expose the femoral nerve to thermal lesions from cement (Simmons et al 1991). The use of certain reinforcing rings, especially when they are oversized, also carry a risk.

The clinical diagnosis of femoral nerve palsy is usually obvious but it should be confirmed by EMG. The absence of clinical and electrodagnostic recovery after four to six months is an indication for exploratory surgery.

**Conclusion.** Complete division of the femoral nerve during THR is extremely rare and very few cases have been described. This danger should be recognised, however, in order to avoid surgery that may possibly injure the nerve. It is important to diagnose these nerve injuries and follow their course closely by regular examination so that repair may be performed at the earliest opportunity.

**REFERENCES**


**MODIFIED BOYD AMPUTATION**

**BAHAA KORNAH**

Amputation is one of the oldest procedures in surgery; this is shown on the wall of the Temple of Rameses III near Luxor. In the foot, amputation between the tarsometatarsal level and the level of the Syme procedure results in an equinus deformity due to imbalance between tendons acting at the ankle.

Syme’s amputation is simple and produces a stump with end-bearing properties and good proprioception (Harris 1956). Its disadvantages are shortening, some difficulty in fitting a prosthesis because of the thickening of the ankle, and occasional failure to achieve full weight-bearing due to migration of the fat pad.

Boyd’s operation (1939) retains the calcaneus and fuses it with the tibia in the ankle mortise. It provides an excellent weight-bearing stump with no need for an artificial limb, but it has been discarded because of difficulty in obtaining sound calcaneotibial fusion (Mills 1981).

During the war in Afghanistan, many soldiers and civilians were injured by mines, and had a foot or part of a foot blown off. In those with partial preservation of the hindfoot, we developed a modified Boyd amputation, using the talus as a bone graft. Three cases are reported.

**Patients and methods.** Three male patients of average age 28 years were referred a few days after injury. All had lost the forefoot and showed equinus deformity of the remaining hindfoot (Fig. 1). The aim was to save as much of the foot as possible and to avoid a higher level of amputation.

Repeated debridement was required before definitive operation (Fig. 2).

**Technique of operation.** When the wound is clean, operation is performed under general anaesthesia, without a tourniquet. Two incisions are made. A curved incision behind the medial malleolus exposes the neurovascular bundle and the medial side of the ankle; a lateral incision behind the lateral malleolus exposes the peroneus tendons and the lateral ankle. Long plantar and dorsal flaps are preserved and the talus is removed in one piece, by careful dissection, tilting the calcaneus medially. The tibial surface of the ankle and the superior surface of the calcaneus are cleared of articular surface to create flat bony surfaces and bony and soft-tissue debris is removed. The talus is trimmed and reshaped to fit the tibia on its superior surface and flattened on its inferior surface to fit the prepared calcaneus. This block graft is inserted and held in position by a Steinmann pin passed from the heel through the calcaneus and the graft into the tibia. The wounds are irrigated and closed. A small incision over the posterior heel allows complete tenotomy of tendo Achilles. A below-knee cast is applied to protect the wound and to help maintain the correct position of the heel pad.

The patient is mobilised, non-weightbearing on crutches. After ten days the wound is exposed, and if there is no infection, the skin defect on the anterior aspect of the stump (Fig. 3) is covered by a skin graft. The pin is retained until there is radiographic bony union at about 10 to 14 weeks. **Important points.** The medial vascular bundle must be exposed to assist preservation of the blood supply to the calcaneus. The division of tendo Achilles is essential to remove a deforming force and allow union without equinus deformity.

**Results.** In all three patients there was bony union (Fig. 4), with eventual skin healing after secondary suture in one
and skin grafting in two cases (Figs 5 and 6). At about 12 months’ follow-up, all had remained healed and none required a prosthesis. Some minor modifications to shoes were required.

Discussion. The stump of this modified Boyd amputation has sound plantar skin with good blood supply and sensation. During our limited follow-up we saw no sign of avascular necrosis in the talar grafts. Letts and Pyper (1990) used a modification of Chopart’s amputation in six children, but recommended it only for congenital malformation in children with intact long tendons, which could be transferred to the neck of the talus and the sustentaculum tali. This operation is not applicable after trauma.

Follow-up in our cases was short because of loss of contact with the patients, but it appears that this modification of Boyd’s amputation gives an excellent weight-bearing stump without the need for a prosthesis; the good plantar skin and fat pad help to provide a painfree stump.

No benefits in any form have been received or will be received from a commercial party related directly or indirectly to the subject of this article.

REFERENCES


