



Case Report

Bilateral open tibia fracture fixed with external fixator with COVID -19

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ABSTRACT

Road Traffic accidents is one of the major causes of musculoskeletal injuries. Tibia is the weight bearing joint which transmits axial weight to ankle joint. The Major bones of lower limb include Tibia, Fibula and femur. Tibia is the long bone which connects knee joint and ankle joint. In an Open fracture External fixation is the choice of treatment because of the soft tissue and bone loss and communication and contamination. A 39-year-old male, driver by profession admitted in orthopaedic male ward was referred to physiotherapy department. He was brought to the emergency department with bilateral tibia visible on observation, severe pain in tibial region and soft tissue and blood loss. Investigations were done RT-PCR for COVID-19 and X-ray. This case report is of a 39 year male with COVID-19 and bilateral open fracture of tibia fibula operated with external fixator. Rehabilitation aim was to make the patient ambulate as soon as possible and to avoid secondary complication. Physiotherapy has significant effect on maintaining the strength of the muscles as well the endurance of prolonged bedridden patients. Early physiotherapy should be started to maintain the strength and endurance.

Keywords: Rehabilitation, Tibia Fracture, Bilateral External fixator, Covid-19.

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INTRODUCTION

Road Traffic accidents is one of the major causes of musculoskeletal injuries. Any Injury to the lower limb affects the whole pattern of living as walking is hampered. The Major bones of lower limb include tibia, fibula and femur. Tibia is the long bone which connects knee joint and ankle joint. Tibia is the weight bearing joint which transmits axial weight to ankle joint. Fracture of tibia is the commonest fracture. Fracture of Tibia can be of Open or Closed Type. Open tibial fractures result in high rates of complications [1]. Open fracture is classified by Gustilo Anderson Classification as type 1, type 2 type 3a, type 3b and type 3c [2]. Medical and Physiotherapy management depends upon the type of fracture. In an Open fracture External fixation is the choice of treatment because of the soft tissue and bone loss and communication and contamination [3]. When the soft tissue is completely recovered internal fixation is done in such cases. In external fixators the stability is compromised so weight bearing is not allowed in such cases because of which deconditioning can be seen. Physiotherapy plays an important role in preventing deconditioning and to maintaining the strength [4]. In bed exercises are given to avoid disuse muscle atrophy. Bilateral involvement brings a bigger challenge as ambulation is completely impossible. In patients with unilateral involvement non-weight bearing is initiated at earliest but in patient with bilateral involvement the phase of non-weight bearing and partial

weight bearing is not possible which led to the problem and makes rehabilitation difficult. COVID-19 is biggest problem faced by the world right now and it is a barrier while planning the rehabilitation program as it affects lungs. So, endurance point needs to be focused in such cases [5].

Presentation of Case

A 39-year-old male, driver by profession admitted in orthopaedic male ward was referred to physiotherapy department. Patient gives history of accident 2 months back where a car hit him and a bike ran over his both legs at that time he was brought to the emergency department with bilateral tibia visible on observation, severe pain in tibial region and soft tissue and blood loss. Investigations were done RT-PCR for COVID-19 and X-ray. X ray showed for left side Fracture at the distal 1/3rd of tibia and distal 1/4th of fibula. RT-PCR was positive. Surgery was done: B/L external fixator was applied-Lt unidirectional external fixator was used while on Rt side hybrid external fixator was applied. Patient was kept in isolation for 35 day and was referred for physiotherapy.

Clinical findings

Patient was examined in supine position. On inspection Right lower limb was elevated with hip flexed to 20-degree, knee flexed to 30 degree and ankle in plantar flexion while on Left side hip was in neutral, knee extended and ankle plantar flexed. On palpation

tenderness was present at the site of insertion of external fixator, distal pulse was present but it was a low volume pulse. On Neurological Examination no loss of superficial sensation was seen for dermatomes of L4, L5, S1 and S2. Myotome S1 was impaired due to the presence of external fixator. Table 2. Range of motion

Table 1. Timeline

Event	Date
Met with accident, Pain ,tissue loss and visible tibial B/L	13-Sept-2020
Operated- B/L external Fixation done for Tibia and K-wiring for left fibula	13-Sept-2020
Diagnosed with COVID-19	13- Sept-2020
Referred for Physiotherapy	14-Sept-2020

