EDITOR'S CHOICE

A Longitudinal Analysis of 281 Cases of Dermofasciectomy Efficacy in Advanced Dupuytren Disease Cases: A 20-Year Perspective

Wg Cdr Ankur Pandya, Eur Dip Hand Surg, FRCS(Plast),* Dujanah Bhatti, MRCS,* Oliver Manley, MRCS*

Purpose This study aimed to evaluate the long-term efficacy and outcomes of dermofasciectomy in patients with advanced Dupuytren disease over a 20-year period.

Methods A longitudinal analysis was conducted on 281 cases of advanced Dupuytren disease treated with dermofasciectomy. Disease severity, surgical techniques, rates of proximal interphalangeal joint contracture recurrences, disease recurrence, wound complications, and postoperative care protocols were systematically recorded and analyzed.

Results A total of 281 cases were reviewed, with patients undergoing dermofasciectomy for advanced Dupuytren disease. Full-thickness skin graft loss occurred in 1.1% of cases, with partial loss in 4.2%, primarily in diabetic patients. Junctional recurrence was observed in 3.1% of cases, with no recurrence under the graft itself. Functional outcomes were favorable, with 97% of patients reporting improved hand function. Nerve damage was minimal, with transient neuropraxia in 2.8% and only one case (0.4%) of persistent sensory loss.

Conclusions Dermofasciectomy appears to be a highly effective surgical intervention for advanced Dupuytren disease, offering substantial long-term benefits in terms of function and disease control. These findings underscore the efficacy and durability of dermofasciectomy in managing advanced cases, particularly with appropriate postoperative care. *(J Hand Surg Am. 2025;50(6):656–662.*

Type of study/level of evidence Therapeutic IIb.

Key words Dermofasciectomy, Dupuytren disease, full-thickness skin graft, operative technique, outcomes.

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*From the *Department of Plastic Surgery, Queen Alexandra Hospital, Portsmouth, United Kingdom.*

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Corresponding author: Wg Cdr Ankur Pandya, Eur Dip Hand Surg, FRCS(Plast), Mountbatten Department of Plastic Surgery, Queen Alexandra Hospital, Portsmouth PO6 3LY, United Kingdom; e-mail: ankur.pandya@nhs.net.

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Dupuytren disease is a progressive fibroproliferative condition that leads to architectural distortion of the palmar aponeurosis.[1] The key pathognomonic finding of Dupuytren disease is the presence of firm subcutaneous nodules found on the palmar surface of the hand.[1-5] Over time, cords may form in continuity with these nodules, and gradual contraction of the cords may lead to progressive finger flexion deformity.[1,2,4] The resulting contractures may result in impaired function of the hand, which affects

activities of daily living, and is usually the main driver influencing these patients to eventually seek medical attention.[1,6]

Without treatment, the disease will usually progress, and symptoms tend to worsen, especially in those who present at a young age with aggressive bilateral disease.[3] Disease that affects the proximal interphalangeal (PIP) joint is much more difficult to correct than disease that affects the metacarpophalangeal joint.[2,3,4,7] This is because the metacarpophalangeal joint is more resilient to ongoing stiffness in prolonged flexion compared to the PIP joint.[4] When practical, early treatment should be offered because longstanding contractures cause substantial deformity that is hard to correct.[2] Surgery is usually considered in those patients who have established finger flexion deformity, such as metacarpophalangeal joint contracture of 30° or PIP joint involvement with functional compromise.[3,4,8,9]

Percutaneous fasciotomy is the least invasive intervention, can be performed in an outpatient setting and has the quickest recovery, but is associated with high recurrence rates.[2,3,10] Fasciectomy involves the surgical removal of the pathological cords. Radical and limited fasciectomies have been described; in the former, all palmar and digital fascia are removed. Limited fasciectomy is less invasive and associated with quicker recovery times and fewer complications, although recurrence rates can still be high, up to 20% at 5 years in one study.[11]

Dermofasciectomy involves the en bloc surgical removal of involved palmar fascia, cord, and overlying skin.[2] The excised skin is then replaced by a full-thickness skin graft (FTSG). With this technique, the risk of recurrence is reduced in comparison to other operative strategies.[3] Dermofasciectomy is the preferred operative strategy for some surgeons in patients who have skin involvement or who are young and have ectopic disease (disease outside the hands), as these patients are at a particularly high risk of recurrence.[2,11] Disadvantages of this procedure relate to graft donor site morbidity, the possibility of graft failure, a longer postoperative rehabilitation and its complex nature in comparison to other techniques.[12,13] As such, it is often reserved for secondary cases where fasciectomy has already been attempted.

