

THE LATERAL DIGITAL FLAP FOR DUPUYTREN'S FASCIECTOMY AT THE PROXIMAL INTERPHALANGEAL JOINT – A STUDY OF 84 CONSECUTIVE PATIENTS

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Fasciectomy is the most common operation performed for Dupuytren's disease. However, as the joint contracture increases, issues of skin deficiency following release become significant. For severe or recurrent disease dermafasciectomy is advised, but a digital transposition flap provides a viable alternative without the need for a skin graft for less-severe disease with moderate skin deficiency. A retrospective review identified 84 patients who had undergone this operation. The flap used was proximally based on the midlateral aspect of the finger allowing direct closure of the donor site. Ninety hands with 134 digits were operated on and 83% of the patients had a full correction. About 70% remained fully corrected at 1 year. All flaps were performed for proximal interphalangeal joint involvement. The mean pre-operative contracture was 34°, corrected postoperatively to 5°. The recurrence rate was 9%. Two percent of the patients had local infection but no flap necrosis was seen. A lateral digital transposition flap is a very stable operation for Dupuytren's disease with moderate skin deficiency and our patients achieved favourable results when compared to other studies that used local flaps combined with skin graft.

Keywords: Dupuytren's disease, local flap, surgery, splint, proximal interphalangeal joint

Various surgical procedures have been described for the treatment of Dupuytren's disease, including fasciotomy, fasciectomy and dermafasciectomy with variations on these basic procedures (Saar and Grothaus, 2000).

Razemon (1982), and Laurenza and Gensini (1992) both describe very similar lateral digital flaps for severe Dupuytren's contracture, with the donor site being reconstructed with skin grafts. There are several other local flap options for reconstruction following Dupuytren's fasciectomy. Kralova and Nemec (1988), and Harrison and Newton (1991) describe the use of a cross-finger flap for Dupuytren's disease and Ekerot (1995) advocated the use of a dorsal hand flap. A palmar V–Y advancement flap was advocated by Rider et al. (1998). These are fairly complex operations, which sometimes incorporate additional procedures to achieve the desired result in moderate to severe Dupuytren's disease.

We present the lateral digital flap, which is helpful when there is moderate shortage of skin after correction of the flexion contracture.

MATERIALS

This was a retrospective casenote analysis. All patients with Dupuytren's disease who underwent a surgical

correction, which utilised the lateral digital flap under the senior author (R.S.B.), from 1990 to 2004, were included in the study.

All patients were seen during their treatment by the senior author, and measurements obtained with a goniometer were recorded in the notes. The measurements recorded were the pre-operative, peroperative and follow-up loss of extension at the metacarpophalangeal joint (MCPJ) and proximal interphalangeal joint (PIPJ).

In all cases, a midlateral digital skin transposition flap was used to cover palmar skin defects following Dupuytren's release with fasciectomy (Fig 1). The width of the flap was on average 10 mm (range 8–12 mm), and the average length was 22 mm (range 19–30 mm). The donor site was closed primarily in all cases.

The shape and length of the flap related to the size of the finger and the flap extended up to one-third the length of the middle phalanx. The tip of the flap was angled at 30°, which allowed the defect to be closed (Fig 2).

The flap is based, if possible, on the non-dominant side of the finger but it should always be based on the side of the finger that has the major Dupuytren's band. This is done so that the widest part of the transposed flap is on the side of the finger with the dominant band. The flap should extend almost all the way across the palmar surface of the finger to the midlateral line of the



Fig 1 Planning and marking out the flap.



Fig 2 Diagram of the flap.

finger on the opposite side. When the laterally base flap is lifted, as much of the soft tissue on its deep surface is maintained, especially at the base where the soft tissue is allowed to rotate with the flap (Figs 3 and 4).

The need to use the flap was decided after the fasciectomy and contracture release had been achieved. The points considered were involvement of the surrounding skin with Dupuytren's disease, amount of skin deficiency, skin quality and laxity at the donor site and amount of contracture at the PIPJ. The flap was generally used in patients with minimal skin involvement and minimal or no MCPJ involvement. Typically, the flap was used in patients with longstanding contractures of the PIP joint and obvious skin shortage after excising the Dupuytren's bands and correcting the contracture.

