Post Operative Physiotherapy Rehabilitation Of Hoffa's Fracture: A Case Series

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ABSTRACT: Background: A coronal fracture of the distal femoral condyle, known as a HOFFA'S fracture, commonly occurs and is easy to misdiagnose. Surgical treatment and rehabilitation is primary method of treatment. So, this study involves left Hoffa's lateral condylar fracture managed by open reduction internal fixation with C-C screw and rehabilitation Case presentation: We reported a 7 cases of 15-50 years patients who visited to our hospital with complaint of pain during knee bending, transfer activities and prolong standing. They presented with lateral and medial condylar HOFFA'S fracture and this cases is managed by C-C screw and Herbert screw fixation by means of ORIF. After surgery physiotherapy management was started after 1 day of surgery. No early complications, such as infection, and loss of reduction were noted after surgery. Outcome measure: VAS, GONIOMETRY, MMT, GIRTH(MEASURETAP) Conclusion: Our case study highlight the importance of early post op physiotherapy management after HOFFA'S fracture. And we reported that physiotherapy plays an important role in rehabilitation of patients with HOFFA'S fracture.

Key words: Cortico-cancellous screw, Herbert screw, HOFFA'S fracture, open reduction internal fixation, post operative.

INTRODUCTION:

Intra-articular, unicondylar as well as bicondylar fractures of the femur occurring in the coronal plane (Hoffa fractures) are rare injuries and mostly affect the lateral condyle with 8-10% of prevalence rate [1]. The aim of the treatment of this kind of intra-articular fracture is to achieve anatomical reduction of the 2 articular surface. Early open reduction and internal fixation are necessary for good longstanding healing in patients with such fractures. But there are many troubles associated with internal fixation in treating Hoffa fracture, especially the lateral Hoffa fracture. It was shows that the internal fixation by only using a plate or lag screws was not enough to achieve enough stability of Hoffa fracture, and as a result, fragment displacement, non-union, and even bone absorption could happen [2], [3]. Except for the steady fixation on lateral Hoffa fracture, early effective rehabilitation is also essential to achieve the satisfactory functional recovery of knee. A review of available data suggests that a combination of exercises is helpful when appropriate precautions are taken to protect the healing fragments and avoid excessive stress to the patellofemoral joint [4], [5]. However, there were very few researches regarding the rehabilitation on this kind of fracture. In this study, we reported 7 cases of 15-50 years patients; our experience of surgical treatment and rehabilitation of Hoffa's fracture in patients fixed by a C-C screws and Herbert screw through the anterior approach, which could provide rigid stability and earlier active rehabilitation.

PATIENT INFORMATION:

In this retrospective review of the orthopedic trauma database at a tertiary-care trauma center—conducted between January 2021 and march 2022—we identified 7 patients with age group 15-50 years old, an isolated coronal plane fracture of either the medial or the lateral femoral condyle. There were 4 lateral and 3 medial condylar fractures Patient demographics are presented in Table 2.I. One fracture was open and had an associated medial traumatic skin wound. One knee had association of lateral and posterolateral ligament injuries. All medial femoral condyle Hoffa fractures were displaced. There was history of immediate swelling and pain; and physiotherapy was started in form of ankle toe movement, knee bending exercise, static quadriceps, hip range of motion exercise, patellar mobilization. After 6 month follow up was taken.

***Table 1**: Patients' Demographic Details:*

PATIENT	AGE	SEX	MECHANISM OF INJURY
1	27	M	Road traffic accident
2	15	M	Soccer
3	35	F	Car collision
4	30	M	Bike blow injury
5	32	F	Fall injury
6	20	M	Road traffic accident
7	50	M	Car accident

CLINICAL FINDINGS:

The patient was examined in supine lying and sitting position after taking written consent of the patient. Involved lower limb is in full extension, in some patients edema present over foot, westing was present over right thigh, incision was present (under bandage), on palpation local temperature was Afebrile, tenderness was present around incision site. There was restricted ROM and muscle strength of knee and ankle joint are found. On physical examination, respiratory system and neurological system are found to be normal.

