An Analysis of Functional Outcome and Factors Influencing the Outcome in Floating Knee Injuries

Ram Gopal Panigrahi[1]

Abstract

Background: The objective of the study is to study the Functional outcome and factors influencing the outcome in Floating Knee Injuries.

Methods: The study was conducted on patients in Department of Orthopaedics in S.C.B Medical College & Hospital from December 2018 to December 2020 who are admitted with Floating Knee Injuries. Detailed history were obtained using study proforma a thorough musculoskeletal examination of both the knees will be done including neuro-vascular status and appropriate radiographs and if necessary CT scan will be done. Collection of Data of the patients were by brief history of injury, systemic and musculoskeletal examination, radiography of thigh with hip and knee and leg with knee and ankle in standard antero-posterior and Lateral View, follow up with radiological and clinical parameters. Clinical follow-up will be done at 2 weeks, 4 weeks, 8 weeks, 4 months, 6 months, 12 months intervals regarding union Of fractured bone, assessment of range of motion of knee, pain on weight bearing.

Results: In our study we found males are affected in 33 out of 34 patients (97%), right lower limb was involved in 28 out of 34 patients (82%), majority of the patients were of young age group between 16-40 years (60%), twenty five out of 34 patients (73%) had type I floating knee injury and 9out of 34 (27%) had type II floating knee injury, in most of the cases (70%) surgery was performed within 1 week of trauma. Knee stiffness was more common in older patients, communited fractures, Poor articular reduction. The communited fractures and poor articular reduction correlated significantly with malunion of fractures. Communited fractures were a statistically significant variable for Shortening. Open fractures, communited fractures and segmental fractures are statistically significant for non-union and delayed union.

Conclusion: Floating knee injuries are due to high velocity motor vehicle accident. Men are affected more than women. The right-side injury is more frequent than the left side. 55% of patients in this study had an excellent and good functional outcome and 45% of patients had a fair or poor functional outcome. Local complications like wound infection seen in 17.1% of patients. A communited fracture is the most common predictor affecting the functional outcomes like Knee stiffness, shortening, and time to union. The other predictors affecting the functional outcomes are poor articular reduction, open fractures, segmental fractures, older age and. The time to union of tibia is more than that of femur. Revision fixation for tibial fractures was more frequent than femoral fractures.

Keywords: Floating knee, Knee injury, Functional outcome

Introduction

The term floating knee is defined as simultaneous ipsilateral fracture of femur and tibia that disconnect the knee from the rest of the limb [1]. It includes both intra-articular and extra-articular fractures [2].

Floating Knee Injuries are becoming more and more common as a result of increasing industrialization and increase in number of vehicles as these injuries are caused by high energy trauma primarily involving high velocity motor vehicle accidents [3].

Due to complex nature of injury and associated complications such as compartment syndrome, vascular injuries, collateral ligament and meniscal injuries, management of these types of fractures is a challenging therapeutic problem [4]. Most often these kind of ipsilateral fractures are compound and associated with severe damage of soft tissues [5].

The combined femoral and tibial fractures are frequently accompanied by life threatening head injury, injuries to spinal cord, thoracic and abdominal (Visceral) injuries [6].

Surgical stabilization of both the femur and tibia fractures, early rehabilitation of the patient produces best clinical outcome. Although treatment planning for each fracture in the extremity should be considered individually to achieve the optimal results, the effect of that decision must be considered in the light of overall injury status of the entire extremity and general condition of the patient [7].

The results will be better and the complications will be less if the fractures are diaphyseal or extra articular than compared to intra-articular fractures [8]. The main aim of the early internal fixation of both, femur & tibia in floating knee injuries is to obtain union of the fractures in the anatomical position compatible with maximal

[1]Department of Orthopaedic Surgery, SCB Medical College and Hospital, Cuttack, Odisha, India.

