

**COMPREHENSIVE PHYSIOTHERAPY MANAGEMENT FOLLOWING
BILATERAL TOTAL KNEE REPLACEMENT IN A 68-YEAR-OLD FEMALE
WITH END-STAGE OSTEOARTHRITIS: A CASE REPORT**

**Dr. Rupinder Kaur Bhatti (1), Dr. Aashirwad Mahajan (2), Dr. Nupoor Kulkarni (3),
Dr. Shrikant Mhase (4), Dr. Ankita Yelikar (5), Dr. Sakshi Dupare (6), Dr. Priya
Chauhan (7)**

Assistant Professor, Marathawada Mitramandal's MM College of Physiotherapy, Lohegaon, Pune –
411047

Email ID- rupinder.mmcopt@gmail.com

Professor, Marathawada Mitramandal's MM College of Physiotherapy, Lohegaon, Pune – 411047

Email ID- principal.mmcopt@gmail.com

Associate Professor, Marathawada Mitramandal's MM College of Physiotherapy, Lohegaon, Pune –
411047

Email ID- nupoor.mmcopt@gmail.com

Associate Professor, Marathawada Mitramandal's MM College of Physiotherapy, Lohegaon, Pune –
411047

Email ID- shrikant.mhase.mmcopt@gmail.com

Assistant Professor, Marathawada Mitramandal's MM College of Physiotherapy, Lohegaon, Pune –
411047

Email ID- ankita.yelikar.mmcopt@gmail.com

Assistant Professor, Marathawada Mitramandal's MM College of Physiotherapy, Lohegaon, Pune –
411047

Email ID- sakshi.dupare.mmcopt@gmail.com

Assistant Professor, Marathawada Mitramandal's MM College of Physiotherapy, Lohegaon, Pune –
411047

Email ID- priya.mmcopt@gmail.com

Corresponding Author:-

Dr Rupinder Kaur Bhatti (PT)

Email ID- rupinder.mmcopt@gmail.com

Contact Number - +91 7507612301

1. Abstract

Introduction:

Bilateral total knee replacement (BTKR) is indicated in severe end-stage osteoarthritis (OA) affecting both knees simultaneously. Optimized physiotherapy rehabilitation plays a central role in functional recovery.

Patient Information:

A 68-year-old female presented with severe bilateral knee pain, deformity, restricted mobility, and functional limitations secondary to advanced OA.

Clinical Findings:

Antalgic gait, ROM restriction (R: 10–70°, L: 12–65°), quadriceps weakness, and radiographic evidence of tricompartmental degeneration (Kellgren–Lawrence grade IV).

Intervention:

Following simultaneous BTKR, physiotherapy included early mobilization, ROM training, quadriceps activation, gait retraining, neuromuscular strengthening, and progressive functional rehabilitation.

Outcomes:

Pain, ROM, strength, functional independence, and gait parameters at 12-week follow-up.

Conclusion: Structured physiotherapy, initiated early and tailored to BTKR demands, significantly enhances postoperative recovery in older adults.

Keywords: Total Knee Replacement, Bilateral TKR, osteoarthritis, physiotherapy, postoperative rehabilitation, functional recovery

Introduction

Knee osteoarthritis is a degenerative condition characterized by cartilage loss, osteophyte formation, and functional disability. When both knees are affected severely, bilateral total knee replacement (BTKR) may provide a faster, single-stage recovery compared to two staged procedures. However, the procedure requires an intensive, structured rehabilitation approach to optimize functional outcomes. This case highlights a unique instance of successful functional restoration in a 68-year-old female following simultaneous BTKR, emphasizing physiotherapy's evidence-based role.

3. Patient Information

A 68-year-old female presented with progressively worsening bilateral knee pain for 10–12 years, difficulty walking >50 meters, sleep disturbances due to pain, and inability to climb stairs. She had no history of inflammatory arthritis or major trauma. Prior conservative treatments included analgesics, activity modification, and physiotherapy, with limited benefit.

