

Progressive Rehabilitation After Intramedullary Nailing of a Proximal Femur Fracture: A Case Report

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Abstract

Background: Proximal femur fractures may cause pain, restricted range of motion (ROM), muscle weakness, and impaired weight-bearing capacity. Progressive physiotherapy may address these impairments following surgical fixation.

Objective: To describe changes in pain, ROM, muscle strength, and thigh circumference following progressive physiotherapy after intramedullary nailing for a proximal femur fracture.

Methods: This case report involved a 46-year-old man with a displaced oblique fracture of the proximal third of the left femur following a slip and fall. Intramedullary nailing was performed on October 3, 2025. Approximately one month postoperatively, he received four physiotherapy sessions twice weekly, comprising therapeutic exercise, progressive strengthening, balance and weight-transfer training, gait training, knee joint traction, and transcutaneous electrical nerve stimulation. Outcomes included Visual Analogue Scale (VAS) pain, hip and knee ROM, manual muscle testing, and upper-thigh circumference.

Results: After four sessions, VAS scores decreased by 1 point for resting, movement-related, and pressure pain. Left hip and knee flexion increased by 5° and 10°, respectively. Hip muscle strength improved from 3/5 to 4/5, while knee and ankle strength remained 4/5. Upper-thigh circumference remained unchanged at 38 cm. No inferential statistical analysis was performed.

Conclusion: Progressive physiotherapy was accompanied by improvements in selected pain, ROM, and hip strength measures. These descriptive findings do not establish treatment efficacy or causality.

Keywords

Proximal Femur Fractures; Intramedullary Nailing; Rehabilitation; Physical Therapy; Case Reports

Introduction

Femur fractures represent an important cause of morbidity, disability, and healthcare burden worldwide. The global burden of femur fractures remains substantial, with demographic changes and population growth contributing to an increasing number of affected individuals.^{1,2} Proximal femur fractures are particularly important because they may result in persistent pain, restricted joint mobility, muscle weakness, and impaired mobility following injury and surgical fixation.^{1,3} The clinical course after fracture fixation is influenced by the fracture pattern, surgical management, postoperative loading recommendations, tissue healing, pain, muscle impairment, and the individual's response to rehabilitation.^{4,5} Therefore, surgical stabilization should be considered as one component of recovery, with rehabilitation playing an important role in addressing postoperative physical impairments and restoring movement capacity.⁶

Postoperative rehabilitation following proximal femur and hip fracture surgery commonly addresses pain, joint mobility, muscle activation, progressive strengthening, balance, weight transfer, and gait-related activities.⁷ Evidence from hip fracture populations indicates that early mobilization and structured rehabilitation may contribute to improved mobility and other clinical outcomes, although the strength and applicability of evidence vary according to patient characteristics and rehabilitation approaches.⁶⁻⁹ Progressive resistance exercise has also been investigated as an important component of rehabilitation following hip fracture surgery, with evidence supporting improvements in muscle strength and selected physical performance outcomes.⁸ However, much of this evidence has been generated in older adults, frequently involving patients aged 65 years or older with hip fractures associated with osteoporosis or low-energy trauma.^{6,8} This distinction is relevant when interpreting rehabilitation in younger patients with traumatic proximal femur fractures because age, fracture characteristics, surgical management, postoperative restrictions, and baseline physical capacity may influence both treatment decisions and recovery trajectories.^{10,11}

The present case involved a 46-year-old man who sustained a displaced oblique fracture involving the proximal third of the left femur after slipping. The fracture was surgically managed with intramedullary nailing on October 3, 2025. During physiotherapy, the patient was partially weight bearing and used an axillary crutch on the left side, with progressive training toward full weight bearing because he remained substantially dependent on the crutch for mobility. The postoperative clinical context therefore required rehabilitation to be progressed while considering the patient's loading status, movement limitations, muscle weakness, and tolerance to exercise. Such clinical circumstances emphasize the importance of documenting not only the exercises provided but also the rationale and progression of rehabilitation according to the patient's observed response.¹²

