Dermofasciectomy and full-thickness grafts in the treatment of Dupuytren’s contracture

We report a 16-year experience with full-thickness grafts to resurface defects created by releasing contractures of Dupuytren’s disease. This technique was used in 68 patients with Dupuytren’s contracture from 1970 to 1985. Follow-up of 36 hands of 24 patients averaged 3.9 years postoperatively. There was no recurrent disease in the palms and digits that were covered with the full-thickness grafts. The incidence of extension outside the grafts was 8%. The area of full-thickness grafting covered most of the width of the palm, an extension of Gonzalez’s technique, which was presented in 1970. (J HAND SURG 1987;12A[2 Pt 1]:659-63.)

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For the last 16 years one of us (L. D. K.) has used full-thickness grafts after the release of Dupuytren’s contracture. This change in our practice from limited fasciectomy alone was stimulated by the report of Gonzalez¹ in which he released and grafted the cords of Dupuytren’s contracture in the same way he released and grafted a burn scar contracture, i.e., incision and full-thickness graft, with no excision of tissue, no dissection, and no treatment of the nodule. Morbidity was significantly reduced, and he found no recurrences in the grafts.

The recurrences after limited fasciectomy alone led us to consider that improved results in the treatment of Dupuytren’s contracture would not likely come from an improvement in surgical technique but in the biological approach to the problem. The full-thickness graft was a lead in that direction.

After doing release and full-thickness grafts for a few years to treat patients with Dupuytren’s contracture, our curiosity led us to examine the world literature, since there had been few reports on the subject in the American medical literature. We found that Berger² and Lexer³ advocated full-thickness grafts in the treatment of Dupuytren’s contracture based on the analogy of correcting burn scar contractures of the palm.

The observation that Dupuytren’s disease did not occur beneath a skin graft was reported by Piutachs and Mir y Mir,⁴ Hueston,⁵ and Gordon.⁶ Hueston,⁷

Fig. 1. Two small full-thickness grafts resurfaced the anterior aspect of the proximal interphalangeal joint and distal palmar crease of a patient with a flexion contracture involving the metacarpophalangeal joint and proximal interphalangeal joint of the small finger.

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Fig. 2. A, The distal palmar crease is the area of dermofasciectomy. The full-thickness skin graft has been taken and is ready to be applied to the bed in which hemostasis has been achieved. B, A bolus has been tied over the skin graft; this is left in place for 3 weeks. C, A mature full-thickness skin graft, with good color match and no recurrence or extension 1 year after dermofasciectomy. D, The donor site scar several months after closure is narrow and obscure on the medial aspect of the upper arm.

prompted by the observation that the fibroblastic process of Dupuytren's contracture appeared to be controlled or eliminated by replacement of skin in that area, initiated the practice of primary excision of the skin and the underlying fascia in selected cases of Dupuytren's contracture. In these cases the prognosis was regarded as likely to lead to local recurrence, specifically those patients that had a diathesis for Dupuytren's contracture. Hueston reported 65 primary dermofasciectomies
and 32 secondary dermofasciectomies (for patients with recurrent contractures). There was total freedom of recurrence beneath the grafts, although extension occurred occasionally immediately adjacent to the graft. He stated that no skin replacement was required in any patient more than 59 years of age.

Tonkin and associates addressed the problem of extension after dermofasciectomy. They reviewed 100 patients who were treated at the Derby Hand Unit for Dupuytren's contracture with a follow-up of 9 to 90 months; thirty-five had dermofasciectomies.

The overall recurrence rate was 46.3%. Three of the grafts had palpable nodules beneath them. Only one was subjected to biopsy; however, the biopsy specimen was not consistent with that of Dupuytren's disease. In the patients who did not undergo a graft operation, there was a 71% recurrence rate.

No female patients had grafts, and there was a 25% recurrence rate in females.

Of great interest was a 42% extension rate outside the grafts for secondary grafts and 33% for primary grafts.

Schneider et al. followed-up 49 bands treated with the McCash open palm technique for an average of 5 years. They found a recurrence rate of 34%, an extension rate of 48%, and some loss of flexion in 41%.

Materials and methods

Patients with a nodular form of Dupuytren's disease were offered an intranodular injection of triamcinolone at 3-month intervals until softening and/or flattening of the diseased area occurred. The patients with a contracture were offered release and graft. The procedure was usually performed in ambulatory surgery with the patient under axillary block anesthesia. Whereas Gonzalez' reported taking grafts from the groin and Hueston reported a vertical excision of skin from the medial aspect of the upper arm, we found that a large swathe of skin that can cover the entire width of the palm can be obtained transversely from the anteromedial aspect of the upper arm, leaving a relatively obscure scar.

