The V-Y Palmar Flap
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The blood supply of palmar skin is by numerous direct perforating arteries (Cormack and Lamberty, 1995; Gajisin and Zbrodowski, 1993). In general their short lengths and small individual territories mitigate against the raising of large flaps in the palm. Flaps based on the web space, however, seem to be an exception to this rule. We describe a V-Y palmar flap based on the web space, and describe its use in the surgical treatment of Dupuytren's disease.

OPERATIVE TECHNIQUE

In order to design and raise this flap safely it is important to understand its vascular basis. The base of the flap should be positioned proximal to the web space. Larger than average perforators are found running through the web fat pad (Fig 1), and these will support a surprisingly large area of surrounding skin. A V-shaped flap is then designed around this point (Figs 2 and 3). One of the limbs is placed over the pretendinous cord, and if two adjacent rays are involved then both limbs will be directly overlying these cords. The apex of the V is in the
proximal palm. Its exact positioning depends on deciding where there is sufficient transverse skin laxity to allow closure as a V-Y plasty.

The flap is elevated distally from the apex. Although the tip can consist of skin only, the plane of elevation should move deeper to just above the superficial palmar fascia. In the midline of the flap, dissection should not continue beyond the distal edge of the transverse fibres to avoid damaging the vessels in the fat pad of the web. However, the flap can be raised over the pretendinous cord into the finger. As the finger is released and straightened, the flap is pulled distally, and can be sutured as a V-Y plasty after careful haemostasis (Figs 2 and 3).

The standard flap is ideal for palmar disease with contracture of the metacarpophalangeal joint. Extension of disease into the digit can be dealt with by continuing the palmar incision along the volar midline of the finger. A Z-plasty in the finger is then advised (Fig 2d).

The basic flap design can be modified in a number of ways. For disease of a single ray the flap can be based on either of the web spaces. The choice is often influenced by minor cords passing into one or other adjacent fingers. When two adjacent fingers are involved the flap is based on the intervening web (Fig 2a). For more widespread palmar disease the flap can even be based across three fingers (Fig 2e). Figure 2c shows a modification that is occasionally required. As the fingers are straightened the flap can swing considerably. It can then be inset more comfortably by transposing a smaller proximally based flap. This is in effect a large Z-plasty.

Further illustrative cases are shown in Figures 4 to 6. Figure 4 shows a flap based on the third web space with one limb extending into the ring finger. It has been closed by technique 2c (a large palmar Z) plus a Z-plasty in the finger. Figure 5 shows a flap based on the fourth web with limbs extending into both fingers. Closure is with a V-Y plasty in the palm and a Z-plasty in each finger. Figure 6 is a postoperative view showing large palmar flaps for three-ray disease. There is a well settled, non-contracted scar in the left palm, and a more obvious scar in the recently operated right palm.
RESULTS

This technique has been used in 20 patients over a period of 18 months. There were no intraoperative complications. Minor degrees of skin involvement by Dupuytren's disease have not been a problem, although extensive involvement of the flap skin would be a contraindication to this technique. In all cases the flap perfused rapidly on release of the tourniquet. When full extension of the fingers was not possible, skin tension was not the reason.

There were two wound infections that settled after antibiotic treatment. A more significant complication was an infected haematoma that required surgical drainage. There were no late problems with scar contractures.

DISCUSSION

A large number of incisions have been used in palmar fasciectomy for Dupuytren's disease (McGrouther,
One may ask therefore whether another approach is justified. We do feel, however, that the use of the V-Y palmar flap has a number of advantages over other techniques.

This flap acts by scar lengthening and skin advancement. Both are useful in surgical treatment of Dupuytren’s disease; to allow direct closure of skin after release of a contracted finger and to prevent later scar contracture. One centimetre advancement is easily obtainable (Fig 3), allowing closure without longitudinal tension. Furthermore the use of serial Z-plasties to break up a linear palmar incision is avoided. Because of the nature of palmar skin, small Z-plasties in the palm are cumbersome and difficult to work with. The single large palmar Z-plasty overcomes these difficulties.

With correct selection of the various modifications exposure is excellent. No significant subcutaneous dead spaces are formed, allowing skin closure with little risk of haematoma formation.

A linear scar in the palm has not been found to be a problem. The technique achieves lengthening at the cost of transverse tightness in the proximal palm. Again, we have not found this to be clinically significant. On follow-up of up to 18 months there have been no problems relating to the scars.

We have not performed anatomical studies and the exact pattern of blood vessels within the flap is unknown, although they clearly enter through the web fatpad that is rarely involved in Dupuytren’s disease. In a number of cases we have observed a single large perforator running into the base of the flap. Although the flap is distally based it is not a reverse artery flap. It may be the palmar equivalent of the distally based dorsal hand flap (Quaba and Davison, 1990). It is possible to raise an extremely large flap including the V itself and the skin of two adjacent proximal phalanges.

McGrouther (1990) illustrates both proximally and distally based V incisions that were described at the turn of the last century. They were small and centred over the cord rather than the web. They therefore did not use the web perforators nor were they closed as V-Y plasties. Harrison and Newton (1991) have used these vessels in their palmar transposition flap that is useful for defects in the base of the finger. Mukerjea (1996) has written of a palmar V-Y plasty similar to the one we describe.

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References


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