A Simplified, Rapid Method for Skin Transplantation in Mice[1] (34150)

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(Introduced by W. H. Hildemann)

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The classical plaster method for skin transplantation in mice (1) has long been employed successfully by many investigators. Nevertheless the method is relatively time-consuming for large scale experiments and commonly allows a certain rate of technical losses, depending on the transplanter. In certain instances, however, technical success with almost every animal is of great importance. Earlier attempts to introduce new techniques (2, 3) have apparently not led to wide acceptance. However, newer plastic bandaging materials now allow simplification of the technical procedure of flank skin grafting. The new method has the advantage of convenience, reliability, and rapidity.

Materials and Methods. Skin grafts of equal sizes (Fig. 2), as many as needed, are cut in advance by a cork puncher from large skin pieces. The skin is previously freed of adherent fat and panniculus carnosus by cautious, tangential scraping with a scalpel (Fig. 1). The recipient is anesthetized as usual and tied down with rubber bands as shown in Fig. 4. On the recipient's chest an area is shaven only a little larger than needed to prepare the graft bed (Fig. 4). Thereby most of the surrounding fur is left to facilitate unbandaging without skin damage by the rather tightly sticking tape. Graft beds are prepared as usual (1) under aseptic conditions with curved scissors, avoiding damages of vessels (Fig. 4). The graft is put into place (preferably close fitting) after prophylactic application of a minute amount of tetracycline powder. A square-shaped piece of nonadhesive surgical dressing[3] (Fig. 3) which is covered by perforated cellophane, is used to cover the graft. A very thin layer of sterile, white petrolatum put on the cellophane keeps the gauze cover in place until the overlying tape is applied. The petrolatum also prevents drying of the graft, but an excess should be avoided, because it can dissolve the tape's glue. This special ventilated tape[4] was chosen because of its capacity to adhere firmly and easily, thereby precluding graft slippage. A piece of finely perforated tape (Fig. 3) is cut. The width of the tape exceeds the width of the gauze cover, providing a dirt-proof, but air-ventilated bandage. One end of the tape is carefully placed on the gauze cover, and by applying some pressure the graft is firmly held in place. The single layer tape bandage is completed circularly around the chest by lifting the animal's body slightly and applying some tension to moderately compress the body. While completing the bandage circle, tape has to be placed on tape again to achieve lasting tightness. But one should avoid blocking the air-admitting perforations in the tape over the graft. Under these conditions, if the graft has been placed far enough forward on the chest, the bandage will almost never be chewed off.

Unbandaging may be done without anesthesia. While holding the mouse in the usual manner at the ears and in the palm of one

[1] Supported by National Institutes of Health International Postdoctoral Research Fellowship No. FO5-TW-1201, from the Office of International Research.

