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Post-Operative Physiotherapy Protocol for Intertrochanteric Fracture: A Single Case Study

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ABSTRACT

Intertrochanteric fractures are common among elderly individuals, especially females, often leading to reduced mobility and dependence. The objective of this case study was to evaluate the effectiveness of a structured post-operative physiotherapy program in restoring function after surgical fixation. A 48-year-old female with a right intertrochanteric fracture underwent open reduction and internal fixation (ORIF) with an intramedullary nail. Physiotherapy methods included early mobilization, cryotherapy, range of motion (ROM) exercises, isometric strengthening, positioning, and progressive weight-bearing exercises over a 4-week rehabilitation period. Results showed significant improvements in hip and knee joint mobility (e.g., hip flexion improved to 90°), pain reduction, muscle strength, and ability to perform daily activities independently.

Conclusion: Early and systematic physiotherapy following open reduction and internal fixation (ORIF) greatly enhances recovery, restores mobility, and improves quality of life in patients with intertrochanteric fractures.

Keywords: Intertrochanteric fracture, physiotherapy, rehabilitation, proximal femur fracture.

INTRODUCTION

Intertrochanteric fractures are defined as extracapsular fractures of the proximal femur between the lesser and lower trochanter. The intertrochanteric aspect of the femur is located between the lesser and lower trochanters and is composed of thick trabecular bone. The lesser trochanter serves as an insertion point for the gluteus medius, gluteus minimus, obturator internus, piriformis, and point of origin for the vastus lateralis. The lower trochanter serves as an insertion point for the iliacus and psoas major, generally appertained to as the iliopsoas (Sneha Agrawal et al., 2021)[1]. Inter trochanteric fracture is the 2 nd most cause of hospitalisation for senior case (Shivani B.et al., 2022)[2]. At earlier periods, there's a nearly equal circumstance of these fractures in males and ladies. It's further generally seen in ladies because of early degenerative changes due to menopause and low bone mass (Devashish T. et al., 2023).[3]

This fracture has multiple groups; the orthopedic trauma association bracket is most preferred among others. This problem generally occurs in the aged population as a result of trivial cascade. In the youngish population, a violent blow to the hipsterism causes an IT fracture. The case comes with the complaint of pain in the groin region and incapability to move the leg followed by a history of cascade or accidents. (Palash R.et al., 2022)[4].

The biomechanical difficulties of femoral neck obsession, combined with the vulnerability of the femoral head blood force, redounded in a high prevalence of nonunion and osteonecrosis of the femoral head (ONFH) following internal obsession of displaced femoral neck fractures. The most common pattern is a Pauwels type III fracture. The first biomechanical bracket for femoral neck fractures, the Pauwels bracket, is still used (Vishnu R.B. et al., 2022)[5]. Until now, intramedullary nails, angled blade plates, locking plates, dynamic hipsterism screws (DHS), dynamic condylar screws (DCS), and dynamic condylar plates. The intramedullary obsession bias gives the most harmonious results in terms of stable obsession, conservation, and biomechanics superiority (Devashish et al., 2023)[3]. Internal obsession procedures have been shown to give instant pain relief, quick rallying, expedited recuperation, and the capability to maintain independence (Sojwal et al., 2021)[6].

The goal of treating intertrochanteric fracture is to return case by avoiding complication and to the pre–fracture position of function. Beforehand, Physiotherapy operation reduces the threat of prolonged bed rest and increases chances of early mobility and independence functional exertion. Physical remedy improves functional issues in case of intertrochanteric fracture. Postoperative recuperation program, gait training as well as proprioceptive exercises should be included specifically (Shivani B. et al., 2022)[2].

CASE STUDY

History: A 48-year-old female presented to the emergency ward at Sharda Hospital with severe right hip pain. The pain began five days prior after she fell while walking. Although the patient reported a gradual decrease in swelling around the affected area, she was unable to bear weight on her right lower limb due to severe pain.