Individualized progression is particularly relevant in rehabilitation because the same exercise program may not be appropriate for patients with different fracture characteristics, surgical procedures, loading restrictions, or levels of physical impairment. Rehabilitation may initially emphasize low-load movement and muscle activation before progressing toward resisted strengthening, weight transfer, balance activities, and more demanding gait tasks as tolerated.^{6,9} In the present case, rehabilitation progressed from basic therapeutic exercises and gait training toward resisted strengthening, weight transfer, sit-to-stand activities, balance exercises, step activities, and gait training involving directional changes. The clinical progression provides an opportunity to

describe how rehabilitation was organized over successive treatment sessions rather than presenting the intervention as a fixed protocol.¹³

Previous case reports have described physiotherapy rehabilitation following proximal or subtrochanteric femur fractures, demonstrating the potential educational value of detailed individual clinical descriptions.^{14,15} Nevertheless, case reports frequently provide limited information regarding the clinical reasoning underlying progression between treatment sessions, particularly the relationship between baseline impairments, therapeutic choices, patient tolerance, and subsequent modification of exercise demands. A transparent description of session-by-session rehabilitation may therefore provide useful clinical information, particularly when the patient population differs from that represented in larger rehabilitation studies. Such reporting does not establish intervention effectiveness but can contribute to understanding how rehabilitation is implemented in routine clinical practice.¹³

Another consideration is the use of adjunctive interventions within a progressive rehabilitation program. In this case, transcutaneous electrical nerve stimulation (TENS) was used to support activation of the quadriceps muscle, which had experienced hypotrophy. TENS has been investigated extensively for pain management across acute and chronic conditions, although its effects may vary according to treatment parameters and clinical context.¹⁶ Because the purpose of TENS in this case was related to muscle activation rather than being presented solely as an analgesic intervention, its role should be interpreted within the broader multimodal rehabilitation program rather than as an isolated treatment effect. The case also included knee joint mobilization using traction for five minutes during a treatment session because knee locking was reported to limit flexion and interfere with a normal gait pattern. These interventions illustrate the tailoring of treatment to documented clinical findings, while the absence of a comparator prevents determination of the independent contribution of any individual modality.

The research gap addressed by this case report is therefore the limited documentation of individualized clinical reasoning and session-by-session progression in physiotherapy rehabilitation following traumatic proximal femur fracture fixation, particularly in a middle-aged patient whose clinical characteristics differ from the predominantly older populations represented in hip fracture rehabilitation literature.⁸ The educational value of the case lies in documenting the sequence of therapeutic progression and the changes observed in objectively recorded clinical measures. These include pain intensity, hip and knee range of motion, manual muscle testing grades, and upper-thigh circumference. The report deliberately does not infer functional recovery because no standardized functional outcome measure was collected. Similarly, changes observed during rehabilitation are not interpreted as evidence of treatment efficacy, safety, or causality.

Accordingly, this case report aims to describe the clinical reasoning and progressive physiotherapy management of a 46-year-old patient following intramedullary nailing for a left proximal femur fracture and to report changes in pain intensity, hip and knee range of motion, muscle strength, and upper-thigh circumference over four physiotherapy sessions. By presenting the clinical context, intervention progression, and measured outcomes together, this report seeks to provide a transparent and clinically relevant description of rehabilitation in an individual patient while maintaining appropriate limits on interpretation and generalizability.

Methods

This report was designed as a single-patient case report describing the assessment, clinical reasoning, and progressive physiotherapy rehabilitation of a patient following surgical fixation of a left proximal femur fracture. The report focused on changes in pain intensity, joint range of motion (ROM), muscle strength, and thigh circumference during four physiotherapy sessions. The purpose was descriptive and was not intended to determine treatment efficacy or establish causal relationships between individual rehabilitation interventions and observed clinical changes.

