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Long term follow-up of dermofasciectomy for Dupuytren's contracture

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SUMMARY. **During the 4-year period 1980–1983, we carried out 338 operations for Dupuytren's disease of the hand. Of these 46 (13.6%) had a dermofasciectomy and skin graft for recurrent disease. In this sub-group, 34 patients (10.1%) were operated on by the same senior surgeon (H.G.B.). Only these cases were included in this study. Average follow-up was 100 months (range 80–120 months). It was found that graft durability was good, there was no clinical evidence of recurrence beneath grafts, contracture did not exceed 15 degrees at any joint and two point discrimination in the graft was equal to, or better than, 12 mm in the palm and 8 mm in the digit.**

The long term outcome following dermofasciectomy for recurrent Dupuytren's disease is not well documented. The longest follow-up appears to be that of Tonkin *et al.*,[1] whose series followed up 100 patients treated surgically for Dupuytren's disease. 26 were treated for recurrent disease by dermofasciectomy and followed up for an average of 43 months (range 10–89 months). One patient was thought clinically to have recurrence under the graft, amounting to a 4% recurrence rate as opposed to a 42% recurrence rate outside the graft. This fact would support the use of a long graft occupying that extent of the ray which has significant potential for producing joint contracture.

We would therefore suggest that a graft extending

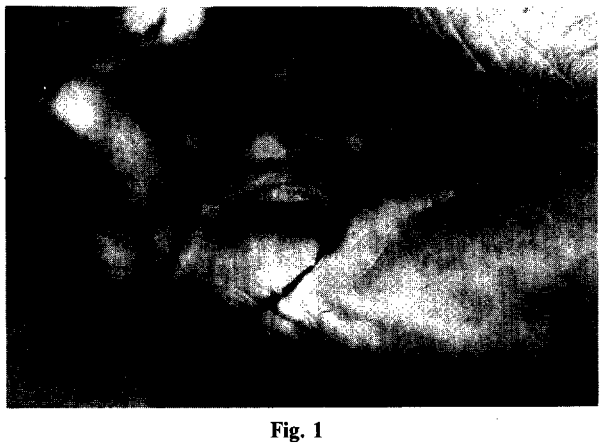

Fig. 1

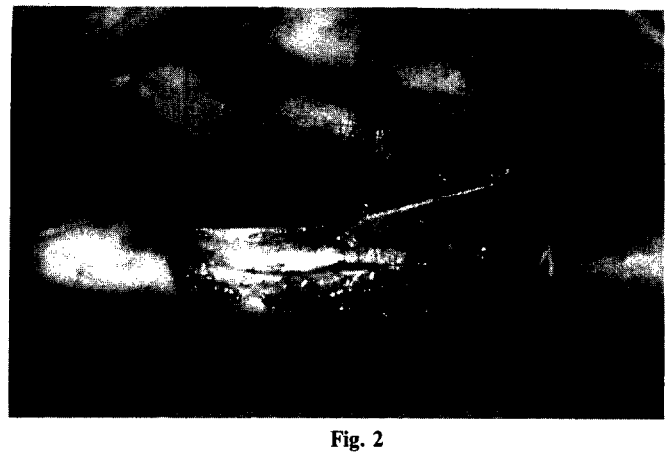

Fig. 2

Fig. 3

Figure 1—Preoperative. **Figure 2**—Perioperative. **Figure 3**—1 week postoperative.

from the distal palmar crease to the distal interphalangeal joint crease would significantly reduce the risk of recurrent disease in the zone of potential contracture. Should recurrence occur outside the grafted region it is unlikely to cause contracture. To test this hypothesis 34 patients, who had long dermofasciectomies extending from the distal palmar crease (metacarpo-phalangeal joint) to the distal interphalangeal joint, were followed up for an average of 100 months (range 80–120 months). The resulting active range of motion, two point discrimination, graft durability and cosmesis were also examined.