The patient's pain was evaluated using the Numerical Pain Rating Scale (NPRS) and reported moderate pain of 6/10 at rest and 8/10 with slight activity. A radiograph of the right hip confirmed an intertrochanteric fracture. Upon admission, the patient was transferred to the orthopaedic ward for further evaluation and management. Open reduction and internal fixation (ORIF) using an intramedullary nail was planned and successfully performed. Following surgery, the patient was monitored in the ward for postoperative care. Physiotherapy was initiated on the first postoperative day to facilitate recovery and restore functional mobility.

The patient sustained a right intertrochanteric fracture on 25/01/25 following a fall. After presenting to the emergency ward with severe hip pain and an inability to bear weight, she was admitted for further evaluation. A radiograph confirmed the diagnosis, and she underwent open reduction and internal fixation (ORIF) with an intramedullary nail on 27/01/25. Postoperatively, she was monitored in the orthopaedic ward, and physiotherapy was initiated on 29/01/25 to promote recovery and restore functional mobility.

After obtaining the patient consent, she was examined for clinical and radiological outcome as well as complication. on general examination, the patient appeared to be awake, well oriented in the term of Time, location person and cooperative. The patient was hemodynamically stable and afebrile, with a blood pressure of the 123/ 80 mmHg, heart rate 83 beat/minute, and respiratory rate is 18 Breath/minute. There were no sign of cyanosis, icterus, clubbing, or edema in the patient. There was no limb length discrepancy. Despite post operative, x-ray of the fracture fixed with implant i.e. intramedullary nail.

Investigatory findings:

FIGURE 1: Displays a Right lateral view of an X-ray showing Intramedullary nail fixation of fracture fragments.

Physiotherapy interventions

The goal of the patient's recovery was to restore her ability to perform Activities of Daily Living (ADLs) as effectively as possible. Over a period of four weeks, she underwent activity therapy. The details of her care and progress throughout weeks 1 to 4 are presented.

Sr.no	Physiotherapy Goal	Therapeutic intervention	Treatment regimen	ROM Progression
1.	To prevent pulmonary, circulatory and integumentary complications post-surgery and to prevent limb rotation deformity.	Manual positioning, half lying/semi-fowlers position was given initially; later upright sitting was given support with pillows -air beds +Ankle pumps	Positioning every 2 hours + 25 reps x 1 set 2 times in day	Hip flexion: 0°Hip abduction: 0°Knee flexion: 0°
2.	To enhance the hip and knee joint's ROM and reduce pain at the fracture site.	**Day 1-3** - Ankle Pumps + Cryotherapy + ADL (Activities of Daily Living)	20 reps x 1 set x 2 times/day →10min/session, 3 times daily	Hip flexion: 0°-20°Hip abduction: 0°-10°Knee flexion: 0°-30°

3.	To enhance the hip and knee joint's ROM and reduce pain at the fracture site.	**Day 3-5** - Ankle Pumps + Passive ROM (PROM) for hip & knee in supine + ADL + Cryotherapy	20 reps x 1 set x2/day (ankle) → 10 reps x 1 set x 2/day (hip & knee) → 10 min/session, 3 times daily	Hip flexion: 0°-30°Hip abduction: 0°-15°Knee flexion: 0°-45°
4.	To improve strength of muscles around hip and knee joint.	**Day 6-8 -** Isometric exercises for quadriceps, glutes & hamstrings + ADL +Cryotherapy	15 reps x 2 sets x 2/day → 10min each session, 3 times daily	Hip flexion: 0°-50°Hip abduction: 0°-25°Knee flexion: 0°-70°
5.	To initiate raise the affected leg and ambulation.	**Week 2 -** Ankle Pumps + Isometric exercises + AROM for hip & knee (as tolerated)	15 reps x 2 sets x 2/day → 10min each session, 3 times daily	Hip flexion: 0°-60°Hip abduction: 0°-30°Knee flexion: 0°-80°
6.	To improve and maintain functional ROM of hip and knee	**Week 3** - Progress ROM: Hip 70°, Knee 90°, Hip abduction 35° + Continue strengthening	15 reps x 2 sets x 2/day	Hip flexion: 0°-70°Hip abduction: 0°-35°Knee flexion: 0°-90°
7.	To improve and maintain functional ROM of hip and knee	**Week 4** - Increase ROM: Hip flexion 90°, abduction 45°, knee 110° + Assisted weight-bearing	15 reps x 2 sets x 2/day	Hip flexion: 0°-90°Hip abduction: 0°-45°Knee flexion: 0°-110°

