OBSERVATIONS ON THE TREATMENT OF CHRONIC ULCERS OF THE LEG

BY

M. UMANSKI, M.D. BERN, L.S.A. LOND.

LATE MEDICAL SUPERINTENDENT, HERZL-MOSER HOSPITAL, LEEDS

In recent years considerable attention has been directed to the treatment of chronic ulcers of the leg, and a number of important contributions have been made to the discussion of the problem. The British Medical Association instituted a collective investigation of the subject amongst members of the profession, and issued in 1928 a very valuable report by A. P. Luff, embodying the results. The importance of the question was also urged last year by A. Dickson Wright, in an address given before the Medical Society of London, in which he estimated the incidence of chronic ulcer of the leg in this country as 1 in 180, and stressed the grave economic loss resulting from disablement caused by this very chronic and intractable condition. Another important aspect of the "leg ulcer" problem is, in my opinion, the sanitary one, because every indolent ulcer of the leg is the breeding ground of a great variety of pathogenic organisms—staphylococci, streptococci, and others. Sabouraud defines these ulcers as "chancre streptococcique." There is a certain potential danger of infection from such patients to those around them, especially if erysipelas happens to complicate the ulcer, and the patient becomes afterwards a "carrier" of this disease. The crowded conditions under which the poor live makes the spreading of any infection so much easier. In a woman of child-bearing age such an ulcer may become a potential source of sepsis during her pregnancy or puerperium. There is also a possibility of conveying sepsis to a maternity case by the "handy woman" suffering from a neglected leg ulcer if she is in attendance on the case.

TREATMENT IN COMMON USE

Of remedies and methods recommended and used for the treatment of chronic ulcer of the leg there is an amazingly great number, and it would be difficult to enumerate them all here. Amongst the most approved ones in recent times, according to Luff's report, the following may be mentioned: (1) Unna's zinc gelatin impregnated bandages; (2) the skin-grafting method; (3) injection of sclerosing solution into varicose veins; (4) ultra-violet radiation.

The sclerosing injection of veins has, in practice, not entirely justified the early hopes and expectations of its advocates. According to Professor Sicard, who introduced the method in 1916, there are some contraindications to it, and it gives good results only in ulcers of moderate size with no considerable secondary changes. Moreover, in order to avoid septic infection, he does not recommend starting the injections until the ulcers have been made aseptic and healing. This method has also the drawback of not being quite safe, and liable to cause complications such as embolism, sloughing of the skin, and others. It is, further, the deeper veins of the tissues which are concerned in the venous return of blood from the ulcerated surface, and these cannot be injected. Again, varicose veins are very rarely the sole cause of chronic ulcers of the leg, and are for the most part only one of the factors in their production. There are many people with varicose veins who have no ulcers; and there are many cases of chronic ulcers of the leg in which no varices are present. At all events, a chronic ulcer which is caused entirely by varices on the leg can be relieved by a well-fitting bandage and antiseptic dressing.

Experience shows that none of the above methods is by itself sufficient to effect a cure or even to afford relief in all cases of leg ulcer. Even a combination of them,

as in A. Dickson Wright's method, does not always bring about such a result. Moreover, as a preliminary to all of them the ulcer must be brought to a healthier and more aseptic state. As to the extensive callous ulcer of the leg of many years' standing, most of the dermatologists are agreed that very little can be done for them, and the surgeon recommends amputation of the limb as the best treatment for such cases.

The method recommended by A. Dickson Wright, for which he claims good results, deserves mention here. In his own description the details of treatment are as follows: (1) The uppermost varicose veins are injected with a 5 per cent. solution of sodium morrhuate. (2) The leg is bandaged very firmly and evenly. (3) Absolute abstention from local treatment of the ulcer. No cleansing, no antiseptics—no matter how foul, how deep, or how long-standing the ulcer. (4) Extensive ulcers are skin-grafted. (5) Permanent support of the limb by an elastoplast bandage or a Bourgeaud bandage. The disadvantages of the method in Dickson Wright's own words are: (1) Eczema under the bandage. (2) A generalized eczema on face and forearms; although rare, very annoying. (3) Occasionally a generalized dermatitis. (4) Itching. (5) Recurrence. To these may be added discomfort from tight bandaging for a few days, to which many patients may object, even for a shorter space of time. In view of these disadvantages, as well as the fact that a certain surgical skill is required for its practice, the method will probably fail to commend itself to the general practitioner. In old people with arteriosclerosis it would scarcely be endurable, and not devoid of risks.