Materials and methods

In the 4-year period 1980–1983, 338 operations for Dupuytren's disease were carried out; 46 of these were dermofasciectomies for recurrent disease. In order to assess a standardised surgical technique only those 34 cases operated on by the same senior surgeon (H. G. B.) were studied. Patient age at the time of operation ranged from 29–66 years (mean 48 years). There were 32 little and 2 ring fingers operated on. The latter 2 patients had previously had amputations of their little fingers for recurrent disease. Of the 34 patients, 19 had 1, 12 had 2 and 3 had 3 previous operations. There were 18 left and 16 right hands. A palmar and digital fasciectomy was undertaken with excision of skin from the distal palmar crease to the distal crease of the finger and to the midaxial line on each side. There was no record of tendon sheath injury, so the effect of such injuries on graft take could not be assessed. Full thickness grafts taken from the upper limb or groin were used in all cases. Haemostasis was obtained and the graft fixed with a tie-over dressing. The hand was immobilised in a wool and crepe bandage for a week, after which the dressing was removed and physiotherapy commenced (Figs 1–3).

All patients underwent a routine programme of physiotherapy and follow-up with no additional or extra attention. For the purpose of this study they were all reviewed at clinics in 1990, when follow-up was from 80 to 120 months. In each case patients were examined for evidence of recurrent disease under grafts, graft durability, graft appearance, two point discrimination over the graft (in the palm and in the digit), joint contracture and range of active motion at the metacarpophalangeal (MP) and proximal interphalangeal (PIP) joints.

Results

There was no evidence of recurrence under the graft in any case, hair growth was present in some cases but was not a problem, the grafts were durable to normal wear and tear and all patients were happy with the cosmetic appearance. Table 1 details the two point discrimination in the graft (palm and finger), degree of flexion contracture and range of movement at the MP and PIP joints. Two point discrimination over the skin graft in the palm ranged from 6–12 mm (mean 9.4 mm). Two point discrimination over the graft in the finger ranged from 4–7 mm (mean 5.1 mm). As a comparison, 20 patients who had a fasciectomy carried out by the same surgeon over the same time period were reviewed for two point discrimination. In the palm the range was 4–7 mm (mean 5.1 mm). In the finger the range was 3–4 mm (mean 3.4 mm). These results are summarised in Table 2.

Flexion contracture at the MP joint ranged from 0–10 degrees (mean 1 degree). Range of motion was 0–90 degrees (mean 1–85 degrees).

Flexion contracture at the PIP joint ranged from

Table 1 Dermofasciectomy (34 patients)

Patient number	*Two point discrimination*		*Flexion contracture and range of motion*	
	Palm (mm)	*Finger (mm)*	*MPJ (degrees)*	*PIPJ (degrees)*
1	9	5	0–85	0–95
2	11	4	0–90	0–90
3	9	5	0–85	0–90
4	8	4	0–85	0–85
5	9	4	0–90	5–90
6	9	4	0–90	0–85
7	6	5	0–90	0–80
8	7	5	0–85	0–85
9	9	5	0–90	0–80
10	10	5	0–80	10–85
11	8	4	0–85	0–85
12	9	6	0–80	5–85
13	9	4	0–85	0–95
14	8	5	0–80	0–100
15	10	4	0–85	15–100
16	9	4	0–75	5–95
17	11	6	0–85	0–85
18	12	5	0–80	5–80
19	11	6	5–85	0–90
20	8	5	0–90	0–100
21	10	6	0–50	0–90
22	12	5	5–90	0–95
23	11	6	0–85	0–95
24	10	6	0–80	0–100
25	10	5	0–85	0–95
26	9	5	0–85	5–75
27	11	6	5–85	0–100
28	10	5	0–90	0–100
29	11	6	0–85	5–95
30	9	5	5–85	0–90
31	9	6	0–85	0–90
32	8	5	0–90	0–90
33	10	7	10–85	0–85
34	9	5	0–85	0–85

Table 2 Fasciectomy (20 patients)

Two point discrimination (mm)	*Palm (patient numbers)*	*Finger (patient numbers)*
3	0	12
4	7	8
5	6	0
6	6	0
7	1	0
Total	20	20

0–15 degrees (mean 2 degrees). Range of motion was 0–100 degrees (mean 2–88 degrees).

