

taken two hours after the injection of the medium have shown complete absorption in normal cases. It is easy to inject, there is no tendency for the substance to crystallize out of solution, and it does not have to be warmed before use. The medium gives rise to no undue tubal spasm and easily penetrates narrow channels and sinuses.

We have had one instance of iodism, but such sensitivity reactions appear to be inherent in all iodine-containing compounds.

We regard pain of early onset (group 1) as being due to peritoneal irritation, and at least two of the five cases in which pain occurred after an interval of 24 hours also appear to be of this type. We have no explanation why there should be a delay between the injection of the material and the onset of pain. The occurrence of this reaction does not seem in any way to interfere with the passage of fertilization of the ovum, since of the 11 patients with early reactions three became pregnant in the same menstrual cycle and one in the subsequent cycle. The patient with the iodine-sensitivity reaction also became pregnant in the subsequent cycle.

In attempting to assess the importance of this pain we should remember that Marshak *et al.* state that some pain and discomfort occurred from 80% of the 2,500 hysterosalpingographies undertaken, and it is worth restating that the pain did not seem to be severe enough to deter our patients from further investigation at the clinic.

It is possible that the injection of endografin may interfere with pregnancy, since in one patient in whom there was a grossly irregular menstrual cycle it was subsequently stated that she had an early miscarriage. This, however, occurred in another hospital, and we have been unable to obtain confirmatory evidence.

In relation to infection, one exacerbation of a tubo-ovarian abscess did occur; but we do not think that the medium alone could be blamed for this, since the timing of the investigation was a little premature. Three cases with tuberculous salpingitis were investigated; in only one of these was there a reaction (Case 2), and it was of a very mild nature, so that we feel that there is no undue risk, with this substance, of lighting up pre-existing pelvic infection.

In conclusion, we feel that the occurrence of pain can be kept to a minimum if only the smallest satisfactory amount of the medium is injected. Whilst the production of pain is certainly a great disadvantage, we feel that in view of its other advantages endografin merits an extended trial.

Summary

Hysterosalpingograms were taken in 75 cases, using endografin.

The merits of this contrast medium are discussed and also its disadvantages. Of the latter, the most serious is the occurrence, within 24 hours of the examination, of lower abdominal pain; this occurred in 11 cases. This pain is regarded as being due to peritoneal irritation.

Pain of later onset is also discussed, and brief notes are given on the five cases in which it occurred.

Our thanks are due to Professor A. S. Duncan and Dr. E. H. Hanson for permission to publish the case reports; to Dr. A. C. Coulthard, who carried out the first 10 hysterosalpingograms; and to Dr. J. Grant for her assistance in the infertility clinic. The earlier supplies of endografin were obtained for us by Mr. G. C. Duncan, of Pharmaceuticals Ltd., to whom we are grateful.

REFERENCES

- Altemeier, W. A., Schiff, L., Gall, E. A., Giuseffi, J., Freiman, D., Mindrum, G., and Braunstein, H. (1954). *A.M.A. Arch. Surg.*, **69**, 309.
 Campbell, H., Kane, P. O., Muggleton, D. F., and Ottewill, I. G. (1954). *J. clin. Path.*, **7**, 252.
 Cary, W. H. (1914). *Amer. J. Obstet. Gynec.*, **69**, 462.
 Heuser, C. (1925). *Lancet*, **2**, 1111.
 — (1926). *Brit. J. Radiol.*, **31**, 110.
 Marshak, R. H., Poole, C. S., and Goldberger, M. A. (1950). *Surg. Gynec. Obstet.*, **91**, 182.
 Rindfleisch, W. (1910). *Berl. klin. Wschr.*, **47**, 780.
 Rubin, I. C. (1915). *Surg. Gynec. Obstet.*, **20**, 435.
 Titus, P., Tafel, R. E., McClellan, R. H., and Messer, F. C. (1937). *Amer. J. Obstet. Gynec.*, **33**, 164.

A NEW METHOD OF TREATING OLD ULCERS OF THE LEGS

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With this title Baynton in 1799 described a method of firm compression bandaging of the leg for the healing of leg ulcers. It is now accepted that the keystone of successful treatment is such firm compression, to prevent the venous stasis and oedema that predispose to ulceration and prevent healing (Dickson Wright, 1931). But this principle has not been widely applied. Too often local applications to the ulcers are continued for years without improvement. Healing is achieved by periods of bed rest, only to be followed by relapse on resuming normal activities. When venous drainage has been permanently impaired by previous deep venous thrombosis, compression must be continued indefinitely. Even in the minority with leg ulcers due to varicose veins (Anning, 1954), surgery to the veins should be undertaken only after the ulcer has been healed with compression bandages (Dickson Wright, 1940). We here describe the successful use of stockinet bandaging, a technique first described by Jaeger (1936) and developed by Birger (1947). Our interest in the method was stimulated by a visit to Dr. Birger in Arlöv, Sweden. The results which he obtained in his own general practice were so impressive that we decided to use his technique. The method is cheap and simple, and usually enables the patient to continue at work during treatment.

