and reliable measure of pain severity.[6] The patient rated the pain as 8/10 during activity and 5/10 at rest, describing it as severe and often accompanied by a catching sensation within the left knee joint. The pain significantly limited activities such as changing position in bed, walking, stair climbing, using public transport, riding a bike.

To assess symptom severity and functional limitations, the international knee documentation committee (IKDC) questionnaire was administered. This standardized tool is effective for evaluating a wide spectrum of knee-related disorders and their impact on daily life.[7] A thorough musculoskeletal examination was conducted. The right lower extremity was used as a baseline for comparison in evaluating the left side for muscle strength, flexibility, sensory integrity, and tenderness on palpation.

The ROM in the left knee was assessed using a goniometer, following standardized procedures by Cynthia C. Norkin.[8] The patient initially exhibited a marked limitation in both active and passive ROM, which showed gradual improvement with intervention. Muscle strength was evaluated using Kendall's manual muscle testing (MMT) scale (0-5).[9] Results indicated reduced strength in the left lower extremity compared to the right. Palpation showed that the region around the patellar tendon was painful. Limb girth measurements were taken using a measuring tape, which is known for its strong reliability and validity in clinical settings.[10] Findings showed swelling over the suprapatellar and infrapatellar regions, along with muscle wasting in the left quadriceps and calf when compared to unaffected limb. Overall, assessment indicated that patient's knee pain and functional impairment were significantly affecting quality of life and necessitated focused therapeutic intervention (Table 1).

Clinical impression

Evaluation, diagnosis and prognosis

Patient required to participate in competent physiotherapy techniques after initial clinical impression was confirmed based on the results of initial evaluation. The patient had significant deficits in tissue extensibility, ROM, flexibility, strength in the left lower extremities, and gait. Prognosis/improvement in scores of outcome measures shows that the patient's tolerance for ADLs, such as walking, bending, and squatting, was diminished despite these anatomical and functional constraints. A case report on conservatively managed rehabilitation after a PCL, medial meniscus repair. The patient remained suitable for this case study in terms of clothing, personal care activities, transfers, and job-related responsibilities. The patient's initial physical therapy diagnosis was difficulty walking, and the medical diagnosis was PCL and medial meniscus repair. The stair climbing, kneeling and squatting for work, dependable family, and strong encouragement to resume work and improve ADL tolerance, prognosis was

considered excellent. A functional daily assessment and the patient's subjective comments were documented at every therapy session. Progress reports were completed every week. Physical therapist's updated evaluations of patients NPRS, IKDC, ROM, muscle strength, limb girth were included in these reports 6 sessions a week for twelve weeks was scheduled frequency of therapy. Left exercise selection to activate the muscle, to increase muscle strength around the joint, to decrease swelling around the joint, to keep optimal loading over the joint. Left lower extremity was trained by combining electrotherapy, manual therapy and supervised functional exercises to improve ROM and muscle strength of left lower extremity, and to improve tolerance to ADLs. There is comprehensive collection of both short-and long-term goals in (Table 2).

Procedure interventions

The patient received manual therapy during a 60-minute physical therapy session, six times per week for twelve weeks, and actively participated in therapeutic activities and exercises. Each session began with a personal assessment of the patient's response to the previous treatment and any improvements observed since the last therapy session. The patient deficiencies in knee terminal extension, knee flexion, strength and motor control were treated using therapeutic exercises and therapeutic activities. The patient underwent manual treatment such as passive mobilization and ROM exercise for left knee joint, faradic current for quads to manage the swelling and activation of muscles, Posterior leg corner activation to reduce posterior capsule shortening, left knee flexion performed in prone, Russian current to increase bulk of quadriceps muscle, gluteus medius and maximus strengthening, To enhance strength recovery and reduce knee stiffness, prone quads strengthening, dynamic quads was given. Bridging, sit to stand, co-contraction of quads, wall sitting along with dorsiflexion and plantarflexion, jumping sideways and backwards, sit to stand with stepper, gait training. To include aerobic exercise in the patient's treatment plan while considering his weight-bearing status, he was encouraged to walk at a comfortable pace for 20-30 minutes or until pain limited his activity. To address patient's quadriceps weakness and motor control issues, electrical stimulation was applied with an on-off time of 10":10", while patient performed short arc quads.[11] For a comprehensive list of exercises (Table 3). Research indicates that individuals who combine cryotherapy with exercise achieve greater strength gains than those who use either therapy alone. To help alleviate pain and inflammation, patient received cold pack therapy at end of each session, specifically applied to left knee joint.

