



Case report

Rehabilitation of patient with tibia-fibula fracture

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ABSTRACT

An orthopedic surgeon may find compound fractures of tibia-fibula challenging to treat. The degree of joint motion and the adequacy of reduction are the two factors that determine whether or not these fractures can be treated successfully. In many patients, open surgical treatment of comminuted tibial pilon fractures is associated with significant complications. Indirect reduction and stabilization of fractures using a circular external fixator can be a useful way of achieving adequate joint restoration, and it uses closed reduction principles to realign disturbed bones and joint structures. In this report, we describe about the effects of early rehabilitation compound grade IIIB fracture tibia, fibula of right side. The patient co-operation and motivation to return to daily functional activities also prove to very crucial for the rehabilitation process. The defect in bone is usually a result of high velocity trauma or a sudden impact. In present case open reduction and external fixation for distal one-third of tibia and fibula on right side was carried out followed by the rehabilitation protocol. Outcome measure used to check for the pain was NPRS. The patient morale and goal-oriented rehabilitation protocol progressed him to return to his functional activities.

Keywords: Tibia fracture, Fibula fracture, Rehabilitation.

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INTRODUCTION

Due to the risk of widespread infection and devitalized soft tissue, open tibial fractures are true surgical emergencies. Amputation is the most severe complication of open tibial fractures, which can usually be avoided with prompt surgical intervention [1]. Road traffic accidents (RTAs), falls from height (FFH), direct blow or assaults, sports injury, and gunshot injury are the five main causes of tibia diaphyseal fracture. The type of fracture, bone density, age group, associated bony and soft tissue injuries, and other comorbid conditions all influence treatment options [1]. The anatomical area affects the accuracy of fracture diagnosis. Regardless, early detection is the best objective for preventing microfractures from becoming macro fractures [2]. Restricted weight bearing is difficult for the elderly, and immobility is associated with major risks and increased morbidity. As a result, early post-operative weight bearing is a primary objective of fracture management in the elderly population [3]. Because the hardware is directly beneath the patient's skin, exposing the distal tibia from the medial side increases the risk of wound dehiscence, infection, and pain [4]. Immediate therapy has been shown to be effective in the

recovery of post-surgical patients' functional issues [5]. The patient was given a 15-day physiotherapy program to focus on increasing knee mobility and reducing swelling [6]. Following that, he was treated with proper rehabilitation procedure at an academic hospital in Sawangi Meghe's Physiotherapy rehabilitation department [7]. Stretching has a huge impact on reducing pain symptoms [8]. The patient's target in physiotherapy was to get back to regular functional activities.

Patient Information

Patient specific information: Patient is a 45 years old male resident of Yavatmal district (Maharashtra) and is farmer by occupation with dominance of right side. Patient met with a road traffic accident while travelling to home which resulted in a mild head injury and severe pain and swelling over the right leg. While coming from Yavatmal he met with an accident, patient experienced pain in his leg which was sudden and progressive in nature. After that the patient was taken to the private hospital by the people nearby and relatives. Then the patient under went for stappled suturing and was referred to AVBRH. Character of pain was described as continuous at the right limb. On NPRS the pain score was 6 with standing, aggravating factors

were walking and other similar physical activities and the pain was relieved at rest. No history of hypertension, diabetes, asthma or hypo/hyper thyroidism.

Clinical Findings

The patient was examined in sitting and supine lying which concluded that the patient showed a forward head posture.

GCS: - E4, V5, M6

Table 1. Range of motion of Lower Limb

Joint	Right			Left		
		Active	Passive		Active	Passive
Hip Joint	Flexion	0-70°	0-80°	Flexion	0-120°	0-120°
	Extension	0-10°	0-15°	Extension	0-30°	0-30°
	Abduction	0-30°	0-35°	Abduction	0-45°	0-45°
	Adduction	0-15°	0-20°	Adduction	0-30°	0-30°
Knee Joint	Flexion	0-80°	0-90°	Flexion	0-135°	0-135°
	Extension	80°-0	90°-0	Extension	135°-0	135°-0
Ankle Joint	Dorsi flexion	0-10°	0-15°	Dorsi flexion	0-20°	0-20°
	Plantar Flexion	0-30°	0-35°	Plantar Flexion	0-50°	0-50°

