

Physiotherapy Management After ORIF for Proximal Femur Fracture: A Case Report

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Abstract

Background: Proximal femur fractures may cause pain, restricted range of motion, muscle weakness, and impaired function after surgical fixation. Detailed reporting of individualized physiotherapy during early postoperative rehabilitation remains limited.

Objective: To describe physiotherapy management and serial clinical changes in a patient with a right proximal femur fracture after open reduction and internal fixation (ORIF).

Methods: This case report followed the CARE reporting framework. A 59-year-old woman underwent ORIF with plate and screw fixation after a motorcycle accident. Physiotherapy was delivered across three sessions and included positioning, ankle pump exercise, interferential therapy, diaphragmatic breathing, active assisted range of motion, isometric exercise, activity modification education, and walking exercise with a walker. Pain, active and passive range of motion, manual muscle testing, and the Lower Extremity Functional Scale (LEFS) were assessed serially.

Results: Rest pain decreased from 4 to 0, movement pain from 7 to 2, and palpation pain from 9 to 3. Active and passive hip flexion increased from 40° to 85° and 50° to 95°, respectively. Active and passive knee flexion increased from 30° to 60° and 45° to 85°. Selected hip and knee muscle strength grades improved. LEFS increased from 4 to 20, representing an absolute change of 16 points.

Conclusion: Improvements in pain, joint motion, muscle strength, and lower extremity function were observed during rehabilitation. However, the single case design, multimodal intervention, and short follow up preclude causal attribution to individual interventions and limit generalizability.

Keywords

Proximal Femur Fractures; Fracture Fixation, Internal; Physical Therapy Modalities; Range of Motion, Articular; Muscle Strength

Introduction

Proximal femur fractures are an important cause of morbidity and functional limitation, particularly among older adults, and their burden is expected to remain substantial as populations age. These fractures are associated with impaired mobility, loss of independence, increased healthcare utilization, and reduced quality of life.^{1,2} Although osteoporosis is an important contributor to skeletal fragility and fracture risk, proximal femur fractures may also occur following traumatic mechanisms, depending on patient characteristics and injury circumstances.³ The clinical consequences of these injuries extend beyond the fracture itself because patients may experience persistent pain, restricted joint mobility, muscle weakness, and difficulty performing daily activities during the postoperative period.

Surgical treatment is selected according to factors such as fracture location, displacement, stability, and the feasibility of achieving and maintaining adequate reduction. Open reduction and internal fixation (ORIF) is one established surgical approach for selected femoral fractures.⁴ However, successful fixation does not necessarily correspond to immediate functional recovery. After surgery, patients may continue to experience pain, reduced range of motion (ROM), muscle weakness, impaired mobility, and functional dependence.⁵ These postoperative problems may also be influenced by immobilization, reduced physical activity, and individual clinical tolerance, highlighting the importance of rehabilitation as part of postoperative management.

Previous studies have identified early mobilization and structured physiotherapy as important components of rehabilitation after hip fracture surgery. Perioperative interventions involving physiotherapist supervised mobilization have been associated with improved physical function, while systematic reviews have also examined the relationship between earlier mobilization and postoperative outcomes.^{6–7} Progressive resistance training and structured exercise programs have similarly been investigated for improving muscle strength and functional capacity after hip fracture, although intervention characteristics and outcomes vary across studies and patient populations.⁸ Comprehensive rehabilitation programs combining therapeutic exercise and functional training have also been evaluated in patients undergoing surgery for lower limb fractures.⁹ Collectively, this evidence supports the role of rehabilitation in postoperative recovery while also demonstrating that the content, dose, timing, and progression of physiotherapy may differ substantially between patients and clinical settings.

Pain is another clinically relevant factor because it may limit movement and participation in rehabilitation. Electrotherapeutic modalities, including interferential current, have been investigated for pain management in musculoskeletal conditions.¹⁰ However, the available evidence is heterogeneous and does not directly establish the effectiveness of these modalities for every postoperative fracture population. Electrotherapy should therefore be considered within the broader context of multimodal rehabilitation rather than as an isolated explanation for clinical improvement. In clinical practice, physiotherapy programs may combine pain management strategies with therapeutic exercise, mobility training, positioning, education, and progressive functional activities according to the patient's documented postoperative condition and tolerance.

