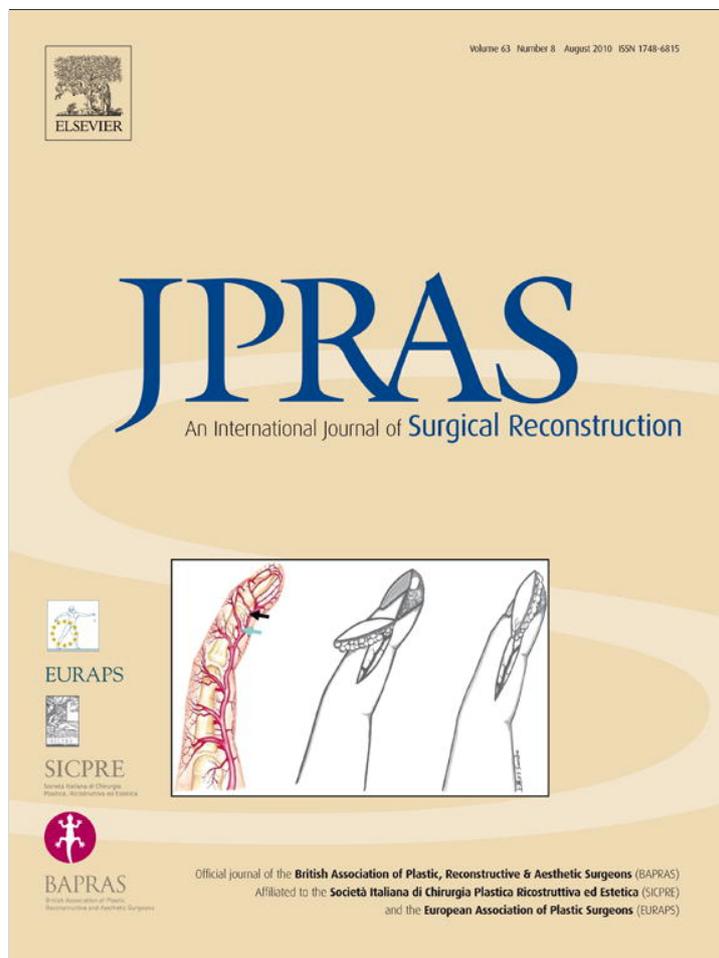


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Figure 3 14 months follow-up showing reconstructed left eyebrow.

eyebrow defects has not been described in the literature. We have employed supratrochlear artery based V-Y flaps with complete skeletonisation of the pedicle in other two cases. No postoperative complications were encountered. When defects exceed 1/2 the length of the eyebrow, the remaining of the aesthetic sub-unit is so exiguous that a good aesthetic result cannot be guaranteed, even using non-surgical camouflage procedures of the contralateral eyebrow. In this cases even the modified V-Y flap as described above cannot be used and it is necessary to use more complex procedures such as free composite grafts, micrografts⁵ or hair bearing superficial temporal artery islanded flap.⁶

Conflict of interest statement

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A new approach to the antecubital scar contracture: Rhomboid rotation flap

Scar contracture is still one of the most complicated challenges developing after either skin damages or burns. Although splints, pressure therapy, massage, and rehabilitation have been widely used for softening of the scar later the skin injury, in some cases all methods are ineffective to avoid developing a scar contracture which is capable of deforming the appearance of skin surface and restricting joint motions. Several approaches to the correction of contractures have been proposed, including skin grafts, Z-plasty, local flaps, regional flaps, transposition flaps, rotating flaps, axial flaps, perforator flaps, and free flaps, but many of which still have some disadvantages such as necrosis, donor site morbidity, long operation time, and difficult surgical dissection, so there is no ideal technique.^{1–5} In this study, a new method for releasing antecubital contractures was presented.

This study included eleven patients who had antecubital scar contracture treated successfully with a new approach, rhomboid rotation flap. Patients were all children, whose ages varied between 5 to 11 years. They suffered from contracture for at least one year which were localized in the left antecubital area in 7 patients and the right antecubital area in 4 patients. Contractures which were in mild to moderate severity, made extension of the elbow joint significantly difficult, needing surgical release.

We modified the well known shape of the rhomboid which is usually used in releasing burn scars as a form of incision. The rhomboid was lengthened through the axis which placed between both obtuse angles, so it gained more tissue available for rotation in this axis which would be turned to the contracture line when the flap elevation and rotation completed (Figure 1 a, b). After this modification, rhomboid consists of two axis, short and long. Naturally, the longer the axis, the more tissue the flap has.

