SKIN REPLACEMENT IN DUPUYTREN'S DISEASE

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We have reviewed 90 rays in 67 patients who had undergone radical digital dermofasciectomy. Follow-up was from 24 to 100 months. Problems with skin grafts, moving two-point discrimination and active range of joint movement were noted. The recurrence rate in this series was 8%, a very much better figure for disease control than has been reported for standard approaches for Dupuytren's disease. Radical digital dermofasciectomy is strongly recommended for all cases of recurrent Dupuytren's disease requiring reoperation and as a primary procedure when there is significant skin involvement.

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Hueston wrote extensively on the control of Dupuytren's disease by skin replacement in the 1960s (Hueston, 1962). By 1969 he had used a total of 65 full thickness grafts and had not seen recurrent disease beneath a graft (Hueston, 1969). The full thickness graft was felt to be the important feature of a dermofasciectomy, and the work of Rudolph (1979) on fibroblast maturation under skin grafts was invoked as a possible explanation. The statement that "Dupuytren's disease does not recur beneath a skin graft" has entered the textbooks (Hueston, 1991). Skin replacement to reduce the risk of recurrent disease (Brotherston et al, 1994) appears to be an acceptable concept without discussion of the extent of the underlying subcutaneous excision.

Our early experience with a remnant of abductor band under a graft (Logan et al, 1985) which eventually required reexcision, and Varian and Hueston's (1990) description of two recurrences which were felt to have developed "on a deeper plane behind the neurovascular bundle" led us to adopt a radical subcutaneous excision. The flexor sheath is bared as are the neurovascular bundles. These are separated from the digit only where frank disease runs deep to them. The excision is carried dorsally to the extensor mechanism on either side. The concept is of excision of all preaxial skin and subcutaneous tissue which may take part in Dupuytren's contracture.

We have reviewed the first 102 such radical digital dermofasciectomies.

PATIENTS AND METHODS

Seventy-eight patients who underwent dermofasciectomy of 102 rays between January 1986 and May 1992 were called for review. There were 57 men and 21 women with a mean age of 64.8.

Skin graft appearance and robustness were noted. Moving two-point discrimination was measured using the method of Mackinnon and Dellon (1985). Donor site scars were assessed. Range of active motion was recorded. The presence of active disease in the form of either nodules or cords was looked for carefully.

Review was performed independently of the senior author (AML).

Results

Sixty-seven patients with 90 operated rays attended for review. Follow-up ranged from 24 to 99 months (mean 48.4 months). Patient details are given in Tables 1 and 2. The indications for dermofasciectomy were either recurrent disease with extensive skin scarring or involvement, or primary disease with extensive skin involvement. Single ray dermofasciectomies had been carried out unless both ring and little fingers were flexed down tightly together when double ray dermofasciectomies were carried out. The numbers of rays operated on is recorded in Table 3. Full thickness skin grafts were taken from the forearm or arm in all cases and the donor defect closed directly.

Table 1—Rays treated by radical dermofasciectomy in reviewed patients

Ray affected	*Number*
Little	61
Ring	17
Middle	8
Index	1
Thumb	3
Total	90

Table 2—Previous fasciectomies on the affected ray in reviewed patients

Previous operations per ray	*Number of rays*
Nil	62
1	15
2	12
3	1
Total	90

Table 3—Number of rays operated upon per patient reviewed

Rays operated on	*Patients*
1	53
2	14
3	1
6	1

Problems associated with the skin grafts were recorded. Only one graft failed: the patient, a diabetic smoker with recurrent disease in whom both digital arteries had been damaged, underwent amputation at his request. Ten grafts required dressings for longer than 3 weeks. Graft and digital skin colour match was generally good. Donor site scars were variable (Fig 1) but no patient found them unacceptable. Two inclusion cysts (confirmed histologically on excision) developed. Five rays had noticeably hairy grafts. Six grafts had problems with cracking or ulceration requiring glove protection for manual work. Seventeen grafts had tight radial or ulnar scars in the proximal finger compartment.

Moving two-point discrimination is recorded in Table 4 and compared with sex and age matched controls. There was no significant difference in the pulp sensation of operated digits compared with controls. Moving two-point discrimination in the skin grafts was approximately double that of control palmar digital skin. Moving two-point discrimination at the forearm donor site was approximately double that measured in the transplanted forearm skin.

