SCLEROTIC THERAPY IN PRACTICE (Part II)

VARICOSE VEINS

By R. R. Foote, M.R.C.S.

In my first article I pointed out some of the advantages of the injection treatment of this condition, and also showed some of the risks attached to their surgical management. All cases of varices may be benefited by injection treatment provided the list of contra-indications mentioned below is excluded from this statement. Many cases submitted to injections will show a rapid recanalisation rate, and are therefore not worth treating by injections alone. In this group of cases injections must be *preceded* by the operation of high resection of the internal saphenous vein. I say *preceded* advisedly, since I am now convinced that the injection at the time of the operation is not advisable. My change in attitude regarding this latter point is caused by the following observations.

1. Many cases which have been dealt with by resection alone are found later not to require injection.

2. The accidental spilling or leakage of sclerosant solution in the wound may lead to faulty wound healing, sloughs and sepsis.

3. Deep vein thrombosis is liable to occur when the injection is given to a patient who is kept in bed for a period of time after injection. Many such cases have been described by Atlas (1943).

Now to return to the *contra-indications* for injection treatment.

Femoral Thrombosis is an absolute contra-indication.

Superficial Thrombophlebitis.—During the active stage injections are dangerous inasmuch as a septic clot may become freed in the bloodstream. Ambulatory treatment of the limb encased in a firm elastoplast bandage is the therapy of election. As a rule it is safe to inject three or four months after the subsidence of all signs and symptoms. In the waiting period there is no reason why the other limb should not receive injections if required. Veins, previously the seat of phlebitis, require a smaller dose of sclerosant when the time arrives for their injection.

Pregnancy.—Conservative measures only are required for the treatment of varices at this time. Varicose veins usually diminish in size after delivery of the patient. These varices may be wanted by the patient if she be unlucky enough to develop a "white leg" during or after the pregnancy. Those who practice the injection of veins during pregnancy should at any rate avoid the use of quinine as a sclerosant.

Severe Debilitating Systemic Diseases.—It is obviously unwise to inject into the veins of sufferers from advanced cardio-vascular disease, cirrhosis of the liver, diabetes and tuberculosis, etc. Conservative supportive measures are all that should be undertaken.

Impairment of the Arterial Blood-supply.—Tests for arterial sufficiency should be undertaken in all suspected cases, since it is not uncommon to find arterio-sclerosis in conjunction with varices.

Mechanical Obstruction to the Venous Return.—Swellings in the pelvis should always be borne in mind when first examining a fresh case of varix.

Excepting for the first of the contra-indications enumerated above, that of femoral thrombosis, the remainder may all be discovered by means of a thorough *general examination* of the patient at the first attendance. This is of cardinal importance, and should never be neglected.

Femoral thrombosis is often preceded by a history of "white leg," and the trained observer finds little difficulty in recognising the fact that there is a deep vein thrombosis from simple observation of the leg. When in doubt it is wise to perform *Perthes' Test*.

It will be recalled that this test consists in occluding the saphenous vein by means of a lightly applied tourniquet high in the thigh. On walking the veins *below* the constriction should disappear or improve. If they become more obvious on exercise, then there is a deep vein obstruction or trouble in the communicating veins between the two systems.

The tests of Ochsner and Mahorner are modifications of this test, giving a more accurate picture of the state of the deep and communicating veins at various levels in the leg.

Now what cases are left to us which may honestly be submitted to injection treatment only?

1. All cases in which a gross valvular deficiency is not present.

2. That group of patients (quite a definite one) who, although suitable for operation, refuse this treatment.

3. Those who require treatment for cosmetic reasons only.

4. The elderly group and poor surgical risks.

5. In the treatment of the veins in certain cases of ulcerated legs.

Incompetence of the venous valves may be determined by means of the Brodie-Trendelenburg test. The results of this test may be negative, positive, or "doubly positive." The test is not necessary for the doctor who is examining large numbers of patients, since the "look" of the vein is usually enough. For those who employ the test, however, details are given herewith.

