

A Prospective Study on Functional Outcome of Surgical Management of Bimalleolar Fractures of the Ankle

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Abstract

Original Research Article

Background: Ankle joint is hinged synovial joint. Ankle is a close fitting hinge-like joint of which two parts interlock like mortise (the box formed by the distal end of Tibia and Fibula) and the tenon (upward projecting Talus). Ankle fractures are very common. The various surgical modalities include fixation with cancellous lag screws, malleolar screw, tension band wiring, semi-tubular plating, fixation with rush pin. These operative methods restore the anatomy and contact loading characteristic of the ankle including easier rehabilitation, early mobilization and earlier weight bearing. **Aims:** To evaluate the functional outcome of surgical management of the bimalleolar fractures of ankle.

Material and Methods: Present study was prospective study, carried out among patients with bimalleolar fractures of the ankle coming to Orthopaedic department of Tertiary health care centre for duration of November 2020-22. Data analysis: Following the above procedure, the findings were recorded in the proforma. These findings were entered in Microsoft Excel 2010. The results were compiled by using suitable tables and graphs wherever necessary. The variations were analysed as a percentage of the total and reported. Data analysis was done with the help of openepi software version 2.3.1. **Results:** The mean age of the patients was 39.86 ± 10.67 years. Majority of the patients 24 (80%) included in the study were male. Almost 15 (50 %) patients had pain score of 1 and 9(30%) patients had zero score. On range of movement 93.3% had zero score and 6.7% had score 2. On final objective scoring majority 73.3% had good, 20% had fair and 6.7% had poor outcome. **Conclusion:** Supination-external rotation injury is the most common type of bimalleolar ankle fracture and also common type associated with dislocations and complications. Good functional outcome was achieved by restoring sufficient stability and providing good mobility at the ankle joint. Anatomical reduction of the fracture is associated with better functional outcome. Early treatment without delay, anatomic reduction and fracture fixation, stringent postoperative mobilization and rehabilitation should help improve outcome in an operated bimalleolar fracture.

Keywords: Ankle, outcome, bimalleolar, fractures.

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INTRODUCTION

Ankle joint is hinged synovial joint. Ankle is a close fitting hinge-like joint of which two parts interlock like mortise (the box formed by the distal end of Tibia and Fibula) and the tenon (upward projecting Talus) [1]. The mortise bones are held together as syndesmosis by inferior tibiofibular and interosseous ligaments and talus is prevented from slipping from mortise by medial (Deltoid ligament), lateral collateral ligaments (posterior talofibular and calcaneofibular ligament) and joint capsule. Ankle moves in one plane flexion and extension but with a complex axis of rotation, as rolling forward of talus when the ankle is in plantar flexion. Surgical reduction and internal fixation have become the mainstay for the treatment of most of

the unstable malleolar fractures [2]. The various surgical modalities include fixation with cancellous lag screws, malleolar screw, tension band wiring, semi-tubular plating, fixation with rush pin. These operative methods restore the anatomy and contact loading characteristic of the ankle including easier rehabilitation, early mobilization and earlier weight bearing [2]. It has been concluded that open reduction and internal fixation provide a better functional outcome and stability even in elderly patients. Hence the present study was undertaken.

AIMS

1. To evaluate the functional outcome of surgical management of the bimalleolar fractures of ankle.

MATERIAL AND METHODS

Present study was prospective study, carried out among patients with bimalleolar fractures of the ankle coming to Orthopaedic department of Tertiary health care centre for duration of November 2020-22.

Inclusion Criteria:-

1. Closed bimalleolar fracture with or without ankle dislocation.

Exclusion Criteria:-

1. Isolated lateral or medial malleolar fractures.
2. Any co-morbidity preventing the surgery like Unconsciousness, head injury, CABG patients, etc.

Data collection procedure:- Patient were called for weekly or as required for follow up for approximately 4 months to the institute and were evaluated as follows:

1. Clinical evaluation:- Patients detailed history was taken in the view of etiology co

morbidities and examination of both normal as well as affected or fractured limb was carried out. Measurements of the limbs were taken as length in centimetres and range of movements in degree.

2. Evaluation by investigations:- Radiographical on the basis of xray, haematological investigations and the functional parameters were carried out.

Data analysis: Following the above procedure, the findings were recorded in the proforma. These findings were entered in Microsoft Excel 2010. The results were compiled by using suitable tables and graphs wherever necessary. The variations were analysed as a percentage of the total and reported. Data analysis was done with the help of openepi software version 2.3.1.

RESULTS

The mean age of the patients was 39.86 ± 10.67 years.

