

ORIGINAL RESEARCH

Outcome in the Analysis of Functional Outcome of Tibial Segmental Fractures

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ABSTRACT

Background and Aim: Segmental fractures of tibia are uncommon and are usually caused by a high-energy trauma. They have a high complication rate. Current treatment options are locked intramedullary nailing, external fixators and plaster of paris cast immobilization. Hence the aim of the study was to evaluate the Functional outcome following interlocking intramedullary nailing for segmental fractures of tibia. **Material and Methods:** The present study was conducted in the department of the orthopaedics, medical college & hospital. A sum total of 42 cases of segmental tibia cases reported and studied. Patients will be followed up for a minimum period of 1 year. Patients were admitted in our with segmental tibia fractures during the described period prospectively and retrospectively with either open or closed segmental tibia fractures with compromised soft tissue and treated with interlocking nail. **Results:** Maximum numbers of the patients were of the age group of 25 years to 35 years. The mode of injury was accounted in the history and was found that two wheeler injuries was the most common mode of injury. The accounted for 83% o the patients. In our study 28 patients had associated fibula fracture at single level, 8 patients had segmental fibula fracture, 2 patients had double segmental fibula fracture and 2 patients had isolated tibia fracture. Except two patients all patient had fibula fracture above the level of syndesmosis. According to johner and wruchs criteria we got acceptable functional outcome was found in 78% of patients and unacceptable outcome was seen in 22% of patients. **Conclusion:** Experience regarding appropriate usage of polar screw and tibial entry point makes the surgical procedure easier with excellent functional outcome. Preservation of vascularity of intermediate segment and nontraumatic reduction of fracture fragments requires expert surgical skill.

Key Words: Intramedullary nail, Fibula, Fracture, Tibia

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INTRODUCTION

Rising incidence of high velocity trauma due to motor vehicle accidents usually results in fractures of long bones. The tibia is the most commonly fractured long bone in the body. Segmental tibia fractures are defined as a unique fracture type characterized by least two different fracture lines with a completely isolated intercalary osseous fragment.^{1,2}

Segmental tibia fractures are defined as a unique fracture type characterized by least two different fracture lines with a completely isolated intercalary osseous fragment. Segmental fractures of tibia are uncommon and are usually caused by a high-energy trauma. They have a high complication rate.³⁻⁵

Segmental fractures of tibia are uncommon and are usually caused by a high-energy trauma. They have a high complication rate. Rising incidence of high velocity trauma due to motor vehicle accidents usually results in fractures of long bones. Incidence is about

12-15% of all tibia fractures. The tibia is the most commonly fractured long bone in the body.^{6,7}

No definitive treatment has been established to prevent such complications, and many treatments have been proposed, ranging from non-surgical to surgical treatment. Intramedullary nailing is widely used because it provides biomechanical stability, can protect the surrounding soft tissues through indirect reduction, and indirectly induces bone healing.⁸

Treatment goal for this type of fracture is clinical and radiological union maintaining normal length, normal alignment, no rotational deformity, normal adjacent joint movements and reduced morbidity. Current treatment options are locked intramedullary nailing, external fixators and plaster of paris cast immobilization.⁹ Delayed unions and nonunion are commonly seen with segmental tibia fractures when compared to non-segmental tibia fractures.¹⁰ Hence the aim of the study was to evaluate the Functional

outcome following interlocking intramedullary nailing for segmental fractures of tibia.

MATERIALS AND METHODS

The present study was conducted in the department of the orthopaedics, medical college & hospital. The ethical committee was informed about the study and the prior to the start of the study certificate was obtained. The Retrospective cases were taken from the record department. A sum total of 42 cases of segmental tibia cases reported and studied. Patients will be followed up for a minimum period of 1 year. With each follow up functional and radiological evaluation will be done. Patients were admitted in our with segmental tibia fractures during the described period prospectively and retrospectively with either open or closed segmental tibia fractures with compromised soft tissue and treated with interlocking nail.

The inclusion & exclusion criteria followed in the study were as follows:

Inclusion criteria: Patients diagnosed with segmental tibia fracture and patients with age group of 18 to 60 years.

