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CLINICAL RESULTS OF DERMOFASCIECTOMY FOR DUPUYTREN'S DISEASE IN JAPANESE PATIENTS

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The surgical outcomes of dermofasciectomy for Dupuytren's disease were evaluated in nine hands of eight patients in a Japanese population. The patients were examined for postoperative complications, problems associated with the skin graft, evidence of recurrent disease, sensation over the graft and pre- and postoperative range of motion at the metacarpophalangeal and the proximal interphalangeal joints. The mean two-point discrimination over the skin graft was 14 mm. The mean remaining flexion contracture at the metacarpophalangeal joint was 5° and that at the proximal interphalangeal joint was 34°. Recurrence occurred in two patients: one had a minor nodule and the other a natatory cord, which did not result in the redevelopment of a contracture. This study supports the use of dermofasciectomy for the treatment of recurrent Dupuytren's disease, as well as for the treatment of primary disease in those patients with a strong Dupuytren's diathesis in this population.

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Dupuytren's disease has generally been thought to be rare, mild and seldom recurrent in Japanese patients. Several reports, however, have suggested that this is not the case and recurrence and extension frequently occur in Japanese patients, particularly in those patients with a strong Dupuytren's diathesis (Abe et al., 2004a,b).

Surgical treatment of Dupuytren's disease cannot be restricted to one procedure alone and the careful selection of appropriate surgical candidates continues to be an important part of the therapeutic approach to this disease. Gordon (1957) and Hueston (1962) observed that recurrence did not occur beneath a skin graft. This finding popularised dermofasciectomy with skin grafting as a treatment for aggressive Dupuytren's disease in the Caucasian population. In contrast, Japanese surgeons seldom carry out dermofasciectomy. Consequently, little information is available on the results of this procedure in Japanese patients.

The purpose of this study was to evaluate the clinical results obtained when dermofasciectomy was used as the treatment for severe Dupuytren's disease in a Japanese population.

PATIENTS AND METHODS

From 2000 through 2004, 78 hands of 67 patients underwent surgery for Dupuytren's disease in our institutes. Of these, nine hands in eight patients were treated by dermofasciectomy. The indications for dermofasciectomy were either recurrent disease or primary disease with more than four points on the diathesis score (Abe et al., 2004b). Of the nine dermofasciectomies, four were performed as a primary procedure and five for recurrent disease. All the patients were men. The average age at the time of surgery was 68 (range 62–73) years and the average age at onset of disease was 55 (range 46–62) years. The demographic data of the patients are shown in Table 1.

Six right and three left hands underwent surgery, with one patient undergoing surgery on both hands (Cases 1 and 2). All the dermofasciectomies were performed on the little finger. In addition to dermofasciectomy, a proximal interphalangeal joint release procedure was performed in Cases 1 and 2.

Surgical technique

All operations in this series were performed under tourniquet. Our standard dermofasciectomy, including excision of the skin from the palmar digital crease to the distal or proximal interphalangeal joint crease, was carried out to the midlateral line on either side of the digit. After careful dissection and removal of all diseased palmar fascia, the tourniquet was released and rigorous haemostasis performed. A K-wire was inserted obliquely across the proximal interphalangeal joint, maintaining the joint in the maximal extension. The full-thickness skin graft was harvested from the anterior aspect of the elbow joint and positioned with tie-over sutures applying gentle pressure (Fig 1). Ten to 14 days after surgery, the K-wire and tie-over dressing were removed.

After removal of the tie-over dressing and confirmation of successful adherence of skin graft, physiotherapy was started with gentle mobilisation. Postoperative splinting was applied in all the cases. Initially, the splint was removed only for physiotherapy exercises. Splinting was gradually reduced but night splinting was continued for 3 to 6 month after surgery.

