



Research Article

J Orthop Rehabil Res
2019; 1(1): 10-12
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Surgical versus semiconservative management of floating knee

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Abstract

Background: The treatment of simultaneous ipsilateral femoral and tibial fractures was a therapeutic challenge often complicated by concomitant multi system injury. There is no fixed protocol for management of this complex injury. The treatment is purely based on the merit of the fracture. Treating these injuries is a mix and match out of the following options available like nailing, plating, minimally invasive screw fixation, external fixation or conservative management. The aim of the study is to analyse the outcome of surgical versus semi conservative management of floating knee. **Method:** Prospective study of fifty cases of ipsilateral fractures of femur and tibia treated in Sri Ramachandra medical collage from June 2015 to January 2019. All the fractures were classified using Fraser et al classification and open wounds were classified using Gustilo and Anderson classification. The patients were segregated into two groups depending on the definitive treatment of the fractures. Group I patients had both fractures treated by surgical stabilisation (either internal fixation or external fixation) and Group II patients had one of the fracture treated by surgical fixation and the other fracture treated nonoperatively. **Result:** We had sixty percentage of excellent/good result in group I compared to thirty percentage of excellent/good result in group II. While we had thirty five percentage of acceptable results in group I compared to fifty eight percentage of acceptable results in group II. We had six percentage of poor result in group I compared to fifteen percentage of poor results in group II. **Conclusion:** Patients treated by operative stabilisation of both fractures did better than patients in which one fracture was treated by non operative methods. Early mobilisation of these multiply injured patients and of their injured limbs was imperative in order to avoid complications and to achieve the best functional end result.

Keywords: Floating knee. Femur Fracture, Tibia fracture, Ipsilateral trauma, Stiffness.

INTRODUCTION

Road traffic accidents causing high-energy violence are becoming a more common cause of fractures. Byproduct of this horsepower race is patients are sustaining simultaneous femoral and tibial fractures in the same extremity, popularly known as floating knee [1]. The treatment of simultaneous ipsilateral femoral and tibial fractures was a therapeutic challenge often complicated by concomitant multi system injury. Several approaches had been described for treating this complex injury. There is no fixed protocol for management of this complex injury. The treatment is purely based on the merit of the fracture. Treating these injuries is a mix and match out of the following options available like nailing, plating, minimally invasive screw fixation, external fixation or conservative management.

Aim: To analyse the outcome of surgical versus semi conservative management of floating knee.

MATERIALS AND METHOD

This is a prospective study of fifty cases of ipsilateral fractures of femur and tibia treated in Sri Ramachandra medical collage from June 2015 to January 2019. The inclusion criteria were femoral fractures distal to the level of lesser trochanter with an ipsilateral tibia fracture proximal to the tibial plafond and minimum follow up of one year. The exclusion criteria were patients who succumbed to craniocerebral, thoracic, or abdominal injuries resulting in death within forty-eight hours and patients below twenty years of age. In our study forty-six were male and four were female. The age group was from twenty one to sixty five years. The mean age is thirty-five years with the maximum incidence in the third decade. The mode of injury was road traffic accidents in forty-four patients, fall from height in four patients and injuries sustained from assault in two patients. Thirty-four patients had fracture on the right side and 16 on the left side. All the fractures

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were classified using the Fraser et al classification [2] and open wounds were classified using the Gustilo and Anderson classification [3].

We had six open fractures of femur and sixteen open fractures of tibia. Thirty-two patients had closed femur and tibia fractures while four had open femur and tibia fractures. Twelve patients had closed femur and open tibia fractures while two patients had open femur and closed tibia fractures. Twelve patients had associated thoracic injury, fourteen had cranio cerebral injury, two had abdominal injury, twenty had ipsilateral fibula fracture, two had mandible fracture while two had metacarpal and metatarsal fractures. In majority of the cases an average of four hours was lost before the patient reached the casualty. Once the patient was haemodynamically stable a detailed thorough clinical examination of the patient as a whole was performed. Radiological evaluation of the injured extremity, chest and other suspected injured parts were carried out. Head injury, abdominal injuries and thoracic injuries were given priority.

The patients were segregated into two groups depending on the definitive treatment of the fractures. Group I patients had both fractures treated by surgical stabilisation (either internal fixation or external fixation) and Group II patients had one of the fracture treated by surgical fixation and other fracture treated nonoperatively. We had thirty-six group I patients and fourteen group II patients. Femoral fractures are surgically fixed within an average of nine days. None of the femoral fractures were treated conservatively. An average of five days was lost between surgical fixation and injury, in the case of tibial fractures. Fourteen tibia fractures were treated conservatively. All open fractures of femur and tibia were treated as emergencies. After hemodynamic stability of the patients, the open fractures were thoroughly irrigated and debrided. After initial debridement all the fractures were stabilized with AO type of external fixator.

Fracture, which does not show any radiological evidence of healing over a period of twenty-four weeks were considered to be nonunion. In all cases of femoral and tibial nonunions secondary bone grafting was done to aid healing [4]. The criteria described by Karlstorm and Olerud was used for assessment and patients were graded as excellent, good, acceptable or poor [5]. The patients were followed up regularly at three months interval upto one year.

