

Skin grafting in Dupuytren's Disease

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Dermofasciectomy and grafting entails the removal of diseased palmar fascia which is excised along with any overlying involved skin hence the term *dermofasciectomy*. A dermofasciectomy requires excision of skin back to the midlateral line in order to prevent scar contracture anterior to the axis of flexion. This would otherwise lead to post-operative scar contracture and thus recurrence of deformity. The dermofasciectomy also, by this midlateral excision, readily exposes the residual fascial connections to the skin and within the lateral digital sheets that may indeed be the source of incomplete correction or later recurrence.

Some surgeons also utilise adjunctive release of the contracted PIPJ capsule. This may be more likely in those who have the severe disease or recurrence that prompts the dermofasciectomy and graft. With a significant contracture, this can expose the flexor tendons denuded of tendon sheath pulley as the pulley is divided transversely to expose the check-rein ligament. The denuded tendon is not an ideal bed for a graft although in the author's experience the tissue will inosculate.

Dermofasciectomy was first recommended by Hueston in 1984 [1]. Excision of the skin as well as the underlying diseased fascia allows removal of all the DD collagen filaments extending between the DD fascia and skin, minimising the risk of recurrence. The resultant skin defects can be primarily closed, partially left open to close by secondary intention e.g. McCash technique or grafted with either autologous skin or with a growing number of biosynthetic or biological skin substitute grafts. The reduction of skin tension may aid in reducing the progression of the Dupuytren's Disease [2].

The literature demonstrates low recurrence rates following dermofasciectomy with skin grafting. There is only one randomized study. Ullah et al. (2008) randomised patients to have either an ellipsoidal "firebreak graft" or a z-plasty [3]. The graft did not reach to either side of the phalanx and the recurrence rates was the same in each group. Whilst there are no other randomised studies (to remove case selection or technical skill bias), the combined literature (Table 1) suggests a reduced recurrence compared with any other needle or surgical intervention.

Table 1: Recurrence rates after skin grafting for DD

Author	Year	Number	Follow up	Recurrence	Comments
Villani [8]	2009	23 hands	8.8 years	3/23	
Ketchum [9]	1987	36 hands	3.9 years	0	
Roy [10]	2006		4.4 (2 to 10 years)	0	Used a frame. No recurrence in graft.
Aby [11]	2007	9 hands	??	2	Nodule, no contracture
Ullah [3]	2009	79 hands	36 months	12.2%	RCT fasciectomy vs firebreak graft. Equal recurrence in each group.
Brotherston [12]	1989	34 hands	100 months	0%	
Tonkin [5]	1984	35 hands	9 to 95 months	0	
Armstrong [13]	2000	103 hands	5.8 years	11.6%	

The skin graft can be taken from various sites. The upper inner arm is a convenient with the donor scar fairly well hidden from exposure. If this site is used, then the tourniquet should be placed as high up the arm as possible to allow space between the elbow and the cuff to retrieve the graft. Other sites include the groin crease (which unnecessarily extends the surgical field), the flexion crease of the elbow or the



upper outer forearm. The latter can leave a noticeable scar. The graft can be attached in a variety of ways depending on the surgeon's training and experience. Meticulous attention to detail is needed to prepare and inset the graft properly.

Up to three fingers have grafted at the same time [4], which might encourage some to avoid staged surgery despite tourniquet time, graft availability, surgical fatigue and potentially more challenging post-operative rehabilitation.

Tonkin et al. [5] reported a return to manual work at 8.5 weeks for fasciectomy (compared with 8.9 weeks for skin grafts) and 3.8 weeks for clerical work (compared with 5.7 weeks for skin grafts).

Complications: Primary skin grafting should have a complication rate similar to primary surgery, with the proviso that if the dermofasciectomy is being performed for dense disease then it may be more prone to neurovascular damage. The complication rate in DD surgery seems to correlate with deformity [6]. Denkler [7] reviewed the English literature and found that arterial injury is 10 times more likely, and nerve injury 5 times more likely, with surgery for recurrent disease than for primary disease. Graft failure is a potential risk but the literature and the author's anecdotal experience suggests that this is very low indeed.

Post-operative management

Post-operative dressings are a matter of preference. Avoidance of haematoma is crucial, so fenestration of the graft, closely applied dressings and elevation will help. Plaster immobilization is certainly not needed – the finger relaxed rather than forcibly extended is probably beneficial. The dressings can be taken down within 5 to 7 days by which time the graft has inoculated and gentle mobilization can be commenced. There is no evidence that splinting is needed after surgery. Identification of which patients may benefit from splinting and the duration of any such treatment is arbitrary and is a matter of clinical judgment by the surgeon and hand therapist. Hand therapy is however very helpful to guide the patient through the initial stages of discomfort, apprehension (the graft can appear quite alarming until it matures) and stiffness.

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