The rhomboid flap: a simple technique to cover the skin defect produced by excision of a mucous cyst of a digit

D. Imran, C. Koukkou, L. C. Bainbridge
From Derbyshire Royal Infirmary, England

Rhomboid flaps were used rather than rotation flaps for skin cover after excision of mucous cysts of the finger in six patients. The rhomboid flap is a safe, reliable technique which is more easily taught and applied than the rotation flap.

When a skin lesion is small it can be excised in an ellipse allowing direct closure. This may not be possible with a larger lesion, when a skin graft or a local flap may be necessary to cover the defect. This is often difficult for mucous cysts of a digit since the flap can neither be raised from the volar skin nor obtained distal to the cyst because of the possibility of injury to the nail or its germinal matrix. The classical teaching has been to use a rotation flap to cover the defect created under these circumstances, but designing such a flap can be difficult for someone with limited experience of plastic surgery. The size and depth of the flap may cause concern, as may deciding on the maximum tension under which the partly devascularised flap can be sutured.

The rhomboid flap, the technique of which is easy to learn and apply, gives a better cosmetic result. There are two varieties, the Limberg and the Dufourmentel, which are different in design and application. We used the Limberg flap which is the easier and is more commonly used.

Patients and Methods

The flap was used on the dorsum of the finger in nine digits in nine patients by the senior author (DI). There were six men and three women with a mean age of 61 years (47 to 72). Six had mucous cysts, two had a giant-cell tumour of tendon sheath and one had a histiocytoma. Three patients had mild to moderate deformity of a nail because of compression of the germinal matrix by a mucous cyst.

A rhombus is an equilateral parallelogram with opposite acute and obtuse angles. The former are planned 60° and the latter 120°. Therefore, in Figure 1, points S-T-U-V represent the rhomboid defect. The axis of the rhomboid is planned after consideration of two factors. If the cyst is oblong, the short diagonal of the rhomboid should fall along its width. If the cyst is round, the short diagonal can be chosen to lie along the maximum extensibility of the skin. After considering the shape and the axis of the defect to be created, the edges of the lesion are marked and a rhomboid is delineated around it (Fig. 2).

In planning the flap, the short diagonal of the rhomboid is extended by its own length to point W (Fig. 1). This can be done from either points S or U, but preferably towards lax skin and, if possible, away from the nail where the skin is less extensible. Another line, WX, is drawn parallel and equal to UV or ST taking into account the laxity of the skin, to complete the planning of the flap.
Usually, a ring block and a finger tourniquet are sufficient. Excision of the lesion is performed (Fig. 3) and the rhomboid-shaped flap of the skin and subcutaneous tissue is raised keeping the extensor tendon intact. Raising the flap before excising the stalk of the cyst may allow more exposure for a radical excision if required. The finger tourniquet can be released at this stage to check the perfusion of the flap and to perform haemostasis. The flap is then rotated through 60° and transposed into the defect closing the donor area directly (Fig. 4).

Results

All the patients were reviewed after six months. The mean finger tourniquet time required to perform the procedure was 15 minutes. All the flaps healed well. There was no
recurrence of a mucous cyst and the deformity of the nail improved in two patients. The scar was scarcely visible (Fig. 5) and movement of the distal interphalangeal joint was unimpaired.

Discussion

Mucous cysts of the fingers are dorsal ganglions and are commonly found in association with osteoarthritis of the distal interphalangeal joints. The cysts are subcutaneous but the overlying skin is usually thin and occasionally may be ulcerated. In an undamaged specimen the attenuated skin of the cyst comprises thinned dermis and epidermis with numerous satellite ducts or lakes filled with mucinous material which must be removed to avoid recurrence.

Mucous cysts in the fingers are usually small but unsightly and may cause considerable discomfort. Treatment has ranged from total excision of the joint to multiple needling and expression of the contents. It was not until the 1970s that communication of the cyst into the joint space was demonstrated, establishing the need to trace the pedicle into the joint space combined with osteophytectomy with appropriate skin cover in order to prevent recurrence.

Designing local flaps when the secondary defect is to be closed directly in an unforgiving area like a finger can tax even the skill of an experienced plastic surgeon. For those who are less familiar with planning and raising flaps, this can be a real difficulty. The advantage of the Limberg flap is its geometrically accurate design. A single measurement can be used to eliminate the defect and construct the flap. No attempt is made to engineer a rhomboid defect and the flap is made smaller than the defect.

All the above parameters led us to try using the rhomboid flap for the treatment of nine lesions on the dorsum of distal phalanges, of which six were mucous cysts. The results of this prospective study after a mean follow-up of six months support the safety, reliability and efficiency of the flap.

No benefits in any form have been received or will be received from a commercial party related directly or indirectly to the subject of this article.

References