UNIVERSITY OF LEEDS

This is a repository copy of *Dupuytren Disease Infiltrating a Full-Thickness Skin Graft*.

White Rose Research Online URL for this paper:

<https://eprints.whiterose.ac.uk/105540/>

Version: Accepted Version

Article:

Wade, RG orcid.org/0000-0001-8365-6547, Igali, L and Figus, A (2016) Dupuytren Disease Infiltrating a Full-Thickness Skin Graft. *Journal of Hand Surgery*, 41 (8). e235-e238. ISSN 0266-7681

<https://doi.org/10.1016/j.jhsa.2016.04.011>

© 2016 by the American Society for Surgery of the Hand. Licensed under the Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International
<http://creativecommons.org/licenses/by-nc-nd/4.0/>

Reuse

Items deposited in White Rose Research Online are protected by copyright, with all rights reserved unless indicated otherwise. They may be downloaded and/or printed for private study, or other acts as permitted by national copyright laws. The publisher or other rights holders may allow further reproduction and re-use of the full text version. This is indicated by the licence information on the White Rose Research Online record for the item.

Takedown

If you consider content in White Rose Research Online to be in breach of UK law, please notify us by emailing eprints@whiterose.ac.uk including the URL of the record and the reason for the withdrawal request.

eprints@whiterose.ac.uk
<https://eprints.whiterose.ac.uk/>

Title

Dupuytren's Disease Infiltrating a Full Thickness Skin Graft

Abstract

Although the role of the skin in the development and propagation of Dupuytren's disease remains unclear, dermofasciectomy and full thickness skin grafting (FTSG) appears to delay recurrence. In 2011, a 71-year-old left-handed retired man presented with recurrent Dupuytren's disease in his dominant hand. He originally underwent a primary dermofasciectomy and FTSG in 1991 for Dupuytren's disease involving the palmar skin. Twenty years later, the left middle finger was drawn into flexion by a recurrent cord, and the old graft and adjacent palmar skin were clinically involved by fibromatosis. We performed a revision dermofasciectomy and FTSG. Microscopic analysis of the excised graft demonstrated dense infiltration of the entire skin graft by Dupuytren's disease, with areas of active and burnt-out fibromatosis distinct from hypertrophic scarring. This report of Dupuytren's fibromatosis infiltrating a skin graft raises the questions about the pathophysiology of Dupuytren's disease.

18 **Introduction**

19

20 Dupuytren's disease is thought to begin within the palmar aponeurosis, progressing axially along
21 fascial bands to infiltrate deeper structures and the overlying skin. Dermal fibromatosis has been
22 demonstrated within the palmar skin of patients with both primary and recurrent Dupuytren's
23 disease¹⁻³. Also, dermofasciectomy with full thickness skin graft (FTSG) reconstruction appears to
24 alter the course of recurrence^{2,4}. However, the role of the skin in the propagation and recurrence of
25 Dupuytren's disease remains a matter of debate.

26

27 We describe a case of Dupuytren's disease infiltrating a skin graft and discuss its significance in
28 our understanding of the behaviour of this common condition.

29

30 **Case Report**

31 In January 1991, a 71 year old retired left-handed male underwent primary dermofasciectomy of
32 the left palm and middle finger for a metacarpophalangeal joint (MCPJ) contracture of 30° with
33 clinically tethered and deficient overlying skin, attributed to Dupuytren's disease. At the time, the
34 skin from the distal palmar crease to the proximal interphalangeal joint (PIPJ) crease was excised
35 along the midlateral line and the defect reconstructed with a FTSG harvested from the ipsilateral
36 medial forearm. Post-operatively, approximately 20% of the graft failed at its proximal margin and
37 this was allowed to heal by secondary intention, resulting in a tethered scar. This symptomatic scar
38 was excised in 1992 and the defect healed by secondary intention. Twenty years later, the patient
39 presented with a recurrent contracture of the left middle finger and a new contracture in the
40 ipsilateral thumb (Figure 1). Both his family history and medical history was unremarkable. He had
41 never smoked and consumed minimal alcohol. He took no regular medication.

42

43

44 On examination, there was a pretendinous cord originating in the palm along the 3rd ray and
45 investing the PIPJ of the middle finger. The overlying skin graft and adjacent native palmar skin
46 was tethered to the cord. The middle finger flexion contracture was 51° at the MCPJ and 62° at the
47 PIPJ. The left thumb had a prominent Type 3 cord⁵ resulting in an abduction deficit of 35°. There
48 were no palpable nodules. The feet and genitals were normal.

49

50 In April 2011, a revision dermofasciectomy to the left palm and middle finger and fasciectomy to
51 the ipsilateral thumb was performed under general anaesthesia. The dermofasciectomy involved
52 excision of the graft as well as all the skin and subcutaneous tissue from the palmar crease to the
53 distal interphalangeal joint (DIPJ) crease, along the midlateral lines. The specimen was sent for
54 histological analysis. Despite releasing the accessory collateral ligaments and volar plate, there
55 was a residual flexion deformity of 20° at the PIPJ. A FTSG was harvested from the ipsilateral
56 medial forearm and inset with 5-0 Vicryl rapide® and a tie-over sponge dressing. Fasciectomy of
57 the thumb was performed through a curvilinear incision in the web space which was closed
58 directly. The hand was wrapped in soft dressing and elevated in a Bradford sling.

59

60 At 2 weeks, there was 100% graft take, the middle finger MCPJ straightened fully, while the PIPJ
61 continued to demonstrate an extension deficit of 20°. For the first 4 weeks, he received
62 physiotherapy without splinting and nurse-led wound care. He was discharged after 14 months of
63 surgeon surveillance. His result at 3 years following the revision surgery is shown in Figure 1.