Outcomes

Throughout the course of treatment, patient demonstrated improvements in ambulation, functional mobility, overall lower limb strength, left knee ROM. These improvements are seen in official objective evaluations and an improved international knee disability score. These improvements are seen in official objective evaluations and an improved international knee disability score. His IKDC was 40.2%/100% [35/87] at time of an initial evaluation and 85.1/100% [74/87] following twelve weeks of treatment. An improvement in AROM was observed as left knee extension rise from 40 degree of incomplete extension to 0 degree of full extension and left active knee flexion increased from 40-128. Hamstring strength increased from 2-to 4+, gluteal strength increased from 3-5, and left quadriceps strength increased from 3-at initial test to 4+. All of patient's long-term goals was fully achieved, and all of his short-term goals from initial assessment fulfilled (Table 2) Patient got ongoing care and professional physical therapy techniques over 12 weeks covered by this case study, more treatment sessions utilized to reduce swelling, to improve ROM, strength growth, improve gait training, ADL independence and ultimately, going back to his manual labour work (Table 1).

Table 1: Prognosis/improvement in the score of outcome measures.

Outcome measures	Base line	After 4 weeks	After 8 weeks	After 12 weeks
Pain (on NPRS)				
On rest	5/10	3/10	1\10	0/10
On movement	8/10	6/10	4/10	2/10
Limb girth				
Suprapatellar	42.8	40	40	39
Joint line	39.3	38	37	36.5
Infrapatellar	37.2	37	37	36
Active knee flexion ROM	40	90	115	128
Extension lag	27	12	5	0
MMT				
Quadriceps	3-	3+	4	4+
Hamstring	2-	3	4	4
Gluteus medius	3	4	4	5
Gluteus maximus	3	4	4+	5
Gastrocnemius	3	4	4+	5
Soleus	3	4	4+	5
IKDC		40.2%	67%	85.1%

Table 2: Short- and long-term goals.

Short term goals (2 to 6weeks)	Long term goals (8 to 12 weeks)
The patient will typically be able to perform self-care and dressing activities with less discomfort or difficulty in order to become independent with these responsibilities. **Reduce pain and swelling [2-4 weeks]. The ideal is to bring the case's NPRS to 3/10 at rest and 6/10 during movement.**	The patient must be able to climb and descend 10 to 15 flights of stairs in a reciprocal pattern in order to use stairs at home and at work. The patient will increase the ROM of knee flexion and extension, muscle strength of lower extremity muscles, proprioception, and dynamic stability to facilitate return to prior level of function.
Full passive and active ROM, to achieve knee flexion [≥120 degree] and controlled extension within limits	The patient can return to their prior level of function while continuing to increase their strength and ROM with a comprehensive at-home exercise program.
The patient will be able to walk with full weight bearing and strengthening of quadriceps, hamstrings, gluteus medius, gluteus maximus, and calf in order to achieve a strength of 3/5 or 4/5 for all muscles.	

Table 3: Rehabilitation protocol.

