Fracture of calcaneum following drop foot surgery – a case report

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Summary  The usual protocol for correction of drop foot in leprosy, a consequence of damage to the common peroneal nerve, is a tendon transfer, immobilisation to heal the tendon juncture and post-operative exercises to put the transfer into use. Tarsal disintegrations have been reported in literature in drop foot patients when the transferred tendons were inserted into the bone making a drill hole to ensure firm anchorage. Such disintegrations are rarely seen these days because bony insertion of the tendon transfers is not performed in the leprosy-affected foot.

We report here a case of drop foot that developed a fracture of the calcaneum during the post-operative period after tibialis posterior two tail transfer (to tibialis anterior and extensor digitorum longus) along with lengthening of the tendoachillis. The case is interesting in the sense that osteoporosis and walking strains resulted in a fracture of the body of the calcaneum which healed with conservative treatment and controlled mobilisation of the patient.

Case Report

SK, a 22 year old male having smear negative borderline tuberculoid leprosy for 14 months, reported with ulnar paresis and drop foot on the right side of 1 year’s duration and drop foot on the left side of 7 months’ duration. In addition he had bilateral posterior tibial nerve damage. He was put on oral corticosteroids, 30 mg to start with, along with multibacillary (MB) multi-drug therapy (MDT). The steroids were continued in tapering doses for 6 months and MDT was given for 24 months. The ulnar and left common peroneal nerve functions fully recovered. During this 2 year period with us he developed plantar ulcers on both feet which healed with appropriate treatment without mutilation.

The drop foot on the right side was operated almost 3 years after he first reported to us. Tibialis posterior two tail circumtibial transfer to tibialis anterior and extensor digitorum longus along with lengthening of tendoachillis was done under local infiltration anesthesia.
The tendon juncture was done with black braided 3/0 silk sutures. The limb was immobilised in a non-weight bearing short leg cast for 4 weeks. The post-operative period was uneventful.

The sutures were removed and post-operative exercises were begun for tibialis posterior isolation. After about 1 week he noticed small swellings at the calf and ankle skin suture sites. The exercises were suspended and he was put on parenteral antibiotics and aspirin. In about 3 days the skin over the ankle swellings necrosed exposing the tendon. The wound was protected with dressings. Since the discharge continued wet dressings were applied. When the discharge did not subside (about 2 weeks) the tendon sutures were removed. The wound healed with secondary intention in about 4 weeks. Till then exercises and weight bearing were not allowed.

The exercises were restarted slowly. Walking with the support of parallel bars was started in another 4 weeks. The transfer was contracting well and the foot was dorsiflexing. While walking it was noticed that when he turned around he put his full weight on the heel, at times on the operated site. He was cautioned about it and asked to make a gradual arc while turning rather than 180° turn pivoting on heel.

One day he complained of swelling around the ankle which was not settling after overnight elevation of the foot. Local examination revealed fullness around the ankle but no tenderness. A radiograph of the foot revealed a fracture of the body of the calcaneum (Figure 1).

The tarsal bones were osteoporotic whereas metatarsals and phalanges had normal calcification. The patient was put on anabolic steroids, calcium and vitamin D. The slow walking exercises were continued under supervision.

The patient settled in 4 weeks time and recalcification of bones and healing of the fracture started. The medication and exercises were continued. The recalcification and healing took about 8 weeks. The patient could walk with a heel toe gait but complained of mild discomfort after slow walking for about 30 minutes. There was a residual swelling around tendoachillis near its insertion at the time of discharge. The range of ankle movement was 8° but no subtalar joint movement at the time of discharge. Stiffness of toes and vascular dysfunction was not observed. An x-ray of the foot showed the healed fracture site. Re-examination of the patient, done 8 weeks after discharge, revealed 5° active dorsiflexion, range of ankle

Figure 1. X-ray of the foot showing fracture of the calcaneum and severe osteoporosis of the tarsal bones.
movement 8° and 2° subtalar joint movement. The patient had mild discomfort on walking about half a kilometer at a stretch. The swelling appeared around the ankle at the end of the day which disappeared after rest. The x-ray showed good re-calcification of the osteoporotic bones and good fracture healing (Figure 2).

**Discussion**

Tarsal disintegrations have been reported in drop foot patients when the transferred tendons\(^1\) were inserted into the hole made in the bone making the bone weak. With tendon to tendon suturing such cases are no longer seen.

The axial loading of calcaneum can result in a fracture of the body of the calcaneum as occurred in this case. The osteoporotic bone, a consequence of suture reaction and prolonged immobilisation in this case, could not withstand the total body weight which probably occurred when patient was turning back pivoting around the heel.

The conservative treatment of calcanean fracture consists of elevation, compression and early active motion.\(^2\) We opted for 'protected mobilisation' because screw fixation was ruled out due to extensive osteoporosis and rigid immobilisation was likely to induce more osteoporosis. Partial and controlled weight bearing was allowed to retain the muscle strength and provided mild stimulus for the bone to heal.

Due to excellent blood supply calcanean fractures almost always heal. If alignment of the articular surface is not correct the joint line may remain incongruous and subsequently subtalar arthritis may develop. Any form of immobilisation external or internal, is not essential for healing.\(^3\) The ankle motion range returns almost to normal and > 50% subtalar movement is restored after conservative (non-operative management) of ankle fractures.

This patient has mild discomfort around ankle. The complications of conservative management of calcanean fractures are pain, malunion and cosmetic problems.\(^4\) Of these pain just below the lateral malleolus due to peroneal tendonitis is most common. Subtalar joint pain may develop due to incongruity of the joint and secondary subtalar arthritis which sets in.

![Figure 2. X-ray of the foot showing healed fracture site (16 weeks).](image-url)
Pain may also result from calcaneo-cuboidal arthritis, nerve entrapment in the callus or calcanean spur developing as a result of malunited fracture. The heel may widen considerably resulting in cosmetic and shoe problems. Heel pad pain may develop especially if weight bearing is not allowed. Heel pad function may become compromised after calcanean fractures due to the disruption of compartmentalised fat, thinning of the fat pad, increased skin mobility and pain. Early weight bearing has been observed to be as stimulatory as early joint motion and seems to desensitise the heel pad.

It is suggested that, in view of the possibility of such a complication, an x-ray of the foot which is to be operated on should be obtained before surgery to assess the status of the bones. The weight bearing process also needs supervision during the post-operative period.

Ethical approval was not required.

References