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Table 1—Demographic data of the patients in the present study

Case	*Age at operation (years)*	*Onset (years)*	*Recurrence before surgery*	*Preoperative range of motion*		*Diathesis score*
				MCP	*PIP*	
1[1]	71	62	Twice	+20/+75	+85/+90	2
2[1]	71	62	Twice	+5/+75	+60/+90	2
3	66	47	–	+70/+80	+85/+95	7
4	62	60	Once	−5/+80	+70/+90	6
5	65	59	Once	−15/+90	+40/+90	2
6	72	46	–	−5/+80	+40/+90	6
7	70	51	Once	0/+80	+45/+90	4
8	66	59	–	+20/+85	+60/+95	6
9[2]	73	57	–	+35/+85	+35/+90	6

MCP = metacarpophalangeal joint, PIP = proximal interphalangeal joint.
[1]Cases 1 and 2 were the two hands of a single patient.
[2]Case 9 had had a recurrence of disease on the contralateral hand after simple fasciectomy.

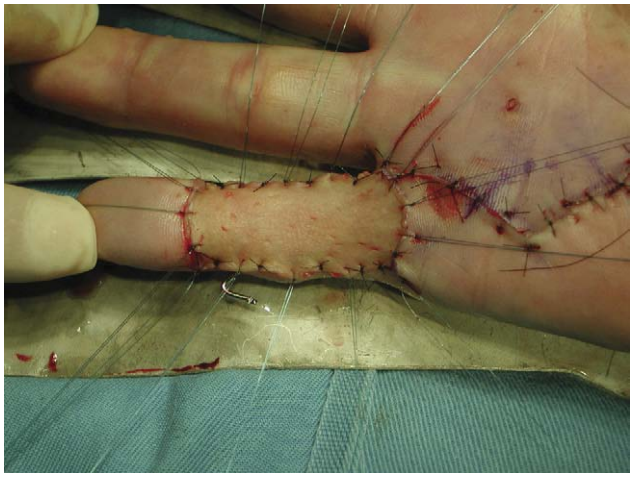

Fig 1 Case 8 illustrating the surgical technique used in this study. Dermofasciectomy was performed from the palmar digital crease to the distal interphalangeal joint crease. A K-wire was inserted across the proximal interphalangeal joint, maintaining the joint in the maximal extension. Skin graft was positioned with tie-over sutures applying gentle pressure.

The patients were examined for evidence of post-operative complications, problems associated with the skin graft and recurrent disease under or outside of the grafts. Additionally, two-point discrimination over the graft and pre- and postoperative ranges of motion of the metacarpophalangeal and the proximal interphalangeal joints were evaluated.

RESULTS

The mean follow-up period was 29 months and the results at final follow-up are summarised in Table 2.

There was no evidence of recurrence under the skin graft in any case. However, two minor recurrences were observed outside of the skin grafts. One was in the form of nodules without cord formation (Fig 2) and the other was a natatory cord, which was not expected to lead to recurrent flexion contracture (Fig 3).

The remaining flexion contracture at the metacarpophalangeal joint ranged from 0 to 20 (mean 5) degrees and that at the proximal interphalangeal joint ranged from 0 to 60 (mean 34) degrees. Case 1 developed a swan neck deformity and Case 2 developed a rigid proximal interphalangeal joint flexion deformity (Fig 4).

All of the grafts took completely. Two-point discrimination over the skin graft in all patients ranged from 7 to 20 (mean 14) mm. One graft formed a tight ulnar scar which eventually softened and became asymptomatic 14 months after surgery (Case 6). Hair growth was present on two skin grafts, but was inconsequential. In Cases 1 and 2, the flexor tendon sheath was inadvertently opened intraoperatively and skin grafts had to be applied to the exposed flexor tendon. There were no infections or nerve damage.

DISCUSSION

This is the first series describing the use of dermofasciectomy for the treatment of Dupuytren's disease in an Asian population.