Despite the availability of evidence regarding postoperative rehabilitation, an important reporting gap remains concerning how multimodal physiotherapy is adapted and documented in individual patients during the early period after ORIF. Most intervention studies focus on standardized rehabilitation programs and group level outcomes. In contrast, case reports can provide detailed information regarding the temporal relationship between clinical assessment, treatment implementation, progression of intervention, and serial changes in patient outcomes.¹¹ The value of such reports, however, depends on transparent documentation of postoperative clinical information, intervention dose, progression criteria, outcome measurement procedures, and relevant limitations. In particular, postoperative restrictions and precautions should not be inferred when they are not documented.

The present case involved a 59 year old woman with a right proximal femur fracture who underwent ORIF followed by physiotherapy. The available clinical documentation supported the description of a multimodal rehabilitation program that included positioning, ankle pump exercise, interferential therapy, diaphragmatic breathing, active assisted ROM, isometric and static muscle exercises, activity modification education, and progressive walking exercise with a walker.¹⁰ Serial assessments documented changes in pain, active and passive ROM, muscle strength, and lower extremity function across four assessment points. The surgeon's specific postoperative weight bearing instruction was not documented in the available medical record; therefore, no weight bearing restriction is inferred in this report. Postoperative radiographic documentation confirmed internal fixation of the proximal femur, and physiotherapy management was based on the documented postoperative clinical condition and available orthopedic information.

Accordingly, this case report aimed to describe the physiotherapy management and serial clinical changes observed during early postoperative rehabilitation in a patient with a proximal femur fracture after ORIF. The report focuses on the documented implementation and progression of a multimodal physiotherapy program and changes in pain, ROM, muscle strength, and lower extremity function. Because the intervention consisted of multiple components and the observation period was limited to three treatment sessions, the report does not seek to establish causal effects or determine the contribution of individual interventions to the observed clinical changes.

Methods

This clinical case report was prepared in accordance with the CARE reporting framework to provide a structured description of the patient's clinical context, physiotherapy management, serial outcome assessments, and observed changes during the documented rehabilitation period. The report was based on available clinical records and information subsequently confirmed by the authors. The purpose was descriptive and did not involve a comparison group, experimental allocation, or inferential statistical analysis. The case is presented as an account of the documented rehabilitation process and associated clinical changes; therefore, no causal relationship between individual physiotherapy components and the observed outcomes was assumed. The CARE reporting framework was used to support transparent reporting of case presentation, intervention, clinical outcomes, and limitations.¹²

The patient was a 59-year-old woman who sustained a right proximal femur fracture in a motorcycle accident. According to the source documentation, the injury occurred on 14 August 2025, followed by ORIF with plate and screw fixation on 16 August 2025. However, the subsequently confirmed assessment dates were recorded as 2 September 2026 for T0 and T1, 4 September 2026 for T2, and 11 September 2026 for T3. Because the available documents contain a discrepancy between the reported year of surgery and the recorded rehabilitation assessment dates, this chronological inconsistency should be verified against the original clinical record before final submission. The present report does not alter or reconstruct the dates beyond the information provided by the authors. Physiotherapy was conducted at Rumah Sakit Umum Pusat Dr. Tadjuddin Chalid, Makassar, Indonesia.

At the initial documented assessment, the patient presented with pain during movement and palpation, restricted hip and knee movement, reduced muscle strength, and limitations in lower extremity function. She arrived using a wheelchair and required family assistance for transfer to the treatment bed. The available history did not identify a major comorbidity or neurological disorder expected to materially influence the rehabilitation process. Postoperative radiographic examination documented internal fixation of the proximal femur. Physiotherapy management was subsequently planned according to the documented postoperative clinical condition, available orthopedic information, functional ability, and the patient's tolerance during mobilization.¹³

The specific postoperative weight bearing instruction provided by the surgeon or orthopedic team was not documented in the available medical record. Similarly, specific postoperative precautions beyond general clinical safety considerations were not available for verification. These details were therefore not inferred or reconstructed. All physiotherapy interventions were performed with consideration of the patient's postoperative condition, clinical tolerance, and safety during mobilization. During walking exercise, the patient received instruction regarding walker use, body position, stepping pattern, and load distribution in accordance with the weight bearing status established by the treating physician; however, the exact prescribed weight bearing category was not available in the documentation.¹⁴

