The effects upon each other of pregnancy and Gaucher's disease are discussed and the conclusions drawn that conception in women affected by the disease should not be discouraged, and that interruption of pregnancy in this condition is not justified.

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USE OF THE ELECTRODERMATOME, WITH SPECIAL REFERENCE TO ITS VALUE IN SERIOUS BURNS

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This article is based on experience with the electrodermatome during the past year at the Basingstoke Plastic Centre. Our experience in plastic and general surgery confirms the view widely held in America that in ease and reliability of cutting grafts of varying sizes and depth the electrodermatome presents an advance over other graft-cutting instruments. The graft-cutting instruments hitherto available have been the Thiersch razor, the Blair blade, the Humby knife, and the Paget dermatome. Of these the Humby knife has the widest range of general usefulness and needs the least experience for reliable results. The razor is, of course, in all respects inferior to the Blair blade, but even with the Blair blade in the most expert hands it is not possible with certainty to cut areas of graft from the thigh (the most common donor site) of more than 8 to 10 by 3 to 4 in. (20 to 25 by 7.5 to 10 cm.); the graft can be cut of uniform thickness only if it is very thin. Irregularities in thickness leading to poor donor-site scars are common. With the Humby knife grafts of 10 by 4 in. (25 by 10 cm.) can be cut with some practice. It has the added advantage of making possible grafts of medium thickness in depth; but again thickness of graft tends to vary. The Paget dermatome cuts an area of up to 8 by 4 in. (20 by 10 cm.). This instrument has been of great value in certain definitive repairs of the hand and elsewhere, but the donor-site scars are liable to keloid formation; it is a time-consuming method, and there is often trouble with the dermatome cement. Furthermore, in addition to the limitation of length it is not possible to cut thin split-skin grafts reliably with it.

There are many repairs which properly belong to the field of general surgery but which are still often referred to plastic centres simply because of the technical difficulty which current grafting instruments present to surgeons. Early experience in watching the use of the electrodermatome in a general surgical service (at the Brooke Army Hospital, San Antonio, Texas) convinced one of us that the electrodermatome could be of value in this way, as well as being an advance on other grafting instruments in the ease, speed, and reliability with

which extensive reasonably thin split-skin grafts could be cut from a variety of donor sites in patients with serious deep burns.

The Instrument

The electrodermatome was introduced in the United States after the last war. It is an electrically powered instrument in which a rapidly oscillating blade placed horizontally cuts against a lower fixed bar. The thickness of the graft can be regulated by adjusting the two micrometer screws which carry a vertically adjustable bar immediately above the knife edge. Grafts from 0.015 to 0.055 in. (0.038 to 0.138 cm.) can be cut. The maximum width of graft, which is 3 in. (7.5 cm.), can be reduced as required by a third screw which operates a pair of width guides against which the blade cuts. The length of graft is limited only by the extent of the donor area. The small electric motor is encased in metal to ensure its being spark-proof. It is connected to the instrument by means of a flexible drive shaft, and is operated on 10 volts A.C. or D.C. by a foot switch controlled by the surgeon. The knife blade is slotted into the instrument much as a razor blade into a razor, and is held there by three screws which are tightened by a spanner. We have found it possible to get good use out of blades which have been sharpened two or three times, although this is contrary to the manufacturers' experience. One blade will remain sharp during the cutting of skin from most of a thigh.

For sterilization, the dermatome, flexible shaft, and spanner are autoclaved; the blades are cold-sterilized. The motor, which does not enter the sterile field, must not be autoclaved. It is simply cleaned with a damp cloth.

Operation of the Electrodermatome

An adequate or the best available site is selected; it may be thighs, buttocks, legs, arms, chest, abdomen, or back—that is, any area except head, neck, hands, and feet. The skin of the donor site is covered with a thin coating of mineral oil such as sterile liquid paraffin. It is put on a slight stretch by the surgeon's free hand, placed behind the area from which the graft is to be cut. The dermatome is then placed with its undersurface flat against the skin. While firm pressure is maintained on it the instrument is moved slowly and steadily forward. An assistant grasps the cut edge of the skin graft with a pair of haemostats placed on each corner as the graft presents above the cutting blade, and slight tension is maintained by him on the graft. When the necessary length of graft has been cut the front of the instrument is directed upwards to sever the attachment of graft to the donor site.

Applications of the Electrodermatome

1. *In Burns.*—*Graft cutting.*—The special value of the instrument is the ease and speed with which extensive areas of graft can be cut even by those with little experience in its use. This saving of time can be of great importance during an operation in the second week in cases of serious

FIG. 1.—Early excision of sloughs with the electrodermatome. The instrument is run once or twice rapidly over the burnt area (in this case on the fifth day).