Exclusion criteria: Patient with history of systemic diseases, active diseases diagnosed, associated neurological injury and presence of pathological fracture.

All patients were subjected to a detailed history and clinical examination. Clinical examination was performed including general, systemic, neurovascular and local examination of injured part. Depending on nature of injury relevant radiological examination was done. If clinical examination indicates diminished distal pulses, further workup for vascular consultation was done. Antero-posterior and lateral radiograph of knee with leg with ankle were done to diagnose fracture type. Routine preoperative investigation was followed. Open fractures were immediately irrigated, washed and temporarily immobilized with posterior POP above knee slab. Plastic surgeon opinion was obtained for grade 2 and grade 3 compound cases. Patients were operated within 3 weeks of hospital admission.

RESULTS

In the present study, a total of 42 patients diagnosed with segmental tibia fracture treated with intramedullary interlocking nail were included in the study. Maximum numbers of the patients were of the age group of 25 years to 35 years.

Of the total 42 cases included there were 36 males and 6 females, the male to female ratio was found to be 4:1. On comparison of side involved it was found that right side is most commonly affected. The young adults in the age group of 25 to 35 years were most commonly affected with the average age of 31.20 years. The mode of injury was accounted in the history and was found that two wheeler injuries was the most common mode of injury. The accounted for

83% of the patients. In our study 28 patients had associated fibula fracture at single level, 8 patients had segmental fibula fracture, 2 patients had double segmental fibula fracture and 2 patients had isolated tibia fracture. Except two patients all patient had fibula fracture above the level of syndesmosis.

The treatments done in the study were as follows: closing nailing procedure was performed in 36 patients, and rest 6 patients underwent the treatment through open nailing of both fracture sites. Only two patients underwent bone grating with dynamization while two patients underwent implant exit after union due to infection. According to Johner and Wruchs criteria we got acceptable functional outcome was found in 78% of patients and unacceptable outcome was seen in 22% of patients.

Table 1: Johner and Wruchs Criteria Satisfied In the Study

Johner and Wruchs criteria	No. of patients
Excellent	26
Fair	6
Good	8
Poor	2
Total	42

DISCUSSION

The aim of the study is to evaluate the functional and radiological outcome of interlocking nailing in closed and compound segmental tibial fractures. Tibia fractures are the commonest among the major long bones fractures. The commonest cause of the fracture being road traffic accident which was in our study and also consistent with study by Dr. Vivek P Nikumbha et al.¹¹

Males (36 patients) are more commonly affected than female (6 patients) with the ratio of 4:1 in our series. A study conducted by Ramji Lal Sahu et al. shows male female ratio was 4.8:1 which same result as in our study.³

Right leg (34 patients) was most commonly affected than left leg (8 patients) in the ratio of 4:1. A study done by Ching-Kuei Huang et al. shows right leg was involved in 40 cases, left leg in 26 cases in the ratio of 2.8:1. Tibia fractures are the commonest among the major long bones fractures.¹² The commonest cause of the fracture was found to be road traffic accidents. In our study 100% of the segmental tibia fractures groups were due to road traffic accidents. A study done by Dr. Vivek P Nikumbha et al. shows road traffic accident was the most common mode of injury accounting for 86.27 % of the cases; assault was the cause of injury in only 3.93 % of the cases which is consistent with our result.

Out of 42 cases in our series, 32 (78%) had acceptable Johner and Wruch's criteria for functional outcome. Excellent score was obtained in 26 patients, good score was obtained in 6 patients, fair score was found in 8 patients and poor score was obtained in 2 patients, the results obtained in the present study is

consistent with a study done by Ekeland and Alho et al reported excellent in 29 (64%), good in 13 (29%) and fair in 2 (4.5%) and poor in one out of 45 cases.

CONCLUSION

Experience regarding appropriate usage of polar screw and tibial entry point makes the surgical procedure easier with excellent functional outcome. Preservation of vascularity of intermediate segment and nontraumatic reduction of fracture fragments requires expert surgical skill. Experience regarding appropriate usage of polar screw and tibial entry point makes the surgical procedure easier with excellent functional outcome.

CONFLICT OF INTEREST

None

SOURCE OF SUPPORT

Nil

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