In several previous series, describing treatment in Caucasian populations, the little finger was the most common site of disease undergoing dermofasciectomy (Armstrong et al., 2000; Brotherston et al., 1994; Hall et al., 1997). Our patients had a greater residual flexion contracture of the proximal interphalangeal joint than did the patients in these series. This may have been due to several factors. Dermofasciectomy, which is considerably more complicated than simple fasciectomy, is relatively unpopular in Japan, and, as a result, we were, somewhat, inexperienced with the technique. Additionally, the pre-operative proximal interphalangeal joint

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Table 2—Clinical results of dermofasciectomy

Case	*Operated digital ray*	*Postoperative range of motion*		*s2PD (mm)*	*Recurrence postoperatively*	*Follow-up (months)*	*Combined procedure*
		MCP	*PIP*				
1[1]	Left little	−5/+90	−30/−10	15	–	38	PIP joint release
2[1]	Right little	+15/+90	+60/+60	15	–	36	PIP joint release
3	Left little	+20/+80	+40/+85	11	–	34	Middle, ring, and first web fasciectomy
4	Right little	−20/+100	+35/+80	20	–	32	–
5	Right little	−10/+90	+25/+90	15	–	29	–
6[2]	Left little	0/+85	+30/+95	11	Natatory	28	First web fasciectomy
7	Right little	0/+90	+35/+90	7	–	26	–
8	Right little	0/+100	+35/+90	15	–	24	–
9	Right little	+10/+65	+45/+85	15	Nodule	18	Middle, ring, and first web fasciectomy

MCP = metacarpophalangeal joint, PIP = proximal interphalangeal joint.
[1]Cases 1 and 2 were the two hands of a single patient.
[2]Case 6 had a tight scar on the ulnar border of graft, but the scar became asymptomatic 14 months after surgery.

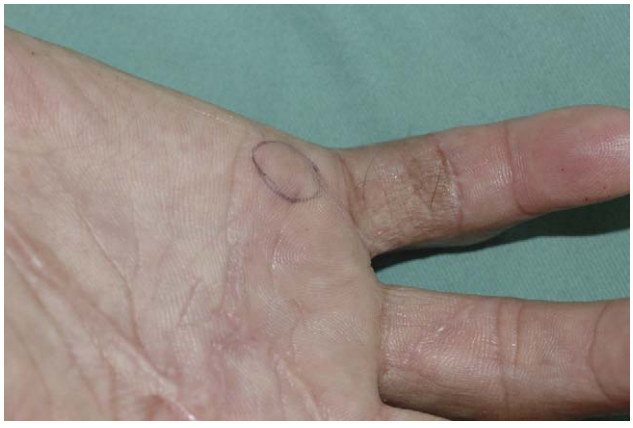

Fig 2 Recurrence in the form of nodules in the palm 5 months after surgery in Case 9. This did not lead to a recurrent flexion contracture.

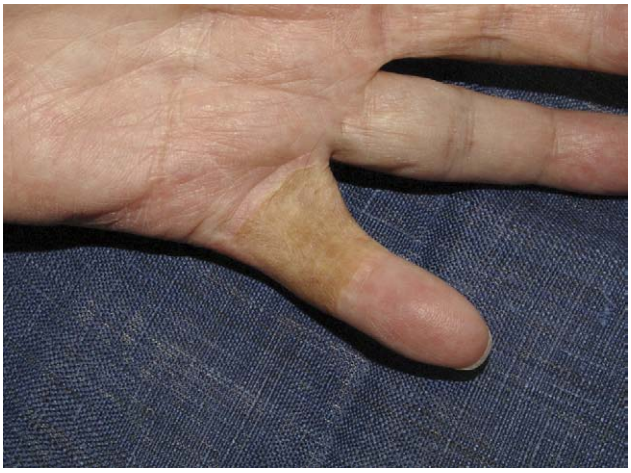

Fig 3 Recurrences in the form of a natatory cord at the margin of the graft 22 months after surgery in Case 6. This did not cause a recurrent flexion contracture.

