SELECTION OF THE TIME FOR GRAFTING OF SKIN TO EXTENSIVE DEFECTS RESULTING FROM DEEP THERMAL BURNS

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Large areas that have been deeply burned should be covered with epithelium by means of skin grafts at the earliest suitable opportunity. It is necessary, however, to wait until shock, alterations in body proteins, fluid and electrolyte balance, renal function, edema, "toxemia," *etc.*, have been controlled. Also, it is desirable to delay the grafting until the epithelium has been restored spontaneously to all areas of second degree burn. To wait for large full-thickness defects to epithelize, however, even though they contain small viable epithelial islands that eventually might spread to cover the area, is usually unwise. Grafting should be done early enough to avoid the period of debilitation so often associated with the presence of large granulating areas several weeks after a severe burn. Such areas are prone to become infected, bleeding, exuding and painful, and lead to extensive loss of protein and other serious nutritional deficiencies, sepsis, emaciation and poor morale. Maintenance of nutrition, with particular reference to a diet high in protein and vitamin C, is essential, especially if early skin grafting is contemplated. Though early grafting may be done successfully in the presence of mild localized infection, extensive, spreading or disseminated infection must be controlled before deeply burned areas can be covered with skin. Infrequent dressings done with aseptic precautions and supplemented by chemotherapy are valuable adjuncts in controlling or minimizing infection.

It is difficult to designate an exact time that will satisfy all of these requirements. Some time between the fourteenth and twenty-first days after the burn often will be found to fulfill most of them. The most difficult problem in this particular period is the removal of the burned tissues from those which are viable, in order to obtain a surface suitable for the application of skin grafts. Many weeks are likely to be required for the autolization or spontaneous casting off of the tissue destroyed by the burn. The elimination of such tissues has been hastened somewhat by employing chemicals such as Dakin's solution and more recently by the use of enzymes[3, 5] or the pyruvic acid method.[2] An alternative method is their removal by surgical excision.[1, 4, 6] This should be done in a fully equipped operating room, preferably at some time between the second and third weeks following the burn. The procedure of excision of burned tissues and early skin grafting may be used both for burned patients treated initially with a compression type of dressing and those upon whom coagulum-producing drugs such as

tannic acid-silver nitrate or the dyes were used. A general anesthetic is required.

The burned area and surrounding skin are cleaned thoroughly with a detergent solution and draped with sterile linens. The proposed donor areas are prepared similarly, but separately. All necrotic tissue is excised, preserving as much viable tissue as is possible. The oozing of blood may be considerable, but is not dangerous if it is kept under control continually

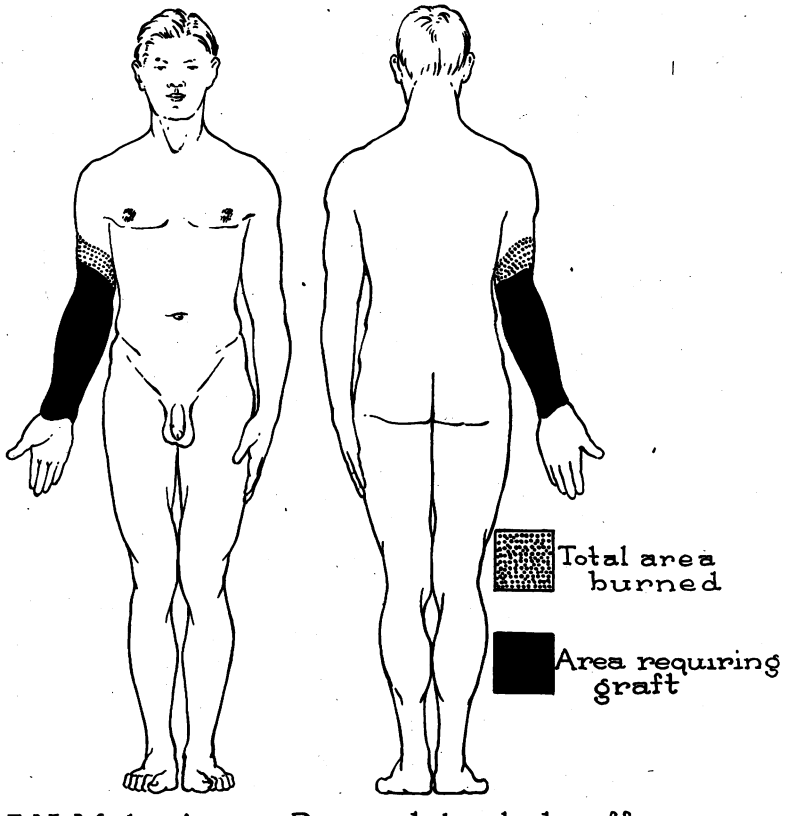


FIG. 1

by pressure applied with warm saline sponges. Occasionally a few ligatures may be required to control actively bleeding vessels. During the dissection of coagulum and nonviable tissue care must be taken to minimize injury to remaining viable tissues. This dissection is difficult and slow. It is preferable to apply skin grafts at the same operation if the condition of the patient permits, but occasionally it may be necessary to delay for a few days before placing the grafts at a second operation.