Clinical outcomes were assessed at four time points, designated T0, T1, T2, and T3. T0 represented the baseline assessment before the initial physiotherapy intervention. T1 corresponded to the first treatment session and reassessment on 2 September 2026, T2 to the second session on 4 September 2026, and T3 to the third and final documented session on 11 September 2026. Thus, the serial assessments were conducted over three documented physiotherapy sessions. The same assessor performed the measurements at T1, T2, and T3 to maintain consistency in the measurement process.¹⁵ The available documentation does not provide additional information regarding the assessor's professional qualifications or training.

Pain intensity was evaluated using the Numeric Pain Rating Scale (NPRS), ranging from 0 to 10, where 0 indicated no pain and 10 indicated the most severe pain. Separate scores were recorded for pain at rest, pain during movement, and pain during palpation. The same scoring approach was applied at each assessment point to monitor serial changes in pain intensity. The available record did not specify additional standardization procedures for pain assessment, such as the exact timing of assessment relative to treatment or activity. Therefore, these details are not reconstructed in this report.¹⁶

Range of motion (ROM) of the involved hip and knee was assessed using a goniometer. Active and passive ROM were recorded separately to distinguish the movement achieved independently by the patient from the movement obtained with external assistance. Measurements were performed using the same patient positioning and measurement procedure at each assessment point to support consistency across serial evaluations. The source documentation did not specify the goniometer model, detailed anatomical landmarks, axis placement, or movement specific testing positions. Accordingly, these procedural details cannot be retrospectively reconstructed and should not be interpreted as having followed an unspecified standardized protocol.¹⁷

Muscle strength was assessed using Manual Muscle Testing (MMT) on a 0 to 5 ordinal scale. The evaluated muscle groups included the hip flexors, hip extensors, hip abductors, knee flexors, and knee extensors. The same general assessment procedure was used across the serial evaluations. Although the grading scale was documented, the available record did not identify the specific

MMT reference procedure, exact patient positions, stabilization methods, or resistance application used during testing. The findings are therefore reported according to the documented grades without additional methodological assumptions. A direct methodological reference supporting the MMT procedure should be added during final reference completion.¹⁵

Lower extremity function was evaluated using the Lower Extremity Functional Scale (LEFS). The instrument consists of 20 items with a total score ranging from 0 to 80, with higher scores representing better lower extremity function. LEFS was administered at each assessment point to document serial changes in the patient's functional status during the rehabilitation period. The score was interpreted descriptively, and the primary analysis focused on the absolute change between baseline and the final documented assessment. A systematic review reported a pooled minimal clinically important difference of 9 points across heterogeneous lower extremity musculoskeletal populations. However, this value was not treated as a fracture specific threshold because the available estimate was not derived specifically from patients with proximal femur fractures after ORIF.¹⁸

The physiotherapy program was individualized according to the patient's clinical presentation, pain, ROM, muscle strength, functional status, and tolerance. The intervention consisted of a multimodal approach including positioning, ankle pump exercise, interferential therapy, diaphragmatic breathing, active assisted range of motion (AAROM), isometric and static exercises for the quadriceps, gluteal, and hamstring muscles, education regarding activity modification and transfers, and progressive walking exercise using a walker. Progression or modification of the program was based on periodic clinical evaluation of pain, MMT, ROM, and functional status measured using LEFS. These parameters were considered collectively when determining the patient's tolerance and readiness for progression.

During the first session, T1, the intervention focused on pain management, prevention of complications associated with immobility, maintenance of joint mobility, early muscle activation, and improvement of tolerance to activity. Positioning and regular position changes were provided to support comfort and reduce prolonged static positioning. Ankle pump exercise was performed for 25 repetitions in one set and was prescribed twice daily. Interferential therapy was administered using a two pole interference configuration with a carrier frequency of 4000 Hz and an amplitude modulation frequency of 100 Hz. The modality was delivered continuously for 10 minutes at an intensity adjusted according to patient tolerance and was scheduled twice weekly.