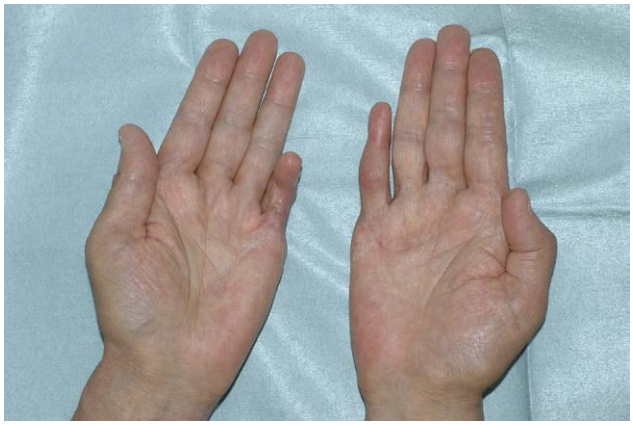

Fig 4 Cases 1 and 2 were the two hands of one patient. Dermofasciectomies were carried out after two previous fasciectomies. Both little fingers had proximal interphalangeal joint releases. Both had exposure of the flexor tendons at surgery. The left little finger developed a fixed flexion contracture of the proximal interphalangeal joint and the right developed a swan neck deformity with adhesion of the skin graft to the flexor tendon.

flexion contractures were greater than, or equal to, 60° in five of the nine cases. Abe et al. (2004a) reported that surgical results for contractures of this magnitude tend to be poor. It is also possible that the residual flexion contracture could be caused, not only by the presence of capsular contractures, but, also, by a lack of extensor muscle tone (Smith and Breed, 1994). Finally, in other reports the digital dermofasciectomy was often larger, extending from the distal palmar crease to the distal interphalangeal crease. In the present series, dermofasciectomy and skin replacement may not have been enough to avoid postoperative residual contracture.

In the present series, two cases experienced flexor tendon sheath injury and both had poor clinical results.

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One developed a rigid proximal interphalangeal joint flexion deformity and another developed a swan neck deformity with adhesion between the skin graft and the flexor tendon. In both of these cases, proximal interphalangeal joint release was necessary and both had undergone two previous fasciectomies. How much the final clinical result in these cases was due to the exposure of the flexor tendon and how much was due to the other circumstances is impossible to tell. Nevertheless, preservation of the flexor tendon sheath by careful dissection is ideal. The indications to perform a proximal interphalangeal joint release in combination with the dermofasciectomy must also be carefully considered. We suspect the swan necking was caused not only by opening the sheath but also by injury of the volar plate of the proximal interphalangeal joint during release of this structure. These complications might have been avoided if the exposed flexor tendons had been covered with a well vascularised tissue skin flap (Hueston, 1962; Leclercq, 2000; McGrouther, 1998).

Other studies have reported recurrence rates ranging from 0% to 47%. However, they have also reported that recurrence was rarely observed beneath the skin graft, with this occurring in only 0% to 8% (Brotherston et al., 1994; Hall et al., 1997; Kelly and Varian, 1992; Ketchum and Hixson, 1987; Tonkin et al., 1984). Of the nine dermofasciectomies in this study, two demonstrated disease recurrence within the study period, although both were minor and both were outside the grafted areas. Given the small number of the subjects and the variable follow-up period, it is difficult to compare our recurrence rate to that in other studies. However, our results support Hueston's (1969) view that skin replacement is also the all-important factor in disease control in Japanese patients presenting with recurrent, or severe, disease.

From the viewpoint of prevention of recurrence, our preliminary results support the use of dermofasciectomy for the treatment of recurrent Dupuytren's disease, as well as for the treatment of primary disease in those patients with a strong Dupuytren's diathesis in this population. However, management of severe proximal interphalangeal joint contracture remains an unsolved problem.

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