Skin grafts of intermediate thickness are removed from donor sites, using the Padgett or Blair method, and are fixed to the denuded areas with cotton

sutures. If the available donor sites do not provide enough grafts to cover the deficient areas completely, the grafts are cut into small squares ("postage stamps"), from 1.5 to 2 cm. in size, and are placed as near to one another as is possible over the entire defect, but they are not sutured. Donor and grafted areas are covered with a single layer of fine-mesh gauze impregnated with a grease base containing a bland antiseptic ointment and voluminous compression dressings are applied. In children or in adults

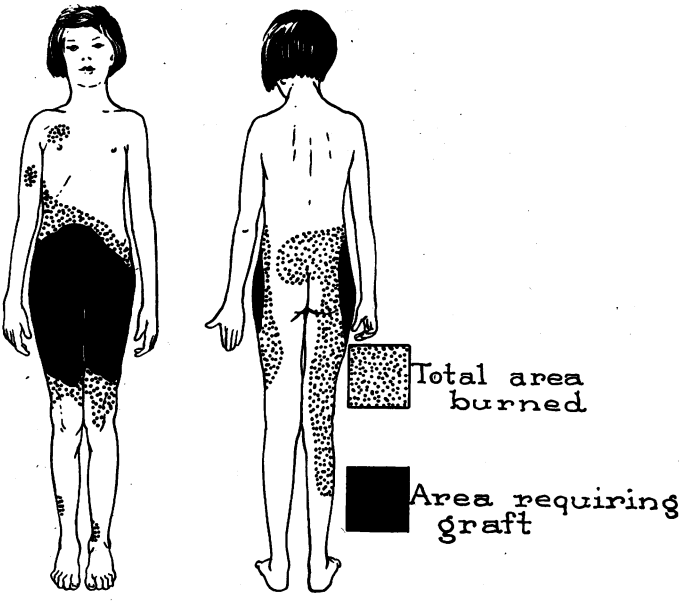
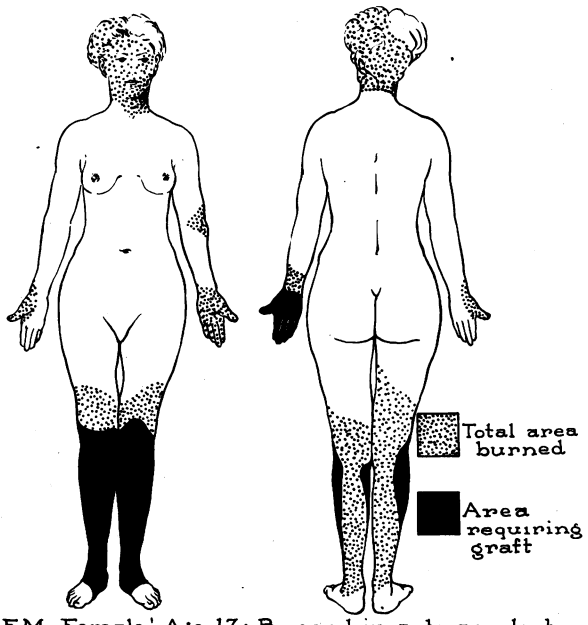


FIG. 2

with burns near joints a light plaster covering may be placed over the compression dressing. If possible, the original dressings are left in place for two weeks following the grafting procedure; if it becomes necessary to remove them earlier, the procedure should be done in the operating room, and a compression dressing should be reapplied at once.