Diaphragmatic breathing was performed for 2 to 3 repetitions over approximately 3 minutes using slow nasal inspiration and controlled expiration. AAROM of the hip and knee was performed in supine and side lying positions according to patient tolerance. The exercise consisted of 10 repetitions in one set with controlled movement within the tolerated range. Early strengthening consisted of isometric and static exercises targeting the quadriceps, gluteal, and hamstring muscles, also performed for 10 repetitions in one set. Education included activity modification, bed mobility, transfer techniques, use of a chair or raised toilet seat, and dressing strategies intended to support safe performance of daily activities.

At T2, the same multimodal intervention was continued with progression of the exercise dose. Ankle pump exercise remained at 25 repetitions in one set, while interferential therapy and diaphragmatic breathing were continued using the same documented parameters. AAROM of the hip and knee was progressed to 8 repetitions in two sets. Isometric exercises for the quadriceps, gluteal, and hamstring muscles were similarly progressed to 8 repetitions in two sets. Education regarding positioning, transfers, assistive device use, and activity modification was continued. The progression was based on the serial clinical evaluation and the patient's response to the preceding intervention, although detailed session specific criteria such as fatigue thresholds or movement quality scores were not documented.

At T3, the intervention was further progressed according to the patient's clinical status and tolerance. Ankle pump exercise was increased to two sets of 25 repetitions. AAROM and isometric exercises for the quadriceps, gluteal, and hamstring muscles were progressed to 8 repetitions in three sets. Interferential therapy continued with the same documented parameters, including a 4000 Hz carrier frequency, 100 Hz amplitude modulation frequency, and 10 minute application duration. Diaphragmatic breathing was also maintained as part of the program.

Walking exercise using a walker was added at T3 as a progression toward functional mobility. The patient received instruction regarding walker use, body alignment, stepping pattern, and load distribution according to the postoperative weight bearing status established by the treating physician. The exact weight bearing prescription was not available in the clinical documentation and is therefore not specified. Walking distance and duration were adjusted according to the patient's balance, pain, functional capacity, and tolerance. Education regarding transfers, positioning, assistive device use, and activity modification was maintained. Exercises were performed in a controlled manner and were modified or discontinued if the patient experienced an increase in pain or other symptoms that could not be tolerated.

The exact duration of the complete physiotherapy session and the precise sequence of every intervention within each session were not documented. Therefore, no estimated session duration or reconstructed treatment order is reported. Likewise, the available documentation did not provide a formal intervention fidelity assessment or detailed information regarding provider characteristics. These limitations affect the reproducibility of the intervention and should be considered when interpreting the case. The intervention is reported only according to the documented treatment content, dosage, progression, and modification criteria confirmed by the authors.

Data were analyzed descriptively. Serial values obtained at T0, T1, T2, and T3 were presented in chronological order to describe changes in pain, active and passive ROM, MMT grades, and LEFS scores. Absolute changes between T0 and T3 were calculated where applicable. No inferential statistical analysis was performed because this report involved a single patient without a comparison group. The analysis was intended to describe the temporal pattern of the documented clinical measurements and was not designed to establish treatment effectiveness or causal relationships.

This case report did not undergo institutional ethics committee review, and no formal ethical approval or exemption number was available. According to the information confirmed by the authors, verbal informed consent was obtained from the patient for the use of relevant clinical information in this case report. Identifying information was omitted to protect patient confidentiality. Because no formal institutional ethics waiver or approval was issued, the ethical status is reported transparently and should be reviewed against the applicable institutional and journal requirements before submission. The patient's perspective regarding rehabilitation experience, perceived benefits, difficulties, or barriers was not formally collected and was therefore unavailable for inclusion in this report.

Results

The clinical course and assessment schedule are summarized in Table 1. The available documentation identified four assessment points, comprising baseline assessment before physiotherapy at T0, followed by reassessments at T1, T2, and T3. According to the author confirmation, T0 and T1 were recorded on 2 September 2026, T2 on 4 September 2026, and T3 on 11

September 2026. The three treatment sessions were therefore conducted over the documented observation period, with T3 representing the final available assessment. Because no further follow up was recorded, the findings are limited to the short term clinical changes observed through T3.

