

Surgical Treatment of Intrarticular Calcaneal Fractures.

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Abstract: 75% of calcaneal fractures are intra articular. Treating calcaneal fractures is a challenge for orthopaedic surgeon due to the complex fracture pathology. A wide range of treatment options varying from non operative to operative methods are available. The purpose of this study is to assess the functional outcome of surgically treated intrarticular calcaneal fractures along with certain important tips and observations made during this case study.

Keywords: calcaneum ,intrarticular, plating, modified rowe scale,screw fixation.

I. introduction

Descriptions of calcaneal fractures exist since 1839 when compression/axial loading mechanism causing this type of fracture has been described [1]. In 1843 Malgaigne described this fracture and proposed a classification .The treatment of these fractures has been evolved since then from conservative to surgical approach .The initial publications of surgical treatment of calcaneal fracture were by Leriche .. Treatment options ranges from non operative to operative methods^{4, 13}

II. Materials And Methods

There were 8 intrarticular calcaneal fractures in 7 patients, with a minimum follow up of 3 months. Mean age of the patient was 33 years among which 6 patients were male and 1 female. 1 patient had a bilateral calcaneal fracture. Mechanism of injury was fall from height in all patients. None of the patients had associated vertebra fractures or neurological deficit. Patients were evaluated clinically and radiologically, lateral radiographs of calcaneum were taken. Intrarticular fractures were classified based on the Essex Lopresti classification and computerized tomography imaging with 3d reconstruction was taken. All patients had swelling associated with the fracture which did not allow immediate surgery. A posterior back slab was given for all patients. Ice compresses were given over the lateral aspect of hindfoot after removal of plaster slab every 3 to 4 hours. Crushed ice or cubes were placed in a plastic cover and the cover was tied. The plastic bag with ice was placed over the hindfoot for a period of 15 minutes. Limb was strictly elevated with 2 pillows. After all these measures, usually swelling reduced within a period of 7 to 10 days. Only on observance of wrinkles over the planned operative site (refer fig.5.1) was surgery done.

All cases were exposed by extensile lateral approach . Full thickness flaps were made using the 'no touch' technique making sure that sural nerve and peroneal tendons were not incised. The flaps were retracted and held with K wires. The fracture was reduced – tuberosity fragment was valgized, the anterior fragment was reduced and the joint depression was elevated and removing the lateral wall. The reduction was checked under image intensifier (for restoration of Bohler's and Gissane angle) and was stabilized with either reconstruction plates or calcaneum locking plates after replacing the lateral wall. In some cases 2 reconstruction plates (1 plate to support the subchondral bone and another plate to stabilize the main fragments) were used along the lateral aspect. The wound was closed by Algoter Donati suturing technique.

Post operatively limb elevation was maintained for 72 hours. Compressive bandage was applied over sterile dressing. Complete suture removal was done at an average of 18 days. All operated patients were kept on absolute non weight bearing for 6 weeks followed by touchdown weight bearing with active and passive movements of ankle and sub talar joints. Full weight bearing was allowed from 12 weeks. Regular clinical follow up examination was performed monthly in all cases and functional outcome was assessed by using Modified Rowe scale (Table 3) after following the cases over a mean period of 4 months.

III. Case Study

Case 1:

A 22year old male had come with history of fall from height. Pre Operative Images.



Post operative images:

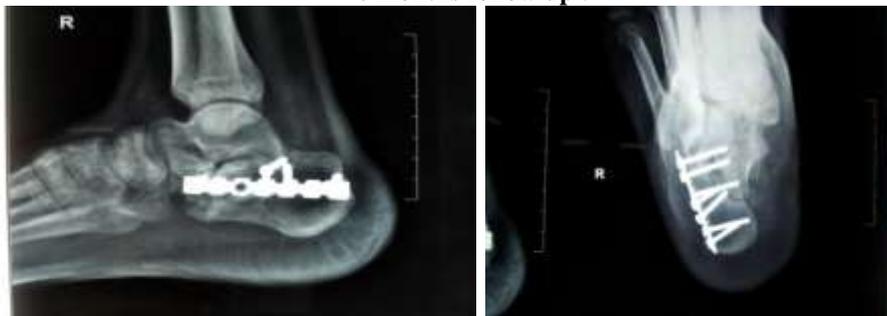


6weeks:



Months follow up:

6 months follow up :



Case 2 : Ravindran

Pre-Op Images:



Intra Operative pics:



6 weeks post op :



3 months post op:



IV. Figures and Tables

Patients Distribution as per functional outcome as per Modified Rowe score¹⁴: Modified Rowe score¹⁴: based upon stability, motion and function post operatively based on which scoring was done.

Excellent >85

- Good 70-85
- Satisfactory 55-70
- Poor <55

All 8 patients had a mean score of above 85 , hence proving surgical fixation as an effective method for intrarticular calcaneal fractures.

V. Conclusion

Calcaneum fractures account for 2% of all fractures, 60% of tarsal bone fractures.10% of fractures are bilateral and 75% are intra articular¹.10% of fractures are associated with vertebrae fractures. Mechanism of injury in majority of patients is axial loading i.e. fall from height. Other mechanisms are brake pedal injuries and high velocity trauma. Current development in imaging technology has allowed better understanding of this complex fracture pathology. Sanders classification³ of intra articular Calcaneum fractures is widely used now a days because of its proven correlation with management and prognosis. Treating Calcaneum fractures is a challenge for orthopaedic surgeon.



(fig 5.1)

Proper pre- operative planning in treating calcaneal fractures helps in producing better results. It is important that the swelling in the foot must recede and presence of wrinkles over skin is a good sign as it reduces the chances of vascularity damage due to edema and prevents necrosis of the skin.

The following cases showed very good results following surgical treatment. Intra-operative planning and proper patient education and mobilization helped in obtaining excellent results and almost no interference in doing day to day life. Flap necrosis can be avoided by reducing swelling by limb elevation, splinting and ice compresses. Surgery should not be done in the presence of swelling. It may take 7 to 10 days for the swelling to subside and wrinkles to appear. Even though reduction becomes slightly more difficult due to the delay wound complications which are more devastating can be avoided.

Acknowledgements

I would like to thank Prof.P.V.Vijayraghavan and Dr.Giriraj Harshavardhan for their time and support in this study.

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