All patients received Capener splints at 2 to 3 weeks postoperatively. Patients were given instructions on applying, removing and exercising with these splints, which were used intermittently for 20 minutes each hour during the day and were removed at night. Splintage was continued for about 4 months. The frequency of applying the splint was reduced when the expected correction had been obtained.

All data were initially collected on a purpose designed paper proforma, and were later transferred to a Microsoft Excel spreadsheet.

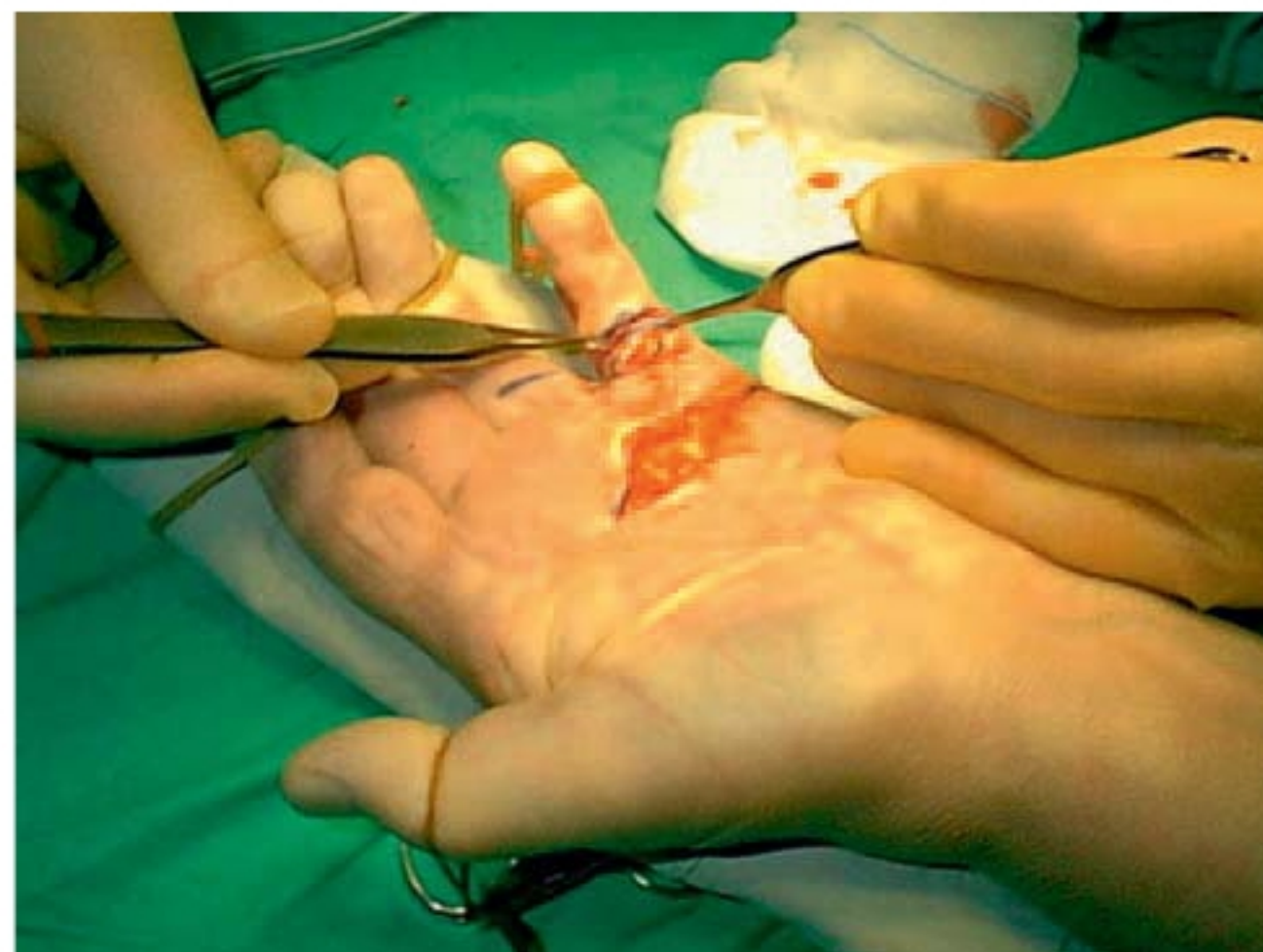


Fig 3 Flap being inset.