Table 1. Clinical timeline and assessment points

Time point	Date	Clinical event
T0	2 September 2026	Baseline assessment before physiotherapy
T1	2 September 2026	First physiotherapy session and reassessment
T2	4 September 2026	Second physiotherapy session and reassessment
T3	11 September 2026	Third physiotherapy session and final documented reassessment

The serial pain assessments are presented in Table 2. Rest pain decreased from 4 at T0 to 3 at T1 and reached 0 at T2, remaining unchanged at T3. Movement pain remained at 7 between T0 and T1, decreased to 3 at T2, and further decreased to 2 at T3. Palpation pain showed a progressive reduction from 9 at T0 to 8 at T1, 6 at T2, and 3 at T3. Overall, the documented pain scores showed a reduction across all three domains during the observation period.

Table 2. Serial pain intensity measured using the Numeric Pain Rating Scale

Pain domain	T0	T1	T2	T3
Rest pain	4	3	0	0
Movement pain	7	7	3	2
Palpation pain	9	8	6	3

NPRS, Numeric Pain Rating Scale; scores range from 0 to 10, with higher scores indicating greater pain intensity.

Serial active and passive ROM measurements of the involved hip and knee are presented in Table 3. Active hip flexion remained at 40° from T0 to T1, increased to 52° at T2, and reached 85° at T3. Passive hip flexion increased from 50° at T0 and T1 to 65° at T2 and 95° at T3. Active knee flexion increased from 30° at T0 and T1 to 40° at T2 and 60° at T3, whereas passive knee flexion increased from 45° to 55° and subsequently to 85°. Changes were also observed in hip extension and abduction. In contrast, knee extension remained at -5° for both active and passive measurements throughout the documented assessment period.

Table 3. Active and passive range of motion of the involved hip and knee

Region	Movement	T0 Active	T0 Passive	T1 Active	T1 Passive	T2 Active	T2 Passive	T3 Active	T3 Passive
Hip	Flexion	40°	50°	40°	50°	52°	65°	85°	95°
Hip	Extension	10°	15°	10°	15°	15°	20°	20°	20°
Hip	Abduction	15°	20°	15°	20°	20°	25°	30°	35°
Knee	Flexion	30°	45°	30°	45°	40°	55°	60°	85°
Knee	Extension	-5°	-5°	-5°	-5°	-5°	-5°	-5°	-5°

ROM, range of motion. Negative values indicate the documented extension deficit.

Muscle strength grades assessed using MMT are shown in Table 4. Hip flexor, hip extensor, hip abductor, and knee flexor strength were graded as 2 at T0 and T1, increased to grade 3 at T2, and remained at grade 3 at T3. Knee extensor strength was graded as 3 at T0 and T1, increased to grade 4 at T2, and remained at grade 4 at T3. Thus, the documented changes in muscle strength occurred primarily between T1 and T2 and were maintained through the final assessment.

Table 4. Manual Muscle Testing grades for selected muscle groups

Muscle group	T0	T1	T2	T3
Hip flexor	2	2	3	3
Hip extensor	2	2	3	3
Hip abductor	2	2	3	3
Knee flexor	2	2	3	3
Knee extensor	3	3	4	4

MMT, Manual Muscle Testing. Muscle strength was graded on a 0 to 5 ordinal scale.

Lower extremity function, assessed using LEFS, is presented in Table 5. The baseline score was 4 at T0 and remained unchanged at T1. The score increased to 13 at T2 and reached 20 at T3. The absolute change between the baseline and final documented assessment was therefore 16 points. This numerical change is presented descriptively and is not interpreted as evidence of treatment effectiveness within the Results section.

Table 5. Lower Extremity Functional Scale scores across serial assessments

Assessment	LEFS score
T0	4
T1	4
T2	13
T3	20

LEFS, Lower Extremity Functional Scale. Total scores range from 0 to 80, with higher scores indicating better lower extremity function.

Across the documented assessment period, serial measurements demonstrated concurrent changes in pain intensity, hip and knee ROM, selected muscle strength grades, and lower extremity function. The largest documented numerical changes were observed in hip and knee flexion and in the LEFS score, while knee extension remained unchanged. These results describe the temporal pattern of clinical measurements from T0 through T3. Interpretation of their clinical significance, the potential contribution of the multimodal physiotherapy program, and the limitations of causal attribution are addressed in the Discussion.

