Ulnar Para-metacarpal Flap for Recurrence of Dupuytren's Disease with Skin Ulcer: A Case Report

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What to Learn from this Article?

Surgical technique and Utility of Ulnar Para-Metacarpal Flap

Abstract

Introduction: In a patient with recurrent Dupuytren's disease, we performed dermofasciectomy including the diseased skin and soft tissue, and covered the soft tissue defect using an ulnar parametacarpal flap.

Case Report: A 65-year-old man had undergone invasive aponeurectomy for Dupuytren's contracture of the right 5th finger 3 years before, but showed recurrence about 1 year after surgery. Since a skin ulcer was noted at the site of recurrence, dermofasciectomy including the scarred skin was performed on the palmar side of the 5th finger, and the skin defect was covered with an ulnar parametacarpal flap. No recurrence has been noted for the 6 months since the surgery.

Conclusion: The ulnar parametacarpal flap, in which the vascular pedicle is easy to identify, is useful for covering a skin defect on the palmar side of the 5th finger if used as an island flap. However, a disadvantage of this flap is that it is likely to develop congestion due to poor venous return.

Keywords: Ulnar parametacarpal flap, Recurrence of Dupuytren's disease, Dermofasciectomy

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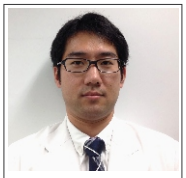

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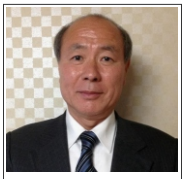

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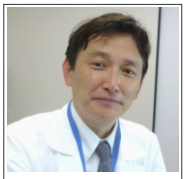

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Introduction

There are various methods for the surgical treatment of patients with Dupuytren's disease [1-3], and invasive aponeurectomy from the palmar side, in particular, is widely performed. However, it is associated with the risk of complications, including a delay of postoperative healing and infection [4]. Moreover, recurrent cases often involve problems with the skin/soft tissue, such as scarring of the surgical wound and ulcer formation [5]. There have been reports of recurrent cases treated with flap grafting and open treatment since covering of the palmar side is difficult after surgery [6,7].

We performed dermofasciectomy including the diseased skin and soft tissue, and covered the soft tissue defect using an ulnar parametacarpal flap in a patient with recurrent Dupuytren's disease.

Case Report

A 65-year-old man had undergone invasive aponeurectomy for Dupuytren's disease in the right 5th finger 3 years before. Although recurrence was observed about 1 year after the initial surgery, the patient was observed as there was no activity of daily life disturbance. However, a skin ulcer (Fig. 1) was noted at the scar of the recurrence site, and the patient re-visited our hospital. On the revisit, the angle of extension of the right 5th finger was -90 at the proximal interphalangeal (PIP) joint and -45 at the metacarpophalangeal (MP) joint, and the Tubiana stage was IV. Surgery was selected to treat the skin ulcer in the scarred area.

Figure 1: Dupuytren's contracture of the right 5th finger. A skin ulcer in the scarred area at the site of recurrence

Surgery was performed with a tourniquet applied to the brachium (250 mmHg) under brachial plexus block. Dermofasciectomy was performed including the diseased skin and scar tissue showing ulcer formation. The restriction of extension after surgery was -45 at the PIP joint and 0 at the MP joint. A skin defect was noted between the PIP and MP joints on the palmar side of the 5th finger, and the flexor tendon and neurovascular bundle were exposed (Fig. 2A). A flap, which was fusiform in the longitudinal direction and had a width of 20 mm, covering the area from the ulnar side of the MP joint to the ulnar side of the hypothenar region was designed (Fig. 2B) and elevated, including the fascia of the abductor muscle of the 5th finger (Fig. 2C). A penetrating branch of the palmar artery of the 5th finger was identified, and, using it as a vascular pedicle, the flap was rotated over 180 as an island flap and applied to the skin defect (Fig. 2D).

