THE TREATMENT OF BURNS BY PARAFFIN.

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DR. BARTHE DE SANDFORT introduced a treatment for burns by means of a preparation of paraffin which he called ambrine. The treatment consisted in washing the burns with sterile water, drying, and painting or spraying a layer of ambrine over the surface. The surface was then covered with a thin layer of wool, and a second coat of paraffin applied. The paraffin solidifies almost instantaneously, and a thicker layer of wool and a bandage are then applied. The paraffin preparation, ambrine, is a secret one, and the property of the Ambrine Company, Paris.

Observations of Dr. Barthe de Sandfort's treatment, and experiments with ambrine, carried out in a military hospital, gave one the impression that the treatment was valuable. Burns healed with rapidity; constitutional symptoms rapidly abated; pain was reduced to a minimum; scarring appeared to be obviated, or at any rate was not apparent. The need for grafting large burns appeared to be avoided. The burns healed so rapidly with healthy granulations that there appeared to be nothing to be gained by grafting. The patients were singularly free from sepsis. The conclusion arrived at from experimenting with the ambrine treatment was that mild burns healed with singular rapidity, and severe cases recovered which would have been unlikely to recover by the ordinary methods of treatment. Observers who had had large experience of burns treated by picric acid, ointments, and other methods in ordinary use, were unanimously of opinion that the paraffin method was superior to the older methods. The experience of those who had witnessed the results of burns after liquid fire attacks was that the ambrine treatment would save many lives, and accelerate the recovery of all burns.

A preparation resembling ambrine may be produced by impregnating hard paraffin with a small quantity of tar. The substance is not in very good solution, and falls to the bottom of the paraffin when the wax is heated. The excellent results obtained would therefore appear to be due to mechanical causes. The protection of the burn from the air, the protection of the newly-formed granulations from damage, the splint-like effect of the wax in holding the damaged tissue immobile and at rest, appear to be the attributes which produce the effect. The heat of the applications and the conservations of heat to the surface may encourage the lymph flow, determine the supply of blood to the new capillaries, and favourably affect healing. The relief from pain and rapidity of healing is due to the fact that the burn is held at rest in a plaster-like cast of paraffin, and a suitable nidus in which the epithelium will proliferate is provided.

The absence of scarring depends upon the fact that skin can be reproduced in two ways. First, by direct proliferation of the epithelium in the depth of the wound. This method of healing is only possible in wounds of the first and second degrees, which form the vast majority of all cases of burns coming under treatment. Secondly, by the extension of the epithelium from the edge of the wound in cases of burns of the third and deeper degrees. These burns are comparatively rare, and are the only cases suitable for grafting. The effect of the paraffin in the first class is to protect and stimulate the growth of epithelium, islets of which can be seen growing over the base of the burn. In the second class the epithelium spreading from the edge is protected and stimulated.

The first point to be determined was whether equally good results could not be obtained with commercial paraffin, section wax, or similar pure hard paraffin. The ambrine preparation has peculiar and valuable mechanical properties. It has a lower melting point than ordinary section wax, is much more plastic when cooling and has not the tendency to crack which ordinary hard paraffin has. It also adheres well to the skin and is not liable to slip after a dressing is applied.

Hard paraffin is not a suitable application in its raw state; it lacks the mechanical properties of ambrine; there is an absence of the flexibility and adhesiveness

which ambrine possesses. I found that if hard paraffin of suitable melting point be subjected to a temperature of 130° C. by means of superheated steam, the melting point was reduced about 2° C., and the hard paraffin now possessed the mechanical properties of ambrine. The therapeutic value of ambrine appears to be entirely mechanical, and I suggest that the processes of impregnation with tar or other substances are associated with the application of superheated steam, and that it is this superheated steam that is the essential process in its manufacture. The clinical results of the application of hard paraffin—treated with superheated steam—to burns appear to me to be indistinguishable from those of ambrine.

Better results are obtained by the addition of certain antiseptic and stimulating substances. The wounds become clean more rapidly, pain is decreased, and the offensive smell associated with the ambrine dressings is avoided, and the burns heal more quickly. It was found necessary to change the treatment of sluggishly-healing burns treated by ambrine to a paraffin containing an antiseptic. The change was always beneficial. The argument that an antiseptic will destroy the saprophytic action of bacteria and will retard the treatment has not been borne out by clinical experience.