Preoperatively, a rhomboid was drawn on the antecubital area, long axis of which was placed just over the antecubital skin crease, perpendicular to the contracture line (Figure 2a). Lateral and medial borders of the flap were determined according to the need of flap length which would release the contracture line after rotation. Incision was made firstly into the skin and scar tissue, and then deepened to the antecubital fascia, releasing the

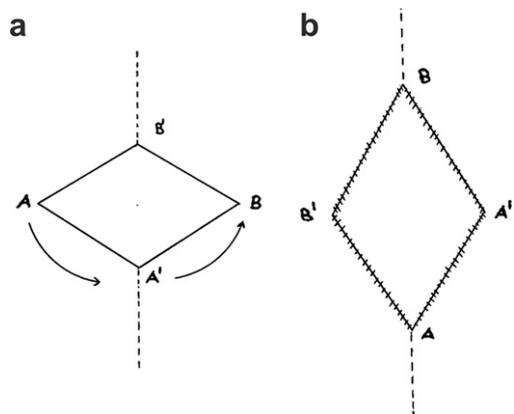


Figure 1 (a) Schematic illustration of the modified rhomboid flap which is lengthened through the axis which places between both obtuse angles. Dotted line shows contracture band. (b) When the flap is rotated with 90 degree, A and B points go to A' and B' respectively.

contracture completely. Tips and margins of the flap were freed a few millimetres from fascia with sharp dissection, which would facilitate rotation of the flap over subcutaneous pedicle (Figure 2b). A 90 degree rotation was made easily in order to turn the long axis to the contracture line which already released, and then besides subcutaneous tissue, skin edges were sutured in the usual manner (Figure 2c).

In this study, there were no major complications such as infection, hematoma, flap loss, suture dehiscence or flap necrosis. All rotated flaps healed uneventfully. No recurrence of the contracture was observed in the follow-up period which was at least 5 months and varied between 5 to 13 months. In one case some of the scar hypertrophy on the flap margins taken place 3 months later the contracture release.

Although elbow contracture of the upper extremity seems to be preventable with splinting, pressure therapy,

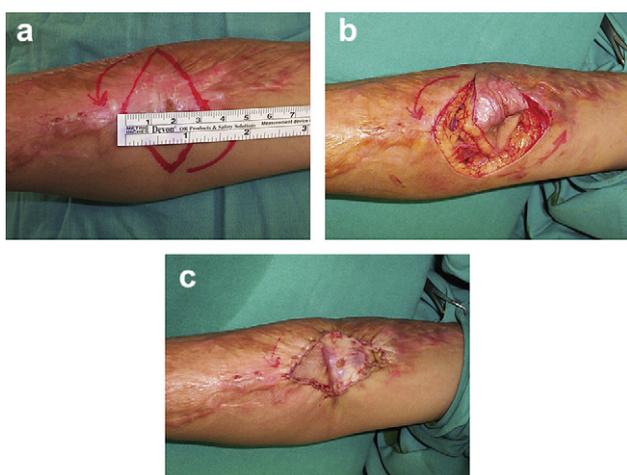


Figure 2 (a) A modified rhomboid flap was marked on the elbow, whose rotation arc was also drawn. Note that width of the flap was demonstrated with a measure. (b) After being incised and elevated from the fascia, the flap was ready for rotation. (c) Rotation and suturation were completed.

massage, rehabilitation or combination of them in patients who have skin damage due to either burns or another accidental causes, many patients suffer from the disability. Many surgical techniques have been described for the release and resurfacing of the skin wound developed after releasing a contracture, however an ideal method has not yet been found. Rhomboid incision is a well known method to release burn scar contractures, but needs additional procedures for the closure of the wound.^{1–3,5} It was firstly used by Uzunismail for chronic moderate flexion contractures of the fingers.¹ Diamond shape incision is another way of releasing a scar contracture, which is simple, easy and effective procedure for contracture release. Aşkar I used this incision successfully in the treatment of postburn scar contractures.² Ertaş et al also investigated the efficacy and versatility of rhomboid flap in the treatment of postburn scar contractures located in various parts of the body.³ Suzuki et al used subcutaneous pedicle flaps for the release of contractures, and presented successful results including only one flap necrosis in 17 flaps.⁴

This procedure may be considered an evolved form of rhomboid relaxing incision, providing the advantages of the rhomboid incision and the flap closure together without needing any additional procedures for closure such as Z-plasty, Y-V plasty or V-Y plasty. The gain in length is provided by rotation of the flap. Moreover, there is no need of lateral relaxing incision. When dealing with this flap for elbow contractures, good functional recovery and cosmetic appearance were obtained in eleven cases without any complication. It is a safe, simple, effective, and reliable method offering a new solution to the correction of the contractures.

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