(e) ISSN Online: 2321-9599
(p) ISSN Print: 2348-6805

ORIGINAL ARTICLE

COMPARISON OF OPERATIVE AND NON OPERATIVE MANAGEMENT OF CALCANEUS BONE FRACTURE

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ABSTRACT:
Background: Fractures of the calcaneus, or heel bone, make up about 2% of all fractures and are the commonest fracture of the tarsal bones. There are two treatment modalities for the management of fractures such as operative and non- operative. The present study was done to compare the operative verses non operative management of calcaneus bone fracture. **Materials & Methods:** This study was carried out in year 2014. It included 140 patients who had fractured calcaneus bone. They were divided into 2 groups. Group I (operative) - It included 70 patients (males- 35, females- 35). Group II (non operative) - It included 70 patients (males- 35, females- 35). In group I, open reduction and fixation and in group II closed reduction was done. Postoperative complications were compared in both groups. **Results:** Patients were divided into 2 groups. Group I (operative) which included 35 males and 35 females. Group II (non operative) which included 35 males and 35 females. The difference was non - significant ($P > 0.05$). Mean age of males and females in group I was 42.5 years and 41.0 years respectively. Mean age of males and females in group II was 48.2 years and 44.6 years respectively. BMI of males and females in group I was 24.2 and 25.4 respectively. BMI of males and females in group II was 26.2 and 24.8 respectively. Number of diabetic males and females in group I was 4 and 2 respectively. Number of diabetic males and females in group II was 5 and 3 respectively. Number of smokers males in group I was 5 and number of smokers males and females in group II was 4 and 1 respectively. Neurovascular injuries in group I was 2 and in group II was 1. The difference was non- significant ($P > 0.05$). Surgical site infection in group I was seen in 10 patients in group I and in I patient in group II. The difference was significant ($P < 0.05$). Reoperations were done in 12 patients in group I and 4 patients in group II. The difference was significant ($P < 0.05$). 1 patient in group I and 4 patients in group II showed sural nerve injury. The difference was significant ($P < 0.05$). **Conclusion:** The management of calcaneus bone fracture is operative and non operative which varies depending upon the situation. The number of complications found to be more in operative group as compared to non operative group.
Key words: Calcaneus, Diabetics, Tarsal

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This article may be cited as: Paul PC. Comparison of operative and non operative management of calcaneus bone fracture. J Adv Med Dent Scie Res 2017;5(1):67-70.

Access this article online	
Quick Response Code	Website: www.jamdsr.com
	DOI: 10.21276/jamdsr.2017.5.1.13

INTRODUCTION

The talus is the bone in the back of the foot that connects the leg and the foot. It joins with the two leg bones (tibia and fibula) to form the ankle joint allowing for upwards and downwards motion of the ankle. Fractures of the calcaneus, or heel bone, make up about 2% of all fractures and are the commonest fracture of the tarsal bones. Some calcaneal fractures are minor injuries, but many are severe, high energy fractures.[1]

This bone sits within the ankle "mortise" or hinge which is made up of the two leg bones, the tibia and fibula. Three joints are present: the ankle, which allows the up and down motion of the foot with the leg; the subtalar joint which allows "inversion" and "eversion" of the foot with the leg; and the talonavicular joint which has a complicated biomechanical function that controls flexibility of the foot and the arch of the foot. The talus has no muscular attachments and is mostly covered with cartilage, which makes injuries to the talus difficult to heal.[2]

These more serious injuries usually occur after a fall from a height, often from scaffolding or a ladder, or as a result of a road traffic incident. These calcaneal injuries are destructive, with fracture and displacement of the whole bone and its joint surfaces; the subtalar joint in particular may be severely disrupted.[3]

There are two treatment modalities for the management of fractures. Non- surgical treatment is recommended for fractures in which the pieces of bones remain close together and the joint surfaces are well aligned. Patients who smoke or have diabetes or poor circulation may be treated without surgery due to the very high risk of developing complications if surgery is performed. With conservative treatment the fracture fragments usually heal together, but the calcaneus remains deformed, the joint surfaces are incongruous.[4] For a majority of patients, surgical treatment is the correct form of treatment. The goal of surgery is to restore the size and shape of the talus. Sometimes this is a problem as the multiple fragments of bone are like putting together the pieces of a difficult puzzle.[5]

The present study was done to compare the operative verses non operative management of calcaneus bone fracture.