It is unnecessary to describe in detail the various experimental preparations. Laboratory experiments were made with a view to impregnating paraffin with various antiseptic substances—resin, essential oils, and tars. Experiments were made in order to produce a paraffin possessing the requisite melting point, plasticity, and adhesiveness. Cases were treated in the burn wards with various experimental preparations. Tar preparations were at first used; paraffin impregnated with oil of eucalyptus proved more efficacious. In order to obtain a painless treatment experiments were made with paraffin preparations containing analgesic substances. Potassium sulphate was used in one successful preparation (No. 4 paraffin), but was discarded as unnecessary in later preparations. After progressively improved results, a paraffin was finally arrived at having the mechanical properties of ambrine and containing a small amount of antiseptic. This is now in routine use known as No. 7 paraffin.

The results obtained by the use of No. 7 paraffin have surpassed the results obtained by ambrine or any other tried preparation. Severe burns of the third degree, accompanied by sloughing, and in a very septic condition, have cleaned and taken on healthy repair under this treatment, after a trial of the ambrine treatment. Severe burns of both palmar and dorsal surfaces of the hands, extending to the tendon sheaths, have healed in three weeks without contracting cicatrices. Extensive burns of the flexor surfaces of the limbs, the regions most likely to be altered by contracting cicatrices, have healed without apparent scarring. Burns of the face heal with a new healthy skin without scarring.

Severe burns due to cordite, petrol, and liquid fire have been healed with this preparation; there have been no untoward results.

Patients who have been admitted with septic burns of extensive areas have rapidly recovered from constitutional symptoms, the temperature usually becoming normal in a few days.

The treatment is practically painless, and patients rarely complain of pain after the first application. It has never been found in the least necessary to give an anaesthetic for the first or subsequent dressings. The rapidity of healing, the absence of sepsis or pain, the healthy new skin resulting, without contractile cicatrices or deformity, have been really remarkable. Burns become clean more rapidly than under ambrine treatment. Sloughs of deep tissues, in some cases down to bone, readily separate, and the burns become clean.

Method of Treatment.

The paraffin treatment is begun at the first dressing; very exceptionally, in very septic burns, the paraffin is replaced by hot boric fomentations for two days after two days of paraffin treatment.

The burn is washed with sterile water and dried. The drying is accomplished by placing a dry piece of gauze over the burn. An electric drying apparatus, such as is used by a hairdresser for drying hair, if available, is a convenient method of drying the burn.

The burn is next covered with a layer of paraffin at a temperature of 50° C. The No. 7 paraffin has a melting point of 48° C. The temperature may be estimated by waiting until the wax shows a solidifying film upon the surface. A broad camel-hair brush, sterilized in wax, has been found to be a rapid and painless method of applying the paraffin. A spray may be used, but sprays readily get out of order, are troublesome to use, and the dressing takes longer. In theory a spray should be used in order to prevent any damage to the epithelium. In practice we have found a brush, skilfully used, sufficiently satisfactory. Sprays are indicated in very painful cases. A metal spray of rather large bore should be employed. The spray must be immersed in hot water during use.

A thin layer of cotton-wool, cut the same size as the area of the burn is placed over the wound after the first layer of paraffin has been applied. This layer of wool is covered with a second layer of paraffin. The wool is cut in thin sheets and pressed between layers of paper in order to obtain thin layers of wool. The dressing is completed by applying wool and bandage. The burns are usually dressed daily. In the later stages, when the burn is clean and only a small amount of pus is formed, the dressing is changed every forty-eight hours.

Blisters are not interfered with in any way at the first dressing, the paraffin is applied after washing the burn. At the second dressing the dead layers of skin are cut away. Sloughs usually separate after a few dressings. The separation of sloughs is accelerated by applying a layer of jaconet over the wool and paraffin beneath the wool and bandage dressing.

Formula for No. 7 Paraffin.

Resorcin	...	...	...	1 per cent.
Eucalyptus oil	...	...	...	2 "
Olive oil	...	...	...	5 "
Paraffin molle	...	...	...	25 "
Paraffin durum	...	...	...	67 "

Melt the paraffin durum, and add paraffin molle and olive oil. Dissolve the resorcin in absolute alcohol (soluble 2 in 1), add the alcoholic resorcin, and lastly add the eucalyptus oil when the wax has cooled to about 55° C.

A smaller amount of resorcin may be used. The whole of the resorcin does not remain in suspension, and we have used a paraffin containing 0.25 per cent. resorcin with good results.

