International Journal of Orthopaedics Sciences

ISSN: 2395-1958
IJOS 2017; 3(1): 213-215

www.orthopaper.com
Received: 03-11-2016
Accepted: 04-12-2016

Dr. Rajneesh Jindal
Professor, Department of Orthopedics, Mayo Institute of Medical Sciences, Barabanki, Uttar Pradesh, India

Dr. GL Arora
Professor & HOD, Department of Orthopedics, Mayo Institute of Medical Sciences, Barabanki, Uttar Pradesh, India

Correspondence
Dr. Rajneesh Jindal
Professor, Department of Orthopedics, Mayo Institute of Medical Sciences, Barabanki, Uttar Pradesh, India

Comparison of different treatment modalities for tibial fractures: A clinical study

Dr. Rajneesh Jindal and Dr. GL Arora

DOI: http://dx.doi.org/10.22271/ortho.2017.v3.i1d.33

Abstract
Background: The management of unstable distal tibia fractures remains Challenging. The proximity to the ankle makes the surgical treatment more complicated. The present study was carried out to compare different treatment modalities for management of tibial fractures.
Materials & Methods: This study was conducted in the department of orthopaedics in 2014. It consisted of 200 patients with tibial fractures. It involves males (100) and females (100). Patients were informed regarding the study and written consent was taken. Patient data such as name, age, gender etc was recorded. Patients were divided into 2 groups of 100 patients each. Group I treated with plaster cast and Group II treated with fixation with plate and screws.
Factors such as time to fracture healing, numbers of delayed union, nonunion and malunion, incidence of infection, and other complications were recorded in all groups.
Results: Patients were divided into 2 groups. Group I treated with plaster cast (100) with 50 males and 50 females. Group II treated with fixation with plate and screws with plaster cast (100) with 50 males and 50 females. The difference was non significant (P>0.05). Non union or delayed union seen in group I was 12% and in group II was 10%. The difference was non significant (P>0.05). Malunion seen in group I was 22% and in group II was 16%. The difference was non significant (P>0.05). There was no superficial infection in group I. In group II, 7% of infection was seen. The difference was significant (P<0.05). The need for reoperation in group I was 8% and in group II was 10%. The difference was non significant (P>0.05). Reason for tibial fractures was road side accident (RSA) (65%), sports injury (25%) and fall from height (10%) in group I. In group II, the reason was road side accident (72%), sports injury (22%) and fall from height (6%). The difference was non significant (P>0.05).
Conclusion: Tibial fractures are becoming common due to road side accidents, fall from height and sports injury. Closed reduction and immobilization and open reduction with plates and screws are widely used. Complications are common with both techniques. Therefore selection of specific treatment modality is essential in preventing complications.

Keywords: Malunion, non-union, tibial

1. Introduction
The management of unstable distal tibia fractures remains Challenging. The proximity to the ankle makes the surgical treatment more complicated. Closed fractures of the tibial shaft are common. Tibia shaft fractures are the most common long bone fractures. They usually occur in young and active patients and are often due to high-energy trauma like motor vehicle accidents, sports or falls from height [1].
Advances in mechanization and the acceleration of travel have resulted in increase in road traffic accidents which is associated with increase in the number of Tibial fractures. Direct trauma like road traffic accidents often cause concomitant severe soft tissue damage with a high incidence of open fractures. The lack of soft tissue covering of the tibial shaft and difficult blood supply make these fractures vulnerable to infection and non-union. Tibial shaft fractures are severe injuries and may result in permanent disability [2].
The direction, magnitude and location of the force, as well as the position of the knee at impact, determines the fracture pattern, location, and degree of displacement. Most studies have shown, that the most injuries affect the lateral plateau (55% to 70%), isolated injuries of the medial plateau occur in (10% to 23%) of cases, whereas involvement of both plateaus is found in (10% to 30%) of reported series.

Fractures of tibia occur as a result of strong valgus or varus forces combined with axial loading [3].

Tibial shaft fractures are classified according to the AO classification of long bones (Type 42) and are divided into simple, wedge and complex fractures (Type 42. A/B/C). Type A fractures are subdivided into spiral, oblique and transverse fractures, type B into spiral wedge, oblique wedge and transversal wedge fractures. Type C fractures are subdivided into spiral, segmental and irregular fractures. Closed soft tissue injuries can be classified by the classification of Tscherne/Oestern and open fractures by the classification given by Gustilo/Anderson [4]

Despite different treatment modalities, controversy still exists as to the best method of treatment. Stable, non-displaced fractures of the tibial shaft can be treated conservatively by cast application. Conservative treatment in a thigh plaster is performed for approximately 4 weeks. Afterwards a functional brace can be used for 8 to 12 weeks. Intramedullary nailing is indicated for open and closed isolated tibia shaft fractures. Conventional plate osteosynthesis used to be the method of choice for tibial shaft fractures without soft tissue injury until recently being replaced by intramedullary nailing with locking screws [5].

The present study was carried out to compare different treatment modalities for management of tibial fractures.