MATERIAL & METHOD

This study was carried out in year 2014. It included 140 patients who had fractured calcaneus bone. They were informed regarding the study and consent was taken. Patient information regarding name, age, gender, past medical history etc was taken on case history proforma. They were divided into 2 groups.

Group I (operative) - It included 70 patients (males- 35, females- 35).

Group II (non operative) - It included 70 patients (males- 35, females- 35).

In group I, interfragmentary screws and neutralisation plates to the lateral wall of the calcaneus were placed through extensile lateral approach within three weeks of injury.

Patients were put on postoperative application of a splint, six weeks non-weight bearing followed by six weeks partial weight bearing, with early active mobilization of the ankle and subtalar joints, managed by a standardized physiotherapy rehabilitation regimen. Postoperative computed tomography was performed within three months of surgery.

In group II, gentle mobilization of the ankle and subtalar joints were done followed by placement of removable splint. Participants were mobilized and non-weight bearing (on the affected side) for six weeks, followed by six weeks partial weight bearing. They were managed by the same standardized physiotherapy rehabilitation regimen as the operative treatment arm.

Factors such as neurovascular injury, incidence of infection and other complications were recorded in all groups. Results thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

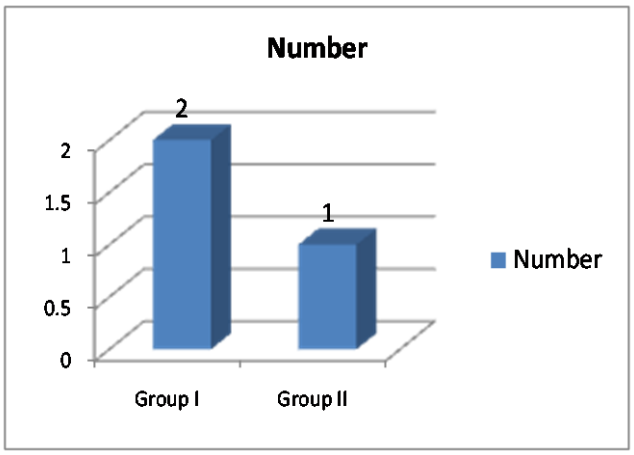
Table I shows that patients were divided into 2 groups. Group I (operative) which included 35 males and 35 females. Group II (non operative) which included 35 males and 35 females. The difference was non - significant (P > 0.05). Mean age of males and females in group I was 42.5 years and 41.0 years respectively. Mean age of males and females in group II was 48.2 years and 44.6 years respectively. BMI of males and females in group I was 24.2 and 25.4 respectively. BMI of males and females in group II was 26.2 and 24.8 respectively. Number of diabetic males and females in group I was 4 and 2 respectively. Number of diabetic males and females in group II was 5 and 3 respectively. Number of smokers males in group I was 5 and number of smokers males and females in group II was 4 and 1 respectively. Graph I shows that neurovascular injuries in group I was 2 and in group II was 1. The difference was non- significant (P > 0.05).

Graph II shows that surgical site infection in group I was seen in 10 patients in group I and in I patient in group II. The difference was significant (P < 0.05). Graph III shows that reoperations were done in 12 patients in group I and 4 patients in group II. The difference was significant (P < 0.05). Graph IV shows that 1 patient in group I and 4 patients in group II showed sural nerve injury. The difference was significant (P < 0.05).

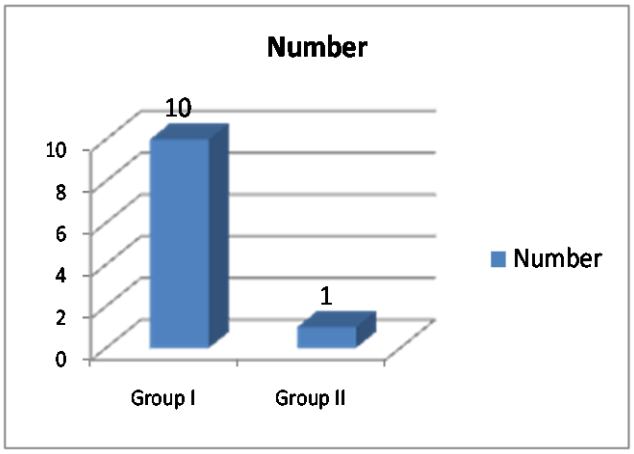
Table I Distribution of patients

Group	**Group I**		**Group II**	
Treatment	**Operative**		**Non operative**	
Gender	**Male**	**Female**	**Male**	**Female**
Number	35	35	35	35
Age (years)	42.5	41.0	48.2	44.6
BMI (Kg/m^2)	24.2	25.4	26.2	24.8
Diabetics	4	2	5	3
Smokers	5	0	4	1

