ASSESMENT OF SUBTALAR JOINT RANGE OF MOTION AFTER DEPRESSED CALCANEAL FRACTURE MANAGED BY CLOSED REDUCTION AND PERCUTANEOUS FIXATION TECHNIQUE

A Thesis submitted for partial fulfillment of M.Sc..degree in orthopaedics

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ABSTRACT

Key Words: Displaced Intra-articular depressed calcaneal fracture-Percutaneous fixation.-Assessment range of motion.

Depressed calcaneal fractures occur most often in middle aged male workers .This explain the economic importance of these fractures.

Percutaneous fixation is safe and can be applied in depressed intraarticular calcaneal fractures in which soft-tissue compromise is present.

Proper evaluation of joint ROM is essential to successful patient management. Success in these evaluations is based on use of accepted measuring methods. Assessment patient improvement based on increases in range of joint motion.

This study was done by clinical assessment of range of motion of subtalar joint with a goniometer and a simple plain radiographic assessment providing a simple and accurate radiographic marker of calcaneal tilts.

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LIST OF ABRIVIATION

Abbreviation	Meaning
R.O.M	Range of motion
C.T.scan	Computerized Tomographic Scan
T.D	three-dimensional
S.T.	Sub talar
ORIF	Open Reduction Internal Fixation

AIM

The assessment of range of motion after managing depressed calcaneal fractures by closed reduction and percutaneous fixation techniques.

INTRODUCTION

Calcaneal fractures make up about 2 percent of all fractures. They account for 60 percent of major tarsal injuries. The economic importance of these fractures is apparent in that although they represent only 2 percent of all fractures, 90 percent occurs in males between 30 and 45 years of age. They occur most often in middle aged workers. The economic impact becomes even more apparent when one considers that 20 percent of patients may be incapacitated for up to 3 years following the fracture and many are still partially incapacitated as long as 5 years after the fracture. [1]

Approximately 75% of calcaneal fractures are intraarticular and result from axial loading, which produces two separate fractures: "tongue type" fracture and "joint depression type" fracture. The primary difference between these two fracture types is the connection of the tuberosity or posterolateral fragment to the lateral portion of the posterior facet, which is present in the tongue type and absent in the joint depression type. [2]

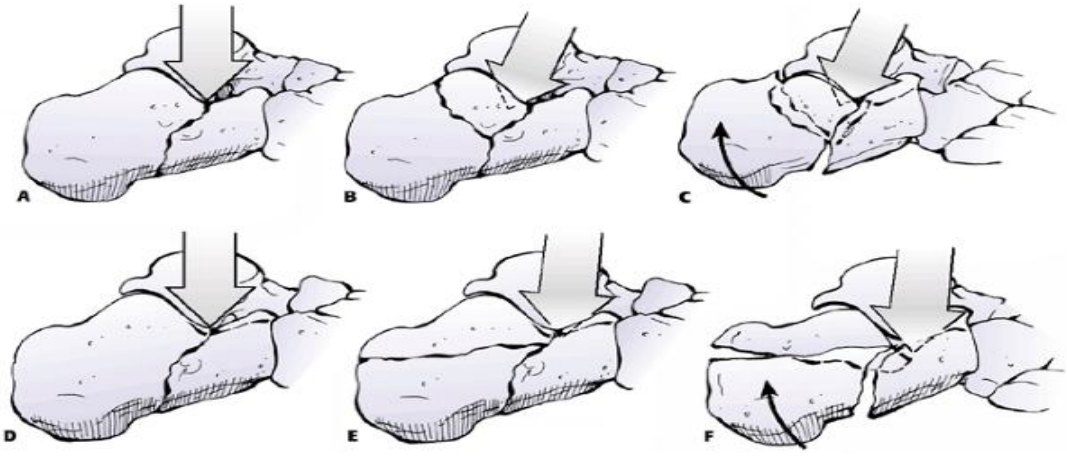

Figure (1) Mechanism of injury according to **Essex-Lopresti**. A to C. Joint depression. D to F. Tongue shape fracture [3].

Minimal incision or percutaneous fixation techniques for intra-articular fractures of the calcaneus represent viable surgical options for these high- risk patients, especially in patients with diabetes mellitus or peripheral vascular diseases, in patients with massive swelling and blood-filled fracture blisters on the foot and for calcaneal fractures in patients with multiple injuries. [4]

Proper evaluation of subtalsr joint range of motion is essential to successful patient management. Success in these evaluations is based on use of accepted measuring methods. [5]

History

Ordinarily speaking, the man who breaks his heel is done

... So said **Cotton** in 1908. [6]

Bankart 35 years later wrote "The results of treatment of crush fractures of foot are rotten". [7]

The first written report of closed treatment was by **Bailey** in 1880 while **Morestin** in 1902 first reported open reduction and internal fixation of calcaneal fractures. [8 & 9]

Cave pointed out that fracture of the calcaneus has been a common, often disabling injury since humans assumed the erect posture and began to defy gravity. [10]

Cotton and **Wilson** in 1908 suggested that open reduction of a calcaneal fracture was contraindicated. They recommended closed treatment with use of a medially placed sandbag, a laterally placed felt pad and a hammer to reduce the lateral wall and 'reimpact' the fracture. [11]

The ideal choice of treatment for displaced intraarticular calcaneal fractures has generated controversy for more than a century. There is evidence from numerous studies with large patient cohorts that anatomic restoration of the calcaneal shape and joint congruity predict higher functional scores and a lower incidence of posttraumatic subtalar arthritis with potentially less need of secondary subtalar fusion when treating these injuries. [12, 13, 14& 15]

However, minor and major wound complications remain a major concern because of the thin and vulnerable skin over the lateral calcaneal wall, which is exposed during surgery. **Folk JW** and his colleagues