Figure 2: Passive Straight Leg Raise

Figure 3: Isometric Exercises for Quadriceps

PATIENT OUTCOMES

Pre-Operative

Sr. No.	Outcome Measure	Pre-Physiotherapy ROM	
	Right Hip ROM	Active	Passive
1.	Hip Flexion	Unable to Perform	50^0
2.	Hip Extension	Unable to Perform	10^0
3.	Hip Abduction	Unable to Perform	0^0 to 20^0
4.	Hip Adduction	Unable to Perform	20^0 to 0^0
5.	Hip Internal Rotation	Unable to Perform	20^0
6.	Hip External Rotation	Unable to Perform	15^0
7.	Right Knee Flexion	Unable to Perform	0^0 to 110^0
8.	Right Knee Extension	Unable to Perform	110^0 to 0^0

Post-Operative

Sr. No.	Outcome Measure	Post-Physiotherapy ROM	
	Right Hip ROM	Active	Passive
1.	Hip Flexion	90°	110^0
2.	Hip Extension	20^0	25^0
3.	Hip Abduction	0° to 40°	0^0 to 45^0
4.	Hip Adduction	20^0 to 0^0	25^0 to 0^0
5.	Hip Internal Rotation	20^0	25^0
6.	Hip External Rotation	20^0	25^0
7.	Right Knee Flexion	0°-110°	0^0 to 120^0
8.	Right Knee Extension	110° - 0°	120^0 to 0^0

DISCUSSION

This case underscores the importance of timely surgical intervention and a well-structured rehabilitation program in managing intertrochanteric hip fractures, particularly in elderly patients. The patient underwent ORIF with an intramedullary nail, followed by a carefully planned recovery.

Cryotherapy and pain relievers led to a considerable reduction in pain, allowing the patient to dedicate more time to rehabilitation, which was associated with subsequent improvements in joint movement and strength training, as well as clinical status. Progressive mobilization was shown to be effective in raising the ROM during recovery and reducing the chance of vascular disease and various methods such as incremental range of motion-exercises, soft tissue mobilization, isometric exercises, open and close chain muscle training, muscle strengthening, stretching, body position training have been established. Muscle energy technique also used to increase ROM explain that physical therapy training had a beneficial effect on morale building, enhancing gait in post-operative physical therapy (Agrawal, S. et al., 2022)[1].

Appropriate weight bearing status should be prescribed by the medical or surgical team; following these guidelines is essential for the best possible recovery because early weight bearing might impede the healing process. To prevent the fracture from happening again, the patient got up from the floor, refused to sit with his legs crossed, and kept both legs apart. These therapy strategies improved the patient's well-being and outcomes. Trauma patients who receive more intense acute inpatient physical therapy are more likely to return home, and new research has shown that this relationship is reliable, leading to quicker mobility improvements. The demand for assistance equipment and the duration of the patient's stay at an assisted living facility increase after surgery, making the rehabilitation process more difficult. Postoperative physiotherapy had a good effect on improving gait and boosting self-confidence (Thote, D. et al., 2023)[3].

The physical therapy sessions were designed to preserve the right lower limb's muscle integrity while also enhancing the left lower limb as well as both upper limbs to encourage individual independent ambulation with an assistive device and very little aid for everyday routines (Lalwani, S.S et al., 2022)[7]. The patient was told to do most of the workouts as part of the home program, given a documented protocol, and told to come back for follow-up meetings.

CONCLUSION

The post-fracture recuperation program is effective, with substantial earnings in physical functioning as well as well-being. This case report provides a comprehensive strategy for the treatment of individuals who have had post-fracture surgery. This case's full recovery had not been attained during the treatment period; still, the maturity of the restorative points has been encountered, including bettered muscle strength, steadily adding range of motion, increased functional capacity, pain reduction, bettered gait pattern, and day to day conditioning of the existent after 4 weeks of focused physical right treatment.

Declaration by Authors

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