International Journal of Research in Medical Sciences
Davis S et al. Int J Res Med Sci. 2026 Jul;14(7):3123-3127
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012
DOI: https://dx.doi.org/10.18203/2320-6012.ijrms20262210

Case Report

One step at a time: physiotherapy management following medial unicompartmental knee arthroplasty – a case report

Stephiya Davis[1]*, Anusha V. Shenai[2], Shuaib[1], Mobaraki Mansoureh[2]

[1]Department of Sports Sciences, R. V. College of Physiotherapy, Bangalore, Karnataka, India
[2]Department of Musculoskeletal Sciences, R. V. College of Physiotherapy, Bangalore, Karnataka, India

Received: 13 May 2026
Accepted: 11 June 2026

***Correspondence:**
Dr. Stephiya Davis,
E-mail: stephi.davis96@gmail.com

ABSTRACT

This case report describes the rehabilitation of a 57-year-old male following medial unicompartmental knee arthroplasty (UKA). After four weeks of unsupervised home-based exercises, he presented with reduced knee flexion, quadriceps weakness, low confidence, and difficulty with stair climbing and sit-to-stand activities. A structured outpatient physiotherapy program focusing on mobility, strength, gait, and functional training was implemented. Over six weeks, the patient showed significant improvements in pain, range of motion, muscle strength, kinesiophobia, and functional performance, ultimately returning to work independently. This case highlights the value of supervised, individualized rehabilitation even when initiated later in the recovery phase.

Keywords: Knee, Arthroplasty, Unicompartmental, Rehabilitation, Physiotherapy

INTRODUCTION

Unicompartmental knee arthroplasty (UKA) is an established surgical option for isolated compartment osteoarthritis, offering advantages over total knee arthroplasty such as smaller incisions, faster recovery, reduced pain, and preservation of joint biomechanics and proprioception.[1,2]

Despite surgical success, postoperative physiotherapy is essential for optimizing outcomes through restoration of range of motion, muscle strength, and functional gait.[3,4] However, structured rehabilitation protocols specific to UKA are less well-documented compared to TKA.

This case report describes the rehabilitation of a 57-year-old male following medial UKA of the left knee, demonstrating how an individualized outpatient physiotherapy program led to improvements in kinesiophobia, pain, strength, and functional performance, thereby contributing to evidence supporting physiotherapy in UKA recovery.

CASE REPORT

Patient information

A 57-year-old right-hand dominant male presented to the Outpatient Department – Department of Sports Physiotherapy, R. V. College of Physiotherapy, for postoperative rehabilitation following a medial UKA of the left knee, performed on 12 December 2024. The patient is self-employed and operates a logistics business, which requires moderate physical exertion, including walking, prolonged standing, and stair negotiation.

During the initial postoperative phase, the patient performed basic home-based exercises without formal supervision. At the time of presentation to the physiotherapy department on 14 March 2025, he reported persistent pain in the operated knee, along with functional limitations including difficulty in sit-to-stand transitions, stair climbing, and walking long distances. He also experienced joint stiffness and subjective weakness around the knee, which interfered with his ability to resume occupational and daily activities. His primary

rehabilitation goals included regaining pain-free joint mobility, reducing fear of movement, improving muscular strength, restoring efficient gait mechanics, and achieving functional independence for return to work.

The patient exhibited an endomorphic somatotype with a body mass index (BMI) of approximately 27.8 kg/m², classifying him within the overweight category. His past medical history was non-contributory, with no known comorbid conditions such as hypertension, diabetes mellitus, or cardiovascular disease. He was not on any long-term medications, reported no known allergies, and denied any use of tobacco or alcohol. A positive family history of knee osteoarthritis was reported, indicating a potential hereditary predisposition to degenerative joint changes.

He resides with supportive family members and demonstrated high motivation and adherence to the rehabilitation program. His engagement in both supervised physiotherapy sessions and prescribed home exercises reflected a positive attitude toward recovery and return to function. Table 1 shows the timeline of the case report.