Table 4—Moving two-point discrimination for patients and controls (mm)

Site	*Patients*	*Controls*
Terminal phalanx	6	5
Intermediate phalanx	11	6
Proximal phalanx	12	6.5
Distal palm	15	7.5
Donor site area	21	25

Recovery of active proximal interphalangeal joint flexion was measured wherever this was assessable. Seventy-three rays could be flexed to 85° or more (range

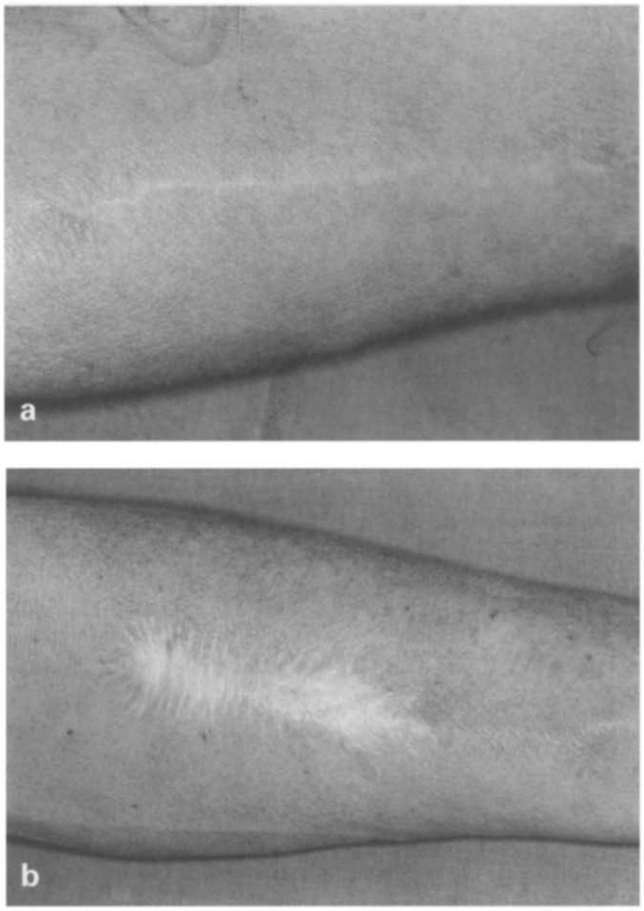

Fig 1 Donor site scars. Grafts were usually taken from the flexor aspect of the forearm which provided good colour match for digital skin. Donor site scars varied from (a) very good to (b) unacceptable, probably depending upon the method of skin closure used.

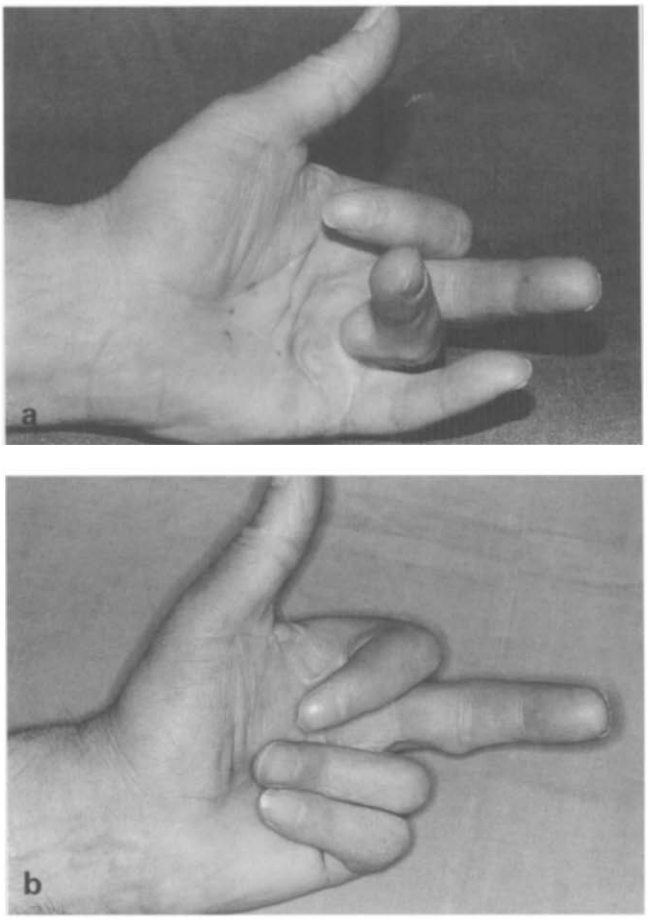

Fig 2 (a) This 63-year-old man had had multiple previous operations to other rays on his left non-dominant hand. A dermofasciectomy to his ring finger achieved a satisfactory on-table correction, yet within 3 months his ring finger was contracted further than in the preoperative situation. This must have been due to a failure of his postoperative management by us. (b) He was not keen for splinting, further surgery or follow-up and when reviewed for this study at 26 months his hand had deteriorated to the position shown and the little finger had come down also.