64

65 Histological assessment of the operative specimens showed that the FTSG was densely infiltrated
66 by Dupuytren's fibromatosis in both the active (proliferative) and burnt-out (involutional) stages
67 (Figure 2).

68

69 **Discussion**

70 This case shows evidence of Dupuytren's fibromatosis invading non-glabrous skin, which
71 represents atypical disease behaviour and a potentially interesting avenue for future research.

72

73 In 1969, Hueston proposed that recurrent Dupuytren's disease should be managed by skin
74 excision and replacement⁶. The benefit of skin excision was explained by Logan and colleagues
75 when they showed Dupuytren's fibromatosis within the dermis and epidermis of patients with
76 recurrent disease, resulting in their conclusion that the only way to adequately treat disease of this
77 magnitude was by radical excision^{1,7}. Recently, our group has also shown that Dupuytren's
78 fibromatosis also exists in the skin of patients without clinically apparent skin involvement³.
79 Consequently, it has become accepted that the skin plays a role in disease recurrence and
80 extension¹, although the underlying pathogenesis remains unclear. The outcomes of most case
81 series have suggested that dermofasciectomy and FTSG reconstruction may delay the onset or
82 reduce the risk of disease recurrence⁴⁻¹⁰; however, they are underpowered retrospective
83 observational studies and subject to substantial risks of bias and confounding. Intuitively, excision
84 of all diseased tissue should result in a longer disease free interval, whether dermofasciectomy
85 confers any benefit remains uncertain. In our unit, we perform dermofasciectomy and FTSG
86 reconstruction for any recurrent disease or primary disease which clinically involves the skin
87 (defined by pitted deficient skin tethered to a nodule or cord).

88

89 The validity of the diagnosis of fibromatosis based on the sequence of events and microscopy
90 alone could be questioned, because the differentiation hypertrophic scarring from Dupuytren's
91 fibromatosis histologically is difficult. The biochemical and immunohistochemical markers of
92 Dupuytren's disease are well described⁸ but these are not in routine clinical use and were not used
93 in this case given the archetypal microscopic appearances.

94

95 We believe that the burden of skin disease in Dupuytren's fibromatosis is greater than currently
96 perceived and clarifying this could be helpful in better understanding the disease. Complete

97 excision through the removal of all diseased tissue, as well as a margin of healthy tissue, is the
98 model applied to many surgically treated conditions including fibromatosis in other anatomical
99 locations. However, the same notion has never been discussed with respect to Dupuytren's
100 disease. Varian et al (1990) support the concept of complete excision because they described
101 recurrent cords beneath a FTSG which they attribute to incomplete clearance⁹. Although it seems
102 intuitive to speculate that radical excision may improve disease control^{1,2,4,6,7,9}, we believe that
103 further prospective clinical research is necessary to better understand this common condition.

104

105

106 **Figure Legends**

107

108 **Figure 1.** Top row: Preoperative photographs. Lower row: Three years post revision
109 dermofasciectomy with a healed full thickness skin graft.

110

111 **Figure 2.** These are micrographs of the skin graft excised from the palm and stained with H&E.
112 Upper row: low magnification showing fibromatosis in the dermis which is distorting the normal
113 architecture of the skin, obliterating the rete ridges and displacing adnexal structures. Middle row:
114 medium magnification showing a zone of active fibromatosis (arrowheads) in the reticular dermis.
115 The adipocytes (arrows), which would have been on the underside of skin graft, are shown to be
116 encased by the fibromatosis, displacing them into the dermis, away from the subcutis. Lower row:
117 high power magnification showing densely proliferating myofibroblasts typical of Dupuytren's
118 disease.

119

120 **References**

- 121 1. McCann BG, Logan A, Belcher H, Warn A, Warn RM. The presence of myofibroblasts in
122 the dermis of patients with Dupuytren's contracture. A possible source for recurrence. *J*
123 *Hand Surg Br.* 1993;18(5):656-661.
- 124 2. Armstrong JR, Hurren JS, Logan AM. Dermofasciectomy in the management of
125 Dupuytren's disease. *J Bone Joint Surg.* 2000;82:90-94.
- 126 3. Wade R, Igali L, Figus A. Skin involvement in Dupuytren's disease. *The Journal of hand*
127 *surgery, European volume.* Sep 9 2015.
- 128 4. Ullah AS, Dias JJ, Bhowal B. Does a "firebreak" full-thickness skin graft prevent recurrence
129 after surgery for Dupuytren's contracture? A prospective, randomised trial. *J Bone Joint*
130 *Surg Br.* 2009;91:374-378.
- 131 5. Figus A, Britto JA, Ragoowansi RH, Elliot D. A clinical analysis of Dupuytren's disease of
132 the thumb. *The Journal of hand surgery, European volume.* Jun 2008;33(3):272-279.
- 133 6. Hueston JT. The control of recurrent Dupuytren's contracture by skin replacement. *Brit J*
134 *Plast Surg.* 1969;22:152-156.
- 135 7. Searle AE, Logan AM. A mid term review of the results of dermofasciectomy for
136 Dupuytren's disease. *Ann Chir Main Memb Super.* 1992;11:375-380.
- 137 8. Shih B, Watson S, Bayat A. Whole genome and global expression profiling of Dupuytren's
138 disease: systematic review of current findings and future perspectives. *Ann Rheum Dis.*
139 2012;71(9):1440-1447.
- 140 9. Varian JP, Hueston JT. Occurrence of Dupuytren's disease beneath a full thickness skin
141 graft: a semantic reappraisal. *Ann Chir Main Memb Super.* 1990;9(5):376-378.

142