While the flap was congested early after surgery, it survived. Presently, 6 months after surgery, the restriction of extension is -45 at the PIP joint and 0 at the MP joint, and no recurrence has been noted (Fig. 3A-C). The 5th finger flexes adequately, and the patient can hold objects.

Discussion

Bakhach et al. elevated the ulnar parametacarpal flap supplied by the dorsal blood flow from the ulnar artery [8], and Hirase et al. used a cutaneous branch of the palmar digital artery as a penetrating branch and obtained satisfactory results [9]. The vascular pedicle of the ulnar parametacarpal flap supplied by the dorsal blood flow is the medial carpal branch of the ulnar artery, and Bakhach et al. reported that this flap can be used for treating skin defects on the palmar side of the 5th finger [8]. However, to cover a skin defect on the palmar side of the 5th finger using a flap supplied by the dorsal blood flow, the vascular pedicle must be extended to the pivot point, which makes the procedure more complicated than elevating a flap using the palmar blood flow. The cutaneous branches of the palmar digital artery, which are distributed on the fascia from the ulnar side of the MP joint to the hypothenar muscle, are easy to identify. Moreover, the blood flow of the palmar digital artery is antegrade in the cutaneous branch part, where it enters the flap [9]. For these reasons, we judged that the flap described by Hirase et al. using a cutaneous branch of the palmar digital artery as a penetrating branch is more useful than a flap supplied by dorsal blood flow from the ulnar artery,

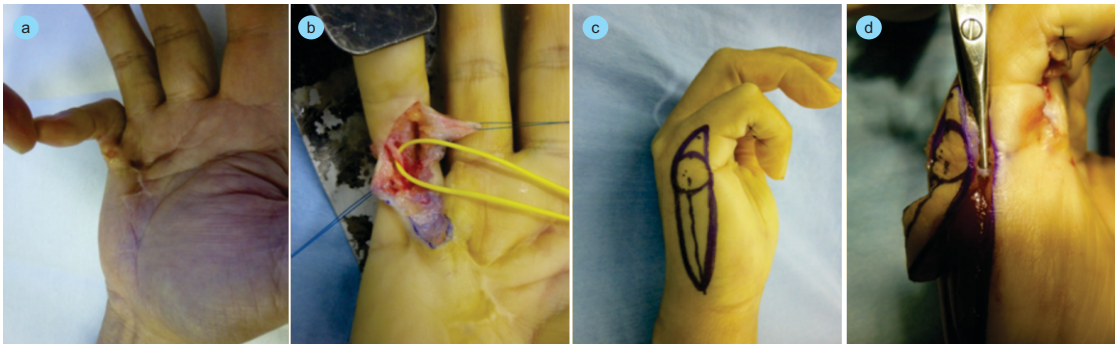

Figure 2:
a) Dermofasciectomy caused a skin defect and exposure of the flexor tendon and neurovascular bundle.
b) A fusiform flap covering an area from the ulnar side of the JP joint of the 5th finger to the ulnar side of the hypothenar region with a width sufficient for plication (about 20 mm) was designed at the border between the palm and dorsum of the hand.
c) A flap including the fascia of the abductor muscle of the 5th finger was elevated. At this time, the penetrating branches of the palmar digital artery of the 5th finger were identified.
d) The skin defect was covered by rotating the flap over 180. The donor site of the skin graft was closed by suturing.