Discussion

The present case described serial clinical changes during a short period of physiotherapy following ORIF for a right proximal femur fracture. Across the four assessment points, reductions in rest, movement, and palpation pain were observed together with improvements in active and passive hip and knee ROM, selected muscle strength grades, and lower extremity function. Rest pain decreased from 4 to 0, movement pain from 7 to 2, and palpation pain from 9 to 3. Active hip flexion increased from 40° to 85°,

whereas passive hip flexion increased from 50° to 95°. Active knee flexion increased from 30° to 60°, while passive knee flexion increased from 45° to 85°. LEFS increased from 4 to 20, representing an absolute change of 16 points. These findings describe concurrent changes during the documented rehabilitation period and should not be interpreted as evidence that physiotherapy, or any individual component of the program, directly caused the observed improvements.

The improvements in hip and knee ROM are consistent with the general rehabilitation objective of progressively restoring movement and functional mobility after proximal femur fracture surgery. Previous studies have identified early mobilization and structured physical rehabilitation as important components of postoperative management, although intervention protocols, patient characteristics, and outcomes differ across studies. In this case, the greatest changes were observed in hip and knee flexion, while knee extension remained at -5° throughout the assessment period. The distinction between active and passive ROM is clinically relevant because the magnitude and pattern of change differed between movements. For example, active hip flexion increased by 45°, whereas passive hip flexion also increased by 45°. Active knee flexion increased by 30°, while passive knee flexion increased by 40°. Despite these changes, the final assessment continued to demonstrate restricted movement, particularly in knee extension. Therefore, the findings should be interpreted as short term serial changes rather than evidence of complete recovery or restoration of normal joint function.

Changes in muscle strength were also observed during the rehabilitation period. Hip flexor, extensor, abductor, and knee flexor strength increased from grade 2 to grade 3, while knee extensor strength increased from grade 3 to grade 4. Exercise and progressive strengthening have been incorporated into rehabilitation programs after hip and lower limb fractures, with previous studies reporting potential improvements in strength and functional capacity. However, the present case involved a multimodal intervention rather than an isolated strengthening protocol. Consequently, the observed changes cannot be attributed specifically to AAROM, isometric exercise, walking exercise, or any other individual component. Reduced pain, increased willingness to move, recovery from the acute postoperative condition, and natural recovery may also have contributed to the observed pattern.

Pain scores declined across all documented domains during the observation period. Interferential therapy was included as one component of the physiotherapy program, while positioning, therapeutic exercise, diaphragmatic breathing, education, and progressive mobility were also delivered. Previous systematic reviews have evaluated interferential current for musculoskeletal pain, although the available evidence is derived from heterogeneous populations and does not specifically establish effectiveness in patients with proximal femur fractures after ORIF. Accordingly, the reduction in pain observed in this case cannot be attributed to interferential therapy. The simultaneous delivery of multiple interventions and the absence of a comparison condition prevent the relative contribution of each component from being determined.

The improvement in lower extremity function was reflected by an increase in LEFS from 4 at baseline to 20 at T3, corresponding to an absolute change of 16 points. A systematic review of the measurement properties of LEFS reported a pooled minimal clinically important difference of 9 points across heterogeneous lower extremity musculoskeletal populations.²⁴ Numerically, the observed 16 point change exceeded this published value. Nevertheless, the pooled estimate was not derived specifically from patients with proximal femur fractures after ORIF, particularly during the early postoperative period represented in this case. Therefore, the 9 point value should be used only as contextual information and should not be interpreted as a fracture specific threshold. The absolute change from 4 to 20 remains the most appropriate descriptive representation of the functional change observed in this patient.

An important contribution of this case is the detailed description of serial assessment and intervention progression over three documented physiotherapy sessions. The program incorporated positioning, ankle pump exercise, interferential therapy, diaphragmatic breathing, AAROM, isometric exercise, activity modification education, and walking exercise with a walker during the final session. Exercise dosage was progressively increased according to serial clinical evaluation and patient tolerance. The progression from one to two and subsequently three sets for selected exercises provides greater detail regarding treatment implementation than was available in the original version of the report. Nevertheless, the case remains limited by incomplete information regarding the exact duration and sequence of each session, detailed patient responses during individual interventions, provider characteristics, and formal assessment of intervention fidelity.