Physical therapy intervention	Week 1-2	Week 3-4	Week 5-6	Week 7-8	Week 9-11	Week 12 onwards
Isometric quadriceps sets	10-15 repetitions [reps] per set, with 3-5 sets per day	Same continued	Same continued	Same continued	Same continued	Same continued
Faradic current for quadriceps	Low to moderate intensity, surged current with 10 sec on-time, 30-50 sec minutes daily	Increase intensity to maximum tolerable level	Per session, 5-6 days/week.	–	–	–
Gluteus medius and gluteus maximus strengthening exercise	Side-lying hip abduction and clamshell exercises, begin with 10 to 15 reps/set, 2 to 3 sets. For glute bridges and prone hip extension exercises, perform 10 to 15 reps/set, 2 to 3 sets	From the 3rd to 4th week, progress the exercises by increase resistance	Same continued	Same continued	Same continued	Same continued
Hip internal and external rotation	Supine hip rotations, 10-15 reps, 2-3 sets, -2×/day	Added resistance bands, 15-20 reps, 3 sets, 1×/day	Standing with bands, 15-20 reps, 3-4 sets, weekly once	Continued	Continued	Continued
Bridging	Start with basic glute bridges in the bed, 10-15 reps, 2-3 sets, 1-2 times/day.	Progress to bridges with resistance bands	Advance to single-leg bridges	Same continued	Continued	Same continued
Hamstring stretch 90-90	Begin with passive 90-90 hamstring stretch, 2-3 reps per leg, once daily.	Increase hold time to 30-45 seconds, 3-4 repetitions per leg, daily.	Progress to active-assisted	Same continued	Same continued	Same continued
Knee to chest with Thera band	10-12 reps, 2-3 sets, rest 30-45 seconds between sets, once daily	Increase resistance and reps to 15-20	Progress to stronger TheraBand	Progress to stronger TheraBand	Same continued	Same continued
Russian current	50-60 mA,10-15	Increased	Same	Same	_	_

Continued.

Physical therapy intervention	Week 1-2	Week 3-4	Week 5-6	Week 7-8	Week 9-11	Week 12 onwards
	contractions/ session, daily once.	intensity to the maximum tolerance	continued	continued		
Prone PLC activation + prone flexion	5 to 7 seconds, 10 to 15 reps/ set, with 2 to 3 sets/ once daily	Gentle active knee bending (limit to 90°)	7-10 seconds reps/sets	Continued	Continued	Continued
Dynamic quadriceps with resistance		10-15 reps 2 to 3 sets, 3 sec at terminal extension	Same continued	Increase resistance	Continued	Continued
Weight-bearing Complete	Non weight bearing walker Assistance	Full weight bearing braces	Full weight bearing with limping	Full weight bearing with limping	Normal walking	Normal walking
Co- contraction of quads and hams for stability of knee joint		5-7 seconds 5 reps	10 reps	Same continued	Same continued	Same continued
Wall ankle dorsiflexion			60 sec 3 reps once daily	Same continued	Same continued	Same continued
Static squats, kneeling down			1 min hold 5 reps, once daily	Same continued	Static quads progress to dorsiflexion and plantar-flexion	Same continued
Sit to stand, stair climbing up and down, marching, jogging and jumping		5 min sit to stand done by using high level of chair,	Same continued	5 min sit to stand from low level of chair, marching 1-2 sec, stair up and down for 5 min	Same continued and jogging for 2 min Jumping sideways, front and backwards	Same continued

DISCUSSION

This case demonstrates the full extent of physiotherapy for a 32-year-old man who presented with swelling, pain, limited mobility, and functional difficulties after an extensive knee injury and posterior surgery. The case endured a high- energy trauma performing in ligament injury, including near-complete PCL tear and a medium meniscus tear and he underwent arthroscopic PCL reconstruction and medial meniscus repair. The post-operative phase was further complicated by immobilization in 30° flexion for three months. The patient presented with significant suprapatellar bursal effusion, extensor lag, and incapability to achieve full flexion and terminal extension, greatly affecting daily activities and occupational demands. Pain intensity, measured using the NPRS, was 8/10 during exertion and 5/10 at rest, indicating the need for both pain modulation and functional restoration. The IKDC score is validated for post-surgical knee issues, verified the substantial impact on the case's quality of life and physical function. Simhal did a study on "postoperative rehabilitation of PCL surgery", this review reports positive outcomes across various studies, with improvements in knee joint function, stability and patient reported outcome measure. Notably, the IKDC score were frequently used to assess recovery, showing consistent improvement over time.[12] The assessment showed fluid buildup, weakness in the quadriceps muscles, reduced strength in the left lower limb muscle measured by MMT and significant limits in both voluntary and passive movement, especially in bending the knee and fully straightening it. The primary physiotherapy goals, restoration of ROM, strength recovery, pain-free gait and return to functional independence were addressed through a multimodal approach. Faradic and Russian currents assist with helping the quadriceps grow and get stronger. When doing short arc quadriceps strengthening exercises (dynamic closures, prone workouts, bridging, sit-to-stand, and gluteal activation), electrical stimulation is used to promote motor control. To increase functional mobility and address limping, gait training is recommended. Aerobic exertion through covered walking, adapted to the patient's pain threshold. Cryotherapy help speed up muscle healing and keep inflammation in limits.

