

Physiotherapy Rehabilitation in Operated Case of Patellar Fracture and Medial Malleolus Fracture of Left Side: A Case Report

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Case Study

ABSTRACT

Introduction: Road traffic accidents (RTA) are responsible for a considerable amount of global death and morbidity, particularly in developing nations. 'Hidden pandemics,' such as mortality from RTA, often go unnoticed over the world.(1) These days traffic road accidents lead to many fractures included patellar fracture. Patellar fractures account for about 1% of all skeletal fractures and are most common in people between the ages of 20 and 50. 1–3 Men have nearly twice as many cases as women.

Clinical findings: On physical examination respiratory system, cardiovascular system and central nervous system are normal and on local examination of left lower limb demonstrate attitude of limb in hip and knee in extension and foot in external rotation and multiple abrasions are present over the knee and there were abrasion of 10*2cm present over medial aspect of great toe and abrasion of 5*2cm present over the postero-medial aspect of distal 3rd leg, lacerated wound on medial malleolus. In this case patient was on 8 week protocol for physiotherapy management.

Discussion: In this case report we are discussing a case of 36 year old male with fracture of patella and medial malleolus managed with tension band wiring and nailing respectively. The primary goal of physiotherapy management was to prevent secondary complications and make the patient independent for which rehabilitation protocol was planned which included isometric exercises, dynamic quadriceps bed mobility exercises and ambulation.

Conclusion: Physiotherapy plays an important role in rehabilitation of patient with medial malleolus and patella fracture.

Keywords: Patellar fracture and medial malleolus fracture; road traffic accident; physiotherapy; rehabilitation.

1. INTRODUCTION

Road traffic accidents (RTA) are responsible for a considerable amount of global death and morbidity, particularly in developing nations. 'Hidden pandemics,' such as mortality from RTA, often go unnoticed over the world [1]. These days traffic road accidents lead to many fractures included patellar fracture. Patellar fractures

account for about 1% of all skeletal fractures and are most common in people between the ages of 20 and 50. 1–3 Men have nearly twice as many cases as women [2]. Direct or indirect forces can cause patellar fractures. 2–5 The majority of them are caused by direct injuries, such as a fall that causes a blow to the patella, a car accident, or a combination of these [2]. Excessive tension in the extensor mechanism or a direct hit to the

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patella might result in a patellar fracture. The intact patella boosts the extensor mechanism's leverage and efficiency, and it articulates with the femoral trochlea. Stiffness, extension weakness, and patellofemoral arthritis can all result from patellar fractures [3]. Nonoperative treatment is possible for stable fractures with no or mild dislocation. Operative therapy is required for dislocations of greater than 2 mm and comminuted fractures [4]. Road traffic accidents were the most prevalent mechanism of damage in the open patellar group (94 percent), while falls were the most common mechanism of injury in the closed patellar group (62 percent). In the open patellar fracture group, there were more related injuries than in the closed fracture group (13 versus 5, $p = 0.01$). The open patellar group had a substantially greater injury severity score (ISS) (mean 22.75, range 5–50) than the closed patellar group (mean 7.06, range 4–20); $p 0.0001$ [5].

A fracture of medial malleolus is an injury to the inner side of the ankle. An isolated distal fibular fracture with modest displacement to a trimalleolar fracture with dislocation and vascular compromise are all possible malleolar fractures [6]. Localized discomfort on the medial side of the ankle was the primary complaint for medial malleolus fracture [7]. According to the study, foot and ankle stress fractures account for just 30% of all stress fractures, and only 9% of them are medial malleolus stress fractures [8]. Managing a patient with more than one fracture requires more effort in this case report management of patella fracture along with medial malleolar fracture is discussed.

2. PATIENT INFORMATION

A 36 year old male resident of khapri visited orthopedic department AVBRH who was then referred to physiotherapy department with the complaint of restricted range of motion for ankle and knee postoperatively. The patient has history of road traffic accident and was diagnosed with patellar fracture and medial malleolus fracture of left leg. Patient was fine till 8 pm on 4/06/21 when he was hit by two wheeler sustaining injury to his left leg. In AVBRH patient had gone under surgery on 8/06/21 before that consent of patient was taken and now the patient is on some drugs and antibiotics and now the patient is complaining of restricted range of motion of ankle and knee and when in motion experience pain and patient have wound of 4 *2cm on medial malleolus.

3. CLINICAL FINDINGS

On physical examination respiratory system, cardiovascular system and central nervous system are normal and on local examination of left lower limb demonstrate attitude of limb in hip and knee in extension and foot in external rotation and multiple abrasions are present over the knee and there were abrasion of 10*2cm present over medial aspect of great toe and abrasion of 5*2cm present over the postero-medial aspect of distal 3rd leg, lacerated wound on medial malleolus. Swelling is present over the suprapatellar and infrapatellar region and also diffuse swelling can be seen over ankle joint. There was no bony deformity seen and no length discrepancy was present. There was local rise of temperature and bony tenderness is present over patella and medial malleolus. There was restricted range of motion in knee and ankle. DPA and PTA palpable.



Fig. 1. X- ray of patients left knee



Fig. 2. X-ray of patients left ankle (antero-posterior view and lateral view)

3.1 Timeline

Date of injury	4/06/21
Date of admission	6/06/21
Date of operation	8/06/21

3.2 Diagnostic Assessment

A patient of 36 year old of road traffic accident is diagnosed with compound grade 3A medial malleolus fracture of left side and comminuted patella fracture of left side.