RESULTS

We had sixty percentages of excellent/good results in-group I compared to thirty percentage of excellent/good result in-group II. While we had thirty-five percentage of acceptable results in group I compared to fifty eight percentage of acceptable results in group II. We had six percentages of poor results in-group I compared to fifteen percentages of poor results in-group II. The results were tabulated in table 1.

Table 1: Result as per Karlstorm and Olerud scale

	Excellent	Good	Acceptable	Poor
Group I	2(5.5%)	20(55%)	12(34%)	2(5.5%)
Group II	-	4(28.6%)	8(57.1%)	2(14.3%)

The mean hospital stay in group I was forty-two days and group II was fifty-nine days. In group I the mean healing of femur fracture was twenty weeks and tibia fracture was twenty-five weeks. In group II the mean healing of femur fracture was twenty-three weeks and tibia fracture was twenty seven weeks.

In group I the range of flexion at knee was 30-130 degrees. In Fractures, which did not involve the knee, the average flexion at knee was 90 degree whereas fractures which involved the knee joint had an average motion of only 80 degrees. In group II the range of flexion at knee was

30-90 degrees. None of the patient in this series had restriction of hip movements.

DISCUSSION

Ipsilateral fractures of the femur and tibia were a serious injury complex, which was often associated with other major injuries to the head, chest, and visceral and musculoskeletal system. In the present series, we had analysed fifty cases of ipsilateral fractures of femur and tibia clinically and radiologically and evaluated their management and functional outcome over a minimum period of one year. On the basis of the present series, it was evident that ipsilateral fractures of femur and tibia commonly occur as a result of high-energy violence (88% were due to road traffic accidents). This was also stressed by Omer et al [6]. In our study, the maximum number of cases was in the third decade, which was comparable to the series of Ravindra.B.Gunaki [7].

Ipsilateral fractures of femur and tibia in our series were classified as described by Fraser et al. In our study, Type-I fractures (seventy two percent) were commoner and there was no case with type IIc fractures. In the present study, we had three cases of Fat embolism and three cases of hypovolemic shock [8]. This finding stresses the importance of routine arterial blood gas analysis in patients with this injury complex and the prime importance of resuscitation in these cases. In our study, the first priority in the management was given to life threatening, associated head and abdominal injuries which was followed by definitive management of musculoskeletal injuries.

The management was according to two different protocols. Group-I - Both fractures were treated by surgical stabilisation either internally or externally. Group-II - One of the fractures was treated non-operatively and the other fracture was treated surgically. The average period of hospitalization in Group-I patients was forty two days and in Group-II was fifty nine days. The average time for femoral fractures to heal was twenty weeks and twenty five weeks in tibial fractures in group-I patients. In group-II patients the mean healing time was twenty-three weeks and twenty-seven weeks respectively. The mean healing time for both femur and tibial fractures in this dual injury complex was long compared to that of isolated fractures of tibia or femur. Based on the results of our series, we emphasize the superiority of operative stabilisation of both fractures over combination of surgical and non-operative methods. In general, the patients with intra-articular fractures of either femur or tibia (twenty eight percent) had poorer functional outcome compared to the series of Ravindra.B.Gunaki. This was because of the prolonged immobilization of knee in our patients compared to that of Ravindra.B.Gunaki.

In our study there were twenty cases of ipsilateral knee ligamentous laxity. In all these patients the laxity was identified only during the follow-up period. The importance of early detection of ligament injuries assumes relevance because of better results reported by Szalay et al following early repair of such ligamentous injuries [9,10]. Moreover it was noteworthy that Fraser et al⁴ have posted a higher incidence of degenerative osteoarthritis of the knee in such injuries in their long term follow up studies. Therefore, we suggest that the possibility of ligamentous disruption should always be thought of in patients with ipsilateral fractures of the femur and tibia, which were mostly detected only after stabilisation of both fractures.

In group I we had twelve percent of healing disturbances and eight percent of osteomyelitis healing disturbance and osteomyelitis. In group II we had twenty four percent of healing disturbances and no case of osteomyelitis. We recommend that, if fixation of both fractures was to be attempted, the operative conditions must clearly be good enough for stable fixation to be achieved without risk of infection.

Stiffness of the knee and ankle joints was associated with more prolonged immobilisation than when these joints were mobile. This

finding emphasizes the importance of early mobilisation of joints. More than half the patients in this study are under thirty-five years of age: Stiffness of the knee or ankle can be an enormous handicap to these young patients, whose demands and expectations were high. Ultimately, it was the condition of the patient that should dictate the treatment approach to be taken. Finally, we would like to stress that each case should be treated as an individual problem and there can be no rigid protocol for management of patients with this dual injury complex. The goal of treatment was to optimise the patient's ultimate level of function. The shortcomings of the study were no sample size calculation as it is a period study and duration of follow up was too short to comment on long term results of our management protocols.

CONCLUSION

Patients treated by operative stabilisation of both fractures did better than patients in which one fracture was treated by non operative methods. A rigid protocol of management cannot be followed and each fracture should be judged on its own merit.

Conflict of interest- Nil.

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