The patient was a 46-year-old man who sustained a displaced oblique fracture involving the proximal third of the left femur after slipping. Following the injury, the patient initially sought treatment from a traditional massage practitioner before subsequently receiving medical care. Radiological examination demonstrated discontinuity involving the proximal third of the left femur, consistent with the documented fracture diagnosis. Intramedullary nailing was performed on October 3, 2025, with metal fixation inserted into the femoral medullary cavity. No other medical history or comorbid condition was reported. The patient had used analgesic medication for pain management. No previous physiotherapy rehabilitation was reported in the available clinical information.

Physiotherapy assessment was performed at the Physiotherapy Outpatient Clinic of RSUP Tadjuddin Chalid Makassar. The initial assessment was conducted on September 29, 2025, with the rehabilitation program comprising four treatment sessions delivered twice weekly. At the time of rehabilitation, the patient was partially weight bearing and used an axillary crutch on the left side. Training toward full weight bearing was progressively introduced because the patient remained substantially dependent on the crutch for mobility. Occupational therapy was also recommended to support greater independence in daily activities. The rehabilitation program was therefore delivered within the context of the patient's postoperative loading status and documented mobility limitations.

The clinical assessment included history taking, observation, palpation, and measurement of pain intensity, joint ROM, muscle strength, and thigh circumference. Pain was assessed using the Visual Analogue Scale (VAS). Pain was recorded under three conditions: at rest, during movement, and during pressure. Hip and knee ROM was assessed using a universal goniometer. Measurements were obtained for the affected left lower extremity, with the same measurement approach applied during the initial and final assessments. Goniometric assessment was used to document changes in joint flexion during the rehabilitation period.¹⁷ Standardized reporting of patient position, anatomical landmarks, stabilization, and movement procedure should be maintained in accordance with established goniometric measurement principles.¹⁷

Muscle strength was assessed using manual muscle testing (MMT) and recorded using the conventional 0 to 5 grading scale. The assessment included the left hip, knee, and ankle. MMT was selected as the documented clinical method for evaluating changes in muscle strength during the rehabilitation period.^{17,18} The results were interpreted as ordinal clinical grades rather than direct quantitative measurements of muscle force.¹⁸

Thigh circumference was assessed using a flexible measuring tape. The measurement was taken at the midline of the thigh based on the recorded thigh length measurement. The initial assessment documented a circumference of 38 cm on the affected left side and 40 cm on the right side. The same measurement procedure was used for comparison at the final assessment. Because the available clinical information did not provide a more detailed anatomical landmark beyond the midline reference, interpretation of circumference changes was limited to the recorded measurements.

The rehabilitation intervention was provided across four sessions and was progressed according to the patient's clinical response, tolerance, and observed improvement in ROM. The patient's adherence to the prescribed rehabilitation sessions and home exercise program was reported as good, and he was described as cooperative with the exercises and home program. The progression of treatment was based on the improvement documented between the initial and final evaluations and the patient's ability to participate in the prescribed activities.

During the first session, treatment included heel slides, quadriceps setting, straight leg raises, active hip abduction and adduction, and gait training. These exercises were used to facilitate lower-limb movement, muscle activation, and mobility within the patient's postoperative condition. During the second session, exercise progression was introduced together with transcutaneous electrical nerve stimulation (TENS). TENS was applied with a documented frequency of 40 and intensity of 100 Hz using an intermittent pulse. The stated clinical rationale was to activate the quadriceps muscle, which had experienced hypotrophy, with the treatment target of improving muscle activation. Pulse width, electrode placement, and treatment duration were not documented in the available information and were therefore not specified in this report.¹⁹

Manual therapy was also provided during the rehabilitation program in the form of knee joint mobilization using a traction technique on the left knee joint. The intervention was delivered for five minutes during one treatment session. The rationale was the presence of knee locking that restricted knee flexion and interfered with a normal gait pattern. The intervention was intended to facilitate knee flexion ROM and support movement during rehabilitation.