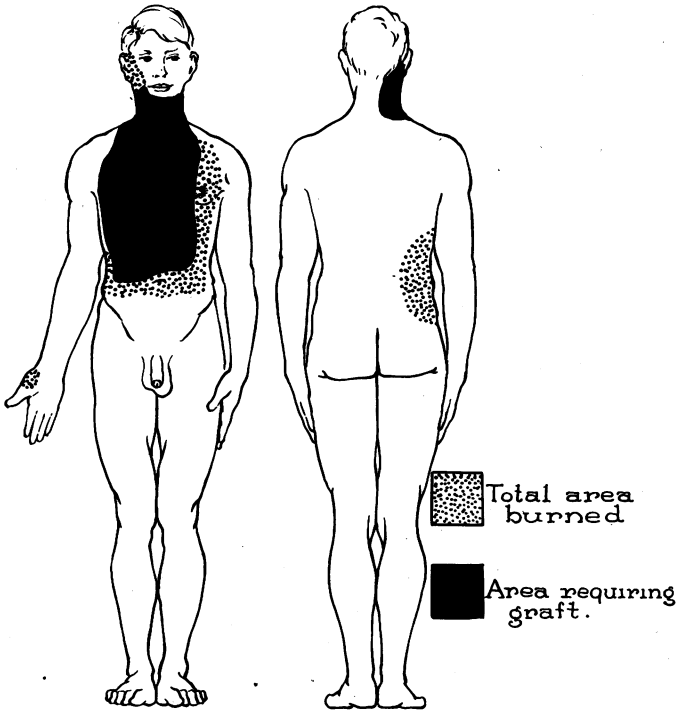
Usually the areas that were fully covered with grafts will be healed by about the fourteenth day, but "postage stamp" areas require longer periods for complete epithelization and should be redressed until they are entirely healed. Occasionally supplementary skin grafting may be required. Grafted areas must be protected from injury for several weeks or months.

Over a period of one year (July 1, 1942, to June 30, 1943) patients who suffered deep burns of the skin of various parts of the body were treated as described above. The burned surfaces were débrided and grafted with skin (during the second or third week) after the injury. The burns varied in extent from two to 32 per cent of the body surface. The total period of hospitalization for this group of patients varied from five to 12 weeks



E.M. Female' Age 17: Burned in auto accident
Hospital stay — 8 weeks.

FIG. 3

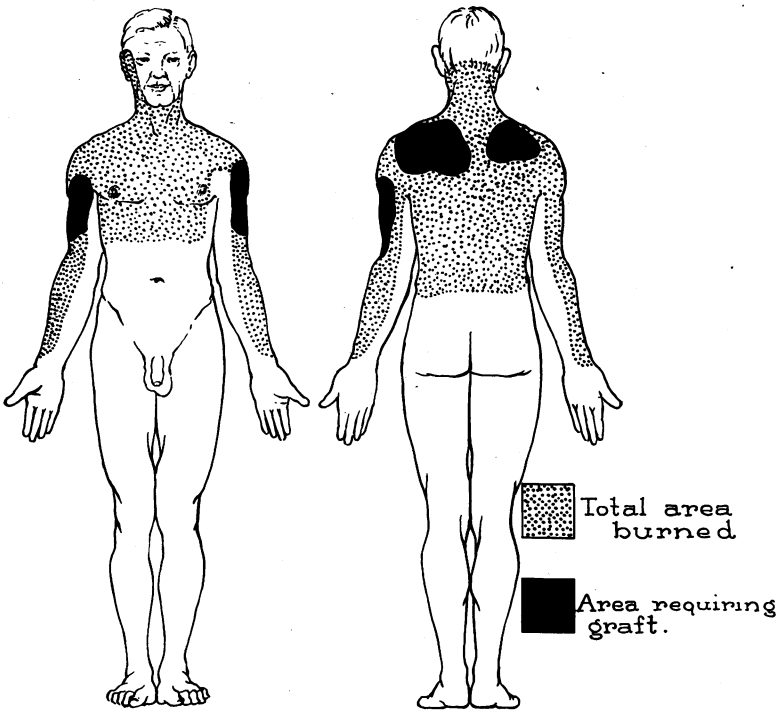


L.McC. Male: Age 28. Burned in bed.
Hospital stay 8 weeks.

FIG. 4

and averaged six and one-half weeks. Figures 1 to 5 indicate the location and extent of the injury in some of these cases.

Apparently, early grafting of skin following extensive deep burns minimizes contracture and deformity. Some patients will need no additional procedures, but others will require plastic correction of contractures that have resulted in spite of early grafting. For such patients the early closure of burn wounds by the application of grafts of intermediate thickness probably will permit earlier plastic repair.



R.M. Male: Age 43: Burned when bed caught on fire. Hospital stay 8 weeks.

FIG. 5

SUMMARY

A period somewhere between the second and third weeks after an extensive deep thermal burn is likely to prove the optimum time for excision of nonviable burned tissues and the immediate application of skin grafts of intermediate thickness. The dissection is difficult and small amounts of viable tissues may be removed inadvertently. On the other hand, morbidity is reduced considerably, and recovery apparently is earlier.

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