CHRONIC LEG ULCERS

II. Treatment

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'If you chance to have in Cure an Apostume, that by the malignitie of the humors, or other evill disposition of the body changeth itselfe into a rebellious Ulcer . . . or that such an Ulcer come to thy hand from another Artist, be not out of hope to cure the same. For if Nature be not utterly thy enemy . . . proceeding as followeth, thou shalt be able to cure the disease, by the helpe of God.' JOHN WOODALL (1639)

We have seen that there are many varieties of leg ulcer and that even in the common venous ulcers multiple factors play a part in the aetiology. It follows that there is no routine method of treatment; every patient must be assessed individually. Moreover, treatment beneficial to one patient may be harmful for another and treatment which suits a patient at one time may be useless when repeated later. Nevertheless, certain principles can be stated: the earlier an ulcer is treated the more readily will it heal; if an ulcer is painful during treatment healing is not taking place and a change is required; with rare exceptions, the less frequently an ulcer is dressed the better; if the oedema is abolished a venous ulcer will heal but, if the oedema persists, nothing will bring about healing; never forget that it is not a leg ulcer we are treating but a patient with a leg ulcer.

With the exception of arterial ulcers, which will be mentioned later, only the treatment of venous ulcers will be considered here. The other less common types of ulcer mentioned in the previous article on aetiology, all demand specific therapy.

Preventive Treatment

The best way to prevent the common post-thrombotic ulcer is obviously to prevent deep venous thrombosis. If post-partum and post-operative thrombosis and that occurring during a medical illness could be obviated there would be 30 per cent. fewer venous ulcers (to mention nothing of the lives saved from pulmonary embolism).

Attempts to prevent thrombosis should be based on our knowledge of the pathology of the condition: thus whenever thrombosis is likely to occur venous slowing should be prevented, blood

loss replenished, and a tendency to clotting controlled.

We know that thrombosis is more likely to occur after complicated labour, after certain operations (especially those in the pelvis), when an anaesthetized patient's calves rest heavily on the operating table, and when there has been a considerable loss of blood. We know that it is more common in those over 40 years of age, the obese, in those with varicose veins and when there is a family history of thrombophlebitis. In the presence of these conditions every effort should be made to prevent it.

Leg exercises are useful and compression of the lower limbs from toes to groins by elastic bandages or stockings (to mid-thigh) helps to prevent slowing of the venous blood flow. Breathing exercises as early as possible after an operation are advantageous and the prophylactic use of anticoagulants may be considered.

When thrombosis has occurred early treatment with anticoagulants is important and firm support for the limb may prevent the appearance of secondary varicose veins and will control the oedema. Sympathetic block has sometimes been found helpful as it reduces vasospasm. Once the acute phase of thrombophlebitis is passed and the patient is beginning to get up, elastic support is essential to prevent the appearance of chronic oedema and the complications of induration and ulceration. It may be necessary for elastic bandages or stockings to be worn for years, if not for life.

The prevention of varicose, as distinct from post-thrombotic, ulcers is a simple matter. When there are early signs of chronic venous insufficiency elastic support is sufficient. Saphenous ligation may be useful, but should not be carried out

lightly if there is the possibility of a previous deep thrombosis. Tying the incompetent perforating veins has been advocated when early signs of the 'ankle blow-out syndrome' are present, but although these surgical measures may give temporary relief it must not be forgotten that the fundamental disturbance is in the deep veins and cannot be alleviated by surgery.

The Medical Treatment of Leg Ulcers

Rest. The primary object of all treatment of venous ulcers is to abolish the oedema as healing then usually proceeds uninterrupted. Gravity can be used for this purpose, the patient being put to bed with the foot of the bed raised about nine inches and a cage placed over the legs so that they are free to move and not pressed on by the bedclothes as this may tend to the development of an equinus deformity. But there are better ways of removing the oedema and there are good reasons why a patient should not be treated in bed. As Critchett wrote in 1849: 'Remove the weight of the column of blood by the recumbent position; keep your patient in bed, and at perfect rest, and the ulcer will heal; but there are many practical objections to this mode of treatment.' He mentioned the social and economic disadvantages. We may add the risk of thrombo-phlebitis and of stiffening of the limb joints. It is only for a very small proportion of patients with intractable ulcers that rest in bed is indicated.