We sought to retrospectively review a series of patients who underwent dermofasciectomy and FTSG reconstruction at our unit and evaluate the indications, operative technique, postoperative regime, and outcomes.

MATERIALS AND METHODS

This was a review of 281 patients who underwent a dermofasciectomy and FTSG for Dupuytren contracture from 2001 to 2017. The minimum follow-up was 5 years. Patients were treated at the regional plastic surgery center and a peripheral hospital in the United Kingdom serving an approximate combined population of 1.4 million persons. Patient notes were collated and reviewed.

Inclusion criteria were patients with aggressive disease, strong family history, bilateral hand involvement, and dense cutaneous involvement, whereas exclusion criteria included patients with other hand conditions or comorbidities that could affect surgical outcomes. Patient demographics, including age, sex, and comorbidities, were recorded and analyzed.

The outcomes studied were graft survival, success of dermofasciectomy as a primary procedure, nerve damage, recurrence, and PIP joint release maintenance. These were assessed in clinic by the operative surgeon, surgical trainee or the hand therapist.

All patients underwent operation performed by a single senior plastic hand surgeon, assisted by a resident or as a supervising primary surgeon. Postoperative follow-up was conducted through in-person clinical assessments by the operating surgeon or/and hand therapist to ensure comprehensive patient monitoring. Patients were scheduled for in-person follow-ups at 1 week, 6 months, and annually for the first 3 years. Subsequent follow-ups were conducted yearly via telephone consultations, only if the patient would not attend in-person follow-ups.

To standardize the evaluation process, a structured questionnaire was developed in collaboration with hand therapists and three hand surgery consultants, and construct validity was preliminarily assessed in a pilot cohort of 15 patients (Appendix, available online on the *Journal*'s website at www.jhandsurg.org). This questionnaire systematically assessed physical symptoms, functional outcomes, and potential recurrence. The evaluation included pain (rated on a scale of 1−10), numbness or tingling (yes/no), grip strength improvement (yes/no), and skin graft concerns such as nodules, tightening, or breakdown (yes/no). Functional outcomes were assessed by asking patients about their ability to perform daily tasks and satisfaction with hand function, rated on a scale of 1−10. Patients were also queried about the recurrence of contractures or new nodules since their last follow-up.

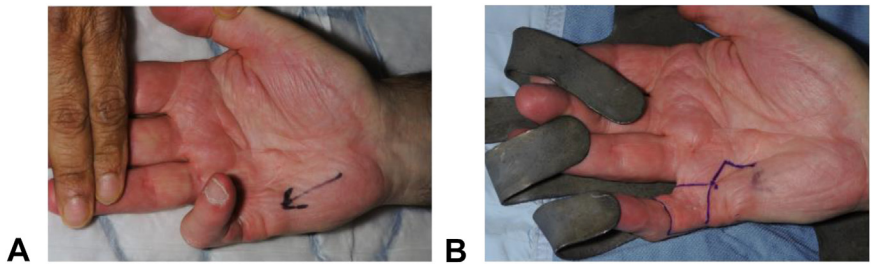

FIGURE 1: A Preoperative marking of the right hand little finger. MCP joint at 30° and PIP joint at 90°. **B** Preoperative marking of the right hand with diseased area on volar little finger marked with skin excision boarders along the midaxial lines and proximal extension. MCP, metacarpophalangeal.

