Calcaneal fractures in children

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Summary

Eight patients with 9 calcaneal fractures were reviewed. Of the fractures 6 were intra-articular and 3 extra-articular, but in children this distinction appears to have little relevance to treatment or prognosis. While these fractures are relatively uncommon in children, clinical suspicion is important in making the diagnosis, since the presentation may be subtle. The overall prognosis in children is excellent.

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Calcaneal fractures in children are uncommon and their diagnosis may easily be missed. The history of trauma may be trivial, the examination findings misleading and the radiographic changes subtle. Fortunately these injuries in children generally have a good prognosis.

Patients and methods

Eight patients with 9 calcaneal fractures, seen and treated at Red Cross War Memorial Children's Hospital over a 2-year period (1984-1985), were reviewed (Table I). The ages of the patients ranged from 18 months to 12 years (mean 6 years). Five patients sustained their injury as a result of a fall from a height (which ranged from 0,5 to 2 m), 2 were injured in motor vehicle accidents, and 1 was struck on the heel by a falling brick. No compound injuries were encountered. Three of the 8 patients sustained additional lower limb fractures, but no spinal injuries were noted. The calcaneal fractures were classified as intra-articular or extra-articular in relation to the subtalar joint. In our series intra-articular fractures predominated (6 of the 9 fractures).

Treatment comprised elevation of the limb for 2 days, compressive wool and crêpe bandaging and early mobilisation of the foot and ankle unless immobilisation in a plaster-of-Paris cast was required owing to a fracture of the ipsilateral tibia (2 cases). All patients were told not to bear weight on the affected side for 8 weeks. They were followed up as outpatients, where it was noted that most had returned to full weight-bearing and normal daily activities within 4 weeks.

Results

Follow-up ranged from 6 to 18 months (mean 9 months). A striking feature was the rapid resolution of symptoms in all patients. Full, pain-free subtalar joint movement returned in all but 2 patients. The latter were aged 9 and 11 years and had sustained intra-articular fractures. Both were pain-free with a normal gait, but had a reduced range of subtalar movement compared with the uninjured side. No problems relating to broadening of the heel or soft tissues were encountered.

Discussion

Few reported series of calcaneal fractures in children have been published, and all have noted that this is an uncommon injury in children.[1-4] However, Matteri and Frymoyer[1] have pointed out that this reported incidence is possibly erroneously low in view of the subtle clinical and radiographic presentation of this injury. A history of trauma may not be forthcoming, and furthermore, the blow required to produce a fracture of calcaneum, especially in the younger child, may be surprisingly trivial.[2] The diagnosis should be considered in any young, ambulatory child who has suddenly refused to walk.

Attempts have been made to classify calcaneal fractures in children in a similar manner to those in adults, but the distinction between intra-articular and extra-articular fractures appears to have little relevance to treatment or prognosis in children.

All the patients in our series were treated by simple conservative methods, all with excellent results. However, one must question compliance with regard to strict non-weight-bearing

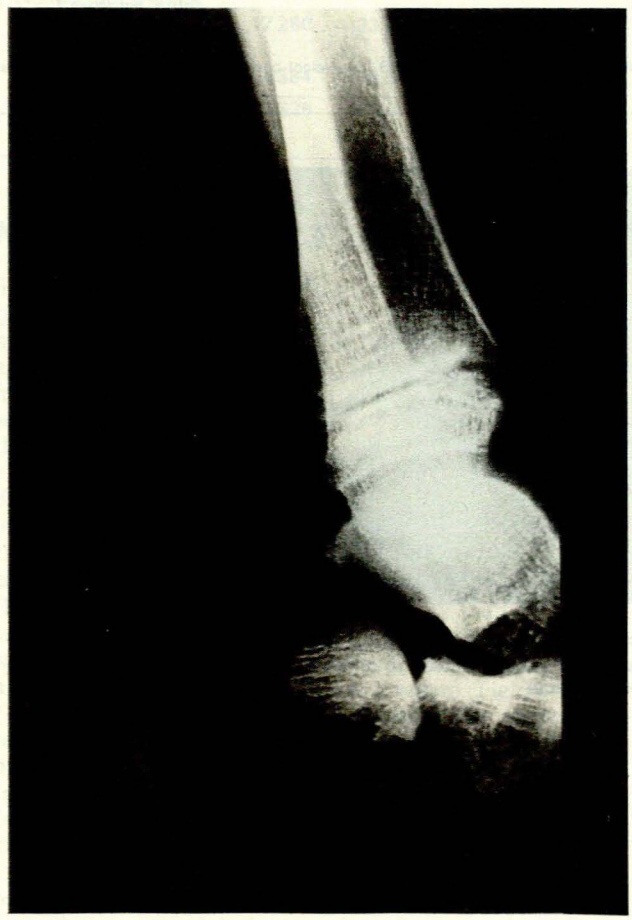

Fig. 1. Lateral radiograph showing an intra-articular fracture of the calcaneum in a 10-year-old child.

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TABLE I. PATIENT DETAILS

Patient	Age (yrs)	Sex	Mechanism of injury	Associated injuries	Fracture pattern	Management	Follow-up and results
1	4½	M	Fall from height	Nil	Extra-articular fracture body L calcaneum	Crepe bandage + NWB 4wks	6 mo. — pain-free, full subtalar joint movement
2	3½	F	MVA (passenger)	Fracture R femur	Extra-articular fracture body L calcaneum	Crepe bandage 4 wks	1 yr — pain-free, full subtalar joint movement
3	4½	M	Crush injury	Nil	Minimally displaced joint depression fracture body L calcaneum	B-K POP + NWB 4 wks	1 yr — painfree, complete loss of eversion, inversion full
4	9	F	Fall from height	Nil	Minimally displaced joint depression fracture body L calcaneum	Wool and crepe bandage + NWB 4 wks	6 mo. — painfree, loss of 10° inversion and 10° eversion, lost to follow-up
5	4	F	Fall from height	Nil	Extra-articular fracture body L calcaneum	Crepe bandage + NWB 3 wks	8 mo. — pain-free, full subtalar joint movement
6	1½	M	MVA (pedestrian)	Closed fracture R tibia/fibula	Undisplaced intra-articular fracture body R calcaneum	A-K POP 4 wks	6 mo. — painfree, full subtalar joint movement
7	11	M	Fall from height	Nil	Bilateral joint depression calcaneal fractures	Bilateral B-K POP 6 wks	6 mo. — pain-free bilaterally, inversion R full, L lacks 5°, eversion full bilaterally
8	12	M	Fall from height	Closed fracture R tibia/fibula, fracture R neck of talus, fracture L ant. tibial spine	Minimally displaced joint depression fracture body L calcaneum	A-K POP 8 wks	18 mo. — pain-freee, full L subtalar joint movement

MVA = motor vehicle accident; NWB non-weight-bearing; B-K = below-knee; POP = plaster of Paris cast(s); A-K = above-knee.

Fig. 2. Lateral radiograph of the same patient 6 months later showing excellent healing of the fracture with preservation of the joint space.

in children, since in children bearing weight tends to be dictated by their pain limits rather than by instruction. While non-weight-bearing is a crucial component in the conservative management of calcaneal fractures in adults, prolonged non-weight-bearing appears to be unimportant in children. The prognosis of calcaneal fractures in children is generally held to be good,[2,3] and this has been our finding in this short-term review. The satisfactory outcome may relate to the relatively low degree of trauma involved in the causation of the fracture, as well as the remodelling capacities of the talus and calcaneum[4] (Figs 1 and 2).

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