Fig 4 The flap at 2 months.

RESULTS

From 1990 to 2004, a total of 134 fingers in 90 hands of 84 patients had surgery for Dupuytren's contracture with fasciectomy and the lateral digital transposition flap. The male:female ratio was 8:1 and the mean age of patients was 56 (range 25–80) years.

There was palmar involvement in 71 (79%) hands, and 26 hands (29%) were treated for recurrent disease. The mean number of previous surgeries was 1.6 (range 1–5). The little finger was involved in 61% of all digits (Fig 5) and the PIPJ was involved in almost all fingers. The mean pre-operative contracture was 34° (range 0–95°) and the mean postoperative contracture was 5° (range 0–70°). Thus the mean correction was 29° (range 0–95°). A joint release

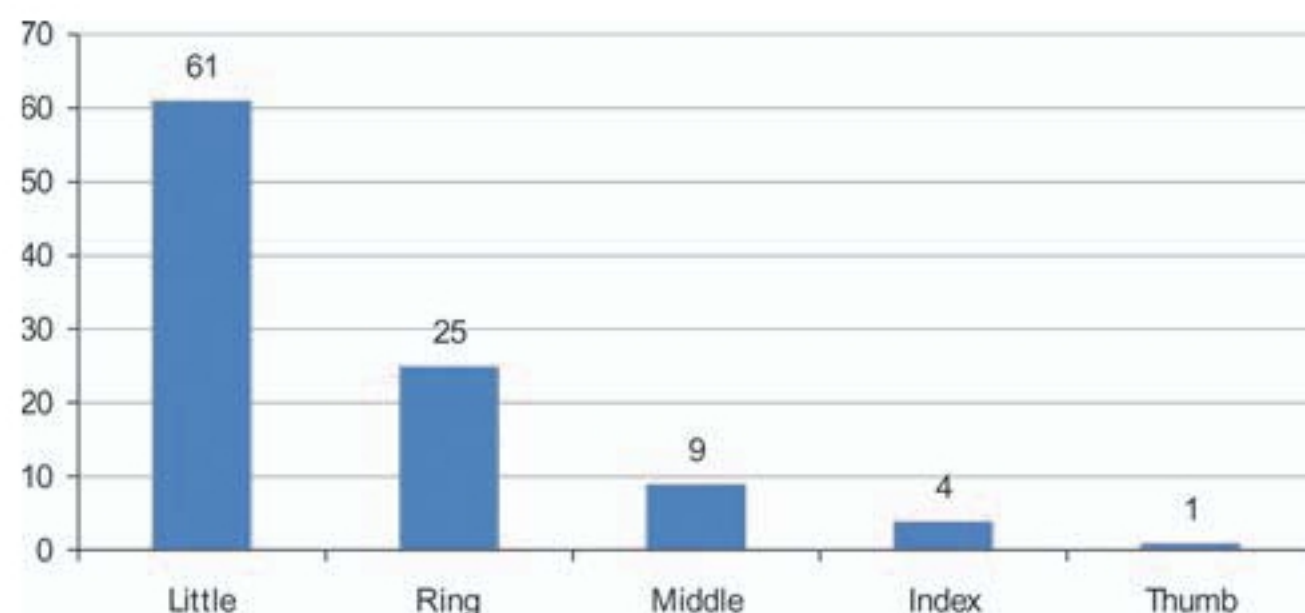


Fig 5 The digits involved (percentages).

of the PIPJ was performed in 19 digits in 12 hands (13%).