After the patient is anesthetized, the tourniquet is placed as proximal on the upper arm as possible and covered with a plastic drape preppeled so that all of the upper arm up to the tourniquet can be visualized. The average graft is 10 cm long by 2 cm at the widest point of the ellipse; after the skin at the distal palmar crease is incised or fibrotic, involuted skin is excised, the tourniquet is released, and absolute hemostasis is achieved. This is done while the graft is being taken and the donor site is being closed.

Initially, small grafts were placed in areas limited to active disease as documented by both Hueston and Gonzalez (Fig. 1). However, because of the appearance of extensions immediately outside the graft, larger grafts that cover over 50% of the palm, including the ulnar side at the distal palmar crease, are now used. The full-thickness grafts extend from the ulnar side of the second metacarpal to the midlateral line of the small finger at the distal palmar crease. The fascia under the skin resection is removed, with no further dissection before application of the grafts (Fig. 2).

A digital contracture is released by a midlateral to midlateral transverse incision on the palmar side of the proximal phalanx. Occasionally, it is necessary to develop short proximally and distally based flaps to sufficiently release a cord or checkrein ligament contracting a proximal interphalangeal (PIP) joint (Fig. 3). Care is taken not to open the tendon sheath in the area to be covered by the full-thickness graft. Once the contractures are released, residual tissue of Dupuytren's disease is injected intraleesionally with triamcinolone, up to 120 mg.

The grafts are covered by a bolster dressing that is
left in place for 3 weeks. After this period of compression and elevation, graft survival is assured. The patients are advised to keep their hands elevated during the 3-week postoperative period.

The metacarpophalangeal (MP) joints and involved PIP joints are splinted in extension until the bolsters are removed, then the splints are worn at night for an additional 6 weeks.

Results

Sixty-eight patients with contractures from Dupuytren's disease were treated surgically with the above protocol from 1970 to 1985. Thirty-six hands of 24 patients were reviewed; the average follow-up was 3.9 years. Twenty patients were male, and four were females. Of the patients 21.7% had plantar involvement; 35% had a positive family history. The average age of onset was 44.6 years. The disease was bilateral in 52%, and the individual finger involvement was as follows: thumb 4.6%; index finger 9.3%; long finger 15.6%; ring finger 31.2%; small finger 39%. Six patients had recurrent disease that had been treated previously elsewhere, and 35% experienced discomfort from the nodules or contractures.

In patients with the nodular form of the disease without joint contracture (these patients are not part of this series), only one of more than 50 patients has progressed to contracture requiring surgical release after a series of triamcinolone injections. Several patients had periodic increases of their nodules that required multiple injections. Some of these patients have been followed-up with conservative management for over 10 years.

Of the 68 patients treated surgically for Dupuytren's disease that had progressed to contracture and had excision and skin graft as described above, 24 patients (36 hands) were available for follow-up.

Only in the early part of the series when the bolster over the graft was left on for 2 weeks was there an occasional partial loss of the graft. In the middle 1970s we began leaving the bolster on for 3 weeks and since that time skin graft loss has been a rare occurrence. There was a total absence of recurrence of Dupuytren's disease to the grafted area of the palm. Extension of the disease to areas outside the graft was seen in three of 36 hands, or in 8% of patients.

There were no breakdowns of the grafted skin and most patients could return to using a hammer, a tennis racket, or golf club in 6 weeks. They were able to return to light duty in a mean of 13.5 days.

Occasionally a light growth of hair was reported from the grafts, which was easily handled with a depilatory. The color match and general appearance of the graft from upper arm to palm was satisfactory in 95% of patients. Decreased sensibility was not a problem.

There was no difference in the functional results, i.e., increased range of motion postoperatively, in this series and our previous experience with limited fasciectomy except where a higher incidence of recurrences and associated recontractions occurred in the later group.

Discussion

Just as the progress of untreated Dupuytren's disease still remains unpredictable, so exists uncertainty concerning its evolution after operation. Is it possible that surgery may aggravate the disease and cause a more rapid development of deformity than would have occurred had it not been performed? This is certainly suggested after seeing numerous hands crippled by contractures in patients with a strong Dupuytren's diathesis who previously had multiple attempts at release and excision of the involved tissue.

It would seem that at present, the surgical treatment of Dupuytren's contracture represents a compromise. Fasciectomy limited to the immediate diseased area corrects the clinical manifestations of the disease but is followed by a high incidence of renewed disease requiring subsequent surgery. Under the best of circumstances, disease will redevelop in half of the hands operated on with a limited fasciectomy, and two thirds of these will require more surgery to correct the functional disability.