Table 2. Manual muscle testing

JOINT	RIGHT L/L		LEFT L/L	
HIP	Flexors	4	Flexors	5
	Extensors	3	Extensors	4
KNEE	Flexors	3	Flexors	5
	Extensors	5	Extensors	4
ANKLE	Dorsiflexors	2	Dorsiflexors	4
	Plantar flexors	3	Plantar flexors	4

Figure 1: Patient is in supine lying position with affected (right) leg supported



Management

Restore normal range of motion at knee and ankle joint if not normal, at least the functional ROM, i.e. 0-110° at the hip and knee, ankle dorsiflexion of 0-10° and plantarflexion of 0-20° each. Improve strength, power and endurance in muscle around the ankle and toes in the inverters and dorsiflexors. Offer stability in all ambulatory activities and the near normal pattern of gait.

Phase 1: The Main Goal in first phase of recovery was patient education and prevention of secondary complication. Patient was educated about his condition, dos and don'ts and the importance of physiotherapy. To prevent the secondary complications early mobilisation was given to avoid pressure sores. Ankle toe movement was taught and patient was asked to repeat every 2 hourly, every time 10 repetitions. Patient was asked to keep the limb elevated in order to

reduce oedema. Active exercises of upper limb like flexion-extension, abduction-adduction were taught also mobility exercises for the unaffected limb. Isometric exercises for hamstring and quadriceps were taught in order to prevent disuse atrophy. To Increase the range and to maintain the strength of unaffected limb Muscle energy technique was used.

Phase 2: The Main aim of Second phase of rehabilitation was to maintain the range and strength achieved in first phase and progress in aspect of strength. For the Maintenance of strength, patient was asked to perform static hamstrings and quadriceps exercises with 10 secs of hold, 10 repetitions were performed. Also, patient was asked to do the heel slides, Straight leg raise and repeat 10 times. For Upper limb, resisted exercise was given using Delorme's technique 10 RM was identified and were given as tolerated by the patient.

Phase 3: This phase was more over ambulatory phase in which the patient was progressing from non-weight bearing to partial weight bearing walking. Preambulatory training was given in phase 1 and phase 2 of the rehabilitation. Patient was given walker and initially patient was just asked to hold the walker in position and bear weight on the affected side when the patient was comfortable, he was asked to take a step without touching the affected leg to the walker. Once the proper non weight bearing gait was achieved patient was progressed from non-weightbearing to partial weight bearing. In stage 3 Muscle energy technique was used but this time for the affected leg to work on the tightness of the hamstring muscles reciprocal inhibition was given.

DISCUSSION

In this case we have seen the patient with the fracture of both the tibia and fibula shaft. The orthopaedic management goes with the open reduction and internal fixation of the bone. As the physiotherapy treatment is allowed to the patient, the patient has increased in range and also the patient has started the weight bearing on limbs. The primary aim was patient education, prevention of secondary complication and maintenance as well as strengthening of quadriceps and hamstrings muscles. The patient has started normal walking pattern and also got the pain relief and without support walking. External fixators are used in the case of open fractures where the damage is more and more care is required in case of external fixator to avoid infection. Physiotherapy management is an important part of rehabilitation to get back to daily routine and achieve quality of life. Tibia being a weightbearing bone, takes less time to heal and in the meantime proper rehabilitation is important. As the Patient was bedridden, proper breathing exercises were taught to maintain the cardiac endurance and it shown significant effect on the patient. Physiotherapy has a significant effect on maintaining the strength and range of motion. In Case of External fixator limb gets heavy making the activities more difficult. Post Physiotherapy endurance was achieved as it is important of all the activities of daily living. Efforts

should be taken to increase or maintain endurance in bed ridden patients

CONCLUSION

Physiotherapy has significant effect in maintaining and improving range of motion and strength in traumatic post-operative cases.

Conflict of Interest

The authors declare that they have no conflict of interest

Informed Consent

Written and Oral informed consent was obtained from the patient included in the study.

Author's contribution

All author made best contribution for the concept, assessment and evaluation, data acquisition and analysis and interpretation of the data.

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