Table 1: Timeline.

Date	Event
09 December 2024	Preoperative radiographs and MRI confirmed medial compartment OA (Kellgren-Lawrence grade III)
12 December 2024	Medial UKA performed using Stryker Triathlon system
13 December 2024 – 13 March 2025	Home-based exercises performed unsupervised (no formal physiotherapy)
14 March 2025	Initial physiotherapy assessment at R. V. College of Physiotherapy
15 March – 30 April 2025	Structured outpatient physiotherapy (phases 1 to 3) with progressive loading
01 May 2025	Patient returned to work with full functional independence

Clinical findings

At the time of initial assessment at the Department of Sports Physiotherapy, R. V. College of Physiotherapy, the patient was alert, cooperative, and oriented to time, place, and person. The surgical incision over the left knee was well-healed, with no signs of infection, discharge, or abnormal scar tissue formation. Mild periarticular swelling was noted, and the patient reported discomfort during weight-bearing activities.

Localized tenderness was elicited along the medial joint line on palpation. Active range of motion (ROM) of the left knee was restricted to 0°–95°, with pain and stiffness limiting further flexion. Terminal extension was achieved with a mild stretching sensation. The contralateral knee exhibited full, pain-free ROM.

Manual muscle testing (MMT) revealed reduced strength in the operated limb, with the quadriceps graded at 3+/5, hamstrings at 4/5, and hip abductors and extensors at 4/5. Functional assessment highlighted significant limitations, including difficulty in sit-to-stand transfers, stair climbing, and an observable antalgic gait with reduced stance phase on the left side. The timed up and go (TUG) test was completed in 17.5 seconds, indicating moderate functional impairment and decreased mobility efficiency.

Pain, assessed via the numerical pain rating scale (NPRS), was reported as 7/10 during stair climbing, 6/10 with prolonged standing and walking, and 3/10 at rest. Sensory examination was intact, deep tendon reflexes were within normal limits, and no neurovascular deficits were noted in the affected limb.

Table 2 and Figure 3 shows range of motion of both knees on day 1, Table 3 shows five times sit-to-stand test (5XSTS), Table 4 shows single leg stance test (SLS) and Table 5 shows Kinesiophobia scores.

Table 2: Knee joint range of motion (ROM) using Activforce 2.

Limbs	Movement	Active ROM (°)	Passive ROM (°)
Affected (left)	Knee flexion	95°	100°
	Knee extension	0°	0°
Non-affected (right)	Knee flexion	120°	125°
	Knee extension	0°	0°

Diagnostic assessment

Preoperative imaging on 09 December 2024, including bilateral standing knee radiographs and a left knee skyline view, revealed medial tibiofemoral and patellofemoral joint space narrowing with marginal osteophyte formation (Figures 1 and 2).

Magnetic resonance imaging (MRI) of the left knee confirmed degenerative changes, including bone marrow edema in the medial compartment, cartilage thinning, tibiofemoral osteophytes, patella baja (Insall-Salvati index: 0.6), and mild joint effusion. A computed tomography (CT) scan was performed to assist with robotic alignment and implant positioning. Additional preoperative evaluations, including arterial and venous Doppler studies and radiographs of the chest, lumbosacral spine, and pelvis, ruled out systemic or vascular contraindications (Table 6).

Table 3: Five times sit-to-stand test (5xSTS).

Parameters	Observed value	Interpretation
Time to complete (seconds)	19.4 sec	Slower than age-matched norms; indicates reduced lower limb strength and functional mobility
Use of hand support	Yes	Indicates compensatory strategy due to weakness or balance limitation

Table 4: Single leg stance test (SLS).

Limbs	Duration (seconds)	Observations
Affected (left)	5 sec	Sway noted; unable to maintain beyond 5 sec without support
Non-affected (right)	15 sec	Stable; within normal limits

Table 5: Kinesiophobia scores.