With an expected control rate of 50% under favorable conditions for limited fasciectomy, one must question this therapeutic modality. Possibly the cure for the condition will be in the nature of a biochemical modality similar to the use of triamcinolone to modify collagen metabolism, fibroblastic proliferation, and contraction of myofibroblasts at the onset of the disease.

Once the disease has become established and advanced to contracture of one or more fingers, the contractures must be released in a way that reduces morbidity and the incidence of recurrence and extension of the disease.

The use of full-thickness grafts after release of contractures appears to us at this time to be a feasible biological approach to the problem. As Hueston suggests, shutting off the mediating organ or tissue that he thinks is the skin, may account for the lack of recurrences after dermofasciectomy as reported by Hueston, Gonzalez, Tonkin and associates and now by us. The question of how the nodule should be handled is most perplexing to us at this time. Hueston suggests
that the nodule is the focal lesion of Dupuytren's contracture; it contains the myofibroblasts, which through their contractions, function as a motor to flex the involved joints by their action on the cords that undergo work hypertrophy.\textsuperscript{16,19} If this is so, should not the nodule be removed? We have elected to leave the nodule alone. In those patients in which the contractile cord was interrupted with a full-thickness graft and the nodule left in place, in most cases the nodule either underwent atrophy or remained unchanged. In one patient the nodule was left untouched and observed for 10 years at which time it was considerably smaller than it was preoperatively. With the contracted joints released, the nodule can be dealt with by intralesional injections of triamcinolone beginning at the time of operation.

Our opinion after this experience is that the most benign and physiological approach to this disease process is the minimal dissection required to release contracted joints and interruption of the disease process with a full-thickness graft or grafts as necessary. The result is less edema, inflammation, stiffness, and re-reduction of the incidence of recurrence. We believe that use of the expanded full-thickness graft particularly over the ulnar aspect of the hand decreases the incidence of extension of the disease process—extension being defined as new disease occurring outside the area of surgical dissection. This technique is appropriate in the surgical treatment of patients with Dupuytren's disease in whom contracture of one or more fingers develops before the age of 40, or who have recurrent disease, or a positive family history or evidence of ectopic disease in addition to contracted fingers.

REFERENCES


See invited comment on page 644.
This article is true to its title. The authors have grouped together all of their patients who had skin grafts applied to the palm or fingers without differentiating those patients in which the skin and/or the fascia was incised or excised. I believe a distinction should be made.

Hueston described dermofasciectomy as an operation in which the overlying skin and the underlying fascia are excised. This has proved to be the operation of choice for recurrent disease. It should also be considered as a primary procedure in the occasional patient who is seen with a strong diathesis. It is an extensive operation. It is not often indicated as a primary operation and should only be performed by an experienced surgeon.

Gonzalez has described a sensible approach to the treatment of Dupuytren’s disease. The skin and fascia are divided transversely, small amounts of either may or may not be removed, and the defect created by extending the joint is filled by a full-thickness skin graft. This is a much less extensive operation than dermofasciectomy. Gonzales has reviewed his results recently (Hand Clinics 1985;1:641) and continues to recommend this operation. He points out however that the problem of persistent and recurrent contracture at the proximal interphalangeal joint is not solved by his (or any other) operation.

In order to evaluate the result gained by an operation to treat Dupuytren’s disease I believe that objective data should be presented concerning the extent of disease, the severity of contracture at the metacarpophalangeal and proximal interphalangeal joints, and the prevalence of recurrence. Aside from stating that there was extension of the disease in the palm in 8% of the patients no data is presented in this article.

Three patients are illustrated in Figs. 1 through 3. There are no preoperative pictures. Fig. 1 illustrates the Gonzalez procedure. Fig. 2 presumably shows excision of skin and fascia. There is no disease in the thumb web or in the distal palm or the fingers. This patient did not have extensive disease. I would question the need for such an operation regardless of age or other factors. Fig. 3 shows a more extensive operation, but the extent of disease in the palm, the degrees of contracture at the metacarpophalangeal and proximal interphalangeal joints, and whether or not skin was incised or excised in the palm or finger are not indicated. Let us blame the editors for not allowing the authors to include more pictures!

These criticisms are academic. The value of this article is to show that full-thickness skin grafts can be used to advantage in the treatment of Dupuytren’s disease. They are required in some cases of recurrent disease but may also be used as described here for less aggressive disease.

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