85–110°, mean 94°). In the remaining 16 rays the mean active flexion achievable was 70° (range 30–80°).

Fifty-eight rays had a residual proximal interphalangeal joint flexion contracture of less than 20° (mean 9°). The remaining 31 rays had residual proximal interphalangeal joint flexion contractures more than 20° (mean 45°).

One patient had been made worse despite a surgically uneventful dermofasciectomy of a ring finger ray (Fig 2). This was felt to be a failure of postoperative management. Eighty-two rays remained clear of disease. Six had recurrent disease. In four cases this was clearly beneath the graft and in the other two was at the proximal graft inset. Two of the recurrences were in the form of nodules (Figs 3 and 4), and four were present as cords. There was one ulnar cord associated with a middle finger ray dermofasciectomy (Fig 5); the remaining three cords were on the radial aspect of the little finger (Figs 6 and 7). None had developed a recurrent flexion contracture.

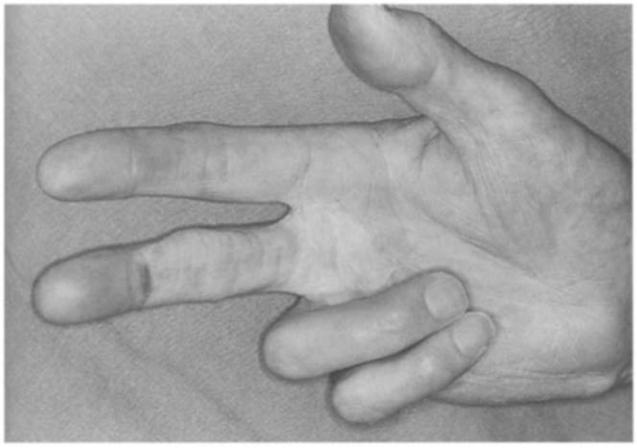

Fig 3 This 59-year-old man had extensive bilateral disease and had had previous fasciectomies for his little and ring fingers with short-lived results. He requested no further surgery for these. Disease in his middle finger ray was treated by dermofasciectomy 79 months before this review photograph.

Clinically, a recurrent cord was palpable extending from the ulnar border of the graft to the badly affected ring finger.

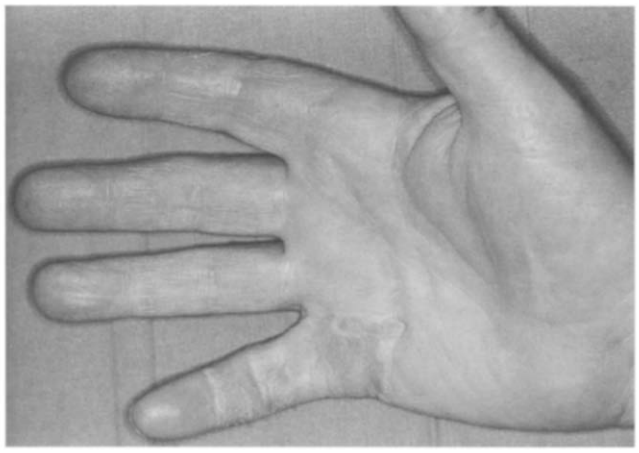

Fig 4 This 53-year-old man had a primary dermofasciectomy and had a palpable cord of radial disease at 61 months.

DISCUSSION

This review again confirms the findings of previous reviews (Brotherston et al, 1994; Logan et al, 1985; Searle and Logan, 1992) that full thickness skin grafts take well, are reasonably robust and can be cosmetically excellent after dermofasciectomy.

Unlike full thickness grafts used for finger tip injuries (Sturman and Duran, 1963) the grafted areas were remarkably comfortable. Sturman and Duran (1963)

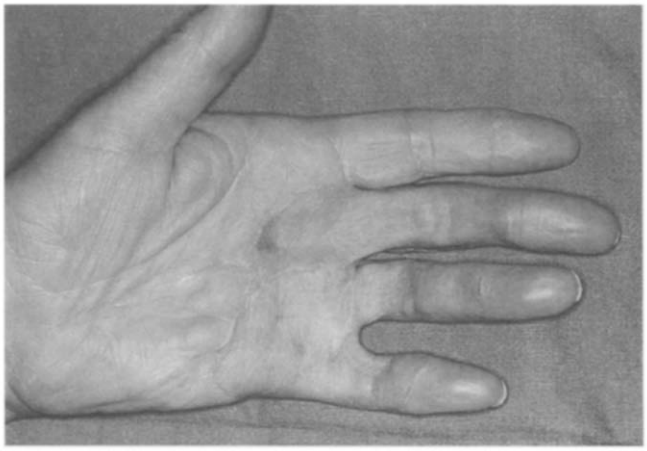

Fig 5 This 74-year-old lady had a total of six staged dermofasciectomies. She developed a natatory band recurrence adjacent to the left little finger graft at 80 months. This finger had had two previous fasciectomies. Overall the procedures appear to have controlled her disease well.