IMAGING:

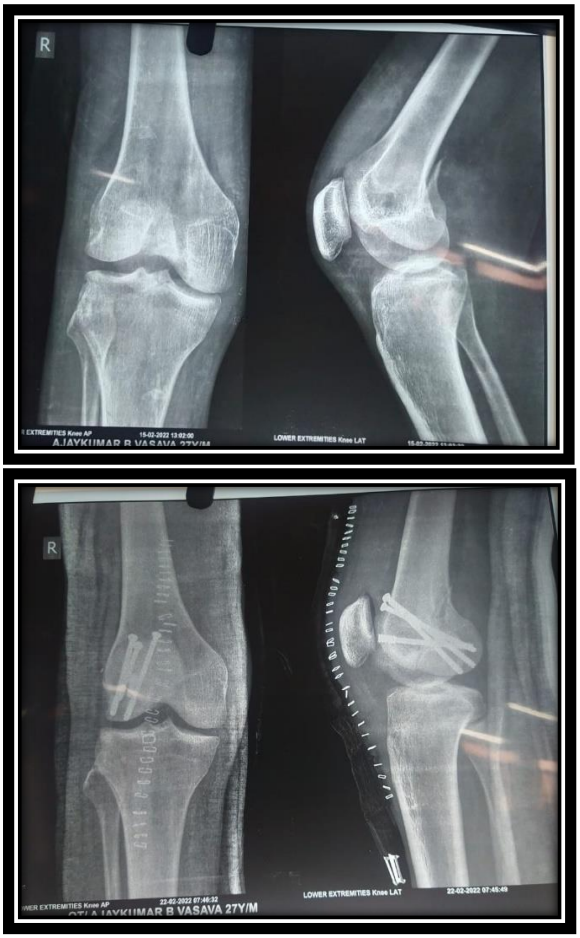

Fig 1. *Pre operative Xray of patient*
Fig 2. *Post operative Xray of patient*

DIAGNOSTIC ASSESSMENT:

Table 2*. Pre Rehab Range Of Motion(average):*

	RIGHT	
	ACTIVE	PASSIVE
KNEE FLEXION	0-30	0-40
KNEE EXTENSION	30-0	40-0
ANKLE DORSIFLEXION	0-15	0-20
ANKLE PLANTARFLEXION	0-20	0-40
ANKLE INVERSION	0-10	0-15
ANKLE EVERSION	0-7	0-9

Table 3. *Pre rehab MMT(average):*

	GRADE
KNEE FLEXORS	3
KNEE EXTENSORS	3
ANKLE DORSIFLEXORS	3
ANKLE PLANTARFLEXORS	3+
ANKLE INVERTORS	3
ANKLE EVERTORS	3

Table 4. *Pre rehab Girth measurement (average):*

	RIGHT	LEFT
PATELLA	-	-
3”	35.2	35.1
6”	37.5	39.8
9”	40.0	42.2

VAS*: 6.4(average):*

MANAGEMENT:

The rehabilitation of HOFFA’S fracture commonly focused on strength improvement, a range of motion (ROM) and gait training. Physiotherapy was started from day 1, which involved isometric strengthening for quadriceps and glutei, ankle-toe movements, MET and gentle hip ROM exercises, for reduction of edema we gave elevation of limb as well as compression bandage. Following discharge, the patient was also prescribed a home exercise regimen. After 2 weeks,. The continuous passive motion was started to allow the patient to obtain full ROM. Isometric muscle strengthening was performed for hamstrings, quadriceps, and glutei by using static board. At 4 weeks postoperatively, continuous passive movement by means of CPM machine was started. It gradually increased to 0°-90° of knee flexion. Strengthening exercises were continued to achieve good quadriceps strength. Heel press were initiated to improves knee extension. Ankle strengthening using resistance bands was initiated. patient progressed to partial weight bearing after 8 weeks. Strengthening of quadriceps was progressed with weights bar in quadriceps table. Elastic band resistance was used for hip and ankle muscle strengthening. Progress of the patient was noted with knee ROM as 135° of flexion. Full weight bearing was initiated at 12 weeks. Patient continued to perform straight leg raises. Gait training and conditioning was progressed to treadmill walking and parallel bar. After 6 months, full ROM was achieved at knee and progress was noted with 140° of knee flexion and full extension with no complaints of snapping or instability. Patient was prescribed a home program designed to attain rehabilitation goals for improving strengthening, gait training, and functional limitations.