Method

First, a local dressing is applied to the ulcer and surrounding eczema. The actual application used is of secondary importance. Chlortetracycline powder is helpful in controlling infection. A useful astringent preparation is a $\frac{1}{2}$ % aqueous solution of gentian violet. For weeping eczema $\frac{1}{8,000}$ potassium permanganate baths are often effective, followed by a dressing of paraffin and acriflavine emulsion or gentian violet as exudation decreases. To limited areas of acute eczema, $\frac{1}{2}$ % hydrocortisone ointment may be applied.

Over the local dressing is applied a bandage of cellulose wadding reaching from toes to knee. This material is sold in rolls 12 in. (30 cm.) wide and consisting of approximately sixteen layers. The rolls should be cut lengthways into three strips, each 4 in. (10 cm.) wide, and these should then be divided into two bandages of eight layers' thickness.* The cellulose wadding absorbs secretions and prevents grooving of the skin by the final compression bandage.

The main compression bandage consists of not less than seven yards (6.4 metres) of 4-in. (10-cm.) tubular stockinet, of the type used by orthopaedic surgeons.† Each patient is provided with two bandages to allow for laundering; stockinet should not be ironed. When dry, the stockinet tube is drawn up on to one arm to restore its width and elasticity, and is rolled up tightly before use. The technique of

*Cellulose wadding bandages, prepared to the right width and thickness, are obtainable from Robinson and Sons Ltd., Chesterfield, Derbyshire.

†These bandages are sold by John Bell and Croyden Ltd., Wigmore Street, London, W.1. The cost of the two bandages required for each leg is approximately 10s.

bandaging is of supreme importance, and to achieve success diligent practice is required. Really firm bandaging is essential, and unless some initial discomfort is produced by the bandaging it is unlikely to be effective. Starting from the medial aspect of the leg, a fixing turn is first placed above the ankle (Fig. 1). A turn is then placed round the point of the heel, followed by one around the base of the toes.

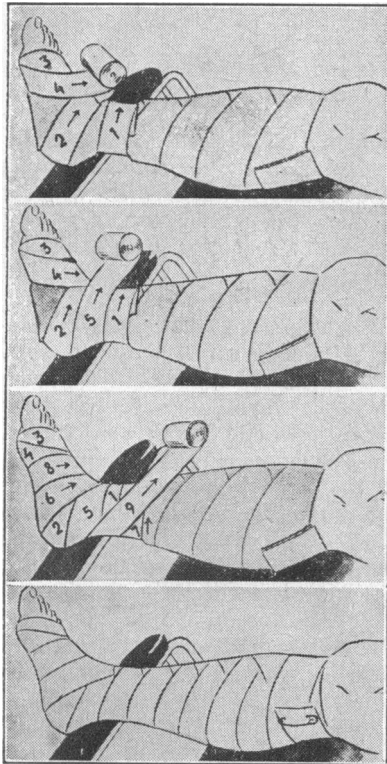


FIG. 1.—Stages in the application of the stockinet compression bandage. Reproduced from Dr. I. Birger's paper (1947).

The bandage is usually left for a week unless excessive secretions indicate the need of more frequent dressings at the start of treatment. When the ulcer is healed, only the stockinet bandage is needed. The patient is taught to apply it herself each morning before rising. The more severely affected legs require the compression of stockinet bandages indefinitely. When less support is needed and the ulcer has been firmly healed for some weeks, medium- or heavy-weight elastic stockings may be adequate. Patients are then seen at follow-up visits two or three times each year.

Clinical Material

Until two years ago the treatment of leg ulcers was divided between several clinics. Effective treatment requires time, patience, and enthusiasm—qualities which were rarely forthcoming in such circumstances. Undoubted improvement has resulted from the establishment of a special clinic for these patients, where one or two nurses are specially interested in applying the technique. We here describe the results of treatment in 50 consecutive patients with leg ulcers treated in this clinic. Two patients who were treated for less than two months have been excluded from the series.

The mean age of our patients was 62 years, with a range from 23 to 83. The accompanying Table shows the aetiology

Aetiology of Leg Ulcers in 50 Cases		
Primary varicose veins	..	16 (32%)
Following deep thrombosis:		
Pregnancy	..	10
Trauma	..	4
Others	..	12
No known cause	..	8 (16%)
		26 (52%)

of the ulceration, so far as could be determined. Both legs were affected in 12 of our 50 patients. The initial area of ulceration was larger than 15 sq. cm. in 19 patients, between 15 and 5 sq. cm. in 15, and smaller than 5 sq. cm. in 16.

