



Case report

**Post-operative physiotherapy management program of inter-trochanteric fracture in an elderly patient**

Shivani Bhurchandi, Achal Birelliwari, Palash Satone, Neha Chitale, Pratik Phansopkar\*, Rashmi Walke

Ravi Nair Physiotherapy College, Datta Meghe Institute of Medical Sciences, Wardha, Maharashtra, India.

**ABSTRACT**

Hip fractures are the most common incidences that increase with age an intertrochanteric fracture occurs outside of the hip joint capsule, between the greater and lesser trochanters, along the intertrochanteric line. Falls occurring in patients with senile and postmenopausal osteoporosis account for most of these fractures. Early Physiotherapy management reduces risk of prolonged bed rest and increases chances of early mobility and independence functional activity. A 69-year-old female with an inter-trochanteric fracture was diagnosed on X-ray after she was hit by a cow on left side, on which open reduction and internal fixation with Dynamic Hip Screw was done. Post-op the patient's concern was pain at the operation site, reduced mobility of the left leg and unable to walk. Post-surgery, patient underwent physiotherapy which comprised of reduction in pain, exercises and gait training for a period of 12 weeks which resulted in improvements in pain, range of motion, functional activities. The case report suggests that classic surgical approach and prompt structured physical rehabilitation led to improving the functional goals progressively and significantly which is a major aspect leading to a successful recovery.

**Keywords:** Physical therapy, Inter-trochanteric fracture, Dynamic Hip Screw, Rehabilitation.

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**Correspondence:** Pratik Phansopkar \* ✉ [drpratik77@gmail.com](mailto:drpratik77@gmail.com)

Department of Cardiorespiratory Physiotherapy, Ravi Nair Physiotherapy College, Datta Meghe Institute of Med. Sci., Wardha, Maharashtra, India.

**INTRODUCTION**

Hip fractures are the most common incidences that increase with age [1]. These fractures are the most common injuries around the hip region. Extra capsular fracture of proximal femur referred as inter trochanteric fracture in trochanteric region [2]. Inter trochanteric fracture is the 2<sup>nd</sup> most cause of hospitalization for elderly patient [3]. This fracture mostly occurs in female due to post-menopausal osteoporosis and low bone mass. It also occur in male which are more prone to traumas and have active lifestyles [2]. There are different types of method to treat inter Trochanteric fracture like dynamic hip screw, compression hip screw, percutaneous compression plate, med off sliding plate, less invasive stabilization system but Dynamic Hip Screws is most common method to treat Inter Trochanteric fracture. It is suitable and safe method. The Goal of treating Inter trochanteric fracture is to return patient by avoiding complication and to their pre – fracture level of function. Early Physiotherapy management reduces risk of prolonged bed rest and increases chances of early mobility and independence functional activity [3].

Physical therapy improves functional outcomes in patient of inter trochanteric fracture [4]. In post-operative rehabilitation program, gait training as well as proprioceptive exercises should be included specifically [5].

**Patient information**

A 69-year-old female, homemaker by occupation was hit by a cow on left lower-limb (hip) by roadside on 9<sup>th</sup>December2020. The patient was unable to walk, move left lower-limb and had severe pain at the site of injury. She was brought directly to hospital casualty and was admitted to orthopedic ward for further investigations and management. X-ray for left lower limb was done on the same day of admission which revealed Inter-trochanteric fracture on left side and also revealed that it is type 2 fracture according to Boyd and griffin classification. Operation was planned on 10<sup>th</sup>December 2020. Open reduction with internal fixation was done using the Dynamic hip screw. Patient was shifted to ward for further management and rehabilitation. Physiotherapy was started on post-op day 1.

**Clinical findings**

A proper informed consent was taken from the patient prior. Physical examination was done; she was examined in supine position. On inspection, patient's right leg was slightly abducted, externally rotated, knee flexed, and foot planter flexed. Marked edema was present on foot and tenderness muscle weakness. Local temperature was normal. Length of scar could not be measured because of dressing.

**Limb length measurement**

Left lower limb = 80.5 cm

Right lower limb = 84 cm

T/T – footwear modifications in a way that both the foot touches ground in same line to correct discrepancy.