Subsequent sessions involved progression of therapeutic exercise and mobility activities according to the patient's tolerance. The documented program included progressive strengthening, weight-transfer activities, balance exercises, gait training, sit-to-stand practice, and step activities. Exercise progression was accompanied by continued assessment of the patient's movement and ROM. The available documentation indicated that the patient responded well to the rehabilitation program and remained cooperative with the prescribed exercises and home program. No undocumented progression criteria, numerical pain thresholds, or additional treatment parameters were introduced into the present report.

The outcome assessment was performed descriptively by comparing measurements obtained at the initial assessment with those recorded after the fourth physiotherapy session. Changes in VAS scores were expressed as differences in pain score, while ROM changes were reported in degrees. MMT findings were reported as changes in muscle grade, and thigh circumference was reported in centimeters. No inferential statistical analysis was performed because this was a single-patient case report with a short observation period. No standardized functional outcome measure was used; therefore, functional recovery, independence, activities of daily living, balance performance, and walking capacity were not treated as measured outcomes.

No adverse events or complications were reported during the four physiotherapy sessions. The patient perspective was available and indicated that he perceived significant and beneficial changes in his daily activities during the rehabilitation process, although his activities had not yet returned completely to normal.

Written informed consent was obtained from the patient for publication of the case report and relevant clinical information. Identifying information was removed from the manuscript to protect patient confidentiality and privacy. According to the information provided by the authors, formal ethical approval was not required for this case report because it did not involve experimental research or procedures that altered the patient's clinical care. Ethical principles concerning confidentiality, privacy, and protection of patient information were nevertheless applied throughout the preparation of the report.²⁰

Results

The patient completed four physiotherapy sessions during the observation period. The initial and final assessments included pain intensity, joint range of motion (ROM), muscle strength, and upper-thigh circumference. The patient was partially weight bearing and used an axillary crutch during the rehabilitation period, with progressive training toward full weight bearing. The patient was reported to be cooperative with the prescribed exercises and home exercise program, and progression was accompanied by an observed improvement in knee flexion ROM. No standardized functional outcome measure was used to quantify activities of daily living, balance, walking capacity, or functional independence.

The changes in the measured clinical outcomes are summarized in Table 1. The table presents the baseline and final values recorded during the initial assessment and after the fourth physiotherapy session, respectively. Pain was assessed using the Visual Analogue Scale (VAS), while ROM was recorded in degrees, muscle strength using manual muscle testing (MMT), and thigh circumference in centimeters. Presenting the outcomes in this format allows the changes observed across the four-session rehabilitation period to be compared directly without inferring treatment effectiveness.

Table 1. Changes in Clinical Outcomes From Initial Assessment to After the Fourth Physiotherapy Session

Outcome	Measurement/Parameter	Initial Assessment	Final Assessment	Observed Change
Pain intensity	Resting pain, VAS	4	3	-1
	Movement-related pain, VAS	7	6	-1
	Pressure pain, VAS	5	4	-1
Range of motion	Left hip flexion, degrees	65°	70°	+5°
	Left knee flexion, degrees	20°	30°	+10°
Muscle strength	Left hip, MMT	3/5	4/5	+1 grade
	Left knee, MMT	4/5	4/5	No change
	Left ankle, MMT	4/5	4/5	No change
Thigh circumference	Left upper thigh	38 cm	38 cm	No change
	Right upper thigh	40 cm	40 cm	No change

Abbreviations: MMT, manual muscle testing; VAS, Visual Analogue Scale.

As shown in Table 1, pain scores decreased by one point across all three recorded conditions. Resting pain decreased from 4 to 3, movement-related pain from 7 to 6, and pressure pain from 5 to 4. The magnitude of change was therefore consistent across the three pain assessments. These findings represent the difference between the initial and final recorded assessments during the rehabilitation period and do not establish that the change was attributable to any specific treatment component.