Results

Of the 50 cases, 42 have healed after a mean treatment period of 3.7 months (standard deviation = 3.1 months). The mean total length of ulcer history in the 50 cases was 11 years. The mean length of the present relapse of ulcer was 5 years.

The following is a typical case history.

A woman aged 39 had developed a post-partum deep venous thrombosis in the left calf after her second pregnancy 10 years previously. Swelling of the leg had persisted since then. Her third pregnancy was uneventful, but during her fourth pregnancy, at the age of 31, ulceration of the left leg developed, followed two years later by ulceration of the right leg. Three periods of in-patient treatment, with a right lumbar sympathectomy and skin grafts, had achieved only temporary healing of the ulcers.

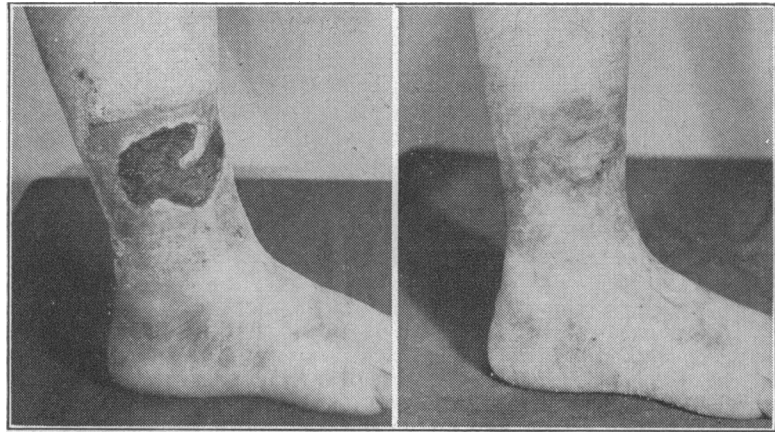


FIG. 2

FIG. 3

FIG. 2.—Chronic leg ulcer at start of compression bandaging. FIG. 3.—Healing after six months' treatment.

Pain was severe, requiring six or eight aspirin tablets daily, and her husband was in favour of amputation. At her first attendance there was considerable oedema of both shins. The ulcer on the left ankle was healed, but above the right lateral malleolus was an ulcer 76 by 46 mm. in size, with extensive surrounding induration (Fig. 2). Compression bandaging was started. Pain was rapidly relieved, and within six months the ulcer was firmly healed (Fig. 3). She was treated solely as an outpatient.

In only five of the successful cases were periods of treatment in bed required. Of the eight which failed to heal, three showed very marked improvement without complete healing of the ulcer. Surgery has been advised in three; in one, healing has resulted from operation, while two more are awaiting surgery. The remaining two patients defaulted from the clinic. This technique has also been used successfully for 45 patients with oedema and eczema but no ulceration.

Similar results can be obtained by other methods of compression treatment, but this method has several advantages. Skin sensitivity, so often produced by adhesive bandages, does not occur; a stockinet bandage can be used repeatedly over many months, and is therefore much cheaper than an adhesive bandage to be used once only; patients can continue at work during treatment; and the method is easily applied in general practice.

Summary

A cheap and effective method is described for the treatment of leg ulcers due to chronic venous insufficiency. The technique has been used successfully in

general practice. Of 50 patients with leg ulcers, 84% have been healed within a few months.

We thank Dr. Inge Birger for stimulating our interest in this method; Sister Deane and Sister Norman for their enthusiastic treatment of these patients; and Mr. A. Booker for the photographs.

REFERENCES

Anning, S. T. (1954). *Leg Ulcers: Their Causes and Treatment*. Churchill, London.
 Baynton, T. (1799). *A New Method of Treating Old Ulcers of the Legs*. 2nd ed. Emery and Adams, Bristol.
 Birger, I. (1947). *Acta chir. scand.*, 95, Suppl. 129.
 Jaeger, F. (1936). *Ätiologie und Therapie der Varizen*. Barth, Leipzig.
 Wright, A. Dickson (1931). *Lancet*, 1, 457.
 — (1940). *Brit. med. J.*, 1, 699.

