



INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Multidisciplinary Physiotherapy Rehabilitation In An Adult With Polytrauma: A Case Report

Jugnool, Amit goal, ,Danish nouman,prachi singh

1 PG student (MPT orthopedic) Jyotirao Phule shubharti college of physiotherapy

2 professor and principle, Jyotirao Phule subharti college of physiotherapy

3 head of department of musculoskeletal physiotherapy, Jyotirao Phule subharti college of physiotherapy

4 PG Student (MPT orthopedic) Jyoti Rao phule shubharti college of physiotherapy

ABSTRACT

A case report details the physiotherapy rehabilitation procedure of a 48 yrs old man having multiple traumatic fractures from a fall injury, fracture is seen involving L3 and L4 vertebral bodies with about 10-20% reduction in vertebral body height. Fracture seen involving the posterior vertebral elements at these levels. The note is made of a fracture involving the right proximal femur. linear undisplaced fracture lines, involving right sided inferior pubic ramus. Fracture is seen involving D7 to D11 right sided transverse process. Fracture is seen involving L2 to L4 right sided transverse process. Left sided 8th rib fracture is seen in its posterior aspect. Fracture involving proximal humerus is seen. After open reduction and internal fixation surgery, an 8–12-week physical treatment regimen was put into place. Exercises for passive and active range of motion, isometric and progressive resistance training, and gait training were provided. The rehabilitation goals were pain relief, increased range of motion, muscle strength, flexibility, endurance, and functional independence. Pain levels, range of motion, muscle strength, and general function all significantly improved between pre- and post-rehabilitation evaluations. Early mobilization and structured physical therapy were crucial in achieving these outcomes, highlighting the importance of tailored rehabilitation protocols for post operative recovery.

Keywords: Polytrauma,physiotherapy rehabilitation,lisfranc fracture,pelvic fracture, functional independence measure, barthel index.

Introduction

Multiple joint fractures involve two or more bone fractures on the different joints of the human body. The ankle is one of the most commonly fractured lower limbs, accounting for approximately 9% of all cases, with an annual incidence of 107-187 per thousand people. The most common fractures in these age groups occur in men under 50 years of age and in women over 50 years of age. Among the most common causes of ankle fractures are motor vehicle accidents, twisting injuries, and falls. Hip fractures happen most often in older patients 65. The most common cause is a fall. As we age, our bones

lose strength and are more susceptible to injury and breaks. Proximal femur fractures are fractures that occur in the femur in the hip region, these fractures include the sites within the lining of the hip joint capsule. These are associated with injury to the blood supply to the head of the femur. A compromised supply may result in avascular necrosis of the femoral head. Femoral head fractures- They usually occur secondary to femoral head dislocation. Femoral neck fracture Depending on fracture location these are further classified as subcapital fracture, transcervical fracture, basicervical fracture. These fractures are present outside the capsule and do not cause the same degree of vascular damage as intracapsular fractures and therefore can be treated differently. The trochanteric fractures are extracapsular injuries. Along with injuries or trauma, spinal fractures can also result from osteoporosis or other underlying conditions, which may lead to pain, loss of function, and serious complications. However, the type and severity of spinal fractures may differ greatly. So, understanding the types and symptoms of spinal fractures is essential for effective treatment and optimal outcomes.

In this case a 48-year-old male had a history of slip and fall injury from 3rd floor balcony at home brought to hospital in emergency. on radiological examination traumatic lumbar L3 L4 burst fracture, D7 to D11 right sided transverse process fracture, right proximal humerus fracture with right subtrochanteric femur comminuted fracture, comminuted fracture talus right ankle, Lisfranc fracture dislocation medial cuneiform fracture left foot, linear undisplaced fracture right sided inferior pubic ramus, left 8th rib fracture. Pain and swelling were progressively in nature after the patient was managed operatively with lumbar L3 bilateral hemilaminectomy with posterior decompression with bilateral L2 and L5 with right side L3 pedicle screw and rod fixation and fusion, ORIF with plating right proximal humerus plus ORIF with PFN right femur, ORIF with CC screws talus right ankle plus ORIF with K wires Lisfranc injury left foot done.

Case presentation

Patient information

A 48-year-old male was admitted in NSICU under neurosurgery team and orthopaedic with slip and fall injury from 3rd floor balcony at home and brought to hospital in emergency. on radiological examination traumatic lumbar L3 L4 burst fracture, D7 to D11 right sided transverse process fracture, right proximal humerus fracture with right subtrochanteric femur comminuted fracture, comminuted fracture talus right ankle, Lisfranc fracture dislocation medial cuneiform fracture left foot, linear undisplaced fracture right sided inferior pubic ramus, left 8th rib fracture. Pain and swelling were progressively in nature after the patient was managed operatively with lumbar L3 bilateral hemilaminectomy with posterior decompression with bilateral L2 and L5 with right side L3 pedicle screw and rod fixation and fusion, ORIF with plating right proximal humerus plus ORIF with PFN right femur, ORIF with CC screws talus right ankle plus ORIF with K wires Lisfranc injury left foot done.

