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Combined AlloDerm® and thin skin grafting for the treatment of postburn dyspigmented scar contracture of the upper extremity

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Summary Postburn dyspigmented scar contractures of the upper extremity often require aesthetic improvement. The ideal reconstruction of this deformity remains a challenge because the various available skin grafts and flaps result in skin colour mismatches, prominent marginal scars and donor morbidity. Postburn scar contractures and dyspigmented areas of the upper extremity can be improved by a combination of dermabrasion and Alloderm® graft over scar-releasing defect. Their raw surfaces are subsequently re-surfaced with thin split-thickness skin graft (0.005—0007 inches thick).

Twenty-seven patients with wide dyspigmented scar contractures of the upper extremity underwent the combined techniques described by us. The median patient age at burn incidents was 3 years and at operation was 24 years. Median thin skin graft area was 180 cm^2, and the median AlloDerm® graft area was 40 cm^2.

Thin skin and AlloDerm® grafts took root completely in all patients without re-grafting. Follow-up periods ranged from 30 to 67 months (average 47.6 months). Re-pigmentation was achieved in all cases and all scar contractures were adequately released and treated with an AlloDerm® graft. Paired differences between preoperative and postoperative parameters as determined by the Vancouver Scar Scale (VSS) were significant. Focal hypertrophic scar and reddish-coloured graft sites gradually improved over 3—4 years postoperatively. Graft margin and donor scars were inconspicuous. Our described combined technique was found to treat these deformities effectively.

We suggest that the use of Alloderm® and thin skin grafting be considered in patients concerned about this type of cosmetic disfigurement.

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Dyspigmented scar contracture of the upper extremity occasionally develops following thick split- or full-thickness burns and can be emotionally devastating to some patients. Those affected often desire aesthetic improvement even when functional impairments due to scar contracture are unremarkable.

Postburn depigmentation has been treated using micropigmentation tattoos,[1] punch grafting,[2] dermabrasion and epidermal grafting,[3] 'chip' skin grafting[4] and thin sheet skin grafting.[5–8] The transfer of the basal epidermal layer of skin provides an opportunity to modify skin colouration at graft sites. However, scar contracture is a major long-term sequela of a conservatively healed scar in cases of partial- or full-thickness burn injuries, especially in joint areas. Furthermore, the thickness of dermis in an autograft is known to play a major role in the functional and cosmetic outcomes of third-degree burns. The devised composite grafting technique relies on AlloDerm® (Life Cell Corp., The Woodlands, TX, USA) to provide a source of dermis and a thin autograft to provide epidermis. Such composite grafts have been previously applied to full-thickness burn wounds over various articular skin surfaces.[9,10] However, previous reports have described small or moderately hypopigmented scars or burn wounds in joint areas.

Our Patients with a large dyspigmented scar contracture were treated using a thin skin graft (0.005—0.007 inches thick) over an AlloDerm® graft, which was placed over releasing defects and dermabraded wounds in irregularly dyspigmented regions.

We performed a retrospective review of the simultaneous use of a thin skin graft and AlloDerm® graft for the treatment of postburn dyspigmented scar contractures of the upper extremities.

Materials

Between December 2003 and January 2007, 27 patients (12 males and 15 females) underwent the surgical reconstruction of wide dyspigmented scar contractures of the upper extremity at our institute. The scar contractures of all patients involved the skin and did not limit the motions of affected joints.

The median patient age at initial burn injury was 3 years (range: 6 months to 10 years), and that at surgery was

Figure 1 (a) A 22-year-old woman with a dyspigmented scar contracture area on the medial aspect of the left forearm caused by a scald burn 21 years previously. (b) Released wound surface covered with an AlloDerm® graft after dermabrasion of the scar surface. (c) The grafted area notes a purple irregular coloured appearance at 4 months after surgery. (d) Photograph taken at 45 months after surgery — note the even surface and adequate coloured skin of the forearm.