THE RESULTS OF CHEMOTHERAPY IN THE TREATMENT OF TUBERCULOUS PLEURAL EFFUSIONS

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The ultimate results of the treatment of tuberculous pleural effusions by chemotherapy are uncertain and have been little investigated (Crofton, 1956). Anti-tuberculosis drugs are used in the hope of abating early symptoms, of hastening the absorption of the effusion, and of preventing later and more serious tuberculous sequelae. Their variable effect upon these early manifestations has often been described (Gerocarni, 1949; Chu, 1949; Moyer, 1949; Danopoulos and Melissinos, 1951; Bauce and Vannini, 1951; Stadler, 1951; Emerson, 1955). In contrast, only two studies have been published which have attempted to assess their long-term prophylactic value (Emerson, 1955; Falk and Stead, 1956), although streptomycin and para-aminosalicylic acid have been used in treatment since 1947.

From 20 to 30% of patients who have suffered from primary tuberculous pleural effusions eventually develop fresh pulmonary and extrapulmonary tuberculous lesions (Robson, 1952; Emerson, 1954). Bed-rest at the time of the effusion has generally been ineffective in preventing this (Emerson, 1954), although success has often been claimed (Roper and Waring, 1955). The chief aim of the present study has been to assess the efficacy of chemotherapy in preventing this high incidence of post-primary tuberculosis. The investigation is retrospective: a control trial at the present time would be quite unethical.

Material

Sources.—Full records and radiographs were obtained of all patients with tuberculous pleural effusions who had been treated in the country branch of the London Chest Hospital from 1949 to 1953. They came largely from east and north-eastern London, and had been diagnosed at clinics or hospitals in that area. Some had been treated for short periods in these latter before being transferred.

Diagnosis.—Cases were studied only if the lung fields were clear on radiographs taken during the whole time that the effusion was present. Where a parenchymatous lesion was seen or a non-tuberculous cause was suspected, these cases were discarded. In all, an effusion of varying size was present, the fluid was invariably and predominantly lymphocytic, and the Mantoux test was positive to 1 or 10 international units of old tuberculin. Of the 56 cases finally studied, there was a family or contact history of tuberculosis in 16. Tubercle bacilli were isolated from the pleural fluid, sputum,

or gastric washings in only 15 patients; though not a high proportion, this finding is comparable to those of many other series where laboratory search for tubercle bacilli has not been exhaustive (Thompson, 1946).

Follow-up.—Because the great majority of tuberculous lesions develop during the first two or three years after the effusion (Thompson 1946; Emerson, 1954; Roper and Waring, 1955; Wynn-Williams and Shaw, 1955), only patients who had been observed for at least 2½ years were included. Many patients were still attending at the out-patient departments of the London Chest Hospital or at their original hospital or chest clinic. Those who had not been so observed were recalled to their local chest clinic, were examined, and a chest x-ray film was taken. In addition, most of them answered a letter inquiring for specific details of health since their original treatment. All the original suitable patients were thus traced, except four who eluded all inquiry; none of these last had received chemotherapy. The proportion followed for various periods is given in Table I; the majority have been observed for over five years since their effusion.

TABLE I.—Follow-up

Duration	No. of Cases		
	Chemotherapy	Relatively Untreated	Total
2½–3½ years ..	6	3	9
3½–4½ ..	3	4	7
4½–7 ..	15	25	40

TABLE II.—Comparison of Groups

	No. of Cases	
	Chemotherapy	Relatively Untreated
Male	12	9
Female	12	23
Age 16–20 years	7	16
„ 21–30	15	14
„ 31 and over	2	8
Family or close-contact history ..	8	2
Size of effusion*:		
Up to dome of diaphragm ..	5	5
„ hilum	7	13
Above	12	14

* There were no bilateral effusions.

Division of Material.—After analysis of the records the cases were divided into two groups according to whether they had received efficient chemotherapy or not. In the first there were 24 patients who had received various forms of effective chemotherapy in addition to bed-rest, while, in the second, 32 had been treated by bed-rest alone. Features of the two groups are compared in Table II. They are not completely matched, but most of the differences are probably not of major importance. So far as the retrospective nature of the study permits, therefore, a comparison may be made between the effects of bed-rest alone and of bed-rest with chemotherapy in these patients. There was concurrence in time of both groups, and the duration of follow-up was proportionately equal in both (see Table I); but there was a tendency for more of the effusions with severe manifestations to be treated with chemotherapy.

Treatment

Both groups were treated initially with strict bed-rest, which lasted for an average of three months. In the chemotherapy group drugs were given for periods ranging from

TABLE III.—Chemotherapy

Type	No. of Cases
Streptomycin 1 g. and para-aminosalicylic acid 15–20 g. daily three times weekly and para-aminosalicylic acid 15 g. daily	17
Streptomycin 1 g. and isoniazid 300 mg. daily	2
Para-aminosalicylic acid 15 g. and isoniazid 300 mg. daily	3
Streptomycin 1 g. and para-aminosalicylic acid 15 g. daily	2