A simple procedure with nail preservation for ingrowing toe-nails

J. H. TWEEDIE AND I. RANGER

Department of Surgery, West Norwich Hospital, Norwich, England

SUMMARY

The numerous methods used for treating ingrowing toe-nails are testimony to the lack of a generally acceptable procedure with a low failure rate. A simple procedure with nail preservation is described, and the results of treatment assessed. The procedure consists of making a transposition flap of the nail wall after preliminary curettage of the granulation tissue in the nail groove. A total of 82 patients were treated by this method over a 3-year period, and the results in 63 patients were assessed between 18 months and 3 years after surgery. A total of 120 operations were carried out and 110 (92%) were successful. The treatment is effective, well tolerated, not technically difficult, and should be considered as an alternative to current methods of treatment.

INTRODUCTION

Ingrowing toe-nails are common. The exact incidence in the general population is not known, but Wallace *et al.* (1979) calculate an approximate annual incidence of 1 per 1000 of the population in the Newcastle area of England. The condition predominantly affects young people with 85% of cases occurring in people aged between 9 and 29 years (Lloyd-Davies & Brill, 1963). In this age group approximately two thirds of patients are male (Palmer & Jones, 1979; Murray & Bedi, 1975). The condition is painful and may lead to time off work or school in addition to restricting recreational activities. Conservative management is generally unsatisfactory, and to be successful requires careful and time-consuming follow-up with a high degree of patient compliance (Lloyd-Davies & Brill, 1963). There is a great number of surgical procedures. Simple avulsion of the nail has an unacceptably high recurrence rate of between 70 and 86% (Palmer & Jones, 1979; Murray & Bedi, 1975). Zadik's operation (Zadik, 1950) of total proximal nail bed ablation has a reported symptomatic recurrence rate of between 16 and 33%

Correspondence: Mr J. H. Tweedie, Department of Surgery, University Hospital, Queen's Medical Centre, Nottingham, NG7 2UH, England

(Palmer & Jones; 1979, Murray & Bedi, 1975; Andrew & Wallace, 1979). The procedure which appears to have the greatest success is that of phenol cauterization of the nail germinating tissue (Dagnall, 1981). A 97% cure rate is reported in one study though details of follow-up are not given (Cameron, 1981). In another study using phenol cauterization of the nail germinating tissue 19% had recurrence of nail spikes at or after 6 months and 8% required further treatment (Andrew & Wallace, 1979). The majority of failures occur within the first year, so assessment of any treatment would require follow-up for at least a year.

In this study an operation for ingrowing toe-nails with preservation of the nail is described and the results of treatment reported. The results were assessed at least 18 months after the operation.

PATIENTS AND METHODS

Patients with onychogryphosis or excessive increase in the transverse curvature of the nail were not treated by the procedure, as the operation is not suitable for abnormalities of nail growth. The case notes of all patients who underwent the operation between 1 January 1979 and 31 December 1981 were reviewed. Patients were traced in September 1983 and were asked whether they needed or had had any subsequent treatment for the same condition.

TREATMENT PROCEDURE

The toe and affected foot are first prepared with 1% Savlon solution and spirit, and anaesthesia can be achieved with a ring block using 1% Lignocaine. The granulation tissue and debris in the nail wall are then curetted away back to healthy tissue. A size 30 blade (Ethicon) is then used to create a transposition flap of the nail wall by passing the blade at 60° to the horizontal and in the long axis of the toe through the area between the nail wall and the margin of the nail (Figs 1 and 2). The flap is then transposed inferiorly and sutured in place with two 3/0 silk sutures. The toe is then dressed with Vaseline gauze and firm crepe bandage and elevated for 12 hours. The dressing is removed after 12 hours and left exposed thereafter.

Patients are instructed to return for removal of stitches after 7 days and again for assessment after 2 weeks. After 3 weeks, the patients were instructed to keep the nail groove clean using a toothbrush and toothpaste.