Joint	Rom right	Rom left
Knee flexion	0-135	0-45
Knee extension	135-0	45-0
Ankle plantar flexion	0-50	0-10
Ankle dorsiflexion	0-20	0-10
Ankle inversion	0-35	0-15
Ankle eversion	0-15	0-5

3.3 Therapeutic Intervention

3.3.1 Phase 1 (0-2 weeks)

The Primary goal of phase 1 was patient education, prevention of secondary complication and maintenance of strength of lower limb muscles.

With the start of physiotherapy intervention patient was explained about the importance of physiotherapy and do's and don'ts in his condition. To prevent secondary complication ankle toe movements were given every 2 hourly 10 repetition. Limb was kept in elevated position above heart level and early mobility was promoted to prevent pressure sores. To maintain the strength of lower limb muscles isometric exercises were given for quadriceps and hamstring 10 repetitions with 10 second of hold.

3.3.2 Phase 2 (3- 4 weeks)

Goal of seconds phase was to maintain the goals achieved in first phase and to increase the range of motion. For range of motion initially active assisted range of motion exercises were given to knee and ankle progressed to active range of motion exercises 10 repetitions 3 times a day. Bed side sitting was initiated in this phase and dynamic quadriceps were performed 10 times. Core strengthening exercises were given which included pelvic bridging exercises and isometric exercises for back and abdomen.

3.3.3 Phase 3(4- 8 weeks)

In this phase the aim was to restore the activities of daily living and improve the quality of life.

All the exercises prescribed in 1st two phases were continued. In 3rd phase ambulation was main goal for ambulation initially non-weight bearing ambulation was initiated followed by partial weight bearing and full weight bearing.

3.4 Follow-Up and Outcomes

Joint	Rom right	Rom left
Knee flexion	0-135	0-130
Knee extension	135-0	130-0
Ankle plantar flexion	0-50	0-40
Ankle dorsiflexion	0-20	0-20
Ankle inversion	0-35	0-35
Ankle eversion	0-15	0-15

4. DISCUSSION

In this case report we are discussing a case of 36 year old male with fracture of patella and medial malleolus managed with tension band wiring and nailing respectively. The primary goal of physiotherapy management was to prevent secondary complications and make the patient independent for which rehabilitation protocol was planned which included isometric exercises, dynamic quadriceps bed mobility exercises and ambulation [9].

Patella Fracture is a common fracture and Mal union, Non-Union are common complications which can occur in these fractures. Though the treatment was given in first two weeks it is quite essential to prevent the complications in these patients. Long term recovery is purely based on the treatment given in first two weeks. In the present case the long-term goals were planned by keeping in mind the complications and acute physiotherapy focused on same. The findings of the study mainly in terms of pain and early mobility were in accordance with the previous studies [10]. Tension band wiring is a surgical approach preferred for patellar fracture fixation as patella is a mobile bone and need a strong fixation due to the movement cause by quadriceps contraction. If multi fragmented fracture is present in the patella tension band wiring is not used as it cannot provide adequate strength in such cases buttress is used [11].

5. CONCLUSION

Patellar fractures are common but should be managed properly as patella is a mobile bone a

proper rehabilitation protocol should be followed for the rehabilitation. Medial malleoli contribute in weight bearing and after surgical management physiotherapy should be advised to prevent secondary complications.

CONSENT

As per international standard or university standard, patients' written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Rajasekaran RB, Rajasekaran S, Vaishya R. The role of social advocacy in reducing road traffic accidents in India. *J Clin Orthop Trauma*. 2021;12(1):2–3.
2. Vinay G, Zile K, Rakesh G, Gaurav S. Bilateral traumatic patellar fracture: a case report and review of literature. *Chin Med J (Engl)*. 2012; 15(3):188–91.
3. 3Melvin JS, Mehta S. Patellar fractures in adults. *J Am Acad Orthop Surg*. 2011;19(4):198–207.
4. Galla M, Lobenhoffer P. [Patella fractures]. *Chir Z Alle Geb Oper Medizen*. 2005;76(10):987–97; quiz 998–9.
5. Anand S, Hahnel JCR, Giannoudis PV. Open patellar fractures: high energy injuries with a poor outcome? *Injury*. 2008 ;39(4):480–4.
6. Gougoulas N, Khanna A, Sakellariou A, Maffulli N. Supination-External Rotation Ankle Fractures: Stability a Key Issue. *Clin Orthop*. 2010;468(1): 243–51.
7. Stress fracture of the medial malleolus. - Abstract - Europe PMC [Internet]. [cited 2021 Oct 19]. Available: <https://europepmc.org/article/med/7890784>
8. Reider B, Falconiero R, Yurkofsky J. Nonunion of a medial malleolus stress fracture: A case report. *Am J Sports Med*. 1993;21(3):478–81.
9. Siroya V, Fernandes L, Wadhokar OC. A Pioneering Physiotherapeutic Approach to the Treatment of a COVID Affected Patient – A Case Report. *J Pharm Res Int*. 2021;17–24.
10. Krischak GD, Krasteva A, Schneider F, Gulkin D, Gebhard F, Kramer M. Physiotherapy After Volar Plating of Wrist Fractures Is Effective Using a Home Exercise Program. *Arch Phys Med Rehabil*. 2009;90(4): 537–44.
11. Bawiskar D, Dhote S, Phansopkar P. Early physical rehabilitation post-surgery in a complex type 5 Schatzker Tibial plateau fracture improves functional outcomes: A case report; 2020;8.