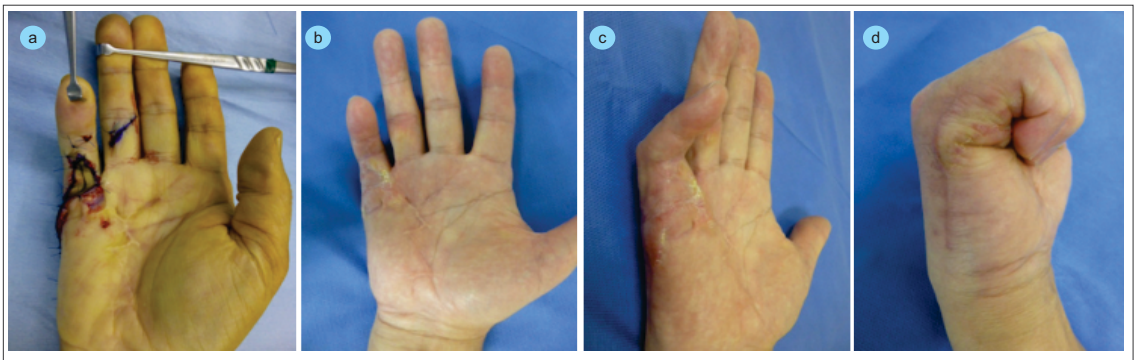

Figure 3:
Gross findings 6 months after surgery
a) The flap has survived, and no recurrence has been noted.
b) The angle of extension is -45 at the PIP joint and 0 at the MP joint.
c) No restriction of flexion is observed in the 5th finger.

and used it in the present case with a skin defect on the palmar side.

This flap is also used as a rotation flap for covering the palmar ulnar MP joints but can also be used as an island flap if a vascular pedicle (a cutaneous branch of the palmar digital artery used as a penetrating branch) is identified and elevated. With this procedure, the flap becomes useful for the treatment of skin defects on the palmar side of the 5th finger, as in the present case.

In Dupuytren's disease, longitudinal scar contracture is observed [10]. Flexion contracture is likely to occur if the finger skin is scarred in the longitudinal direction [7]. While the recurrence rate after fasciectomy has been reported to be 27-46.5% [11,12], that after dermofasciectomy including skin resection has been reported to be 11.6% [7]. Also, Armstrong et al. performed full-thickness skin grafting for skin defects after dermofasciectomy [7]. Moreover, there are several reports for the treatment of recurrence of Dupuytren's disease. Although severe recurrent digital Dupuytren's disease was often treated with amputation in 1980s, Watson et al treated 14 severe recurrent by PIP joint fusions with shortening [13]. Tonkin et al and Brotherston et al detailed their experiences with dermatofasciectomy and skin graft [12, 14]. Tonkin et al (mean follow-up, 43 months) found a 4% (1 of 26 patients) recurrence rate under the graft and a 42% recurrence rate outside the graft [12]. Brotherston et al (mean follow-up, 100 months) found no recurrences in 34 patients [14]. Both of these studies solely considered patient outcome following dermatofasciectomy and skin graft for recurrent disease.

The advantages of this procedure are that bleeding can be controlled and skin defects can be covered without tension. However, directly grafting a flap over the flexor tendon and neurovascular bundle is considered to be associated with the risk of restriction of the range of motion and neurological disorders due to adhesion of the flexor tendon. Using the ulnar parametacarpal flap, adhesion of the flexor tendon and neurological disorders can be avoided, because the flexor tendon and neurovascular bundle are covered with the fascia of the hypothenar muscle.

If this flap is used as an island flap, it is likely to be congested due to poor venous return. The digital artery flap is also likely to develop congestion for the same reason, and various modifications, such as the inclusion of a large amount of soft tissues in the vascular pedicle [15] and postoperative heparin administration [16], have been devised. However, there is presently no measure to prevent congestion in the ulnar parametacarpal flap, and attention to this problem is necessary.

Conclusion

We treated a patient who developed an ulcer on the palmar side of the 5th finger due to the recurrence of Dupuytren's disease by dermofasciectomy including the skin, and covered the consequent skin defect with an ulnar parametacarpal flap. While this flap is extremely useful for covering skin defects on the ulnar side of the palm or on the palmar side of the 5th finger, attention to congestion is necessary.

Clinical Message

For recurrence of Dupuytren's disease, there remains much difficulty to treat. Ulnar parametacarpal flap is used as a rotation flap for covering the palmar ulnar MP joints but can also be used as an island flap if a vascular pedicle is identified and elevated. This flap is useful for ulcer on the palmar side of the 5th finger due to the recurrence of Dupuytren's disease.

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