The absence of a documented surgeon prescribed weight bearing instruction represents another important limitation. The available record did not specify the exact postoperative weight bearing category or detailed orthopedic precautions. These restrictions are clinically relevant because they may influence the selection and progression of mobility and walking activities. The present report therefore does not infer a specific weight bearing status. Walking exercise at T3 was described only according to the documented information that load distribution and progression were intended to follow the status established by the treating physician. Future case reports should prospectively document postoperative restrictions, precautions, and relevant orthopedic information to improve clinical interpretability and reproducibility.¹⁹

The postoperative radiographic record confirmed internal fixation of the proximal femur. However, detailed radiological findings relevant to fracture alignment, healing progression, or other postoperative characteristics were not available in the provided documentation. Consequently, no additional radiological interpretation can be made. Similarly, although ROM, MMT, pain, and LEFS were assessed serially by the same assessor, detailed standardization procedures for goniometry and MMT were not fully documented. The consistency of the assessor may support comparability across repeated measurements, but the absence of detailed procedural information limits methodological reproducibility. A reference supporting the actual MMT and goniometric procedures used should be included during final reference completion.²⁰

Several limitations should be considered when interpreting this case. First, a single case without a comparator cannot establish causality or separate intervention related changes from natural postoperative recovery. Second, multiple interventions were delivered concurrently, preventing the effects of individual components from being isolated. Third, follow up ended at T3 after three documented physiotherapy sessions, precluding conclusions regarding medium or long term recovery. Fourth, incomplete documentation of postoperative weight bearing instructions, specific precautions, session duration, treatment sequence, provider characteristics, and intervention fidelity limits reproducibility. Fifth, the patient's rehabilitation perspective, perceived benefits, difficulties, and barriers were not formally collected. Finally, the available documentation contains a discrepancy between the reported year of injury and surgery and the confirmed dates of the rehabilitation assessments. This chronological inconsistency should be verified against the original clinical record before final manuscript submission.

Despite these limitations, the case provides a descriptive account of multimodal physiotherapy management and serial clinical changes during the documented rehabilitation period after ORIF for a proximal femur fracture. The findings demonstrate temporal changes in pain, ROM, muscle strength, and lower extremity function, but they do not establish treatment effectiveness. Future research should include longer follow up, clearly documented postoperative restrictions, standardized measurement

procedures, detailed intervention fidelity, and comparative designs to better evaluate the contribution of specific rehabilitation strategies to recovery after proximal femur fracture fixation.

Conclusion

In this case of a 59 year old woman undergoing physiotherapy after ORIF for a right proximal femur fracture, serial assessments across three documented treatment sessions showed concurrent reductions in rest, movement, and palpation pain, together with improvements in active and passive hip and knee ROM, selected muscle strength grades, and lower extremity function. The LEFS score increased from 4 at baseline to 20 at the final documented assessment, representing an absolute change of 16 points.

These findings describe favorable clinical changes during the observed rehabilitation period. However, the single case design, absence of a comparison group, multimodal nature of the intervention, and short follow up prevent causal attribution of these changes to the overall physiotherapy program or to any individual component, including interferential therapy or specific exercise interventions. Natural postoperative recovery and other concurrent factors may also have contributed to the observed changes.

Interpretation is further limited by incomplete documentation of the surgeon prescribed weight bearing status, specific postoperative precautions, detailed session duration and sequence, and several aspects of intervention fidelity. Therefore, the findings should not be generalized to other patients or interpreted as evidence of long term recovery. Future studies should incorporate longer follow up, detailed documentation of postoperative restrictions and intervention implementation, standardized measurement procedures, and comparative designs to better evaluate the contribution of specific rehabilitation strategies after proximal femur fracture fixation.

Author Contribution

Muthiah: Conceptualization, Formal Analysis, Investigation, Data Curation, Writing Original Draft, Visualization.

Hermansyah: Validation, Resources, Writing Review and Editing, Supervision.

Rijal: Methodology, Validation, Writing Review and Editing, Supervision.

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Conflict of Interest Statement

The authors declare that they have no conflicts of interest related to this case report.

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Ethics Statement

This case report was not reviewed by an institutional ethics committee, and no formal ethical approval or waiver number was obtained. Verbal informed consent was obtained from the patient for the use and publication of relevant clinical information. The patient provided permission for the publication of this case report, and all identifying information was omitted to protect patient confidentiality.

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