Discussion

Dermofasciectomy and skin grafting for Dupuytren's contracture has been advocated since 1952.[2] It has not been popularised because of the dissection involved and the longer convalescence compared to simple fasciectomy.[1] Hueston[3,4] recommends dermofasciectomy as a secondary procedure in all patients with recurrent contracture and as a primary procedure in the younger patient with a strong Dupuytren's diathesis (onset under 40 years of age, strong family history, knuckle pads, plantar disease or extensive disease in both hands). McFarlane[5] believes it has a place but has the following reservations: 1) skin flaps can be separated from diseased fascia by sharp dissection under magnification; 2) two common causes for PIP joint contracture, the spiral and retrovascular cords, are not attached to skin throughout their course; 3) full correction of the PIP joint contracture often results in exposure of the flexor tendons producing an unfavourable bed for graft take, or the procedure is compromised by retaining potentially diseased skin to maintain flexor tendon cover; 4) a strong diathesis is rare. He quotes a 40% recurrence rate for simple fasciectomy with less than 10% requiring secondary surgery. To take these points in turn: 1) While skin itself is probably not primarily involved, ultrastructural studies show a close relationship between skin and the Dupuytren's nodule; the skin and cord appear to be passively drawn by the contracture forces.[6] Thus sharp dissection in advanced cases will elevate flaps consisting of dermis-epidermis only, separating the dermal-subdermal plexus on which random flaps depend.[7] This may result in skin necrosis. 2) Although the spiral and retrovascular cords may not be attached to skin throughout their length, this does not rule out the possibility of recurrence after their excision. 3) It is up to the operator to preserve the flexor sheath. A full thickness graft will bridge a gap of a couple of millimetres in a flexor sheath rent. Should a rent develop, the options are: a) stop the dissection while the rent is small and accept the contracture present at that point, b) proceed to correct the contracture (by systematically dividing the check-rein ligaments, excising accessory collateral ligaments, releasing collateral ligament adhesions to adjacent phalangeal surfaces and incising the volar plate) using a local flap or cross finger flap to resurface larger rents, or c) amputate. 4) Although strong diatheses may be rare, a recurrence rate of 10% is a large group in whom dermofasciectomy may be appropriate. Furthermore, several studies have demonstrated that fasciotomy and fasciectomy give long term correction of MP joint contracture; however long term correction is not maintained where there is PIP joint involvement.[8–10] Repeated fasciectomy puts skin flaps and neurovascular bundles at ever increasing risk. Hueston[11,12] noted that application of undiseased full thickness graft prevents recurrence of contracture. This observation was supported in the laboratory by Rudolph[13] who demonstrated inhibition of myofibroblasts by full thickness grafts in a rat model.

The cases reported here are a combination of new referrals and the authors' and other surgeons' recurrences. All had single ray dermofasciectomies. While multiple ray involvement is common, the need for multiple ray dermofasciectomy is not. No multiple rays were treated in this series and while the authors have performed multiple ray dermofasciectomy, it is a long operation requiring a very large, hairless, full thickness graft (single ray grafts are typically 7×2.5 cm). Because of restriction of tourniquet time, and the availability and success of take for large full thickness grafts, it would be the senior author's practice to operate in two stages, the second stage being when the first graft is well established and a good range of movements restored.

Every attempt is made not to skeletonize the neurovascular bundles, thus ensuring vascular viability and good sensory recovery. In severe disease some degree of skeletonization is inevitable but if good correction of flexion deformity is obtained, the neurovascular bundles will not bowstring across the affected joint and graft take will not be compromised. Mild degrees of bowstring can be corrected by the tie-over dressing, while care is taken not to occlude arterial input. We have found that the greatest need for dermofasciectomy is in the little finger ray and a few ring finger rays. We have rarely if ever had to carry out this procedure in any other ray or in the first web space, where the skin is seldom severely involved.

To conclude, in this study with a long follow-up (80–120 months) dermofasciectomy produced good results in respect of absence of recurrent disease, durability, cosmetic appearance, two point discrimination, correction of joint contracture and range of active motion. No patient in the group has subsequently required further surgery to the involved digit.

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