2. Materials & Methods

This study was conducted in the department of orthopaedics in 2014. It consisted of 200 patients with tibial fractures. It involves males (100) and females (100). Patients were informed regarding the study and written consent was taken. Patient data such as name, age, gender etc was recorded. Patients were divided into 2 groups of 100 patients each. Group I treated with plaster cast and Group II treated with fixation with plate and screws.

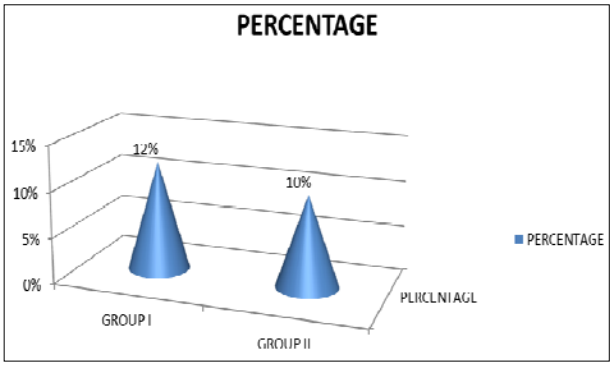
Factors such as time to fracture healing, numbers of delayed union, nonunion and malunion, incidence of infection, and other complications were recorded in all groups. Results thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

3. Results

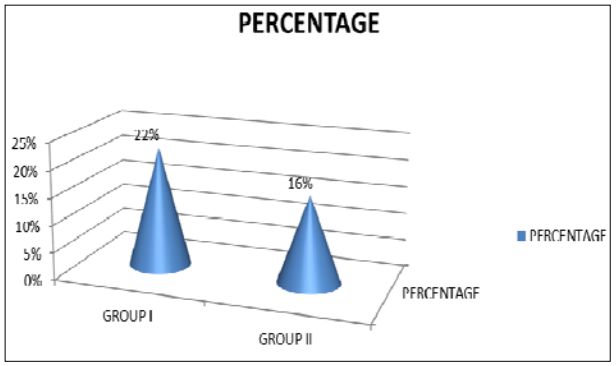
Table I shows that patients were divided into 2 groups. Group I treated with plaster cast (100) with 50 males and 50 females. Group II treated with fixation with plate and screws with plaster cast (100) with 50 males and 50 females. The difference was non-significant (P>0.05). Graph I shows that non union or delayed union seen in group I was 12% and in group II was 10%. The difference was non-significant (P>0.05). Graph II shows that malunion seen in group I was 22% and in group II was 16%. The difference was non-significant (P>0.05). Graph III shows that there was no superficial infection in group I. In group II, 7% of infection was seen. The difference was significant (P<0.05). Group IV shows that the need for reoperation in group I was 8% and in group II was 10%. The difference was non-significant (P>0.05). Graph V shows that reason for tibial fractures were road side accident (RSA) (65%), sports injury (25%) and fall from height (10%) in group I. In group II, the reason was road side accident (72%), sports injury (22%) and fall from height (6%). The difference was non significant (P>0.05).

Table 1: Distribution of patients in both groups

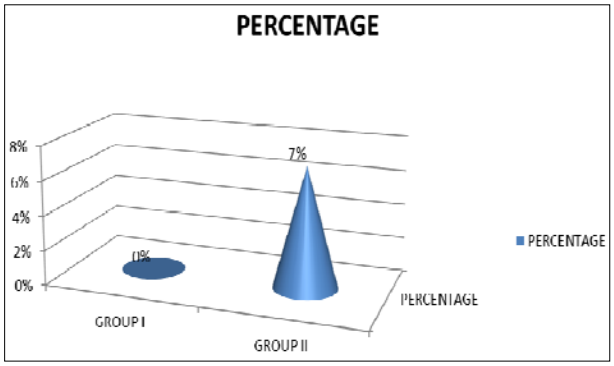
Group	Group I		Group II	
Treatment	Plaster cast (100)		Fixation with plate and screw (100)	
Gender	Male	Female	Male	Female
Number	50	50	50	50