#### Pain assessment

Pre-rehabilitation: NPRS 9/10 at slight movement, 7/10 at rest.

Post-rehabilitation: NPRS 5/10 at slight movement, 3/10 at rest.

#### Berg's balance score

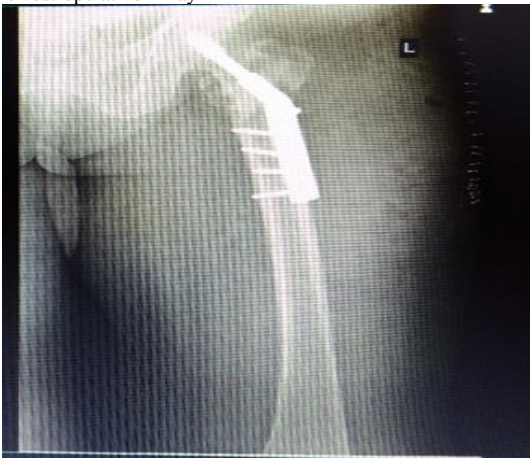
Pre-rehabilitation:3/56

Post-rehabilitation:50/56

**Figure 1.** Pre-operative X-ray



**Figure 2.** Post-operative X-ray



**Table 1.** Timelines

Date of injury	09/12/2020
Date of operation	10/12/2020
Date of suture removal	20/12/2020
Date of Physiotherapy rehab	26/12/2020

**Table 2.** On the 1st day of physiotherapy, the ROM assessed

Joint	Left (Operated side)		Right	
	Active	Passive	Active	Passive
Hip Flexion	Unable to perform	0-5	0-110	0-118
Extension	Unable to perform	0-10	0-15	0-18
Abduction	Unable to perform	0-5	0-40	0-48
Adduction	Unable to perform	0-5	0-26	0-30
Knee Flexion	0-5	0-10	0-135	0-135
Extension	Unable to perform	10-0	135-0	135-0
Flexion (BSS)	0-5	0-10	0-135	0-135
Extension (BSS)	5-0	10-0	135-0	135-0
Ankle Plantar Flexion	0-20	0-30	0-50	0-50
Dorsiflexion	0-5	0-10	0-10	0-10

**Table 3.** MMT (strength) assessment on 1<sup>st</sup> day of Physiotherapy

		Left	Right
Hip	Abductors	Unable to perform	5/5
	Adductors	Unable to perform	5/5
	Flexors	Unable to perform	5/5
	Extensors	Unable to perform	5/5
	Internal rotators	Unable to perform	5/5
	External rotators	Unable to perform	5/5
Knee	Extensors	1/5	5/5
	Flexors	1/5	5/5
Ankle	Plantar flexors	1/5	5/5
	Dorsiflexors	1/5	5/5

**Figure 3:** Physiotherapy management of patient



#### In-hospital management

##### Phase 1

0 to 1 week: Passive range of motion should be avoided during the first week. Hip and knee flexion, extension, and abduction exercises are gentle active range-of-motion exercises. To strengthen the gluteus maximus, vastus medialis, and quadriceps, do isometric workouts. To reduce hip flexion, utilize an elevated toilet seat.

##### Phase 2

2 to 3 weeks: The hip and knee are provided active range of motion. Isometrics exercises to quadriceps, glutei and hamstrings to strengthen muscles. Advice to avoid standing on affected leg without support and to avoid passive range of motion. Non weight bearing with walker.

##### Phase 3

4 to 7 weeks: Avoid twisting at the fracture site. Active, active-assistive range of motion to hip and knee is given. Isometric exercises to glutei, quadriceps, and hamstrings are performed. Active resistive exercises to quadriceps, glutei, and hamstrings (if motion is well tolerated). Weight bearing as tolerated on the affected extremity during transfers. Ambulation with walker is started. Weight bearing, as tolerated for stable fractures. Partial to non-weight bearing to toe-touch for unstable fractures.

##### Phase 4

8 to 12 weeks: Active and active-assistive range of motion is continued. stretching to hip and knee is given. Progressive resistive exercises to hip and knee are started. The patient uses involved extremity with weight bearing as tolerated or full weight bearing during transfers and ambulation. In gait training includes walking with walker by three-point gait method is initiated. Cycling is also initiated.