ROM measurements demonstrated increases in flexion of both the left hip and knee. Left hip flexion increased from 65° at the initial assessment to 70° at the final assessment, corresponding to an observed increase of 5°. Left knee flexion increased from 20° to 30°, corresponding to an observed increase of 10°. The greater absolute change was therefore observed in knee flexion. These values represent the ROM measurements that were sufficiently documented for comparison between the initial and final assessments.

Muscle strength findings showed an increase in the left hip MMT grade from 3/5 to 4/5. In contrast, the left knee and ankle remained at 4/5 at both assessments. The hip finding represents a one-grade increase on the MMT ordinal scale, whereas no change was recorded for the knee or ankle. Because MMT provides categorical grades rather than a continuous measurement of force, the observed change is reported as a change in grade and is not interpreted as a specific percentage increase in muscle strength.

Upper-thigh circumference did not change during the observation period. The left upper thigh measured 38 cm at both the initial and final assessments, while the right upper thigh remained at 40 cm. The recorded difference between the affected and contralateral sides was therefore 2 cm at both assessments. Because the available documentation identified the measurement location only as the midline of the thigh based on thigh length, the circumference values are reported descriptively without interpreting them as direct measures of muscle mass or muscle hypertrophy.

The progression of rehabilitation activities occurred across the four sessions. The initial session included heel slides, quadriceps setting, straight leg raises, active hip abduction and adduction, and gait training. Subsequent treatment incorporated progressive strengthening, weight-transfer activities, balance exercises, sit-to-stand practice, step activities, and gait training with changes in direction. TENS was introduced during the second session, and knee joint traction was provided as manual therapy during one treatment session. The progression was accompanied by the documented improvement in knee flexion ROM and the changes in selected outcome measures presented in Table 1.

The patient reported that the rehabilitation process produced significant and beneficial changes in his daily activities, although his activities had not yet returned completely to normal. This perspective is presented as the patient's reported experience rather than as a measured functional outcome. No standardized instrument was used to quantify functional independence, activities of daily living, gait performance, or return to previous activity levels. Accordingly, the present Results section does not interpret the patient's reported experience as evidence of objectively measured functional recovery.

No adverse events or complications were reported during the four physiotherapy sessions. There was no documented report of clinically significant worsening of pain, swelling, or other unexpected events during the treatment period. The available information therefore supports reporting the absence of reported adverse events during the documented rehabilitation sessions.

Overall, the four-session observation period showed a one-point reduction in each of the three recorded VAS pain conditions, increases of 5° in left hip flexion and 10° in left knee flexion, and a one-grade increase in left hip MMT. Left knee and ankle MMT and upper-thigh circumference remained unchanged. These findings provide a descriptive account of the clinical measurements recorded before and after the rehabilitation period and do not permit determination of the independent contribution of individual rehabilitation interventions to the observed changes.

Discussion

This case report described the clinical course of a 46-year-old man with a displaced oblique fracture involving the proximal third of the left femur who underwent intramedullary nailing and subsequently received four physiotherapy sessions. The main observed changes were a one-point reduction in pain under resting, movement-related, and pressure conditions, increases of 5° in left hip flexion and 10° in left knee flexion, and a one-grade increase in left hip muscle strength from 3/5 to 4/5. Left knee and ankle muscle strength remained unchanged at 4/5, while upper-thigh circumference remained unchanged. These findings represent changes recorded during a short rehabilitation period and should not be interpreted as evidence that physiotherapy, TENS, manual therapy, or any other individual intervention caused the observed changes. Recovery may also have been influenced by postoperative healing, natural temporal changes, analgesic use, and other factors that were not controlled in this single case.¹³

The reduction in VAS pain scores occurred while the rehabilitation program progressed from basic therapeutic exercises to more demanding strengthening and mobility activities. TENS was introduced during the second session, with the documented purpose of activating the hypotrophic quadriceps muscle. Evidence from a systematic review and meta-analysis indicates that TENS can influence pain intensity in adults with acute and chronic pain, although effects vary across clinical conditions and treatment parameters.¹⁴ In the present case, however, pain decreased by only one point across each recorded condition, and the observation period was too short to determine whether this change was clinically meaningful or attributable to TENS. Moreover, the available documentation did not include pulse width, electrode placement, or treatment duration. Therefore, TENS should be considered only as one documented component of the multimodal rehabilitation program rather than as an established explanation for the observed pain reduction.

