INGROWING TOE NAILS: THE EXTENT OF THE GERMINAL MATRIX

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Zadik's operation and segmental ablation of the nail bed are common treatments for ingrowing toenails, but reported recurrence rates vary from 16% to 50% (Townsend and Scott 1966; Andrew and Wallace 1979; Wallace, Milne and Andrew 1979; Morkane, Robertson and Inglis 1984; Pettine et al 1988). Recurrence is often caused by growth of a nail spike due to incomplete excision of the germinal matrix. The normal extent of the matrix proximally and into the nail folds has not been fully reported.

Materials and methods. Ten healthy great toes were obtained from limbs amputated for peripheral vascular disease. The nails were avulsed before fixation in formal saline. One transverse (A) and one longitudinal (B) block were cut from each toe by hand saw (Fig. 1). They were decalcified, processed and embedded for section using a standard microtome. Staining was by haematoxylin and eosin.

Results. Under the microscope the germinal matrix appears as a thick epidermis and a dermis. The most superficial layer of the epidermis is of pigmented cells and is called the stratum granulosum; the basal layer is formed of cylindrical cells which send deep rete ridges into the dermis. The latter is blended with the periosteum of the terminal phalanx. All the longitudinal sections (Fig. 2) showed that the germinal matrix (crosses) extended to the insertion of the extensor tendon (arrow). In the cross-germinual matrix is inadequate, since the far edges which are left behind may cause nail regrowth as spikes.

The addition of chemical ablation with phenol has been shown to reduce the failure rate. Nail edge excision and phenol gave a recurrence rate of 9% (Greig et al 1991); wedge resection with phenol was reported to give no recurrence (Issa and Tanner 1988). Our findings question the efficacy of both Zadik's procedure and segmental resection performed alone.

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REFERENCES
A SIMPLE METHOD FOR REMOVAL OF A FRACTURED INTRAMEDULLARY NAIL

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Fatigue failure of an intramedullary nail may occur if there is delayed or nonunion of the fracture (Zimmerman and Klasen 1983; Winquist, Hansen and Clawson 1984; Bucholz, Ross and Lawrence 1987) and the distal end of the fractured nail is then difficult to remove. Several methods have been described (Böhler 1968; Yoslow and LaMont 1986; Mooney, Chabon and Poehling 1991) to which we add a simple and reliable technique.

Patients. From 1986 to 1991 we treated five patients with fractured femoral intramedullary nails, all associated with painful delayed union or nonunion. Four nails were of the locking type and one was a Küntscher pattern. They had been in place for one to four years.

Technique. The operation is performed with the patient on a fracture table with image-intensifier control. The intramedullary canal is opened at the greater trochanter (Taylor 1992) and any locking screws are removed. The proximal part of the nail is removed and a nail which is 1 mm smaller in diameter than the fractured nail is passed down the intramedullary canal and gently impacted in the opening of the distal nail fragment. Both nails are then removed (Fig. 1). If there is delayed or nonunion the intramedullary canal is then reamed and a nail of larger diameter is inserted.

Results. In all five cases the removal of the distal nail fragment was easy and uneventful with no difficulties during extraction. The average time taken was ten minutes (7 to 15).

Discussion. An intramedullary nail imparts stability only for a limited period of time until bone healing is attained. During this period there is a race between bone healing and fatigue failure of the implant and fractured nails will continue to be seen. Our method of removal is simple, reliable and safe and requires no special equipment. It could also be used in the tibia and the humerus.

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REFERENCES