RESULTS

The operation was performed on 82 patients in the 3-year period, and 63 patients (77%) were traced and the results of treatment assessed. There were 62 (76%) male patients

Figs 1 & 2 Stages in the construction of the transposition flap of the nail wall (A–E).

and 20 (24%) female patients, and 67% of the patients were between the ages of 10 years and 21 years. The average duration of symptoms was 18 months (range 3 months–10 years). Of the patients in the study 56% had had previous surgery outside the hospital, either a simple avulsion of the nail, or wedge excision of the nail, and were referred because of recurrence. Table 1 gives details of the site of disease. In all 120 transposition flaps were performed on 63 patients and 110 of these were successful (92%). Six out of ten operative failures were re-performed with no further recurrence, giving an overall success rate of 97% for the operation. Figure 3 shows the appearance of the toe in a patient 3 years after surgery for severe bilateral ingrowing toe-nails affecting both nail walls.

Table 1 Details of 82 patients with ingrowing toenails

Site of disease	Patient no.	%
Single hallux	55	67
Both halluces	27	33
Both nail folds	39	47
Lateral fold only	35	43
Medial fold only	8	10

Fig. 3 Photograph of foot 18 months after transposition flaps to medial and lateral sides of big toe.

DISCUSSION

The age and sex distribution in this study is similar to that found by others and supports the contention that this is predominantly a disease of adolescent males (Lloyd-Davies & Brill, 1963; Palmer & Jones, 1979; Murray & Bedi, 1975). We were able to trace 77% of the patients treated during the study period. We were unable to trace the remainder because they had moved out of the area; this was felt to be a reflection on the young age of the patient group. The review percentage is similar to other retrospective studies of this type (Palmer & Jones, 1979; Wallace *et al.*, 1979). However, the reviewed group were representative of the whole in terms of duration of disease, number of previous operations, site of infection, age and sex. None of the untraced patients had been subsequently referred as treatment failures during the time of the study.

While the exact pathogenesis is not known, the essential pathology is an ulceration of the nail groove in the area of contact between the edge of the nail and the nail wall. This ulcerated area is covered with granulation tissue and the adjacent skin of the nail wall is notably hyperkeratotic. An explanation of the pathogenesis must take into account the sex and age distribution and that in the majority of cases the shape of the nail is normal and not actively ingrowing into the nail wall, and that the nail wall itself appears hypertrophied, particularly in the adolescent or young adult (Dagnall, 1981; Fowler,

1958). Factors implicated in the pathogenesis include external pressure on the nail wall, sweat and dirt and drastic cutting of the nail. The trophic effects of hormone(s) on the nail wall of the toe is also a possibility for which there is some circumstantial evidence.

As emphasized by Boll (1974) a classification of nail abnormality is necessary before rational treatment is undertaken. This procedure is not suitable for the treatment of the less common onychogryphosis or where there is excessive increase in the transverse curvature of the nail. In these conditions, treatment must be directed to the nail itself. The idea of surgery to the nail wall rather than to the nail itself is not new. Cotting (1873) excised the nail wall and side of the toe, and left the wound to granulate. Others have removed slices of wedges from the side of the toe in order to draw the nail wall away from the edge of the nail (Howard, 1893; Ney, 1923).

In the procedure described in this report, the nail wall is moved inferiorly away from the edge of the nail by means of a transposition flap. The aim of this manoeuvre is to prevent further repeated trauma to the nail wall against the edge of the toe-nail, and also to allow freer drainage of dirt and cellular debris from the nail groove. The operation is effective with an initial operative success of 92%, and after re-operation an overall operative success of 97%. Patients are up and walking within 24 hours and remarkably pain free. All patients were reviewed between 18 months and 3 years after operation. Since recurrence is thought to occur within one year of operation, these figures probably reflect an overall cure rate. We feel that adequate inferior transposition of the flap is critical to the success of the operation and our failures were largely due to inadequate displacement of the transposition flap (nail wall). Post-operative care of the nail groove after surgery is also important in preventing recurrence, and we advise regular cleaning of the nail groove with a toothbrush and toothpaste. This was found to be a very satisfactory method for keeping the nail groove free of dirt and desquamated epithelium. We feel the operation is well tolerated and subsequent cosmetic appearances of the toe well accepted, and should be considered as an alternative to current methods of treatment. Our experience has shown that this operation can be satisfactorily performed as an out-patient procedure under local anaesthesia.

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