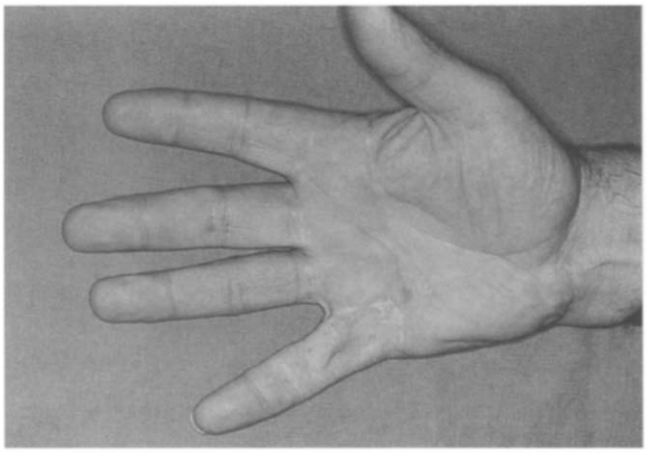

Fig 6 This 50-year-old man 26 months after dermofasciectomy to his right little finger has a hard cord beneath his graft which is clinically Dupuytren's disease. We would expect him to develop a recurrent contracture and need further surgery at some stage.

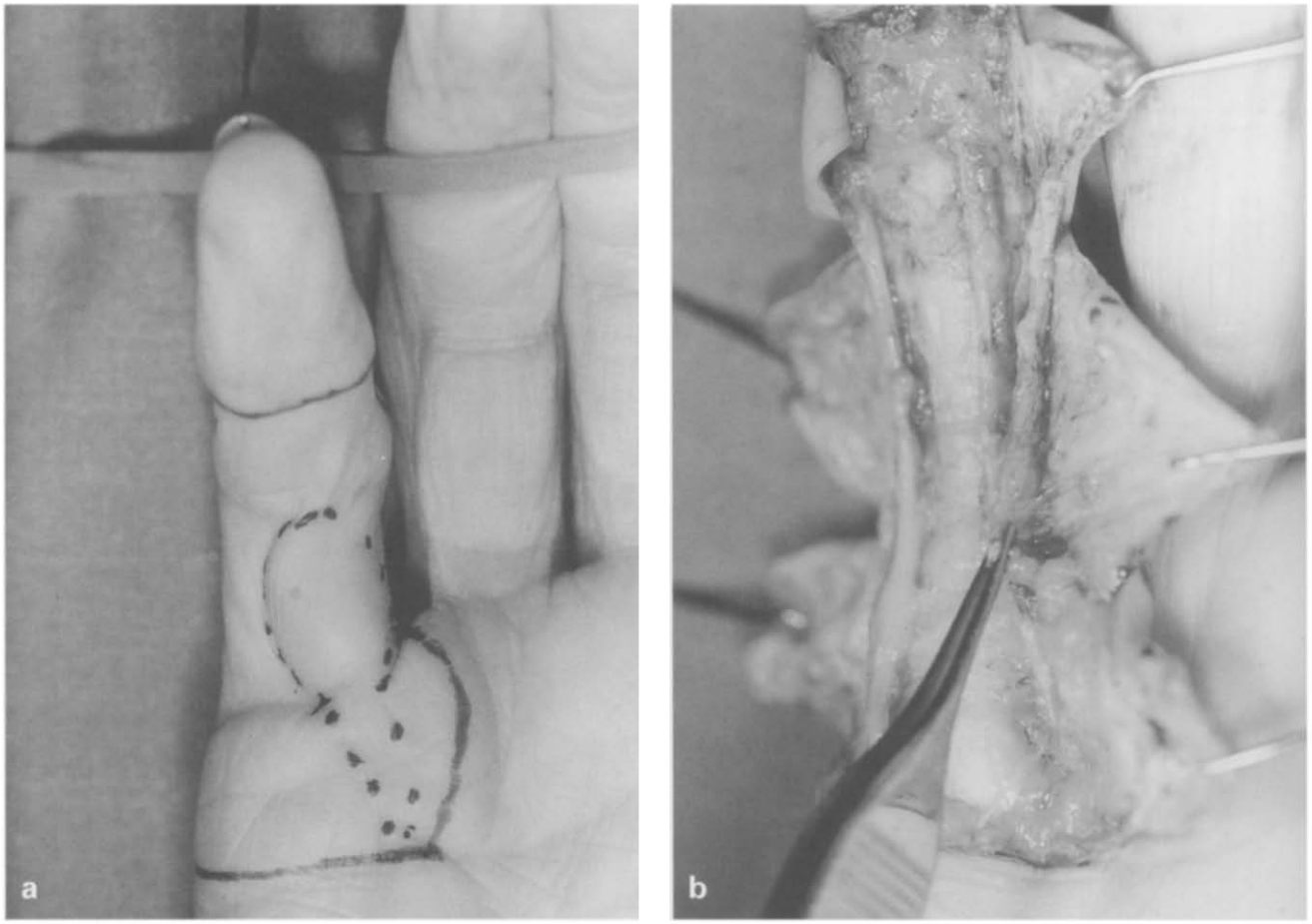

Fig 7 (a) A clinical case showing the marked out extent of clinical involvement which appears to be mainly a pretendinous cord. (b) After excision of this pretendinous cord the wide exposure allows clear identification of a radial cord which had not been suspected preoperatively.

noted that two-point discrimination in skin grafts approached that of the normal recipient area; in our series moving two-point discrimination in each finger compartment was approximately half that of controls.

The most common problem with the grafts was the development of tight radial or ulnar marginal scars despite carrying the excision out to the midaxial lines on each side. These occurred in the proximal finger compartment and were felt to be the result of the graft inset changing planes from dorsal distally to palmar proximally as the web was crossed. As with syndactyly release, web reconstruction with skin graft as opposed to flap often proves unsatisfactory. No patient has found marginal scar tightness enough of a problem to warrant secondary release.

When both ring and little fingers are flexed tightly we believe double ray dermofasciectomy is indicated. Both metacarpophalangeal contractures must be released at the same time to allow the distally advanced common extensor to return to its normal position. Having identified the neurovascular structures and flexor sheath and excised the tissue causing metacarpophalangeal contracture, completing a ray dermofasciectomy is a relatively simple procedure. Although this is a more extensive procedure for a more significant deformity with resultant longer recovery period than single ray dermofasciectomy, we encountered no particular problems. Contrary to the view of Brotherston et al (1994), large hairless full-thickness grafts are usually available from the medial aspect of the arm and graft take is generally excellent being independent of graft area.