Address of Correspondence
Dr. Ram Gopal Panigrahi,
Department of Orthopaedic Surgery, SCB Medical College and Hospital, Cuttack, Odisha, India.
E-mail: ramgopalpanigrahi@gmail.com

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Figure 1: Radiological and functional outcome of floating knee

functional return of the extremity and to reduce the complications such as delayed union, non- union and knee stiffness [9].

Methods

The data was collected from the patients in Department of Orthopaedics in S.C.B Medical College & Hospital from December 2018 to December 2020 who were admitted with Floating Knee Injuries.

Detailed history were obtained using study proforma a thorough musculoskeletal examination of both the knees will be done including Neuro-vascular status and appropriate radiographs and if necessary CT scan were done.

Collection of Data of the patients will be as follows

- Brief history of injury.
- Systemic and musculoskeletal examination.
- Radiography of thigh with hip and knee and leg with knee and ankle in standard antero-posterior and lateral view [10].
- Post-operative analgesics and antibiotics and supervised rehabilitation.
- Follow up with radiological and clinical parameters.

Clinical follow-up will be done at 2 weeks, 4 weeks, 8 weeks, 4 months, 6 months, 12 months intervals regarding

- Union of fractured bone.
- Assessment of range of motion of knee [11].
- Pain on weight bearing.

Inclusion Criteria

- Patients with floating knee injuries presented in Accident and emergency department within 24 hours of injury.
- Patients with minimum follow up of 1 year after the injury.

Exclusion Criteria

- Patients with femoral fractures proximal to the subtrochanteric level.
- Patients with tibial fractures distal to the distal metaphysis.
- Open fracture of tibia and femur
- Floating knee with compartment syndrome

Results

In our study we found males are affected in 33 out of 34 patients (97%), right lower limb was involved in 28 out of 34 patients (82%), majority of the patients were of young age group between 16-40 years (60%), twenty five out of 34 patients (73%) had type I floating knee injury and 9 out of 34 (27%) had type II floating knee injury, in most of the cases (70%) surgery was performed within 1 week of trauma. Knee stiffness was more common in older patients, communited fractures, Poor articular reduction. The communited fractures and poor articular reduction correlated significantly with malunion of fractures. Communited fractures were a statistically significant variable for Shortening. Open fractures, communited fractures and segmental fractures are statistically significant for non-union and delayed union (Figure 1).

Discussion

Four out come measures were analyzed with seven baseline variables statistically.

Four outcome measures [12] were

1) Knee stiffness
2) Malunion
3) Shortening
4) Nonunion and time to union

Six baseline variables [13] were

1) Age of the patient
2) Time to surgery after injury
3) Type of the fracture (open or closed)
4) Presence of Communition
5) Segmental fractures
6) Articular reduction

1) Knee Stiffness [14]:

The six base line variables were correlated with knee stiffness using the Chi-square test & found out to be Knee stiffness was more common in older patients, Communited fractures, Poor articular reduction.

2) Malunion [15]:
The communited fractures and poor articular reduction correlated significantly with malunion of fractures.

3) Shortening [16]:
Communited fractures were a statistically significant variable for Shortening.

4) Nonunion [17] and time to Union [18]:
Open fractures,communited fractures and segmental fractures arestastically significant for non-union and delyed union

Conclusion

Floating knee injuries are due to high velocity motor vehicle accident. Men are affected more than women. The right side injury is more frequent than the left side. 55% of patients in this study had an excellent and good functional outcome and 45% of patients had a fair or poor functional outcome. Local complications like wound infection seen in 17.1% of patients A communited fracture is the most common predictor affecting the functional outcomes like Knee stiffness, shortening, and time to union. The other predictors affecting the functional outcomes are poor articular reduction, open fractures, segmental fractures, older age and. The time to union of tibia is more than that of femur. Revision fixation for tibial fractures was more frequent than femoral fractures.

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Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his/her consent for his/her images and other clinical information to be reported in the Journal. The patient understands that his/her name and initials will not be published, and due efforts will be made to conceal his/her identity, but anonymity cannot be guaranteed.

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