

## Bone-cement fixation for calcaneus fracture—a report on 2 elderly patients

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We treated a 77-year-old man and a 68-year-old woman with comminuted calcaneal fractures by reposition and bone cement filling. Using CT, we diagnosed a Sanders et al. (1993) type III intraarticular fracture of the subtalar joint in each case (Figures 1 and 2).

A lateral skin incision passed from the calcaneocuboid joint to a point a little below the lateral malleolus. The lateral bulging wall together with the peroneal tendon sheath was gently turned up by an elevator to expose the fracture fragments. Under fluoroscopic imaging, the articular surface and varus deformity of the calcaneal body were preliminarily reduced and temporarily fixed with Kirschner wires. After reduction of the fracture, there remained a large bone defect in the middle of the calcaneus. The loose cancellous bone in situ was compressed to the periphery and the cavity was further enlarged using a curette, so that a sufficient amount of bone cement could be filled in. After irrigation of the cavity and removal of blood by suction, it was filled with cement. The floor of the peroneal tendon sheath was smoothed and the wires were removed before polymerization (Figure 3). Active exercise of the foot and ankle was started immediately after surgery and weight-bearing was permitted after a few days. Using an insole, both patients could walk without pain 2 weeks after surgery. Radiographic cortical bone healing was completed within 7 weeks. After 3 years, the postoperative alignment of the fracture and the normal mobility of subtalar joint were preserved. The patients led their daily life without pain.

### Discussion

Old age has been considered one of the poor prognostic factors in calcaneal fractures (Paley and Hall, 1993). Previous reports have suggested that bone cement can be successfully used for osteoporotic Colles' fractures (Schmalholtz 1989, Kiyoshige 1995). Since the calcaneus has a spongy structure, especially in elderly patients, even rigid internal fixation does not allow early weight bearing. In our 2 patients, the

Figure 1. A 68-year-old woman with a calcaneus fracture.



The calcaneus fracture with depression of the subtalar joint.



Temporal Kirschner-wire fixation after reduction, followed by preparation of the cancellous cavity for cementing.



After cement filling, reduction of the subtalar joint surface was well preserved.

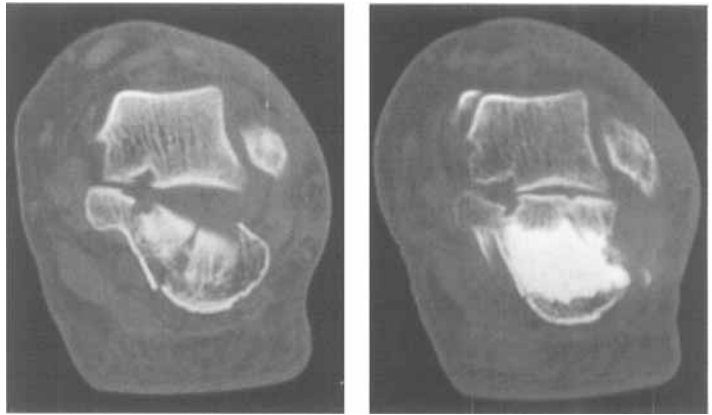
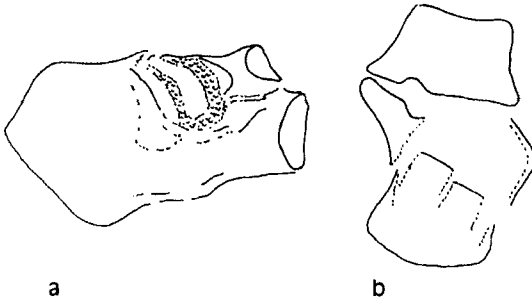
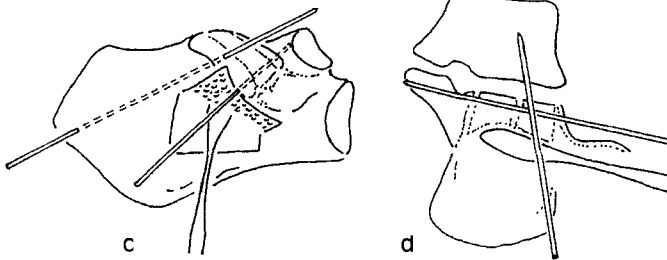


Figure 2. CT showed involvement of the subtalar joint (left). After cement fixation, the subtalar joint was restored (right).

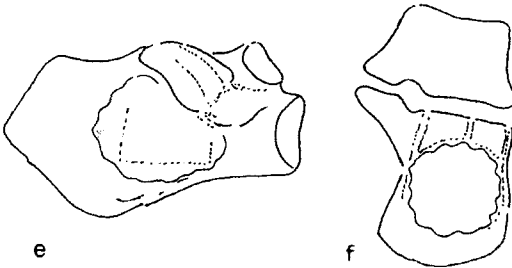
Figure 3. Surgical procedure of intramedullary bone-cement fixation.



Intraarticular fracture of the calcaneus.



The cavity arrangement in the fractured calcaneus after reduction and temporary Kirschner-wire fixation.



The cavity is filled with bone cement.

appropriately reduced position was maintained by intramedullary bone cement fixation. This method made it possible to start weight bearing soon after surgery, and a good clinical and radiographic outcome was still found 3 years later.

**Reference**

Kiyoshige Y. Bone cementing of distal radial fracture in the elderly. In: Fracture of the distal radius. (Eds. Saffar P, Coony W P). Martin Dunitz, London 1995.

Paley D, Hall H. Intraarticular fracture of the calcaneus. A critical analysis of results and prognostic factors. *J Bone Joint Surg (Am)* 1993; 75: 342-54.

Sanders R, Fortin P, Dipasquale T, Walling A. Operative treatment in 120 displaced intraarticular calcaneal fractures. Results using a prognostic computed tomography scan classification. *Clin Orthop* 1993; 290: 87-95.

Schmalholtz A. Bone cement for redislocated Colles' fracture. A prospective comparison with closed treatment. *Acta Orthop Scand* 1989; 60: 212-7.