



## CLINICAL AND RADIOLOGICAL OUTCOMES OF CALCANEUM FRACTURES TREATED CONSERVATIVELY

### Orthopaedics

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### ABSTRACT

**Background:** The calcaneum bone is the largest bone of the foot and is the major weight-bearing osseous structure of the foot. It is one of the components of the tri-tarsal articulation and has important functional tasks with regard to normal ambulation. Calcaneum fractures can be treated conservatively or with operative intervention by K-wire fixation, C-C screws and plating. We have conducted the retrospective study of patients with calcaneum fracture treated conservatively.

**Material and method:** During 2017 to 2019, we have conducted retrospective study of 20 patients (16 male 4 female) with calcaneum fracture treated conservatively. patient's evaluation was done by using ankle-hindfoot scale clinically and using Bohler and Gissane angle radiologically.

**Results:** with minimum follow-up of 6 months 65% showed radiological union by 3 months and resumption of work by 4 months. According to ankle-foot score 85% patient had excellent results and 15% had good results

**Conclusion:** Calcaneum fractures treated conservatively in 20 patients had good clinical outcome with low incident of difficulty of walking and persistent pain

### KEYWORDS

Calcaneum, K-wire, CC screw, Bohler angle, Gissane angle, Ankle-hindfoot scale.

#### INTRODUCTION:

Calcaneal fractures make up about 2% of all fractures. They account for 60 % of major tarsal injuries. The economic importance of these fractures is apparent in that although they represent only 2 percent of all fractures, 90% occurs in males between 30 and 45 years of age. The economic impact becomes even more apparent when one considers that 20 % of patients may be incapacitated for upto 3 years following the fracture and many partially incapacitated as long as 5 years after the fracture<sup>3</sup>.

The calcaneum is the largest bone of the foot and is the major weight-bearing osseous structure of the foot. It is one of the components of the tri-tarsal articulation and has important functional tasks with regard to normal ambulation<sup>1</sup>. Calcaneal fractures have a track record of being difficult to treat and have frustrated doctors for years. The problem in treating calcaneal fractures is in trying to rebuild the fracture so that healing may take place. , the calcaneum often shatters when broken. Calcaneal repair not only requires re-approximation of multiple fracture patterns, but also requires restoration of the subtalar joint. The subtalar joint is the interface between the calcaneum and talus. It is a primary load bearing joint of the foot. In some cases, additional joint surfaces may be affected (the calcaneal cuboid joint) but are of lesser importance due to their limited weight bearing roles<sup>2</sup>

Anatomic restoration of the three-dimensional anatomy of the calcaneum is the goal of surgical management of calcaneal fractures. Over the years, various techniques have been developed to accomplish this goal. All these techniques have certain steps in common including dis-impaction of the fragments, reduction of the displaced fragments either manually or percutaneously and protection of reduction with plaster pins and plaster, external fixation and open reduction and internal fixation<sup>4</sup>. Providing the maintenance of articular surfaces around the calcaneum bone, calcaneum fractures can be treated conservatively.

There is no current consensus of opinion regarding the treatment of all calcaneum fractures. Additionally, a direct comparison of various treatment modalities is difficult for several reasons: Different authors have used different methods of classification of calcaneal fractures, which makes comparisons difficult<sup>5</sup>

#### MATERIAL AND METHOD:

We have retrospectively studied 20 patients with calcaneum fractures treated conservatively with Below Knee slab and cast. The inclusion criteria of this study was all patients with age of 15-60 years with closed calcaneum fractures during the period o 2017 to 2019 treated conservatively. Patients with neurovascular involvement, presenting after 4 weeks of injury were excluded in this study.

The average age of patient in our study was 40 years with 16 males(80%) and 4 females(20%).12 patients(60%) had fracture over right side and 8(40%) patients had fracture over left side.15(75%) patients acquired injury from road traffic accident and 5(25%) patient acquired injury by fall from height.3 patients(15%) had associated spine injury and 17(85%) patient did not have any associated injury.2 patients(10%) had intra-articular extensions of fracture and 18(90%) patients had extra-articular fractures.



**Figure 1: Below Knee cast**

Diagnosis of patient was done by proper history & clinical and radiological examination. All patients were thoroughly assessed for associated injury. As calcaneum fractures are frequently associated with spinal injuries, neurological examination was done. Patients were given below knee slab in emergency department and advised about limb elevation and discharged with proper analgesics. All the patients were regularly followed up after 15 days, after which, slab was reinforced with below knee cast. Patients were followed up monthly for clinical and radiological examination. At the mean of 2 months

after the injury cast was removed and partial weight bearing was started and followed up monthly till 4 months and then after 3 monthly upto 1 year.



Figure 2: immediate x-ray post injury

**RESULTS:**

Study of the results were done retrospectively with detailed evaluation of cases along with personal interview, clinical examination and radiological evaluation at the time of follow-ups. 19(95%) patients had complaint of mild pain over the injured sight. All patient could walk with full weight bearing at the end of 6 months. Return of routine activity was seen in 14 patients (70%) at the period of 6 month. Sixteen(88.8%) patients out 18 patient with extra articular fractures had excellent result(score 90-100) and 2(11.2%) patient had good result(score 80-89).One patient(50%) out of 2 patients with intra articular fracture had excellent result according to ankle hind-foot scale. All 20 patients (100%) had increased heel pad thickness. Radiological union started appearing at the mean of 3 months in 65% of patients. Mean time of partial weight bearing was 3 months and full weight bearing was 4 months.

With 19 patients (95%) with full Range of dorsiflexion and planter flexion.with normal inversion and eversion. one patient had restricted dorsiflexion with normal planter flexion



Figure 3: Day 1 of injury



Figure 4: 6 month follow-up



Figure 5: Clinical images at 6 month follow up

**DISCUSSION:**

Calcaneal fractures make up about 2 percent of all fractures. These fractures are treated with either conservative method or with open reduction and internal fixation, with Below knee slab post operatively. in our study of 20 patients treated with conservative method, outcome appeared to be excellent in 88.8% of extra articular fractures and 50% of intra articular fracture treated conservatively.

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