FOLLOW UP AFTER 6 MONTH:

Table 5*. Post rehab Range of motion (average):*

	RIGHT	
	ACTIVE	PASSIVE
KNEE FLEXION	0-60	0-90
KNEE EXTENSION	60-0	90-0
ANKLE DORSIFLEXION	0-20	0-20
ANKLE PLANTARFLEXION	0-30	0-40
ANKLE INVERSION	0-15	0-15
ANKLE EVERSION	0-9	0-10

Table 6*. Post rehab MMT (average):*

	GRADE
KNEE FLEXORS	4+
KNEE EXTENSORS	4
ANKLE DORSIFLEXORS	3+
ANKLE PLANTARFLEXORS	4+
ANKLE INVERTORS	4
ANKLE EVERTORS	4+

Table 7*. Post rehab Girth measurement (average):*

	RIGHT	LEFT
PATELLA	34	34
3”	36	35
6”	39	39
9”	41	42

VAS*: 3(average):*

DISCUSSION:

This case study involved a7 cases of 15-50 years patients who sustained HOFFA’S fracture following a road traffic accident. Patients underwent open reduction internal fixation using C-C screw and Herbert screw. Postoperatively, the patients was advised for physiotherapy and underwent a rehabilitation program. Inpatient physiotherapy was initiated on Day 1 postoperatively and the patient continued outpatient physiotherapy after 2 days. Patients underwent an initial examination, on post op day 1 which showed limited mobility at knee and ankle, decreased muscle strength of knee flexors, extensors and ankle group of muscles, partial weight bearing gait, edema present over right foot and decreased girth of right side quadricep group of muscles. Initially, the goals were to improve mobility, muscle strength, improve weight bearing status and gait training. Progress of exercises was dependent on attainment of these goals. Isolated distal femoral condyle fractures were first described by Hoffa in 1904 and are uncommon injuries. Fractures in the condyles occur as isolated injuries to the involved femur and are more common in the lateral than the media condyle Physical examination may reveal edema, effusion, or skin lesions. Varus and valgus instabilities may be subtle and neurovascular examination of the whole extremity should be carefully performed [6]. Holmes et al. [6] achieved rigid fixation with optimally positioned lag screws placed perpendicularly to the fracture plane with an ipsilateral parapatellar approach. In a case with heterotopic ossification and arthrofibrosis complications, 145° flexion of the knee was achieved 2 years after surgical intervention; notably, the authors recommended indomethacin prophylaxis. In most studies on the treatment of knee fractures, anterior, medial, and lateral approaches have been used. We believe that an incision of sufficient length made with either an anterior midline parapatellar [6] or a posterior approach facilitates favourable outcomes, whereas a small incision (e.g., 3 cm) makes adequately reducing and fix a condyle fracture [1] Transverse plane fractures of femoral condyles are uncommon and can be easily missed on routine radiography. To achieve favorable long-term results, open reduction, stable fixation with corticocancellous lag screws, and early mobilization are mandatory. Physical therapy can be initiated as soon as possible to reduce joint contractures.

CONCLUSION:

It is an uncommon injury, the HOFFA’S fracture is often difficult to diagnose and may be susceptible to improper treatment. Early rehabilitation after surgery should be advised to prevent secondary complications. after surgery, the rehabilitation program should emphasis on attaining full knee ROM and excellent hip and knee muscle strength. However, weight bearing must be overdue until the fracture has united properly. A home program concentrating on improving strength, balance and performance of daily activities must be advised.

CONSENT:

As per the hospital standards, patient written consent has been collected and preserved by the author.

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