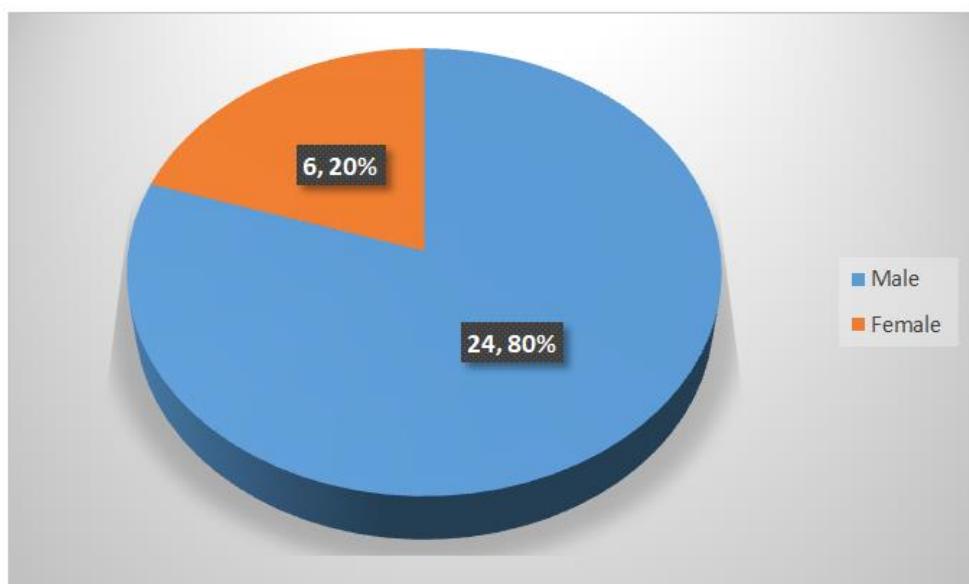


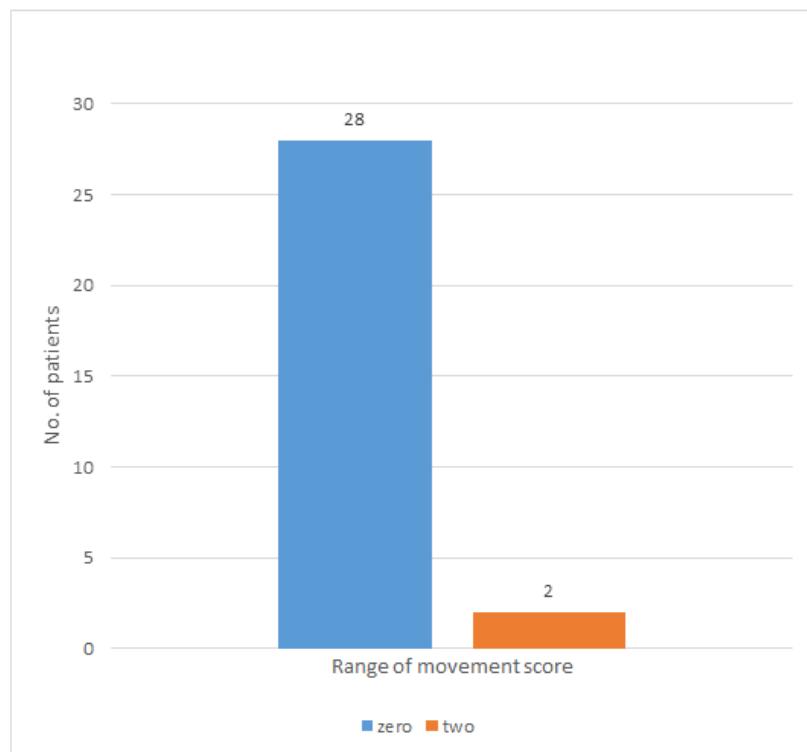
Chart 1: Genderwise distribution of patients

Majority of the patients 24 (80%) included in the study were male.

Table 1: Distribution of patients according to pain score

| Pain score | Frequency | Percentage |
|------------|-----------|------------|
| 0 | 9 | 30.0 |
| 1 | 15 | 50.0 |
| 2 | 5 | 16.7 |
| 3 | 1 | 3.3 |
| Total | 30 | 100.0 |

Almost 15 (50%) patients had pain score of 1 and 9(30%) patients had zero score.

**Chart 2: Distribution of patients according to Range Of Movements score**

On range of movement 93.3% had zero score and 6.7% had score 2.

Table 2: Distribution of patients according to objective scoring results

| Objective scoring results | Frequency | Percentage |
|---------------------------|-----------|------------|
| Fair | 6 | 20.0 |
| Good | 22 | 73.3 |
| Poor | 2 | 6.7 |
| Total | 30 | 100.0 |

On final objective scoring majority 73.3% had good, 20% had fair and 6.7% had poor outcome.

DISCUSSION

The mean age of the patients was 39.86 ± 10.67 years. Majority of the patients 24 (80%) included in the study were male.

Study by Roberts SR [3] showed that 44% were males and 56% were females. Study by Beris et al., [4] showed that 38% were males and 62% were females and mean age was 30 years. Baird and Jackson [5] showed that 70% were males and 30% were females. Zakir Ali Shah et al., [6] showed that 60% were males and 40% were females and mean age was 37.4 years. Jhatoth D et al., [7] showed that 77.7% were males and 22.3% were females. Dharmesh Patel et al [8] showed that 51.7% were males and 48.3% were females.

In present study almost 15 (50 %) patients had pain score of 1 and 9(30%) patients had zero score. On range of movement 93.3% had zero score and 6.7% had

score 2. On final objective scoring majority 73.3% had good, 20% had fair and 6.7% had poor outcome. Study by Narendra Singh et al., [9] showed that 76% had good and excellent outcome, 13.4% had fair and 12% had poor outcome. Study by Vaghela, H et al., [10] showed that excellent results were achieved in 15 cases (57.6%), good in 07 cases (26.9%), fair in 4 cases (15.3%) and poor results in 2 cases (7%). Jhatoth D et al., [7] showed that 83.25 had good outcome, 8.3% had fair and 8.3% had poor outcome. Dharmesh Patel et al., [8] showed that 49 cases (81.7%) achieved excellent results and 9 cases (15%) achieved good results at 12 months follow up.

CONCLUSION

Supination-external rotation injury is the most common type of bimalleolar ankle fracture and also common type associated with dislocations and complications. Good functional outcome was achieved by restoring sufficient stability and providing good mobility at the ankle joint. Anatomical reduction of the fracture is associated with better functional outcome. Early treatment without delay, anatomic reduction and

fracture fixation, stringent postoperative mobilization and rehabilitation should help improve outcome in an operated bimalleolar fracture.

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