However, postural drainage is of value in ambulant patients and may be combined with compression. The patient should lie on her back with the lower limbs raised to an angle of about 45 degrees and supported by cushions or by a specially made leg rest. Half to one hour in this position reduces the oedema appreciably and, if possible, this treatment should be carried out daily. Afterwards elastic webbing or other compressive bandages should be applied.

Compression. The cure of ulceration in a walking patient requires compression of the limb in order to abolish oedema or prevent its return. This has long been appreciated and Celsus used a linen roller for the purpose. Since then flannel and, more recently, elastic bandages have been used. Firm, elastic support is beneficial because it relieves the oedema, assists the pumping and massaging effects of muscular contraction, and compresses dilated veins, perhaps allowing the valves to recover their lost action if this has resulted from distension of the vein. Certainly, the flow of blood in the deep veins is accelerated by the application of elastic stockings or by compression from elastic bandages, presumably by reducing the calibre of the veins.

In 1930 Dickson Wright demonstrated the value

of the adhesive elastic bandage which is so effective because it remains in position, gives good support, prevents interference with the healing ulcer and relies not at all on the intelligence of the patient. All compressive bandages, to be effective, have to be carefully applied and this is beyond the capacity of many patients. Hunt, in 1859, asked why the treatment of leg ulcers is so notoriously unsuccessful. 'Mainly,' he said, 'because the application of a bandage is looked upon as an easy and simple operation which may safely be entrusted to the nurse or the patient.' He added that the bandage must be applied 'in such a manner that every portion of the limb, from the toes to the knees (including especially the hollow between the heel and the inner and outer malleolus) shall receive equal and abiding support. If it be at all tighter round the leg, for instance, than round the foot, the foot and ankle become swollen and oedematous.' He mentions another point of some importance: 'It is very often requisite to apply a compress of tow or cotton wadding to the hollow of the ankle, to secure sufficient pressure there, especially if that be the seat of the ulcer.' We often use a gauze pad in this manner and sometimes a pad of 'sorbo' rubber may be employed with advantage to produce pressure over an ulcer in this site where otherwise oedema may persist. A further direction of Hunt is worth quoting: 'If the patient complains that the bandage cuts anywhere, it should be taken off, and re-applied with additional care.'

The importance of bandaging in the treatment of ulceration cannot be overstressed. The application of this method to relieve oedema of the leg can only be learnt by practical experience. It is worth reiterating the words of Spender (1868): 'The proper application of the bandage is of such great importance in the treatment of varicose ulcers of the legs, that it should, when possible, always be executed by the surgeon in attendance.'

The majority of leg ulcers can be cured in a few weeks or months by treatment with compressive bandages. When the elastic adhesive type of bandage be used the risk of irritation is greatly reduced if the leg be first painted with an aqueous solution of gentian violet (1 per cent.), probably because of the hardening or tanning effect of the dye. Irritation from these bandages may rarely be caused by allergic sensitization to certain substances used in the manufacture of the sticky material on their surface, and more commonly by mechanical irritation from its adhesiveness, or by closure of the skin pores which become infected. The modern type of porous bandage is designed to make this less likely to occur.

An elastic adhesive bandage should never be used if the patient gives a history of being allergic

to it, and she should always be questioned about this. If such bandages are not tolerated a cotton bandage spread with ichthyol compound may be used under them or an elastic crepe bandage spread with diachylon paste.

It is not necessary to shave the leg first as with chronic venous insufficiency the hairs usually disappear. The leg having been painted with gentian violet solution and allowed to dry, longitudinal strips of the adhesive elastic bandage are applied along each side of the leg from the sole to just below the knee. The strips should cover the ulcer or ulcers if possible and they prevent the formation of ridges round the leg from the pressure of the edge of the bandage. No other dressing is required unless it be a pad of dry gauze. The bandage should be applied evenly from the base of the toes to just below the knee covering that part of the limb completely with no creases or folds. The bandage should be rather tighter round the foot and ankle than round the small of the leg and calf.

It is best to change the elastic adhesive bandage one week after the first application as the oedema is likely to be much reduced and the bandage a little slack. Furthermore, during the first weeks of treatment, when oedema is still present, the discharge from the ulcer may be profuse. Later the bandage may be left undisturbed three or four weeks before replacement.

The Unna's-paste bandage or its convenient successor, the 'viscopaste' bandage, is useful when there is no oedema, when the skin is unhealthy or when there is sensitivity to elastic adhesive bandages. It should not be used when there is extensive moist eczema with a red glazed appearance because it makes this worse. Under such conditions an ichthyol paste bandage is better.