THE PRINCIPLE OF RATIONAL TREATMENT

Before describing my method I should like to make a few remarks on the physiological and pathological principles on which it is founded, as well as describing the therapeutic nature of the remedies used in it.

In devising this method of treatment of chronic ulcer of the leg I considered that, whatever the original cause of an ulcer may have been, the essential conditions for its persistence in not healing—that is, its chronicity—are: (1) the presence in the sore of bacteria and their toxins acting destructively on the tissues and impeding healing; (2) certain trophic changes and lowered vitality in the tissues, with resulting diminished resistance to bacterial action. The chief indications for the treatment of a chronic non-specific ulcer, which form the basis of my method, thus resolve themselves into: (a) combating the microbic infection and preventing reinfection by the use of suitable antiseptic remedies; (b) improving the nutrition of the tissues and stimulating their natural power of repair by remedies promoting granulation and epithelization. To fulfil the first indication I use a 1½ per cent. solution of hydrogen peroxide, which is equal to the B.P. solution containing 10 volumes of oxygen diluted with an equal volume of water. I consider this solution the best antiseptic for the initial disinfection of an ulcer, since it acts quickly by means of the liberated oxygen on the bacteria (anaerobic and others) destroying them and mechanically dislodging them, as well as the debris of dead cells and leucocytes, from the deeper parts of the sore, and so assisting in their removal from the ulcer. The oxygen liberated from the H₂O₂ solution acts at the same time as a tonic on the devitalized tissue cells; it also causes a certain amount of local active hyperaemia by its mild irritation of the tissues with resulting beneficial leucocytosis.

The hydrogen peroxide solution not being suitable for prolonged disinfection, some other antiseptic must be used for this purpose. I have found from long experience and recent bacteriological tests that balsam of Peru is the most suitable one, as it combines good antiseptic properties with valuable granulating and epithelizing qualities. It is safe in use, being non-toxic, and does not decompose; it pro-

fects granulations, and makes easy the removal of the dressing. Balsam of Peru has been known as a healing remedy for centuries, and owes its parasitocidal (in scabies) and disinfectant properties to benzyl and other esters of benzoic and cinnamic acid. It has been used in combination with silver nitrate in the treatment of ulcers in the form of ointment. Balsam of Peru is insoluble in water and almost all substances, except chloroform and alcohol. The emulsion prepared with gum acacia is ineffective. After many experiments I found that glycerin mixes well with the balsam, when 5 to 10 per cent. of alcohol (70 per cent.) is added. This makes a uniform and not too viscid solution, suitable for dressing wounds. An 8 to 12 per cent. solution of the balsam has considerable antiseptic properties, and proved very successful as a dressing for ulcers and wounds.

The value of glycerin in my method is not only in its being a good solvent for the balsam of Peru, but also in its antiseptic and osmotic properties, which render it a superior vehicle to vaseline, lanoline, etc. As an antiseptic it inhibits the growth of bacteria by abstracting water from their protoplasm without injuring tissue cells. Its highly hygroscopic properties make it hypertonic, thus causing an active flow of lymph and leucocytes from the surrounding tissues, which washes out the organisms embedded in them and so drains the ulcer. The lymph containing antibodies, according to Sir A. E. Wright's theory, has a certain valuable bactericidal action on micro-organisms. Over the hypertonic salt (5 per cent.) solution (used in Sir A. E. Wright's method), glycerin has the advantage that it does not irritate the tissues or cause pain, as does the concentrated salt solution, and is more suitable for routine ambulatory treatment. Glycerin also possesses antiseptic properties which the salt (5 per cent.) solution does not. I have for many years used glycerin solutions of antiseptics (boric acid, iodine, thymol, etc.) in the treatment of infected wounds in preference to aqueous solutions. But although glycerin has thus a certain antiseptic action it is much below that of the 10 per cent. solution of balsam of Peru in glycerin, as I was able to prove from bacteriological control tests.

THE METHOD IN DETAIL

1. At the first dressing the affected limb is washed with soap and warm water; the ulcer is cleansed with sterile water or physiological salt solution.