The observed increases in hip and knee flexion occurred alongside repeated active movement and progressive exercise. Heel slides, active hip exercises, straight leg raises, strengthening activities, weight transfer, and gait-related exercises were progressively incorporated during treatment. Rehabilitation after hip fracture surgery commonly includes mobility training, strengthening, balance activities, and gait-related interventions, while early mobilization has been associated with improved outcomes in hip fracture populations.^{6,8} Progressive resistance exercise has also been investigated as a component of postoperative rehabilitation, with evidence suggesting improvements in muscle strength and selected physical performance outcomes.⁹ Nevertheless, most of this evidence concerns older adults with hip fractures. The present patient was 46 years old and sustained a traumatic proximal femur fracture, making direct extrapolation from predominantly geriatric hip fracture populations inappropriate. The ROM changes in this case therefore provide an individual clinical observation rather than evidence that the documented exercise progression produces similar effects in other patients.

The increase in left hip MMT from 3/5 to 4/5 occurred during progression from muscle activation exercises toward resisted strengthening. This sequence is consistent with the general clinical rationale of gradually increasing exercise demand as tolerated. Progressive resistance training has been associated with improvements in muscle strength following hip fracture surgery, although the populations and intervention periods in the available evidence differ from this case.⁸ In addition, MMT is an ordinal assessment method and is influenced by examiner technique, patient effort, and the characteristics of the grading scale.¹⁸ Consequently, the one-grade increase should be interpreted as an observed clinical change rather than a precise quantitative increase in muscle force.

The unchanged upper-thigh circumference provides a contrasting finding. The affected left thigh remained at 38 cm compared with 40 cm on the contralateral side. A four-session rehabilitation period may be insufficient to produce a measurable change in circumference, and circumference measurements may also be influenced by factors other than muscle tissue. Furthermore, the clinical record specified the measurement as the midline of the thigh based on thigh length but did not provide a more detailed fixed anatomical landmark. This limits the precision with which repeated measurements can be compared. The unchanged circumference therefore cannot be interpreted as evidence for or against muscular adaptation. Objective assessment methods, such as ultrasound-based muscle thickness measurement, may provide additional information in future rehabilitation reports when clinically appropriate.²¹

The progression of treatment from low-load exercise toward strengthening, weight transfer, balance, sit-to-stand activities, step training, and more complex gait practice reflects an attempt to increase task demands in accordance with the patient's clinical presentation and tolerance. The patient was partially weight bearing and used an axillary crutch, while progressive training toward full weight bearing was introduced because he remained dependent on the crutch for mobility. This loading context is clinically

important because rehabilitation progression after fracture fixation should be considered alongside surgical stability and postoperative medical recommendations.^{12,22} The available case information does not provide sufficient detail regarding the surgeon's specific loading protocol or radiographic healing status to determine how these factors influenced each progression decision. The progression should therefore be understood as the documented physiotherapy process rather than as a standardized protocol for proximal femur fracture rehabilitation.

Knee joint traction was included because the patient presented with knee locking and restricted knee flexion that interfered with walking. The intervention was provided for five minutes during one treatment session and was intended to facilitate knee flexion ROM. The observed 10° increase in knee flexion occurred during the same overall rehabilitation period, but the case design cannot determine whether the change was related to traction, therapeutic exercise, postoperative recovery, or their combined effects. Similarly, the inclusion of gait, balance, and weight-transfer activities does not establish improvement in functional mobility because no validated functional outcome measure was used. The patient's report of beneficial changes in daily activities provides useful contextual information but should remain distinguished from objectively measured functional recovery.