If the patient is intelligent and can be taught to apply a bandage herself, and if daily dressing of the ulcer is required on account of gross secondary infection, an elastic webbing bandage worn over stockinet provides excellent support. It is preferable that such a bandage should stretch only in the longitudinal direction; those which stretch in two directions tend to become progressively narrower. They should be so woven that, on stretching, the edges do not become tighter than the central part. The ordinary elastic stocking is not practicable until the ulcer is healed and the skin of the leg reasonably smooth. Whatever method of compression is adopted the patient should be encouraged to walk.

Physiotherapy. Although White (1918) advised the employment of massage for 'phlegmasic ulcers' it was Bisgaard (1948) who firmly established the advantages to be derived from elastic

support combined with deep, firm massage. Chronic oedema even with considerable induration can be reduced by these means. The massage is given to the sole, the hollows by the malleoli and to the leg while the foot is raised. Pads are then placed in the malleolar hollows, and an elastic webbing bandage over stockinet applied to the leg. The patient should walk as much as possible and the treatment should be carried out daily or at least two or three times a week. Sometimes it is possible to train one of the patient's relatives to give this treatment which should then be continued indefinitely. Cramp in the legs, which is not uncommonly a troublesome symptom in patients with chronic venous insufficiency, usually disappears after a week or two of treatment with Bisgaard's massage.

Local ultra-violet radiation from a mercury vapour source is occasionally useful to stimulate healing and it is said to have a slight antiseptic effect. The dose should not be greater than that required to provoke a mild erythema as the unhealthy tissue in the neighbourhood of the ulcer can readily be burnt.

General Treatment. The importance of a complete examination must first be stressed. From the point of view both of aetiology and treatment of the ulcer, underlying disease such as diabetes anaemia, hypertension, arteriosclerosis, syphilis, carcinoma or any other debilitating illness must be excluded or, when possible, treated. Intra-abdominal tumours, such as the pregnant uterus or a large ovarian cyst, cause increased venous pressure in the lower limbs. Because examination is perfunctory and limited perhaps to the legs, such conditions are sometimes missed. Delay in healing may result from a deficiency of iron, vitamin C or protein in the diet and replacement therapy may be required.

Local Treatment. It is unfortunate that in the treatment of leg ulcers attention is so often concentrated on applications to the affected area, the primary and essential consideration, that of eradicating the oedema, being neglected. It is only in a very small proportion of patients with leg ulcers that local treatment is of any importance.

Inevitably an ulcer becomes secondarily infected with various organisms commonly present on the skin, but infection plays no primary part in the aetiology of the condition except when it causes venous thrombosis. There is rarely any relationship between the type of infection or the number of bacteria in the ulcerated area and the slowness or rapidity with which the ulcer heals. Many foul ulcers quickly become dry and begin to heal with no treatment other than that designed to clear the oedema.

Nevertheless, an ulcer sometimes becomes

painful, offensive, surrounded by erythema and rapidly increased in area as a result of secondary infection with *Pseudomonas pyocyanea*, *Pr. vulgaris* or a virulent streptococcus. After bacteriological investigation, including the sensitivity of the organisms to various antibiotics, treatment may be given with the appropriate antibiotic employed locally or internally. If used locally, antibiotics liable to provoke allergic sensitization, such as penicillin or streptomycin, should not be used for more than three or four days and they are better employed, when indicated, by internal administration. Certain antibacterial substances have proved particularly useful for offensive ulcers infected with Gram-negative organisms. Of these, phenoxethanol ('Phenoxetol') may be mentioned and is conveniently used in Lassar's paste in the strength of 2 per cent. spread on gauze or linen, the dressing being changed daily or less frequently. Allergic sensitization is rare. Another application which is effective in cleaning offensive ulcers is Lassar's paste containing 25 per cent. of sodium bicarbonate, but this sometimes causes pain and irritation. Recently a powder containing neomycin, bacitracin, cystine and glycine ('Cicatrinx') has been found useful in the local treatment of ulcers infected with Gram-negative organisms.

Gentian violet has a well-deserved reputation in local treatment, but it must be remembered that patients who are sensitive to sulphonamides are often also allergic to other aniline derivatives such as acriflavine and gentian violet.