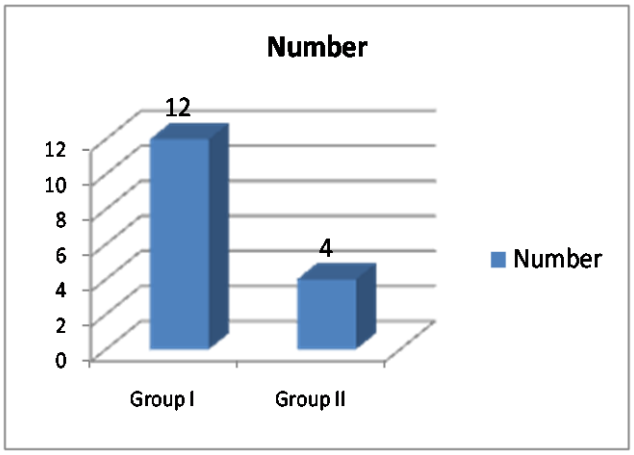
Graph I Neurovascular injury in both groups



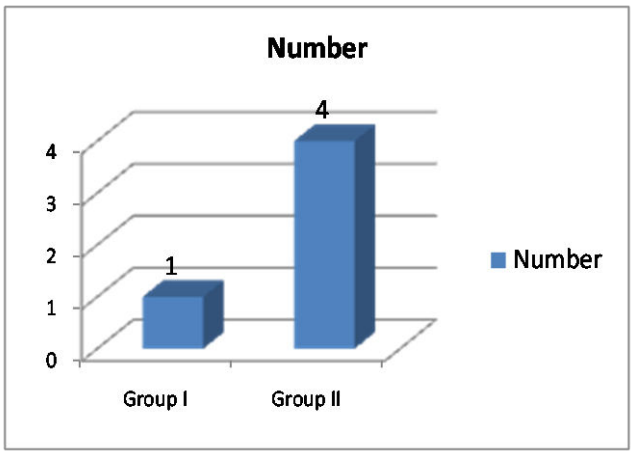
Graph II Surgical site infections



Graph III Reoperations in both groups



Graph IV Sural nerve injury in both groups



DISCUSSION

There are two treatment modalities for fracture of calcaneus. First is operative in which open reduction and fixation is done. Second is non operative in which closed reduction and mobilization is done. Complications are common in both techniques. Early complications are most often related to the significant swelling that can occur after these injuries causing wound problems and infection.[6] People who smoke, have diabetes or poor circulation are at greatest risk for these complications. Late complications are typically related to the severity of the initial injury. Most people experience a certain degree of stiffness with the upwards and downwards motion of the ankle. When the blood supply to the talus is damaged it can lead to death of the bone, a condition called avascular necrosis (AVN). This condition can lead to significant deformity and arthritis requiring additional surgery.[7]

The present study was done to compare the operative verses non operative management of calcaneus bone fracture. This study was carried out in year 2014. It included 140 patients who had fractured calcaneus bone. Patients were divided into 2 groups. Group I (operative) which included 35 males and 35 females. Group II (non operative) which included 35 males and 35 females. Mean age of males and females in group I was 42.5 years and 41.0 years respectively. Mean age of males and females in group II was 48.2 years and 44.6 years respectively. Our results are in agreement with Ibrahim et al.[8] BMI of males and females in group I was 24.2 and 25.4 respectively. BMI of males and females in group II was 26.2 and 24.8 respectively. Similarly Eastwood[9] in his study compared the two groups and the mean of BMI of patients was 25.8. We compared the complications in both groups and found that number of neurovascular injuries, surgical site infections and reoperations in group I was more as compared to group II. Our results are in agreement with Tennent et al.[10]

CONCLUSION

The management of calcaneus bone fracture is operative and non operative which varies depending upon the situation. The number of complications found to be more in operative group as compared to non operative group.

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Source of support: Nil **Conflict of interest:** None declared