Difficulty having been experienced in obtaining resorcin in large quantity, beta naphthol, which has the additional advantage of being a cheaper antiseptic, has been substituted for resorcin in more recent preparations, as follows:

Beta naphthol	...	...	...	0.25 per cent.
Eucalyptus	...	...	...	2.0 "
Olive oil	...	...	...	5.0 "
Paraffin molle	...	...	...	25.0 "
Paraffin durum	...	...	...	67.75 "

We have employed No. 7 paraffin in certain stages of the treatment of trench feet. The mode of application of paraffin to the ulceration following frost-bite is in every respect similar to the application of paraffin in the treatment of burns, and the results have been equally satisfactory.

Lectures

ON

THE EARLY DIAGNOSIS AND TREATMENT OF SYPHILIS.

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(Continued from p. 3.)

[ABSTRACT.]

ALTHOUGH it is not to be expected that many practitioners will be able to carry out personally the rather complicated technique of the "Wassermann" reaction, it is within the power of all to take the necessary specimen of blood, which can be forwarded to a laboratory. As a general rule it will be found easier to remove the blood by a hypodermic syringe. A band should be placed round the upper arm, and the bend of the elbow having been cleansed by

ether or painted with iodine, the hypodermic needle should be passed longitudinally into the most prominent vein in front of the elbow, and at least two cubic centimetres of blood withdrawn. In some laboratories five cubic centimetres are demanded, and no doubt, when the arrangements are complete, the necessary capsules sent out from the laboratories will be accompanied by instructions as to the quantity required. Another method is to wind a rubber tube round the patient's thumb, making a puncture with a sterilized needle and drawing off the blood into a capsule of the type devised by Sir Almroth Wright. It is important to see that the ends of the capsule are carefully sealed by heat before posting to the laboratory.

THE EXAMINATION OF CONTACTS.

It is impossible to investigate contacts in many instances, but valuable work may be done in this direction. It is my practice, whenever possible, in the case of a married man presenting himself for treatment, to see the wife and to examine her and have a blood examination made. Likewise, if a married woman comes to the clinic and is found to be suffering from syphilis, every endeavour is made to induce the husband to come up for examination. Where there are children I have them brought up and they are examined. A boy, aged 6, was shown suffering from acquired syphilis. His mother was attending for secondary syphilis. The fact of the child being infected was discovered at once on his being brought for examination. In one family the following members were affected: The mother suffered from secondary syphilis acquired from her husband, her infant had congenital lues, while two other children in the house, one of them the mother's young sister, aged 12, were suffering from primary lesions due to kissing. In another family four members were infected.

TREATMENT OF WOMEN WHO HAVE HAD REPEATED MISCARRIAGES.

Another part of the work to which I wish to draw your attention, and which, in my opinion, is an important feature of the present movement, is the treatment of women who have had repeated miscarriages. We are working in collaboration with the Obstetric Department in this matter. I am happy to say that in a number of cases women who have had several premature births have been referred to us, and on the "Wassermann" reaction being found positive, have been treated by intravenous injection of one or other of the arsenical compounds, and by mercury, with the result that the subsequent pregnancies have gone to full term and the children born have been quite healthy. I take it to be the duty of every medical practitioner who knows of such cases to have a blood examination made and to put the patient under treatment should the Wassermann reaction be found positive.

CONGENITAL SYPHILIS.

At the outset I desire to enter a protest against the exaggerated statements which have been made as to the large mortality of children from congenital syphilis. Syphilitic infection is responsible for the deaths of a very large number of fetuses *in utero*, but I deny that it is the commonest cause of infantile mortality. Many mistakes are made in diagnosis, and I particularly wish to call attention to two or three points in this connexion. Very rarely a child is born with an extensive bleb or bullous eruption of syphilitic origin. I have seen instances in which the whole, or nearly the whole, of the epidermis has been shed in such a case. Occasionally a blister or bullous eruption develops on the palms and soles four or five days after birth. Blisters may develop elsewhere, but the palms and soles are always affected. Such an eruption is syphilitic and the infant rarely survives. A much commoner bullous eruption develops about the eighth or ninth day after birth, usually in association with a septic umbilicus. The blebs most commonly develop on the trunk, and they may be of very wide distribution. Sometimes such cases occur in epidemics, and in some epidemics the mortality is 30 per cent. This affection, known as *pemphigus neonatorum*, is a bullous impetigo, and is of coecal origin. It is not syphilitic.

The common congenital syphilitic eruption appears about a month after birth; the child is described as being quite healthy when born, and it may remain so until the third or fourth week, when an eruption very similar to