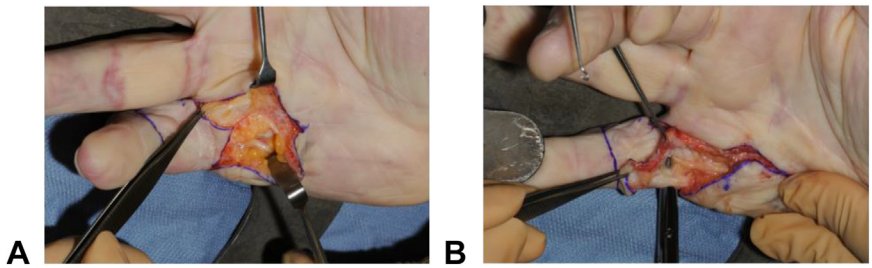

FIGURE 2: A Standard approach to visualize the neurovascular bundle, proximal to distal. **B** Extension of skin excision proximally and distally along the midaxial line.

During the initial postoperative clinic visit, patients received detailed instructions and education on the structured questionnaire to ensure consistency and reliability in subsequent assessments. Data on demographics, disease severity, surgical techniques, complications, and reoperations were recorded.

The study was approved by the institutional review board, and informed consent was obtained from each participant. All procedures adhered to the ethical standards of the responsible committee on human experimentation and the Helsinki Declaration of 1975, as revised in 2000. Necessary Health Insurance Portability and Accountability Act consents were also obtained.

Operative technique

All patients were offered regional anesthesia with or without general anesthetic augmented with a long-acting local anesthetic at the surgical site. A brachial tourniquet was used at a pressure of 280 mm Hg and deflated to facilitate hemostasis prior to insetting a FTSG. Incision on the diseased segment was made with extension proximally (Fig. 1A, B). The neurovascular bundles were identified proximal to the disease in normal tissue and dissected out in a proximal to distal fashion (Fig. 2A, B).

Aggressive resection of the involved skin, underlying fibrotic diseased fascia, and tissues was performed. Incisions went beyond the cordal disease to ensure maximal disease resection and extended laterally to the midaxial line of each digit. The skin, underlying cordal disease, fascia, and most of the fat were excised together en bloc where possible. Residual cords were individually resected if not excised en bloc with the skin. Proximal interphalangeal joint check rein release was performed, if residual flexion contracture was thought to be correctable, in 97 out of 143 (67%) of primary, all 61 (100%) of tertiary cases (which were all recurrences referred by other surgeons), and 71 out of 77 (92%) of general practitioner-referred cases (secondary cases) that included severe contractures that had worsened over time.

A FTSG harvested from the proximal volar forearm, or the inner aspect of the arm was used as the donor site during the main procedure. The FTSG was secured using a 5.0 Monocryl continuous suture along with a tie over dressing in the shape of a longitudinal bolster (Fig. 3).

None of the patients in our cohort were suitable candidates for collagenase injections, percutaneous needle fasciotomy, or fasciectomies because of either extensive skin involvement or the presence of aggressive disease in younger patients.

RESULTS

A total of 281 cases were identified over 17 years. Data collection ceased in April 2017. From then until

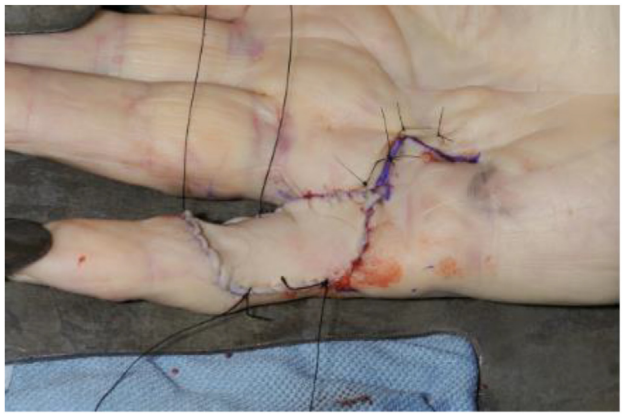

FIGURE 3: FTSG inset, harvested form volar forearm.