Outcome measures	Week 5 (initial)	Week 10 (final)	Improvement
TSK score	42	31	↓ 11 points (↓26.2%)

Table 6: Phase-wise UKA rehabilitation protocol outlining timelines, goals, interventions, and frequency.

Phases	Weeks post-op	Frequen-cy	Goals	Interventions	Session duration (minutes)
Phase 1: post-operative	0–2	6 days in a week	Control pain and swelling, achieve knee extension to 0°, initiate quadriceps activation, attain knee flexion ≥70°, independent ambulation with assistive device	Cryotherapy with limb elevation, ankle pumps, gentle patellar mobilizations, passive and active-assisted range of motion (ROM) exercises (heel slides, knee extensions), isometric quadriceps and gluteal sets, straight leg raises (SLR) when able, gait training with walker or crutches, emphasizing proper weight-bearing	45
Phase 2: early rehabilita-tion	3–4	Alternate days	Reduce swelling, improve knee flexion to ≥100°, enhance quadriceps strength, begin transition to full weight-bearing	Continue phase 1 exercises with increased intensity, introduce closed kinetic chain exercises (mini-squats, step-ups), stationary cycling without resistance, balance and proprioception drills (double-leg stance on unstable surfaces), wean off assistive devices as tolerated	45
Phase 3: advanced rehabilita-tion	5–6	Alternate days	Restore full ROM (0°–120°), achieve normal gait without assistive devices, improve functional strength and endurance, return to daily activities	Progress strengthening exercises with resistance (leg presses, hamstring curls), advance balance training (single-leg stance, dynamic activities), functional drills (sit-to-stand, stair negotiation), introduce low-impact aerobic exercises (swimming, elliptical), educate on activity modification and joint protection strategies	45
Home exercise program	On-going	Daily (self-directed)	Maintain ROM and strength gains, promote independence in ADLs, prevent deconditioning	Personalized exercise regimen focusing on ROM, strengthening, and balance, patient education on joint protection, pacing, and lifestyle modifications, encourage adherence to prescribed exercises and activity guidelines	20–30

Based on clinical and radiological findings, the patient was diagnosed with medial compartment osteoarthritis (Kellgren-Lawrence grade III) and deemed suitable for partial knee replacement.

The surgical procedure performed was a robotic-assisted medial unicompartmental knee arthroplasty using the Stryker Triathlon system. No diagnostic challenges were encountered.

Follow-up and outcomes

At the start of outpatient rehabilitation (week 5 post-op), the patient exhibited an antalgic gait, limited knee flexion (~95°), quadriceps weakness (MMT grade 3+), and difficulty with sit-to-stand and stair climbing. He had previously completed unsupervised home exercises for three weeks with minimal functional improvement.

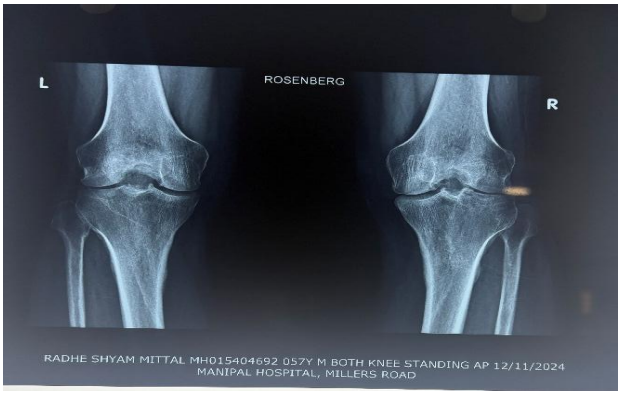

Figure 1: Preoperative standing anteroposterior radiograph (bilateral knees). Radiograph showing bilateral standing AP view of the knees. The left knee demonstrates medial tibiofemoral joint space narrowing and marginal osteophyte formation, consistent with medial compartment osteoarthritis.

Following six weeks of structured physiotherapy, he showed significant progress. Pain during activity reduced from 5/10 to 2/10, active knee flexion improved to 120°, gait normalized without assistive support, quadriceps strength increased to grade 4+/5.