Monitari did a study on "physiotherapy management for post reconstruction PCL acute phase: a case study", this study reviews that considerable increase in ROM, muscle strength, functional activities by reporting the outcomes [NPRS, goniometer, MMT grading].[13] According to current literature, delayed controlled motion, progressive weight-bearing, and muscle strengthening are pivotal for restoring common function and precluding long-term complications like stiffness and muscle imbalances. Progress was covered using objective outgrowth measures. The case demonstrated gradational advancements in pain situations, limb circumference (indicating reduced effusion), ROM, and muscle strength over the 12 weeks intervention period. This confirms the effectiveness of combining electrotherapy, manual mobilization, and supervised functional exercises in recovering function after complex knee surgeries. The use of both case-reported and clinician-assessed tools assured a holistic view of recovery. Importantly, the part of patient compliance and early referral to activity cannot be exaggerated. Delay in mobilization, as seen in this case due to prolonged bracing, can contribute to common adhesions, muscle atrophy, and delayed return to function. thus, personalized, phase- wise rehabilitation acclimatized to surgical protocols and patient tolerance is essential for optimal issues.

CONCLUSION

This study highlights the role of structured physiotherapy in recovery after delayed PCL surgery with meniscus repair. A 12-week program combining electrotherapy, manual therapy, strengthening, gait training, and cryotherapy resulted in significant improvements in pain, mobility, strength, and independence. Early referral, patient compliance, and phase-wise rehabilitation are critical to preventing complications and ensuring a return to daily and occupations activities, particularly for manual labourers.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

REFERENCES

1. Sonnery-Cottet B, Ripoll T, Cavaignac E. Prevention of knee stiffness following ligament reconstruction: Understanding the role of Arthrogenic Muscle Inhibition (AMI). Orthop Traumatol Surg Res. 2024;110(1):103784.
2. Senese M, Greenberg E, Lawrence JT, Ganley T. Rehabilitation following isolated posterior cruciate ligament reconstruction: a literature review of published protocols. Int J Sports Physical Ther. 2018;13(4):737.
3. Halawar RS. Magnetic Resonance Imaging Study of Types and Incidence of Injuries in Traumatic Knee Joint (Doctoral dissertation, Rajiv Gandhi University of Health Sciences (India)).
4. Monitari T, Supriyadi A, Mardianto H. Physiotherapy Management for Post Reconstruction Posterior Cruciate Ligament Acute Phase: A Case Study. In Academic Physiotherapy Conference Proceeding. 2021.
5. Memmel C, Koch M, Szymski D, Huber L, Pfeife r C, Knorr C, et al. Standardized rehabilitation or individual approach? a retrospective analysis of early rehabilitation protocols after isolated posterior cruciate ligament reconstruction. J Personal Med. 2022;12(8):1299.
6. Alghadir AH, Anwer S, Iqbal A, Iqbal ZA. Test–retest reliability, validity, and minimum detectable change of visual analog, numerical rating, and verbal rating scales for measurement of osteoarthritic knee pain. J Pain Res. 2018:851-6.
7. Higgins LD, Taylor MK, Park D, Ghodadra N, Marchant M, Pietrobon R, Cook C. Reliability and validity of the International Knee Documentation Committee (IKDC) subjective knee form. Joint Bone Spine. 2007;74(6):594-9.
8. Norkin CC, White DJ. Measurement of joint motion: a guide to goniometry. FA Davis. 2016.
9. Conroy VM, Murray Jr BN, Alexopulos QT, McCreary J. Kendall's muscles: testing and function with posture and pain. Lippincott Williams and Wilkins. 2022.
10. Bakar Y, Özdemir ÖC, Sevim S, Duygu E, Tuğral A, Sürmeli M. Intra-observer and inter-observer reliability of leg circumference measurement among six observers: a single blinded randomized trial. J Med Life. 2017;10(3):176.
11. Snyder-Mackler L, Delitto A, Bailey SL, Stralka SW. Strength of the quadriceps femoris muscle and functional recovery after reconstruction of the anterior cruciate ligament. A prospective, randomized clinical trial of electrical stimulation. JBJS. 1995;77(8):1166-73.
12. Simhal RK, Bovich M, Bahrun EA, Dreese JC. Postoperative rehabilitation of posterior cruciate ligament surgery: a systematic review. Sports Med Arthroscopy Rev. 2021;29(2):81-7.
13. Kew ME, Cavanaugh JT, Elnemer WG, Marx RG. Return to play after posterior cruciate ligament injuries. Cur Rev Musculosk Med. 2022;15(6):606-15.
14. Reiman MP, Bolgla LA, Loudon JK. A literature review of studies evaluating gluteus maximus and gluteus medius activation during rehabilitation exercises. Physiother Theory Pract. 2012;28(4):257-68.
15. de Castro MP, de Brito Fontana H, Fóes MC, Santos GM, Ruschel C, Roesler H. Activation of the gluteus maximus, gluteus medius and tensor fascia lata muscles during hip internal and external rotation exercises at three hip flexion postures. J Bodywork Movement Therap. 2021;27:487-92.
16. Lehecka BJ, Edwards M, Haverkamp R, Martin L, Porter K, Thach K, et al. Building a better gluteal bridge: electromyographic analysis of hip muscle activity during modified single-leg bridges. Int J