April 2022, all 281 patients had undergone a minimum 5-year follow-up. These included 143 cases with single-digit disease, 115 with two-digit disease, and 23 with three-digit disease. Of these cases, 21 patients were insulin-dependent diabetics.

Dermofasciectomy as a secondary procedure was performed as a revision after recurrence following a limited fasciectomy. A total of 61 cases were referrals from other surgeons for dermofasciectomy consideration. These cases were all recurrences. A total of 77 recurrent cases following a solitary prior procedure were referred from general practitioners, including cases with severe or longstanding contractures that had worsened over time.

The remaining 143 were cases of primary disease, but a large number had a delayed presentation because of waiting lists and the nature of the population distribution.

All 281 subjects completed the assessment up to 3 years. However, because of attrition primarily attributed to patients moving away or being uncontactable, patients were followed-up via telephone appointments with the use of our questionnaire to collect data.

Outcomes

Graft take: There were three (1.1%) total FTSG losses, two of which were in diabetic patients, and the other one in a fisherman who fell into the sea returning to work in the early postoperative period. One FTSG was performed again, and the other two were treated non-operatively with secondary intention healing and splinting. There were a total of 12 cases of less than 10% partial loss in the palmar aspect of the grafts; these were allowed to heal secondarily. Nine of these 12 were diabetic patients.

Reoperation was offered for one partial FTSG loss and one total FTSG loss, and twelve (3.4%) z-plasty procedures were performed because of tight linear FTSG borders.

Disease recurrence

No palpable recurrence was identified under any of the FTSGs during in-person assessments, including nodules or cords. Nine cases (3.1%) demonstrated disease extension at the junctions of the graft, with eight occurring at the proximal border of the FTSG and one distally. These findings were thought to most likely represent progression of fibroproliferative activity beyond the grafted area rather than true recurrence.

All patients were discharged from in-person follow-up only once acceptable functional recovery was achieved, and there were no complications or recurrences.

PIP joint contracture recurrence

A total of 211 of the 281 patients underwent surgical correction of the PIP joint contractures. This was in the form of a check rein ligament release in all patients. Twenty-nine patients (including all the patients with a PIP joint contracture greater than 90°) also underwent an accessory collateral ligament release. In patients with less than 45° PIP joint contracture (before surgery), there were 11 recurrences of PIP joint contracture out of 149 cases (7.4%). Among those with 45° to 90° PIP joint contracture (103 cases), there were 15 recurrences (14.9%). Twenty-nine cases had a PIP joint contracture of greater than 90°, and nine recurrences of PIP joint contracture (31%) were noted during the clinical follow-ups.

None of the 281 patients returned with a recurrence of disease. However, 21 patients were lost to follow-up, likely because of moving away, not wanting further surgery, or other reasons. This loss to follow-up means some symptomatic recontractures could have been missed.

Table 1 is divided into three columns, each representing a range of degrees of PIP joint contracture and the corresponding surgical outcomes.

Nerve damage

Of the 281 patients who underwent dermofasciectomy, altered sensation was documented in eight cases (2.8%). Most of these instances were classified as transient neuropraxia, presenting as temporary numbness or tingling in the affected digits. These symptoms typically resolved within 3 months after surgery with nonsurgical management, including physical therapy and careful monitoring. One patient (0.4%) experienced a more severe nerve injury,

TABLE 1. Results of PIP Joint Releases in our Cohort of Dermofasciectomy Patients

Preoperative PIP Joint Contracture <45°	Preoperative PIP Joint Contracture 45° to 90°	Preoperative PIP Joint Contracture >90°
• 149 cases • All corrected • 11 recurrences	• 103 cases (mainly secondary) • 91 complete corrections • 12 corrected up to 75° • 15 recurred (related to longstanding PIP joint arthrosis)	• 29 cases (all redo) Correction: • 3 not possible • 13 corrected up to 45° • 10 corrected between 10° to 45° 9 recurred