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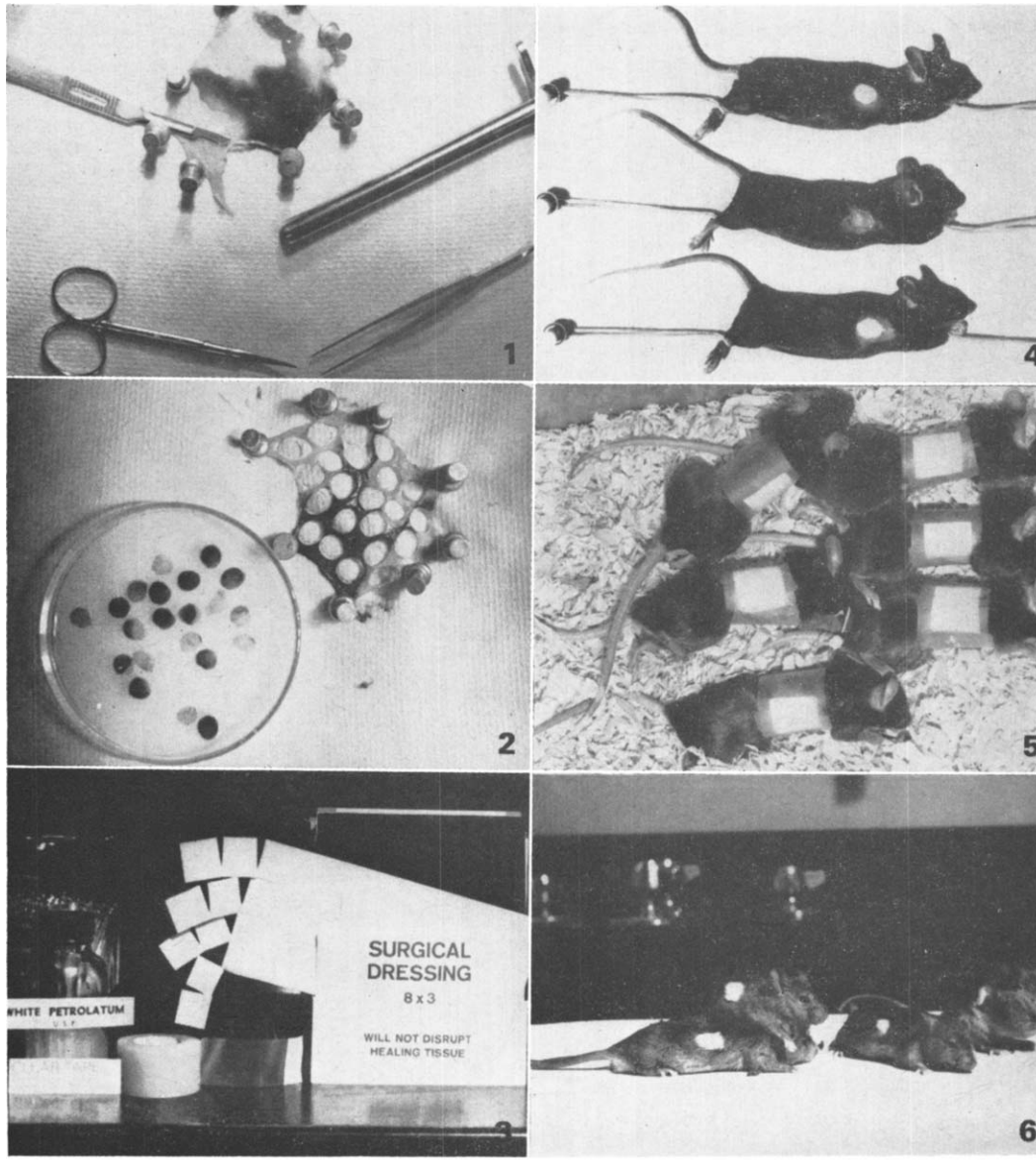
[3] Telfa surgical dressing, 8 × 3; Kendall Hospital Products Division, Chicago, Illinois.

[4] Band-Aid Clear Tape, Medium (1 in.); Johnson and Johnson, New Brunswick, New Jersey.

hand, the tape is cut with blunt scissors over the ventral side and slowly peeled off. This can be done for early scoring as early as five days after grafting, but a loose second bandage, preferably of a full circular gauze layer underneath the circular tape, including some petrolatum, will usually be necessary. Otherwise, final unbandaging may be done 8–10 days after grafting.

Discussion. The desire to have few or no technical losses in a grafting series originated from adoptive immunity experiments involving valuable sensitized cells which were difficult to obtain. The tape method avoids these graft slippages which sometimes occur under plaster bandages because of the need to achieve a tight fit. In addition, the potentially toxic adhesive compound dissolved in benzene is avoided.

Including anesthesia and shaving, a single



FIGS. 1-6. Technique for skin grafting.

person can graft about 12 mice/hr. Given some experience, the technical success should be nearly 100%. Bilateral grafts can easily be done as described above with the same success rate, using two separate gauze covers.

Skin irritation by the tape is usually not observed, unless closely spaced repetitive grafts have been done. Some fur sticks to the tape when one removes the bandage. It usually is replaced in a few days (Fig. 6). With certain mouse strains, where vigorous scratching is predictable, a protective bandage or rebandaging may be desirable until 12–14 days after grafting.

Hundreds of mice have now been successfully grafted by this method. A selection of mice bearing tolerated albino skin grafts is shown in Fig. 6, to demonstrate that no toxic side effects of the plastic tape are apparent which otherwise could cause late skin damage.

Summary. A simple and rapid method for skin transplantation in mice which allows consistent technical success is described.

I would like to thank Dr. W. H. Hildemann for introducing me to the classical method of experimental skin grafting.

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Received April 18, 1969. P.S.E.B.M., 1969, Vol. 132.