Demographic details

age - 48

gender-male

occupation-not relevant

chief complaint

the patient was presented with pain and inability to move as was bedridden after the surgery

history

present - the patient complains of pain and unable to move the right arm freely and inability to sit, stand and move after the internal fixation surgery for the fractures from the fall injury.

past- healed right wrist fracture

Allergy- no known allergies.

Personal- patient is an occasional drinker.

Pain- 8/10 on NPRS scale

OUTCOME MEASURES

1.numerical pain rating scale (NPRS): used to measure the intensity of pain on a scale from 0 to 10.

2. Barthel index: used to assess independence in activities of daily living including feeding, bathing,grooming, dressing, transfers and mobility.

3. Functional independence measure (FIM):used to evaluate functional independence in motor and cognitive activities.

BASELINE ASSESSMENT

NPRS:8/10

Barthel index:25/100

FIM score:40/126

The patient required maximum assistance for transfer, mobility, and most activities of daily living.

PHYSIOTHERAPY INTERVENTION

Rehabilitation was divided into three phases according to the patients recovery stage.

Phase1:acute phase (week 1-2)

Goals:

Pain reduction

Prevention of complications

Maintenance of circulation and respiratory function

Treatment

Cryotherapy to reduce swelling

Diaphragmatic breathing

Toe movements to improve circulation and prevent DVT

Isometric contraction of quadriceps,gluteals,and shoulder muscles

Gentle passive range of motion exercises within surgical restrictions

Grade 1 and 2 of glenohumeral mobilisation.

Bed mobility training and patient education

Phase 2: subacute phase (week 3-8)

Goals:

Improve ROM

Increase muscle strength

Initiate functional mobility

Treatment

active assisted range of motion (AROM) exercises.

Glenohumeral joint mobilisation all grades

Progressive Resistive strengthening exercise of upper and lower limb.

Pelvic stabilization exercises

Core strengthening exercises

Progressive Sitting with support to without support

Transfer training from bed to chair

Partial weight bearing exercise

Phase 3: rehabilitation phase (week 8-12)

Goals:

Restore functional mobility

Increase independence in daily life activities

Treatment:

Full ROM exercises

Progressive resistance and weight bearing training

Sit to stand with ankle foot orthosis

Walking with support aids (walker) heel support in right side to help with LLD

Gait training with to without walker or aid support

Gradual functional training stair climbing and transfers

RESULTS

After 12 weeks of physiotherapy rehabilitation, significant improvement was observed in pain levels, functional mobility, and independence.

NPRS: Reduced from 8/10 to 2/10

Barthel Index: Improved from 25/100 to 85/100

FIM Score: Improved from 40/126 to 110/126

The patient progressed from dependent mobility to independent ambulation with minimal support.

Discussion

Polytrauma patients often experience prolonged immobilization, severe pain, and functional limitations. Early physiotherapy intervention plays a vital role in preventing complications and promoting recovery.

The rehabilitation protocol implemented in this case emphasized gradual mobilization, strengthening, balance training, and functional retraining. These interventions helped restore joint mobility, improve muscle strength, and enhance independence in activities of daily living.

Functional outcome measures such as NPRS, Barthel Index, and FIM demonstrated substantial improvements, highlighting the effectiveness of structured physiotherapy rehabilitation.

Multidisciplinary collaboration between orthopedic surgeons, physiotherapists, and nursing staff is essential for optimal recovery in polytrauma patients.

Conclusion

This case study demonstrates that a structured physiotherapy rehabilitation program significantly improves pain, functional mobility, and independence in patients with multiple fractures following trauma. Early mobilization, progressive strengthening exercises, and functional training are essential components of rehabilitation. Outcome measures such as NPRS, Barthel Index, and FIM provide valuable tools for monitoring patient progress during recovery.

References

1. 1. Kisner C, Colby LA. Therapeutic Exercise: Foundations and Techniques.
2. Magee DJ. Orthopedic Physical Assessment.
3. American Physical Therapy Association Rehabilitation Guidelines.
4. World Health Organization Rehabilitation Protocols for Musculoskeletal Injuries.
2. Al Hanna R, Amatya B, Lizama LE, Galea MP, Khan F (2020) Multidisciplinary rehabilitation in persons with multiple trauma: a systematic review. J Rehabil Med 52(10):jrm00108 [DOI] [PubMed] [Google Scholar]
3. Christodoulou VN, Varvarousis D, Theodorou A, Voulgaris S, Beris A, Doulgeri S et al (2019) Rehabilitation of the multiple injured patient with spinal cord injury: a systematic review of the literature. Injury 50(11):1847–1852 [DOI] [PubMed] [Google Scholar]
4. Khan F, Amatya B, Hoffman K (2012) Systematic review of multidisciplinary rehabilitation in patients with multiple trauma. Br J Surg 99(Suppl 1):88–96 [DOI] [PubMed] [Google Scholar]
5. Simmel S (2010) Frührehabilitation Nach Polytrauma. Trauma und Berufskrankheit 12(2):194–198 [Google Scholar]
6. **Leg Length Discrepancy—Treatment Indications and Strategies:** Björn Vogt ², Georg Gosheger ¹, Thomas Wirth ³, Joachim Horn ⁴, Robert Rödl ².