Although various forms of local treatment may be useful, it is important that they should only be employed as ancillary measures. If attention is directed to the circulation of the limb as a whole, the base of the ulcer and its flora may usually be ignored.

Surgical Treatment. For the details of surgical treatment some authoritative work such as that of Dodd and Cockett (1956) should be consulted. Here only the general aspects will be considered.

The surgical treatment of leg ulcers may be directed towards dealing with the internal and external saphenous veins when they become varicose, the deep veins, or the perforating veins. In addition, skin grafting and sympathectomy are sometimes indicated.

As we have seen, in discussing the aetiology of ulcers, it is only rarely that varicosity of the internal or the external saphenous veins plays any important part, the main defect being in the deep venous system. However, in these occasional cases the veins require treatment and the problem is what is best. Many surgeons now believe that the injection of sclerosing fluids for this condition is not only useless, but dangerous. It is unlikely that gross varices will become blocked

and deep venous thrombosis may occur (Anning, 1954). Ligation of the saphenous veins is better or stripping of the internal saphenous vein. Although there is diversity of opinion on the subject, there seems little to be gained (and sometimes much to be lost) by carrying out these procedures when there has been a previous deep thrombosis.

Treatment of the deep veins has been attempted. Parona, in 1894, endeavouring to apply the theory of Verneuil (1855) that the deep veins are responsible for the superficial varices, ligated the popliteal vein to cut off the hydrostatic pressure of the column in the femoral vein from the varicose veins below. In recent years popliteal ligation has again been advocated by Bauer (1948), but the results do not seem to have been good except in his hands.

Cockett (1955) introduced extra-fascial ligation of the incompetent perforating veins near the ankle and excision of the ulcer. It remains to be seen whether the late results fulfil the early promise. It must not be forgotten that the perforating veins are not likely to become incompetent unless there is a defect in the deep system causing hypertension and the operation does nothing to rectify this.

Excision of the ulcer with the surrounding diseased skin and the scar tissue beneath it has been employed, the area being covered with a split-thickness skin graft, but unless combined with measures to control oedema it is doomed to failure.

Aftercare. When a leg ulcer has been healed, by whatever method, medical attention should not be discontinued. Unless aftercare is adequate, relapse is probable for oedema is likely to recur.

For women elastic stockings provide a convenient and comfortable means of supporting the leg after the ulcer has been healed. Many of the more elegant stockings on sale nowadays do not, however, provide sufficient support and a firm stocking reaching to the mid-thigh is essential, fitted after careful measurement of the patient's leg when no oedema is present.

Elastic stockings are not so useful for men as those reaching to just below the knee tend to slip down the leg. An elastic webbing bandage is comfortable and provides excellent support, and to men its clumsy appearance does not make it unacceptable.

Treatment of Arterial Ulcers

Patients with ulcers caused by arterial disease need warmth and rest in bed and these simple measures usually result in considerable improvement. They should be given a trial even when there is arteriosclerotic ulceration so severe that amputation seems inevitable. The limb is best

bandaged loosely or left uncovered under a cage with a light dressing over the ulcer. Patients with arteriosclerosis often complain when in bed of burning pain in the lower limb (erythralgia) and may prefer to sleep with their legs uncovered by bedclothes. Bandaging only makes such a condition worse. Nevertheless, the body should be warmly clad to keep vasomotor tone low and it is probable that smoking is best prohibited.

The local treatment is similar to that for venous ulcers, though an ointment containing cod liver oil or irradiated sterol is sometimes useful for the arterial type.

In the treatment of arteriosclerotic ulcers vasodilator drugs are worth a trial and are found by some to be most effective when given intra-arterially. In hypertensive patients side-effects have been described but seem uncommon, and for those with hypertensive ulcers treatment aimed to reduce the hypertension should be given.

Buerger's postural exercises should be given a trial, but intermittent venous compression is not of value. Sympathectomy should be considered if sympathetic block causes an increase in the temperature of the limb. A small proportion of arteriosclerotic ulcers may be healed by such measures, but unfortunately a greater proportion require amputation.

Summary

The prevention of leg ulcers is discussed with particular reference to the prevention of venous thrombosis. In the treatment of venous ulcers the importance of getting rid of oedema is stressed and various methods of doing so are mentioned, especially that of compression. Local treatment of the ulcer is shown to be a matter of secondary importance. Surgical treatment is briefly dis-

cussed. The treatment of arterial ulcers is mentioned.

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