FIG. 2.—Grafting of extensive varicose ulcers. The pre-operative photograph of an elderly patient who had been in hospital for two years on account of circumferential bilateral extensive ulcers.

burns. An additional advantage is the thinness of the skin. There need therefore be less blood loss during the operation, and these donor sites can be soon "milked" again when necessary. Nor are they likely to give rise to hypertrophic and unsightly scars so often caused by the Paget dermatome. The instrument is also of value in definitive repairs for burn deformities, when medium or thicker-quality skin may be needed. *Slough removal*.—The electrodermatome is also in our experience the quickest and least haemorrhagic of methods for the early removal of some sloughs (Fig. 1). In a matter of a few minutes very extensive areas can be cleared. The dermatome can be run over the same area more than once until an unquestionably viable bed is exposed. In some circumferential burns of the trunk of uniform depth it can happen that front and flank skin has been lost to full-thickness depth while the thicker lumbar skin still has viable dermal elements. These if covered by homogenous grafts, after removal of the coagulated superficial sloughs by the electrodermatome, may heal permanently without the breakdown which appears in the homogenous grafts placed on subcutaneous beds in the same patient at the same time. This is presumably due to a creeping substitution of the homogenous cells by autogenous epithelial elements in the surviving dermis.

FIG. 3.—Post-operative photograph of the same case as Fig. 2. Four months after radical excision of ulcer, scarred epithelium, and fibrous tissue. Areas covered with thin split-skin grafts cut by the electrodermatome from the thighs.

tion the superficial layer of epidermis could be easily and quickly removed as thin grafts from those areas of the flaps whose future viability was suspect. These grafts could be stored at 4° C. for subsequent use (leaving the flap to declare itself) or applied at primary operation after excision of the flaps.

2. Avulsion Flaps.—The instrument has potential value in the treatment of patients who have severe shearing injuries with avulsion of skin and subcutaneous tissue from their underlying beds. Much of these flaps apparently viable at first is later lost by thrombosis or other cause. By use of the electrodermatome at primary operation

3. Other Soft-tissue Injuries and Surgical Problems.

—The instrument is of most value where extensive uniform-depth grafts are needed, and especially when it is desirable to save time and limit blood loss. It has therefore a role in any major soft-tissue loss. Its value in the reparative stage of radical mastectomy operation is the ease with which the adjacent trunk skin can be cut to cover residual defects.

4. Varicose Ulcers.—Certain extensive varicose and gravitational ulcers, such as the circumferential ulcers depicted in Fig. 2, need a repair by very extensive grafts (Fig. 3) of a skin of reasonable quality. Many of these patients are elderly, for whom it is undesirable to prolong the time of operation. We have used the electrodermatome to provide extensive grafts quickly and of a quality which holds a suture securely.

5. Lymphoedema.—In cases chosen for treatment by circumferential excision of skin and fat down to fascia and muscle, the electrodermatome is the most efficient method of first removing skin grafts from the skin of affected areas to be discarded. These grafts can be used to cover the raw areas established by the excision.

6. Tattoo Marks and Facial Acne.—The electrodermatome will rapidly efface the design of a tattoo mark (Fig. 4). It may not remove the staining completely if the tattoo is deep, but the result is generally a very effective obscuration of a design which has often long since ceased to please the patient. The instrument has also been used to remove severe and extensive acne of the face.

Summary

Attention is drawn to the value of the electrodermatome, both in general and in plastic surgery.

It is suggested that the expense of this rather costly instrument would be justified for any large surgical service. Our reasons for this belief are the greatly increased ease and speed with which extensive grafts of any thickness may be cut by it with little experience. We believe the instrument represents a further stage in the simplification of graft-cutting techniques, and one that is likely to increase the scope of the reparative work which can be retained in general surgical services.

We have found it of special value in cutting extensive grafts for severe burns, especially when the usual donor sites are not available.

It has also proved a most efficient agent for the removal of burn sloughs from the trunk and limbs.

As a graft-cutting instrument it has a number of other valuable uses, especially in the surgery of trauma.

FIG. 4.—Use of the electrodermatome for removal or obscuration of extensive tattoo designs.

A new low record for accidents in the mines was established in 1951, according to the annual report of H.M. Chief Inspector of Mines. Persons killed totalled 487, and 1,942 were seriously injured. In comparison with 1950 these were 6 fewer killed and 78 fewer injured. These record figures were attained in spite of the serious disaster at Easington Colliery, in Durham, which caused the death, directly or indirectly, of 83 people.