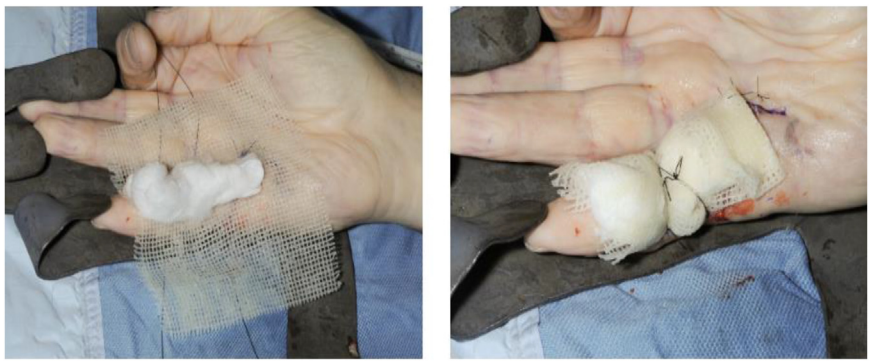

FIGURE 4: Tie-over dressing of FTSG with cotton wool soaked in hibitane (chlorhexidine gluconate 1% w/w, equivalent to 5% v/w chlorhexidine gluconate solution Ph.Eur) on a base of jelonet.

resulting in partial loss of sensation that persisted beyond 6 months. However, this patient did not report impairment in hand function (assessed via our questionnaire assessment). These findings indicate a low incidence of severe nerve damage associated with the dermofasciectomy procedure, aligning with existing literature on the safety profile of this surgical intervention.

Nearly all patients (97%) reported improved hand function postsurgery.

DISCUSSION

In 1984, Hueston[14] described the dermofasciectomy technique in young patients with a strong Dupuytren diathesis, excising skin and fascia as a primary prophylactic procedure. Our practice and indications for dermofasciectomy encompass the initial principles by Hueston[14] but also include a case-by-case approach for those with severe primary and recurrent secondary disease. Since the article by Hueston,[14] case series of varying numbers and the length of follow-up have been presented with varying results.[15] This study presents one of the largest longitudinal case series of dermofasciectomy to date, reporting favorable functional outcomes and low recurrence rates based on in-person assessments.[15]

The tie over dressing technique, augmented with an extension splint plaster and a delayed graft check at 14 days resulted in good rates of FTSG take rate (Fig. 4). Only 3 patients (1%) experienced graft loss, and 12 experienced less than 10% partial loss, with graft loss comparing favorably to the rate reported in the literature of approximately 4%.[16]

Kalb et al[17] conducted a literature review and outlined their approach to Dupuytren disease, emphasizing the importance of adhering to fundamental principles in each technique. These principles facilitate the removal of pathological tissue, the preservation of mobile skin, and the consideration of vascularity, making various approaches valid. Edmunds and Chien[18] proposed a straightforward approach that provides complete exposure and accommodates a wide range of closure options. This technique involves creating transverse incisions that can be extended to the midaxial line to enhance exposure, facilitate skin release, and reposition the scar apices laterally. Tanagho et al[19] also emphasized the importance of resection extending to the midaxial line to avoid contracture; however, they also used cross-finger flap reconstruction as well as FTSG technique.

van Rijssen et al[20] discussed the use of z-plasty in providing a good exposure of the pedicles and taking advantage of the greater pliability of the skin on either side of the cord to lengthen the skin by about 75%, thereby limiting the risk of the complications seen with needle aponeurotomy (skin tears and minor nerve injuries). This has been adopted in multiple dermofasciectomy procedures for Dupuytren disease for tight closures.[21] Twelve of our cases (4.2%) required revision Z-plasties because of tight linear FTSG borders. Cutaneous resection must extend to the midaxial line of the digit to minimize the risk of tight longitudinal volar scar, which can result in flexion contracture.[19]

Tonkin et al[21] also concluded that FTSG replacement did not jeopardize hand function in terms of two-point discrimination, finger flexion to palmar crease, return to work, and full functional recovery. However, Roush and Stern[22] reported poor outcomes of dermofasciectomy for the treatment of recurrent disease and found that total active range of motion was worse than prior to their procedure at the final follow-up visit. Our study demonstrated correctable results if PIP contracture was less than 45°. In addition, 11.6% had a residual PIP joint contracture of 15° to 20° if the PIP contracture ranged from 45° to 90°. For patients with severe PIP contracture of greater than 90°, the results varied, but were generally poorer.