While this series does not match the recurrence-free series from Newcastle (Brotherston et al, 1994), our 8% recurrence rate is comparable to the Derby series (Tonkin et al, 1984) in which three out of 41 followed-up patients were found to have recurrence beneath the graft (7.3%). It is certainly low when compared with a recurrence rate of 36% after segmental aponeurectomy (Moermans, 1991) and a recurrence rate after fasciectomy of 28% in the Melbourne series (Hueston, 1969), 50% in the East Grinstead series (Hakstian, 1966) and 66% in the Paris series (Tubiana and Leclercq, 1985).

Moreover, two of our recurrences were in the form of nodules without cord formation. Of the four cords, one was a natatory band which is not expected to lead to recurrent flexion contracture. Three of the recurrences were in the form of longitudinal cords. It is expected that these will develop and in due course lead to recurrent flexion contracture.

Besides the removal of pathologically involved skin, we feel that lifting the overlying skin without concern for flap viability allows full exposure of all flexor Dupuytren's disease. Limited fasciectomy excises the clinically palpable cords. However, on this full surgical exposure Dupuytren's disease is frequently more extensive than recognized clinically (Fig 7). In the little finger, radial, pretendinous and abductor cords are frequently all present and are sought out in radical digital dermofasciectomy. The radial cord is the most frequently absent element in little finger disease and failure to excise the structures which will develop into this radial cord may be a cause of "recurrence". Four of our recurrences, one nodule and three longitudinal cords, were on the radial side of the little finger.

Dermofasciectomy by this method allows good recovery of digital function and cosmesis. It offers very considerably better local disease control than either fasciectomy or segmental aponeurectomy. It is indicated when the surgeon feels that either of these procedures will prove inadequate. We feel it is particularly indicated in cases of primary disease which is diffuse with significant skin involvement and in recurrent disease where these features are almost universally present.

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