MCPJ involvement was seen in 50 fingers (31 hands). The mean pre-operative contracture was 15° (range $0-72^\circ$) and the mean postoperative contracture was 1° (range $0-25^\circ$). Thus, the mean correction was 14° (range $0-72^\circ$).

A full correction was obtained on the operating table in 111 fingers (83%). This decreased to 94 fingers (70%) at 1 year.

The most common surgical complications were infection (two patients) and nerve injury (two patients – Radial Digital of the little finger). The recurrence rate was 9% and the mean disease-free period was 17 months. The mean follow-up time was 14 (range 1.5–23) months.

DISCUSSION

Razemon, in 1982, utilised the latero-digital flap in 141 cases, but used a full-thickness skin graft to cover the donor site. He reported very favourable results, and as such, an increasing proportion of patients in his series underwent this type of procedure. Laurenza and Gensini (1992) used a very similar rotation flap in 20 patients and reported an improvement of 78% from the mean pre-operative contracture at 8 months. Our series of patients had less-severe contractures than Razemon's (140° mean lack of extension) and Laurenza's (135° mean lack of extension) series, but our results are encouraging and we avoided the use of skin grafts. In our view, if the combined finger contracture was more than 49° , and there is significant skin involvement, leading to skin shortage, a skin graft is required for closure. The ideal procedure, in this situation, would be a dermafasciectomy, rather than a procedure that gives the patients a skin graft in a site previously free of disease as done by Razemon/Laurenza. We used the lateral digital transposition flap when there was a shortage of palmar skin in patients without significant skin involvement, especially at the donor site. The average contracture in our series was less severe, and thus narrower flaps were

employed so that in all cases the donor site was closed primarily.

Kralova and Nemec (1988) and Harrison and Newton (1991) described the use of the cross-finger flap for Dupuytren's disease. Their papers do not mention any figures on pre- and postoperative contracture measurement, but as with any cross-finger flap one should be wary of causing scarring on an adjacent disease-free finger.

Ekerot (1995) wrote about the distally based dorsal hand flap for reconstruction in Dupuytren's disease, and used it in 15 patients (17 flaps). The average contracture at the PIPJ was 77° and was corrected to 15° . The MCPJ was fully corrected in all cases. They also used K-wire fixation of the PIPJ in some cases and Plaster of Paris (POP) splintage in others (Ekerot, 1995). The results obtained in this series are good, but the author reported distal subtotal flap necrosis in four of the 17 flaps. In our series, there were no cases of flap failure (total or partial), and the flap dissection and planning were much simpler compared to the dorsal hand flap. Dynamic splintage is also much more controlled than K-wire fixation or POP splints.

Rider et al. (1998) described a V-Y palmar flap for Dupuytren's disease. They used it in 20 patients with palmar disease and some MCPJ involvement. However, other techniques have to be incorporated to address significant PIPJ involvement if present.

The benefits of this type of surgery are that the procedure takes a similar length of time to a straightforward Dupuytren's fasciectomy yet allows complete closure of the flap donor site and increases the length of the palmar skin. This enhances the potential to correct the original contracture of the PIPJ. A second benefit is that in most patients the skin from the lateral side of the finger is minimally involved with Dupuytren's bands and it therefore provides a transverse firebreak across the middle of the palmar surface of the finger, thus reducing the rate of recurrence, causing further joint contractures.

All the patients in our series received postoperative Capener dynamic splintage, starting at 2 to 3 weeks, for 4 months. This form of splintage is very versatile because it is patient- and surgeon-controlled. Initially the splint was worn for 20 minutes per hour during the daytime, and its frequency was subsequently reduced as correction progressed.

The complication and recurrence rates in our series compare very favourably to previously published series of Dupuytren's surgery.

We conclude that the lateral digital flap with direct closure of the donor site in conjunction with dynamic splintage postoperatively is a good option for mild to moderate Dupuytren's contractures involving the PIPJ where some skin deficiency is expected. However, for more severe skin involvement and deficiency, dermafasciectomy is the procedure of choice.

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