Our study showed that PIP joint mobility was limited in some patients following surgical intervention, and we attribute this to degenerative changes within the contacted joint rather than an inflammatory process. Among patients with severe preoperative contractures (>90°), 9% demonstrated persistent stiffness despite successful surgical release. The lack of pain, combined with the duration of preoperative deformities, suggests that secondary degenerative changes, such as cartilage wear and periarticular fibrosis, may play a key role in restricting mobility.

De Ketele and Degreefe[15] found varying effectiveness and recurrence rates among different techniques for Dupuytren disease treatment. In their systematic review comparing limited fasciectomy, open palm technique, and dermofasciectomy with FTSG, they analyzed 79 studies. The results indicated that dermofasciectomy with FTSG had a lower recurrence rate, but many of the included studies were case series with potential bias.

Armstrong et al[23] carried out dermofasciectomy in 103 patients with recurrence in 11.6% of patients during their mean follow-up of 5.8 years. Smaller case series by Brotherston et al,[24] Searle and Logan,[25] Hall et al,[26] and Torrekens et al[27] all reported recurrence rates between 0% and 10%. Kelly and Varian reviewed 32 dermofasciectomies demonstrating recurrence rate at 47%.[28] A large population-based cohort study of 121,488 patients using Hospital Episode Statistics data showed overall rates of reoperation on the same hand for Dupuytren disease after dermofasciectomy as 20%, the same figure as limited fasciectomy, however this includes disease extension.[29] Our study demonstrated no recurrence under the FTSG and eight cases of junctional recurrence at the proximal border of the FTSG with one distally, as observed in our in-patient follow-ups.

Searle and Logan[25] report junctional recurrence in 4 of 40 rays (10%) at the proximal and distal ends of grafts, highlighting the importance of a more radical resection extending into disease free tissue. Ketchum and Hixon[30] reported an 8% incidence of extension outside the grafts in their series. Kelly and Varian[28] demonstrated a 6% incidence under the skin graft. We suggest wide resection of the diseased skin to minimize the risk of under-graft recurrence. In our study, we observed no-under graft recurrences; however, we did report a low frequency of junctional recurrence (3%, nine of the 281 cases).[28]

Few studies have directly compared fasciectomy with dermofasciectomy. Tonkin et al[21] compared fasciectomy and dermofasciectomy techniques and demonstrated an average of 46% recurrence across the whole cohort of 128 procedures; however, no recurrence was found deep to the graft reconstruction arm of the group. Chen et al[31] reported no recurrence under the graft in 40 hands treated with dermofasciectomy and FTSG, whereas there was recurrence in 46% of hands treated by fasciectomy alone.

Dupuytren disease follow-up varies based on treatment, disease severity, and individual factors. The goal is to assess treatment outcomes, detect recurrence, and ensure effective management. In their study, Ansari et al[16] assessed treatment outcomes in patients who underwent dermofasciectomy with hand therapy, tracking progress until 12 months after surgery. However, it is important to note that the mean time from follow-up to discharge from care in their study was approximately 7 months. In a separate study conducted by Armstrong et al[23] of 103 patients, dermofasciectomy was performed with a considerably longer mean follow-up period of approximately 5.8 years. Abe et al[13] reported a follow-up duration of 32.2 months in their investigation. Finally, Roush and Stern[22] conducted a study of various techniques with a median follow-up period of 4 years (with a range spanning from 1 to 15 years). These varying follow-up durations allowed for comprehensive assessments of the outcomes and long-term effects of dermofasciectomy in the management of Dupuytren disease and

compare well with our study wherein all patients were followed-up and assessed clinically for a minimum period of 3 years with a 5-year telephone assessment regarding their function prior to discharge.

CONFLICTS OF INTEREST

No benefits in any form have been received or will be received related directly to this article.

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