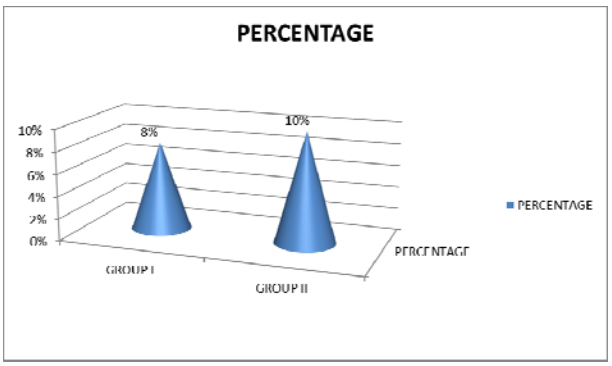
Graph 1: Delayed and non-union



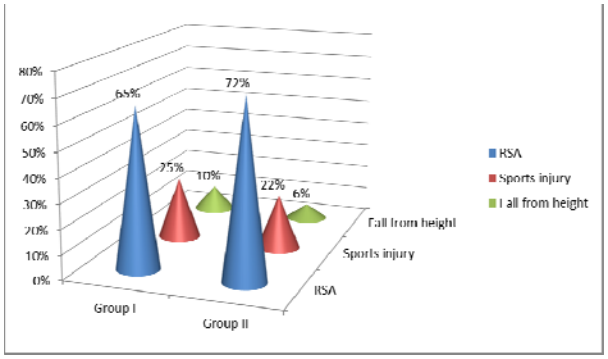
Graph 2: Malunion in both groups



Graph 3: Superficial infection in both groups



Graph 4: Need for reoperation in both groups



Graph 5: Mode of injury in both groups

4. Discussion

Tibial fractures are difficult to treat because of their intra-articular nature, cancellous bone involvement, and proximity to a major weight bearing joint. Despite of many advances in the care of intra-articular fractures, management of these fractures remains challenging for orthopaedic surgeons even in the present day. Open reduction and stable internal fixation is required for depressed or displaced and unstable fractures to regain the early and complete range of motion. Proper physiotherapy and compliance of patient are equally important to achieve good results. Full weight bearing fast, solid bony union, avoidance of pseudarthrosis, regain full range of motion of the knee and ankle joint, avoiding infections and further soft tissue damage are the aims of the tibial shaft fractures therapy [6].

The present study was carried out to compare different treatment modalities for management of tibial fractures. It consisted of 200 patients having tibial fractures. It involves males (100) and females (100). Patients were divided into 2 groups of 100 patients each. Group I treated with plaster cast and Group II treated with fixation with plate and screws.

We found that non union or delayed union seen in group I was 12% and in group II was 10%. The high prevalence seen with plaster cast has been supported by Wiss DA [7].

We also reported cases of malunion among all groups. Malunion seen in group I was 22% and in group II was 16%. Similar results were seen with the study of Krettek C *et al* [8]. They found that malunion in common among plaster cast in which closed reduction was carried out. We also found slight higher prevalence of malunion in group I. Harrington *et al* [9]. in her study found similar results.

We did not report any superficial infection in group I. In group II, 7% of infection was seen. Raikin S *et al* [10]. found high prevalence of infection with plates and screws in their study. The need for reoperation in group I was 8% and in group II was 10%. Similar results were seen in study of Tscherne H *et al* [11]. However, Bowes DN [12] reported higher prevalence of reoperation with plaster.

5. Conclusion

Tibial fractures are becoming common due to road side accidents, fall from height and sports injury. Closed reduction and immobilization and open reduction with plates and screws are widely used. Complications are common with both techniques. Therefore selection of specific treatment modality is essential in preventing complications.

6. References

1. Chiu FY, Lo WH, Chen CM, Chen TH, Huang CK. Unstable closed tibial shaft fractures: a prospective evaluation of surgical treatment. J Trauma. 1996;40: 987-91.
2. Blachut PA, O'Brien PJ, Meek RN, Broekhuyse HM. Interlocking intramedullary nailing with and without reaming for the treatment of closed fractures of the tibial shaft: a prospective, randomized study. J Bone Joint Surg. 1997; 79:640-6.
3. Court-Brown CM, Will E, Christie J, Mc- Queen MM. Reamed or unreamed mailing for closed tibial fractures: a prospective study in Tscherne C1 fractures. J Bone Joint Surg. 1996; 78:580-3.
4. David PB, Sean EN, William JM *et al*. Functional outcomes of severe bicondylar tibial plateau fractures treated with dual incisions and medial and lateral plates. J Bone Joint Surg Am. 2006; 88:1713-1721.
5. Abdel-Salam A, Eyres KS, Cleary J. Internal fixation of closed tibial fractures for the management of sports injuries. Br J Sports Med. 1991; 25:213-7.
6. Blokker CP, Rorabeck CH, Bourne RB. Tibial plateau fractures. An analysis of the results of treatment in 60 patients. Clin. Orthop. 1984; 182:193-9.
7. Wiss DA, Stetson WB. Unstable fractures of the tibia treated with a reamed intramedullary interlocking nail. Clin Orthop. 1995; 315:56-63.
8. Krettek C, Schandelmaier P, Tscherne H. Nonreamed interlocking nailing of closed tibial fractures with severe soft tissue injury. Clin Orthop. 1995; 315:34-47.
9. Harrington P, Sharif I, Smyth H, Fenelon GC, Mulcahy D, Pegum M. Unreamed mailing of tibial fractures - a prospective study of the routine use of the unreamed tibial nail. Ir J Med Sci. 1996; 165:282-5.
10. Raikin S. Froimson MI. Combined limited internal fixation with circular frame external fixation of intraarticular tibial fractures. Orthopedics. 1999; 22:1019 - 25.
11. Tscherne H, Lobenhoffer P. Tibial plateau fractures. Management and expected results. Clin Orthop Relat Res.1993; 292:87-100.
12. Bowes DN, Hohi M. Tibial condyle fracture: Evaluation of treatment and outcome. Clin Orthop Relat Res. 1982, 104-108.