4. Clinical Findings

Preoperative examination revealed:

Parameter	Right Knee	Left Knee
Pain (NPRS)	8/10	8/10
ROM	10-70°	12-65°
Varus deformity	8°	10°
Quadriceps strength	Grade 3/5	Grade 3/5
Gait	Antalgic	Antalgic

Additional findings: Grade 3 joint line tenderness, crepitus, and reduced patellar mobility.

5. Timeline

Time	Event
Day 0	Simultaneous BTKR performed
Post-op Day 1	Physiotherapy initiation
Week 2	Assisted ambulation, ROM 0-90°
Week 6	Strengthening, balance retraining
Week 12	Independent ambulation, functional restoration

6. Surgical Management

Simultaneous bilateral cemented posterior-stabilized TKR was performed. Components were aligned to restore mechanical axis. Postoperative care included thromboprophylaxis, IV antibiotics, and multimodal analgesia.

7 Physiotherapy Intervention

Phase 1: Acute Phase (Post-op Day 1-14)

Goals: Pain control, ROM initiation, quadriceps activation, safe ambulation.

1. Cryotherapy (15-20minutes, 3-5 times a day)
2. Ankle pumps, deep breathing
3. Quadriceps sets, gluteal sets

4. Assisted heel slides (ROM target up to 0–90°)
5. Straight leg raises with NMES support
6. Gait training with walker (POD2)

Phase 2: Early Rehabilitation (Week 2–6)

Goals: Improve ROM, strength, proprioception.

1. Stationary cycling
2. Closed kinetic chain (CKC) training: mini-squats, step-ups
3. Hip and core strengthening
4. Balance exercises (foam surfaces)
5. Gait progression to cane
6. Task-specific training (sit-to-stand)
7. Patellar mobilizations

Phase 3: Advanced Rehabilitation (Week 6–12)

Goals: Functional restoration, community ambulation.

1. Stair training
2. Independent walking
3. Outdoor walking
4. Retrowalking,

Physiotherapy Outcome Measures

Outcome Measure	Pre	Post (12 weeks)	Absolute Change	% Improvement	Interpretation
NPRS Pain	8/10	1/10	↓ 7	87.5%	Clinically significant reduction
Right Knee	70°	115°	+ 45°	64.3%	Marked ROM gain

Outcome Measure	Pre	Post (12 weeks)	Absolute Change	% Improvement	Interpretation
Flexion					
Right Knee Extension	10°	0°	10°	100%	Full extension achieved
Left Knee Flexion	65°	118°	+ 53°	81.5%	Large ROM gain
Left Knee Extension	12°	0°	12°	100%	Full extension achieved
Quadriceps Strength	3/5	4/5	+1 grade	—	Improved functional strength
KSS	42	76	+ 34	80.9%	Significant functional improvement
Ambulation	Limited	Independent	—	—	Independent mobility restored

8. Follow-Up and Outcomes

At 12 weeks:

1. Pain markedly reduced to 1/10
2. Near-normal ROM achieved
3. Strength restored to functional levels
4. Independent gait pattern achieved
5. Patient returned to community activities without assistive devices

No postoperative complications were observed.

9. Discussion

Simultaneous bilateral TKR is increasingly favoured for patients with severe bilateral knee OA due to comparable complication rates and accelerated overall recovery when performed on appropriately selected patients. Research indicates early physiotherapy enhances neuromuscular

activation, reduces stiffness, and supports functional restoration (Stevens-Lapsley 2012; Bade 2010).

This case demonstrates that, with structured and progressive rehabilitation, older adults undergoing BTKR can achieve excellent functional outcomes within 12 weeks.

Unique aspects of this case:

1. Significant preoperative deformity
2. Rapid early-phase recovery despite bilateral procedure
3. Excellent functional restoration shown through objective measures

10. Conclusion

This case reinforces that timely, structured, and evidence-based physiotherapy plays a crucial role in recovery following bilateral TKR. Even in older adults, simultaneous bilateral procedures are safe and effective when paired with an aggressive yet patient-specific rehabilitation protocol.

11. References

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