Functional outcomes improved; single leg stance increased from 5 sec to 15 sec, sit-to-stand performed independently, Kinesiophobia: 42 to 31. The patient resumed daily activities confidently and reported high satisfaction with recovery.

Figure 2: Immediate postoperative radiograph (left knee – medial UKA). Postoperative X-ray showing a well-aligned medial unicompartmental knee arthroplasty implant (Stryker Triathlon system) in the left knee with proper joint space restoration and component positioning.

Figure 3: Range of motion assessment using Activforce 2.

DISCUSSION

This case highlights the effectiveness of a structured, goal-oriented rehabilitation program following medial UKA using the Stryker Triathlon system. The patient showed limited functional recovery after unsupervised home-based exercises but achieved significant improvements in pain, mobility, strength, and gait through supervised physiotherapy.

UKA is a preferred surgical option for isolated medial compartment osteoarthritis, offering faster recovery and preservation of normal knee kinematics compared to TKA.[1] However, its success depends equally on an individualized rehabilitation protocol addressing ROM, muscle strength, proprioception, and gait.[2]

In this case, basic postoperative home exercises led to a plateau in progress due to lack of supervision. On presentation, the patient had impaired functional mobility, antalgic gait, and reduced knee flexion. Early and progressive rehabilitation significantly improves UKA outcomes by preventing stiffness, promoting muscle reactivation, and restoring independence.[3,4]

The phased, evidence-based strategy began with gait retraining and ROM restoration, progressing to strengthening and dynamic balance training. This aligns with Hamilton et al, who showed that supervised physiotherapy after UKA yields faster return to daily activities and better functional scores than unsupervised care.[5]

Outcome measures, including the 30-second sit-to-stand test and Tampa scale for Kinesiophobia, provided objective evidence of recovery. Improvements reflected clinically meaningful gains in lower-limb function and fear-avoidance behaviour. Regaining 120° of active knee flexion by week 10 is consistent with postoperative UKA benchmarks.[6]

From a clinical reasoning perspective, reducing supervised sessions after two weeks prevented joint overload while

the home exercise program-maintained adherence. The absence of complications and return to full activity by week 10 support this model's appropriateness.

CONCLUSION

This case demonstrates the effectiveness of a structured, individualized supervised physiotherapy programme following medial UKA. Despite limited progress with initial home-based exercises, the patient achieved substantial gains in pain relief, joint mobility, strength, and functional independence through progressive loading, task-specific training, and regular outcome monitoring. These interventions enabled a timely return to daily and occupational activities, reinforcing the essential role of guided physiotherapy in optimising post-UKA recovery beyond surgical intervention alone.

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

REFERENCES

1. Berger RA, Meneghini RM, Jacobs JJ, Sheinkop MB, Della Valle CJ, Rosenberg AG, et al. Results of unicompartmental knee arthroplasty at a minimum of ten years of follow-up. J Bone Joint Surg Am. 2005;87(5):999-1006.
2. Price AJ, Svard U. A second decade lifetable survival analysis of the Oxford unicompartmental knee arthroplasty. Clin Orthop Relat Res. 2011;469(1):174-9.
3. Thompson SM et al. Rehabilitation following UKA: A systematic review. Physiotherapy. 2020.
4. Jenkins C, Lowe CM, Barker KL. Early post-operative physiotherapy rehabilitation after primary unilateral unicompartmental knee replacement: a systematic review. Physiotherapy. 2023;118:39-53.
5. Hamilton DF et al. Supervised versus self-managed rehabilitation after UKA: Functional outcomes comparison. BMJ Open Sport Exerc Med. 2018.
6. Pennington DW et al. Knee flexion following UKA: Return to function and ROM analysis. J Arthroplasty. 2013.

Cite this article as: Davis S, Shenai AV, Shuaib, Mansoureh M. One step at a time: physiotherapy management following medial unicompartmental knee arthroplasty – a case report. Int J Res Med Sci 2026;14:3123-7.