**Table 4.** ROM assessment on last day of physiotherapy treatment

Joint	Left (Operated side)		Right	
	Active	Passive	Active	Passive
Hip Flexion	0-105	0-115	0-110	0-118
Extension	0-10	0-15	0-15	0-18
Abduction	0-35	0-40	0-40	0-48
Adduction	0-25	0-30	0-26	0-30
Knee Flexion	0-130	0-135	0-135	0-135
Extension	130-0	135-0	135-0	135-0
Flexion (BSS)	0-130	135-0	0-135	0-135
Extension (BSS)	130-0	135-0	135-0	135-0
Ankle Plantar Flexion	0-50	0-50	0-50	0-50
Dorsiflexion	0-10	0-10	0-10	0-10

**Table 5.** MMT (strength) assessment on last day of physiotherapy

		Left	Right
		Hip	Abductors
	Adductors	4/5	5/5
	Flexors	4/5	5/5
	Extensors	4/5	5/5
	Internal rotators	5/5	5/5
	External rotators	5/5	5/5
Knee	Extensors	4/5	5/5
	Flexors	4/5	5/5
Ankle	Plantar flexors	5/5	5/5
	Dorsiflexors	5/5	5/5

## DISCUSSION

Dyer SM et al and others concluded in their critical review that hip fracture has a substantial impact on older people's medium- to longer-term abilities, function, quality of life and accommodation [6]. Chang S-M et al and others concluded in their study that the treatment of intertrochanteric hip fractures has undergone favorable evolution and revolution during the past 20 years, as manifested by new technical concepts, such as TAD (Tip-to-apex distance), lateral wall, cortex support reduction, and the instrument success of intramedullary nailing. Anteromedial cortex-to-cortex support reduction is important because it allows for restricted sliding, which provides both high mechanical stability and fracture healing by sharing the stresses from the implant and biological environment [7].

THA as a salvage treatment for fixation failure is increasingly becoming adopted by the majority of clinical orthopedic surgeons for elderly intertrochanteric fracture patients, according to Liu L et al and others. It has the potential to lower the risk of early hip discomfort while also improving function and patient satisfaction [7]. According to Lepore M et al and others, OT and PT practitioners believe there is a core set of techniques that form high quality hip fracture rehabilitation. These procedures have been implemented as part of an interdisciplinary team in which all disciplines collaborate to meet the patient's objectives [8]. Frenkel Rutenberg T et al and others in a retrospective study concluded that Post-operative delay in PT following fragility hip fracture surgery was related to increased risk for in-hospital mortality [9]. Nk L, Ba H, Jf B, T H, C G, S Z, et al. in a randomized clinical trial concluded that among patients who had completed standard rehabilitation after hip fracture, the use of a home-

based functionally oriented exercise program resulted in modest improvement in physical function at 6 months after randomization<sup>[9]</sup>. Over 40% of older adults fell in the 12 months after elective hip replacement surgery and thus, rehabilitation after hip replacement surgery should consider fall prevention<sup>[10]</sup>.

In a literature study, Alves DPL et al. found that surgical treatment of proximal femoral fractures, along with postoperative physical therapy, reduces morbidity. Exercises conducted with weight bearing, especially after a weight-bearing restriction, have proven to be beneficial and have improved dynamic balance as well as functional performance. Aerobic exercise. Aerobic fitness is something the physiotherapist should think about when developing a treatment plan, as it can increase the patient's physical function, because cardiorespiratory fitness can result in an increase in walking capacity<sup>[11][12]</sup>.

## CONCLUSION

Recent article suggests that there is a core set of practices that physiotherapy practitioners perceive to constitute high quality hip fracture rehabilitation. The positive effects of TENS on pain during walking and increased walking distance determined in present study support the integration of TENS with standard care of elderly patient implication for rehabilitation physiotherapy therapy practitioner's perspective on the cumulative best practices that reflect high quality care, which should be delivered during hip fracture rehabilitation.

### Conflict of interest

They have no conflict of interest that is declared by author.

### Informed consent

Informed consent was obtained from patient included in study.

### Author's Contribution

All authors contributed equally for study.

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