The case also highlights the importance of comprehensive documentation in rehabilitation case reports. Information regarding the patient's lack of comorbidities, analgesic use, fracture characteristics, surgical fixation, loading status, treatment progression, adherence, and adverse events provides important clinical context for interpreting the observed changes. The patient's reported good adherence and cooperative participation in the prescribed exercises and home program may have supported continuity of treatment, although adherence cannot be established as a determinant of outcome in a single case. No adverse events or complications were reported during the four sessions. Future reports would benefit from documenting treatment parameters, loading instructions, progression criteria, adherence, and adverse events systematically to improve reproducibility.¹³

Several limitations should be considered. First, this was a single case without a comparator, preventing causal inference and estimation of treatment effectiveness. Second, only four physiotherapy sessions were observed, limiting conclusions about longer-term recovery or maintenance of the observed changes. Third, no standardized functional outcome measure was collected, preventing objective assessment of walking ability, balance, independence, or activities of daily living. Fourth, MMT and thigh circumference may be affected by measurement variability, and the circumference landmark was not described in sufficient anatomical detail. Fifth, some intervention parameters, particularly for TENS, were not documented completely, limiting reproducibility. Finally, evidence cited from hip fracture rehabilitation literature is derived predominantly from older populations and should not be generalized directly to this 46-year-old patient with a traumatic proximal femur fracture.⁶

Overall, this case demonstrates the value of linking rehabilitation progression with clearly documented clinical measurements. During four sessions, pain scores decreased, hip and knee flexion increased, and left hip MMT improved, whereas knee and ankle MMT and thigh circumference remained unchanged. These observations are compatible with a progressive rehabilitation approach but cannot establish the effectiveness or independent contribution of any treatment component. The main clinical implication is the importance of individualized progression, transparent documentation, and outcome measurement that reflects the specific impairments being treated. Future research should include larger patient populations, clearly defined fracture and surgical characteristics, standardized functional and patient-reported outcomes, more complete intervention parameters, and longer follow-up periods.

Conclusion

This case report described the clinical reasoning and progressive physiotherapy rehabilitation of a 46-year-old man following intramedullary nailing for a displaced oblique fracture of the proximal third of the left femur. Over four physiotherapy sessions, reductions in Visual Analogue Scale pain scores were observed across resting, movement-related, and pressure conditions. Left hip flexion increased by 5°, left knee flexion increased by 10°, and left hip muscle strength increased from 3/5 to 4/5 on manual muscle testing. Left knee and ankle muscle strength and upper-thigh circumference remained unchanged during the observation period.

These findings describe clinical changes observed during a short rehabilitation period and should not be interpreted as evidence of treatment efficacy or causality. The single-case design, absence of a comparator, short follow-up, and lack of standardized functional outcome measures limit interpretation of the patient's overall recovery. The case highlights the importance of documenting individualized rehabilitation progression alongside measurable clinical outcomes. Future reports should provide comprehensive fracture and surgical characteristics, postoperative loading recommendations, complete intervention parameters, standardized functional outcomes, and longer follow-up to improve the interpretability and reproducibility of rehabilitation case reporting.

Author Contribution

Mawaddah Warahmah: Conceptualization, methodology, clinical assessment, physiotherapy intervention, data collection, data interpretation, manuscript drafting, and final manuscript preparation.

Irianto: Supervision, clinical guidance, critical review of the manuscript, and approval of the final version.

Hermansyah: Clinical supervision, case management guidance, critical review, and approval of the final version.

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Conflict of Interest Statement

The authors declare that they have no conflicts of interest related to the preparation or publication of this article.

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Ethics Statement

Formal ethical approval was not required for this case report because it did not involve experimental research or procedures that altered the patient's clinical care. Ethical principles concerning patient privacy and confidentiality were maintained throughout the preparation and publication of the report. Written informed consent was obtained from the patient for publication of the case report and relevant clinical information. All potentially identifying information was removed from the manuscript.

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