2. A pad of sterile non-medicated wool or lint is soaked in a 1½ per cent. solution of hydrogen peroxide (equal to the B.P. preparation diluted with an equal volume of water). It is then wrung out and is applied to the ulcer for half to three-quarters of an hour. From time to time some of the hydrogen peroxide solution is poured on the wool to keep up the concentration of oxygen in it.

3. After three-quarters of an hour the wool is removed and the surface of the ulcer is dried with sterile gauze. A dressing of gauze soaked in an 8 to 10 per cent. solution of balsam of Peru in glycerin, to which 5 per cent. of alcohol is added to assist solution, is placed on the surface of the sore, and covered with a pad of sterile non-medicated wool, which is kept in position by a roller or crêpe bandage applied from the foot to the knee, without much compression. The leg should, however, be raised while the dressing is being applied.

4. The ulcer is dressed for the first few days twice every twenty-four hours; then, if there is no discharge, or very little, only once a day. At the second and subsequent dressings, the disinfection of the ulcer with the H₂O₂ solution need not be prolonged for more than a few minutes. Removal of the dressing is facilitated if it is sprayed with hydrogen peroxide solution before removal.

5. After a week, or longer, when the granulations look healthy and epithelization from the edges of the ulcer has

begun, the strength of the balsam of Peru solution may be reduced to 5 or 6 per cent. only. It is also advisable to protect the edges of the sore with a layer of sterile vaseline, to which may be added some balsam of Peru. In some cases, after a fortnight or three weeks, a 6 to 8 per cent. ointment of the balsam of Peru may be substituted for the glycerin solution, but in most cases the glycerin solution answers the purpose best.

The method can be described as one founded on the principle of osmosis for the capillary drainage of an ulcer, and the choice of suitable antiseptics which can simultaneously disinfect it as well as promote repair of tissue by stimulating granulations and epithelization. I found it to be very efficient and successful in the treatment of chronic ulcers, and it can easily be carried out in general practice, even by the patient himself. It is clean, simple, inexpensive, entails no pain or risk to the patient, and very little trouble to the medical or other attendant of the case. I never observed any toxic effects from absorption of the balsam. The eczema and general conditions of the patient also usually improved. Bacteriological investigations have confirmed the soundness of the principles underlying the method. I have tried it with marked benefit in patients suffering from all kinds of chronic non-specific ulcers. It proved of particular value in the so-called "varicose" ulcers of the leg where other methods of treatment have failed or are inapplicable.

Reasons of space do not allow me to give here a detailed description of all the clinical trials and bacteriological tests made in connexion with this method. The work was carried out under proper supervision and control at the surgical and dermatological clinics of Bern University, directed respectively by Professors Dr. de Quervain and Dr. Naegeli, and at the Bacteriological Institute, directed by Dr. Sobernheim, professor of bacteriology and hygiene, Bern.

To all the above-mentioned professors and their staffs, particularly to Professor Sobernheim, whose guidance in the most important part of my work was very valuable, I desire to offer my thanks for their courtesy and facilities given in carrying out my investigation.

SUMMARY

From many years' experience in general practice, confirmed by recent clinical and bacteriological tests, I came to the conclusion that:

1. Even the most extensive ulcers of the leg of non-specific character may heal under adequate ambulatory local treatment, provided the patient's general health is not too greatly impaired.

2. The treatment should be directed towards eliminating microbe infection and stimulating the inherent natural forces of repair of the damaged tissues.

3. A solution of 8 to 12 per cent. of balsam of Peru in glycerin and alcohol answers this purpose best, since not only has it a bactericidal action on the pyogenic organisms of the ulcer, but it simultaneously promotes repair of damaged tissues by stimulating the granulating as well as the epithelization process.

4. Glycerin acts as a good excipient for the balsam of Peru and is useful as an exosmotic and hypertonic for draining ulcers and intensifying the antiseptic and penetrative action of the balsam of Peru.

5. Other methods should only be used after the above has been given a fair trial.

6. In ulcers of distinctly varicose character some support of the limb by elastic bandages may be applied for some time, preferably only during the day-time.

BIBLIOGRAPHY

- Luff, A. P.: Collective Investigation into the Treatment of Varicose Ulceration, *British Medical Journal*, 1928, ii, 1144.
Wright, A. Dickson: Treatment of Indolent Ulcers of the Leg, *Lancet*, 1931, i, 457.