

ORIGINAL RESEARCH

Clinical profile of patients with trimalleolar fracture attending tertiary care hospital

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Received: 08December, 2023 Accepted: 28December, 2023

ABSTRACT

Fractures of the posterior rim of distal end of tibia occur in upto 50% of all malleolar fractures. The presence of a posterior tibial fragment in malleolar fractures has been associated with a less favourable prognosis. We conducted a retrospective analysis on patients who were admitted from 2017 to 2022. We used the AOFAS (American Orthopaedic Foot and Ankle society score) scoring system which is a self-reported outcome measurement for the evaluation of the outcome of the management at 3 month, 6 month and 1 year follow-up post operatively. Using appropriate statistical methods, we assessed the pattern of recovery of ankle function. Fracture was more common in the age group of 20-40 years. The proportion of males with fracture was high. Left side involvement was high. Type A and Type C were more common.

Key words: Trimalleolar fracture, clinical profile, denis weber

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INTRODUCTION

Ankle fractures are one of the most common lower limb fractures accounting for 9% of all fractures, representing a significant portion of the trauma workload. The annual incidence of ankle fractures is between 107 and 187 per 100,000 people, and about 2% of ankle fractures are open fractures. Ankle fractures often affect young men and older women, but ankle fractures are more common in men under the age of 50. After this age, females become predominant¹.

Fractures of the posterior rim of distal end of tibia occur in upto 50% of all malleolar fractures. The presence of a posterior tibial fragment in malleolar fractures has been associated with a less favourable prognosis. Earle, in 1828, first described a fracture of the posterior rim of the distal end of the tibia in an ankle fracture-dislocation. In the large body of German literature, this fragment is commonly referred to as the "Volkman'sches Dreieck" (Volkman triangle). The term "malleole postérieure" (posterior malleolus) was introduced in 1911 by Destot. A bimalleolar fracture in combination with a posterior malleolar fracture was described in 1836 by Adams, after which Henderson¹⁶, in 1932, introduced the term "tri-malleolar fracture"².

METHODOLOGY

All surgically managed patients with tri-malleolar fracture of the ankle satisfying the inclusion criteria admitted from 2017 to 2022 in Basaveshwara Medical College and Hospital, Chitradurga were included in the study.

Total Number of patients-30.

INCLUSION CRITERIA

- Adults in the age group of >20 years of age.
- Radiographically confirmed tri-malleolar fracture of the ankle.
- Those willing to give consent.
- Patients without intra-operative or immediate post-operative complications.

EXCLUSION CRITERIA

- Age < 20 years.
- Open fractures of Ankle.
- Polytrauma patients.
- Pathological Fractures.
- Ankle fractures without involvement of posterior malleolus.

We conducted a retrospective analysis on patients who were admitted from 2017 to 2022.

We used the AOFAS (American Orthopaedic Foot and Ankle society score) scoring system which is a self-reported outcome measurement for the evaluation of the outcome of the management at 3 month, 6

month and 1 year follow-up post operatively. Using appropriate statistical methods, we assessed the pattern of recovery of ankle function.

RESULTS

Table1: Distribution of study subjects based on Age group

Age group	Frequency	Percentage
20-40 years	12	40.0
41-60 years	10	33.3
More than 60 years	08	26.7
Total	30	100

Table2: Distribution of study subjects based on Gender

Gender	Frequency	Percentage
Male	18	60.0
Female	12	40.0
Total	30	100

Table3: Distribution of study subjects based on Side of injury

Side	Frequency	Percentage
Right	14	46.6
Left	16	53.4
Total	30	100

Table4: Distribution of study subjects based on Type of injury (Denis Weber)

Type of injury	Frequency	Percentage
Type A	12	40.0
Type B	06	20.0
Type C	12	40.0
Total	30	100

DISCUSSION

The first reports on screw fixation of the fractured posterior tibial rim date back to the 1920s. Despite a steadily growing number of studies, there is still no consensus on the best treatment³. However, with more frequent use of computed tomography (CT) imaging recently, a better understanding of ankle fracture patterns has resulted in a more individualized approach to treatment. As a weight bearing joint, the ankle is exposed to forces that transiently exceed 1.25 times body weight with a normal gait and they may exceed 5.5 times body weight with vigorous activities⁴. Stable anatomical reduction of the ankle talus and fibular length correction is needed as 1 mm of lateral displacement will reduce the contact area by 42%, and fibular displacement of more than 2 mm will lead to a significant increase in joint pressure. A fracture of the posterior tibial margin larger than 5% of the involved articular surface may lead to the development of posttraumatic osteoarthritis, especially in fractures that involve the weight-bearing part of the tibiotalar joint⁵. Moreover, persistent postoperative dislocation of the posterior fragment in Tri-malleolar fractures may result in ankle instability, osteoarthritis, and functional impairment. According to the Arbeitsgemeinschaft für Osteosynthesefragen (AO), a posterior fragment comprising more than 25%

of the intra-articular surface needs to be fixated, as do fragments larger than 10% that remain persistently instable after fixation of the lateral and medial malleolus⁶. Recently, studies have stated that anatomical reduction and fixation of the posterior malleolus should be carried out in all cases of Tri-malleolar fracture irrespective of its size and type to obtain good clinical and functional outcome. Primary reduction and fixation of posterior malleolar fragments involving the incisura recreates the fibular notch and facilitates fibular reduction. If the fibula is reduced into a deformed and unstable incisura, posterior and rotational malalignment of the fibula may occur, further preventing reduction of the posterior malleolar fragment. Anatomic restoration of the posterior malleolus also helps in reducing the distal part of the fibula to its proper length through the pull of the PITFL. Indirect reduction with anterior-to-posterior screw fixation has been popular for several decades^{7, 8}.

CONCLUSION

- Fracture was more common in the age group of 20-40 years.
- The proportion of males with fracture was high.
- Left side involvement was high.
- Type A and Type C were more common.

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