

# AN EXPOSURE-FIXATION TECHNIQUE FOR SKIN GRAFT IN BURNS

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The primary treatment of burns by exposure, as against that by occlusive dressings, is well established, soundly conceived in its principles and satisfactory in its results (Clarkson, 1963). First described by Copeland (1887), it was advocated by Sneve (1905) and Haas (1915) but did not gain wide acceptance until the publication of papers by Wallace (1951). Encouraged by reports of its successful application in the Middle East, we introduced the method into our wards at St. Luke's Hospital as early as 1952-53, and it has continued to be the standard form of treatment with us for burns of most sites and in the great majority of patients of all ages. Among the many advantages of the method is the avoidance of painful changes of dressings coupled with the ease of observation of the state of the burnt area.

Exposure of burns is also of itself an excellent means of preventing and controlling infection, even in hospital units such as ours where cross-infection is a major problem. However, at an early stage we found it useful and advisable to modify the method by adding to it the repeated spraying of the burnt area with solutions of antibiotics, preferably "Polybactrin". This has undoubtedly contributed to successful control of the infection problem while retaining all the advantages of the open method of treatment. In particular, the value of "Polybactrin" thus applied has been amply proved by Lowbury and his colleagues (1968). The systemic exhibition of Penicillin and/or other antibiotics is also a matter of routine with us for the first week or so in extensive burns.

When in due course the burnt area is skin-grafted generally one has to forego the advantages of exposure, since it is

usual to cover the grafts with tulle gras and pressure dressings. This is not strictly necessary with large grafts which can be sutured into place, and such grafts have since many years, by some surgeons been left exposed. However, the necessity of ensuring continuous close apposition of the graft to the raw area compels most surgeons to cover the grafts with large dressings. Moreover there are many cases where the wide extent of the area to be grafted and the relative exiguity of the donor sites necessitate recourse to the valuable expedient of "postage stamp" grafting as introduced by Gabarro (1943); and stamp grafts would seem to require, and indeed usually receive, pressure dressings to keep them firmly in place.

Skin grafts applied to burnt areas usually succeed in their purpose by "taking", but it is notorious that they have a variable survival rate. This depends on several factors, but like others we have been impressed in our cases of partial success or, even, occasional total failure, by the miserable appearance of the soggy, macerated strips of skin floating on a thick film of pus. This pus may be sterile; it often seems to be more abundant when tulle gras has been used as a dressing, so that vaseline seems to be a major component of it. However, infection is often present and is undoubtedly fomented by the dark and damp environment under hot and heavy dressings, despite the systemic administration of antibiotics.

It seemed logical to us to seek to give skin grafts the benefits of the open method of treatment with its attendant dryness and exposure to bright sunlight, particularly if we could couple this with firm apposition and topical application of anti-

biotics. We had read of the use of adhesive tape for the coaptation of the skin edges in wounds, the tape being the familiar household "Scotch" type used on parcels. This was reported as not requiring sterilisation in virtue of some phenolic compound that enters into its composition. We decided to use "Scotch" tape to keep skin grafts in place, applying no other dressing than periodical spraying with "Polybactrin".

In the summer of 1958 a lad of thirteen in Gozo sustained severe burns through his clothes catching fire when a lighted torch ("fjakkola") fell from a rooftop and landed at his feet. The burns involved most of the left arm, the front and back of the left half of the torso, and the front of the left thigh extending well laterally: a total area conservatively estimated at about forty per cent of the whole body surface. All this area sustained a full thickness skin loss and therefore required grafting. We achieved this in one session, cutting the required skin from the intact areas of the right arm and leg and front of trunk with a razor, and eking out the available skin by dividing it into innumerable "postage stamps". We decided to use the "Scotch" tape fixation and exposure technique as we were most anxious to avoid further grafting sessions, particularly because of the psychological state of the patient and the non-availability of further donor sites. The "postage stamps" were therefore spread out at close intervals on long strips of tape, with the superficial surface of skin applied to the adhesive, and the strips of tape were then firmly strapped on the raw area. Narrow intervals were left between adjacent strips to permit "drainage" and the free access of air. "Polybactrin" was then sprayed liberally over tape and all; no other dressing was applied. The subsequent supervision and nursing proved gratifyingly simple and easy; the patient moved freely in bed, was comfortable and free from pain. The strips of tape stayed in position. The grafts were easily seen through the film of tape and "Polybactrin", and looked healthy; the whole area was dry and clean with a minimum of crusting. When we removed the

tapes on the twelfth day, practically all the grafted skin had survived and was firmly anchored. Exposure with occasional Polybactrin spraying was then continued for several more days until complete healing. No further treatment was required, other than Z-plasty for a couple of axillary webs some years after the accident.

We have since used this technique on a number of cases requiring skin grafting, of both large and small extent, and have been well satisfied with the results. Skin grafts thus treated are more viable, more healthy and more supple; they very quickly become indistinguishable from normal skin. Even from the technical point of view at the time of application, the grafts adhere much better to tape, without awkward curling of the edges, than they ever do to tulle gras or similar backing.

"Scotch" tape for surgical use has now been replaced by "Micropore Surgical Tape" produced by the "3 M Company of Minnesota". This is made of rayon fibres bonded with acrylic resin; the adhesive is a synthetic polymeric acrylate applied to the backing in a manner which maintains the microporosity of both backing and adhesive. This property renders it even more suitable as an open dressing. It has a very high coefficient of adhesion to skin. It causes no irritation or maceration even of sensitive skin (Golden, 1960). It can be autoclaved but is also available as pre-packaged sterile "Steri-strips". The use of this special tape in place of skin sutures for the closing of wounds, with the many advantages thereof, is now increasing and is well documented (Skoog, 1963; Rothnie and Taylor, 1963; Murray, 1963; Horton and Duffin, 1965; Shepherd, 1966; Zederfeldt *et al.*, 1967).

Reese (1946) devised a dermatome which uses a sheet of "Dermatape" as a backing for skin graft. Fischl (1965) has used "Micropore Tape" in skin grafting; he fixes strips of tape to the donor area, from which the knife or dermatome then cuts off strips of skin plus tape, which are easily divided into "postage stamps". Skoog (1963) describes a use of "Micropore Tape" for fixation of skin grafts much closer to the technique we describe

above, but he covers the grafts with a pressure dressing.

No claim to priority is made for the technique we describe, particularly as our search of the literature has been incomplete. However, it is presented as a well tried and tested method which seek to follow principles that have proved their worth in the treatment of burns.

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