Sports Phys Ther. 2017;12(4):543.
17. Reid DA, Kim J. The frequency of hamstring stretches required to maintain knee extension range of motion following an initial six-week stretching programme. N ZealJ Physiot. 2014;42(1):22-7.
18. John RF, Wang YE, Wu YC, Chen WL, Hsueh TC. Electrical Stimulation versus Conventional Exercise in Strengthening Quadriceps After Lower Leg Injury. Rehabil Pract Sci. 1995;23(2):129-34.
19. Kim JG, Lee YS, Yang BS, Oh SJ, Yang SJ. Rehabilitation after posterior cruciate ligament reconstruction: a review of the literature and theoretical support. Arch Orthop Trauma Surg. 2013;133:1687-95.
20. Cury RD, Kiyomoto HD, Rosal GF, Bryk FF, de Oliveira VM, de Camargo OP. Rehabilitation protocol after isolated posterior cruciate ligament reconstruction. Rev Brasileira de Ortopedia. 2012;47(4):421-7.
21. Lu CC, Yao HI, Fan TY, Lin YC, Lin HT, Chou PP. Twelve weeks of a staged balance and strength training program improves muscle strength, proprioception, and clinical function in patients with isolated posterior cruciate ligament injuries. Int J Environ Res Pub Health. 2021;18(23):12849.
22. Escamilla R, Zheng NA, Macleod T, Brent Edwards W, Imamura R, Hreljac A, Fleisig G, Wilk K, Moorman C, Andrews J. Patellofemoral joint force and stress during the wall squat and one-leg squat. Medicine+ Science in Sports+ Exercise. 2009;41(4):879.
23. LaPrade RF, Johansen S, Engebretsen L, Wentorf FA, Engebretsen AH. Return to play after posterior cruciate ligament injuries. Clin Sports Med. 2015;34(1):179-87.
24. Pierce CM, O'Brien L, Griffin LW, LaPrade RF. Posterior cruciate ligament tears: functional and postoperative rehabilitation. Knee Surgery, Sports Traumatology, Arthroscopy. 2013;21:1071-84.

Cite this article as: Priya S, Nimmy A, Kusuma GJ. Post-operative rehabilitation following posterior cruciate ligament reconstruction on manual labourer. Int J Res Med Sci 2025;13:4406-12.