2a. Hip Range of motion

Hip	Active Left	Active Right	Passive Left	Passive Right
Flexion	0-90	0-90	0-90	0-90
Extension	NA	NA	NA	NA
Abduction	0-20	0-40	0-40	0-40
Adduction	20-0	40-0	40-0	40-0
Internal Rotation	0-30	0-30	0-30	0-30
External Rotation	0-15	0-15	0-15	0-15

2b. Knee Range of motion

Ankle	Active Right	Active Left	Passive Right	Passive Left
Dorsiflexion	0	0	0	0-10
Plantarflexion	0	10-15	0	10-20
Inversion	0	0	0	0
Eversion	0	0	0	0

2c. Ankle Range of motion

Knee	Active Right	Active Left	Passive Right	Passive Left
Flexion	0-70	0-100	0-100	0-110
Extension	70-0	100-0	100-0	110-0

Figure 1. Post Operative Xray of Left side

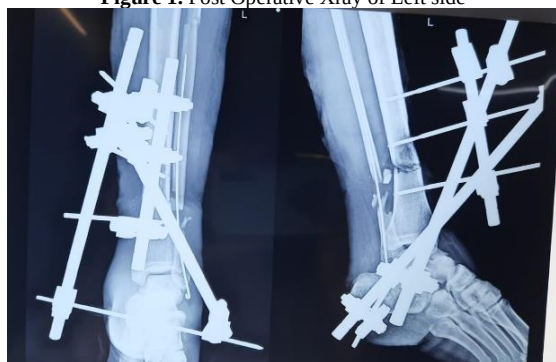


Figure 2. Post Operative X-Ray of Right Side



Management

Phase 1 (0-4 weeks)

Phase 1 focused on patient education, counselling and preventing any secondary complications and crutch training. Toe curls were initiated immediately after the surgery in order to maintain the circulation. Deep breathing exercises were given for airway clearance and semi fowler position was given as in increases intra-abdominal pressure and helps in breathing. Isometric exercises for quadriceps and hamstrings were given in order to maintain muscle strength. Crutch training was given for upper limb in which active open kinematic exercises were given for shoulder elbow and wrist joint. Which included shoulder flexion, extension, abduction and adduction, elbow flexion and extension and wrist flexion and extension.

Phase 2 (4-8 weeks)

Phase 2 focused on advancement in phase 1, strengthening of upper limb muscles. Ankle movement was initiated in the available range as the range was restricted because of external fixator. Deep breathing exercises were continued in order to maintain airway clearance. Strengthening exercises for hip were given which included straight leg raise, hip abduction exercises in supine lying. Active range of motion exercises for knee joint were given in available range and isometrics were continued. Upper limb strengthening exercise with one kg weight were given for shoulder flexors, extensors, abductors and adductors.

Phase 3(8-12 weeks)

Phase 3 focused on maintaining the functions and strength achieved in Phase 2 and progressing in the same. For Endurance training upper limb endurance training was given to the patient. Deep breathing exercises were continued and purse lip breathing was taught.

Limitations

Early weight bearing was delayed because of bilateral involvement of lower limb. Healing was delayed because of Diabetes Mellitus.

DISCUSSION

This case report is of a 39 year male with COVID-19 and bilateral open fracture of tibia fibula operated with external fixator. Rehabilitation aim was to make the patient ambulate as soon as possible and to avoid secondary complication. The patient was a driver by profession so back to work was also a point of consideration while planning the rehabilitation program. With the rehabilitation program the patient could perform all the ADLs on his own [6].

We gave deep breathing exercises in order to maintain airway clearance and to reduce the post-operative pain [7]. The exercises were given 3 times a day, 10 repetition each time. Along with deep breathing exercises, crutch training for upper limb muscles was given in order to increase the upper limb strength for walker. As good upper limb strength is required while lifting the walker. Hip and knee

range of motion exercises were given in order to maintain the range and strength of the muscles [8]. In addition, improved mobility also confers more general benefits, such as reduced risk of muscular atrophy, joint stiffness, venous thromboembolism (VTE), and pressure ulcers [9].

CONCLUSION

Physiotherapy has significant effect on maintaining the strength of the muscles as well the endurance of prolonged bedridden patients. Early physiotherapy should be started to maintain the strength and endurance.

Conflict of Interest

None

Informed consent

Informed consent was taken in written after explaining the whole procedure to the patient

Author's Contribution

All Authors did equal contribution and read the manuscript before submitting

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