



Surgical versus non-surgical treatment for fracture of the heel

A small, 2-year randomised controlled trial in the UK reported that surgical treatment appeared to be no better than non-surgical treatment at improving function and pain in patients with intra-articular fracture of the heel, and was associated with a higher rate of complications.



Overview: Fractures of the heel bone (calcaneus) can be broadly divided into intra-articular injuries (where the joint surfaces are damaged) and extra-articular fractures (where the joint surfaces remain intact). Intra-articular calcaneal fractures where the bones become misaligned (displaced fractures) can be serious. These fractures typically occur after a fall from a height, such as from scaffolding or a ladder, or as a result of a road traffic incident.

Calcaneal fractures are more common in men than in women: of the 2425 people in England admitted to hospital with fracture of the calcaneus in 2013–14, 2063 (85%) were men ([Health and Social Care Information Centre 2015](#)). These fractures are also more common among people in their 20s and manual labourers ([Mitchell et al. 2009](#)).

Outcomes after calcaneal fractures can be poor: often the calcaneus is deformed and the alignment of the leg through the ankle to the heel is lost. Many patients need to use a walking stick after injury, and some may experience severe, painful osteoarthritis of the subtalar joint.

Conservative, non-surgical treatment of calcaneal fracture usually comprises elevation, use of ice, early mobilisation and use of a splint ([Schepers et al. 2007](#)). Calcaneal fractures can also be treated with surgery, which realigns the bone fragments, fixes them with plates and screws, and restores the subtalar joint. However, the efficacy of surgical versus non-surgical treatment for calcaneal fracture is unclear owing to a paucity of randomised controlled trials ([Bruce and Sutherland 2013](#)).

Current advice: [Guidance from the American College of Occupational and Environmental Medicine](#) recommends surgical management or non-surgical cast immobilisation for calcaneal fractures. It also recommends pneumatic compression of the foot to reduce swelling for patients with significant oedema after closed calcaneus fractures (that is, fractures where no bone is exposed).

NICE is currently developing guidelines on [fractures](#), with anticipated publication in February 2016.

New evidence: A randomised controlled trial by [Griffin et al. \(2014\)](#) compared surgical treatment with non-surgical treatment for people with intra-articular calcaneal fractures.

Adults with a recent (within the past 3 weeks) closed, intra-articular, displaced calcaneal fracture were recruited from 22 hospitals in the UK. People randomised to surgical treatment underwent open reduction and internal fixation within 3 weeks of injury. Postsurgical care comprised a splint and a standardised physiotherapy rehabilitation regimen. People randomised to non-surgical treatment received gentle mobilisation of the ankle and subtalar joints as pain allowed, a removable splint, and the same standardised physiotherapy rehabilitation regimen as the surgical treatment arm.

The primary outcome was pain and function at 2 years after injury, as reported by patients using the Kerr–Atkins calcaneal fracture score (range 0–100, with 100 points indicating normal pain and function).

Overall, 2006 people presented with calcaneal fractures during the 2 year recruitment period; 502 had severe fractures that met the eligibility criteria. Of these people, 151 (7.5%) agreed to take part and were randomly assigned to surgical treatment (n=73) or non-surgical treatment (n=78). Participants were aged 46.5 years on average (range 18–80 years), and only 24 (16%) were women.

At 2 years, pain and function did not differ significantly between the surgical treatment group (mean Kerr–Atkins score=69.8) and the non-surgical treatment group (mean Kerr–Atkins score=65.7; adjusted difference=-0.03, 95% confidence interval [CI] -7.08 to 7.02). Regression analysis showed no evidence that outcomes after surgery were affected by fracture severity (p=0.697). Pain and function improved for 18 months after injury in both groups and were then stable until 2 years. General health and quality of life did not differ significantly between treatment groups at 2 years, and a similar proportion in each group had returned to work.

The rate of complications was significantly higher in the surgical treatment group (23%) than in the non-surgical treatment group (4%; odds ratio=7.5, 95% CI 2.0 to 41.8, p<0.001). The most common complication was surgical site infection.

This study is limited by the low recruitment rate of eligible patients. The authors suggested that longer term follow-up may show significant differences in outcomes between surgical and non-surgical treatment because other factors, such as arthritis, would have time to become apparent.

Commentary: “This study by Griffin et al. (2014) suggests that surgery is no better than non-surgical treatment for people with calcaneal fractures, but the study has several limitations that may undermine this conclusion. This study included only 7.5% of the people with calcaneal fractures who attended the hospitals involved. This small number of cases after application of the exclusion criteria means that the 27 surgeons in the 22 different hospitals operated on a median of only 2 fractures. The infection rate of 19% of the surgically treated patients is by no means the standard wound complication rate and is hugely worrying.

“Previous studies have shown that initial fracture severity and fracture severity classifications correlate with clinical outcome after surgery ([Rammelt et al. 2013](#)), but Griffin et al. (2014) were unable to power their trial to investigate this. Instead they estimated this relationship via regression analysis, drawing the conclusion that there was no evidence that the effect of surgery was affected by fracture severity. It may be inappropriate to conclude this given that the study may have inadvertently excluded the more severe fractures.

“The authors rightly highlight that their results may change over the duration of patient follow-up. In a similar multicentre randomised controlled trial in Sweden, clinical outcomes for surgically and non-surgically treated calcaneal fractures were similar at 1 year. However, in the same cohort of patients, there was a tendency toward improved pain and physical quality of life at 8–12 years’ follow-up in the surgery group, in addition to reduced incidence of radiographically detectable subtalar joint osteoarthritis.

“Overall, it is inappropriate to conclude on the basis of this evidence that surgery provides no benefit to the treatment of calcaneal fractures.” – **Mr Stephen Bendall, Orthopaedic Surgeon, Brighton & Sussex University Hospitals, and Past President, British Orthopaedic Foot and Ankle Society**

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