The patient lies on the couch. The operator's hand compresses the internal saphenous vein at the femoral junction. The patient gets up from the couch whilst the hand is kept in position. The hand is then removed, and if the vein fills slowly from below the test is negative and the valves are competent. Rapid filling of the vein from above demonstrates incompetence of the

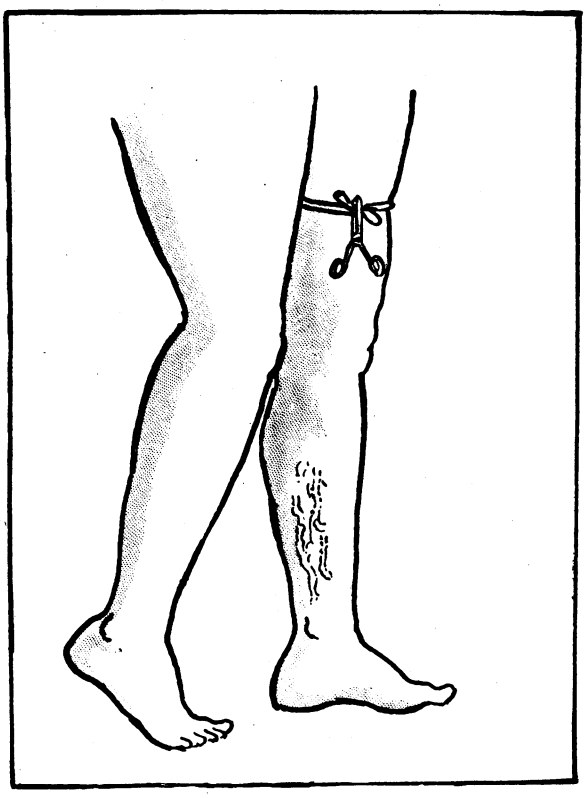


FIG. 1.—PERTHES' TEST.

A tourniquet is applied to the middle of the thigh. On walking, the veins become more prominent, showing that there is some obstruction to the deep system. An improvement in the condition of the varices after exercise will demonstrate the converse, demonstrating that the communicating veins between the two systems are not thrombosed, and that the blood is able to return via the deep system.

venous valves, and gives a Trendelenburg positive result. If the test is now repeated and the difference made that the operator's hand is not removed after the patient has stood up, filling of the vein within thirty seconds suggests that the communicating veins below the saphenous opening are incompetent. This is what is known as the "doubly positive" reaction.

The selection of cases for injection treatment cannot be done by rule of thumb measures, and experience is necessary. However, it is hoped that the remarks I have made may serve as a guide, and that it is now possible to say a few words about sclerosant solutions and the technique of their administration. There is no perfect solution in use, since they all suffer from various disadvantages. Maingot's *Lithocaine solution* is to my mind the only reliable fluid for the sclerotic treatment of large veins. The solution consists of 30 per cent lithium salicylate with 1 per cent tutocaine added as an analgesic. The solution is reliable, has stood the test of some seventeen years, causes but little pain, is non-toxic in correct dosage, and gives the most firm sclerosis with the smallest number of recurrences. The only disadvantage is that in inexpert hands an injection ulcer may be caused. Given proper dosage and technique this risk is virtually negligible.

Mono-ethanolamine oleate (Ethamolin, Neo-Varicane, Monolate, etc.) is valuable for small veins in which the risk of producing an injection ulcer is greater.

Quinine-Urethane (Genevrier's solution).—I reserve this solution for "Twin Injections" only. The frequency of cinchonism, even after a preliminary test dose, gives one too much anxiety, even admitting that it is a reliable and painless solution.

Sodium Morrhuate.—I only mention this in order to condemn it as a dangerous drug. Collapse, allergic reactions and fatal results are too common. The only advantage, as stated by Harold Dodd (1940), is that an injection ulcer does not necessarily follow if the solution is given perivenously . . . beyond that he joins with many others in his condemnation of this substance.

Mono-ethanolamine oleate is very widely used, and it is not common to get severe allergic responses. I have recently had a case which very nearly died after the injection of one-half c.c. however, and in looking into the literature find that I am far from being alone in my experience. Shelley (1939) reported a death in a patient, and refers to three other cases of death which have been brought to his notice. Cogswell (1940), Dean (1940), and Golden (1940) amongst others have published their warnings. The risk is not great, however, and I find I have personally given 1500 c.c. last year alone with no severe reaction. As a precaution the physician will be wise to have an ampoule of adrenalin solution to hand, and will not hesitate to give this direct into a varix on the first signs of collapse.

Of the many other solutions, I have not been satisfied that there are any to compare with the properly used lithocaine solution, especially when the end results are observed. There is no space in this article for their proper discussion however, and I submit that lithocaine, mono-ethanolamine

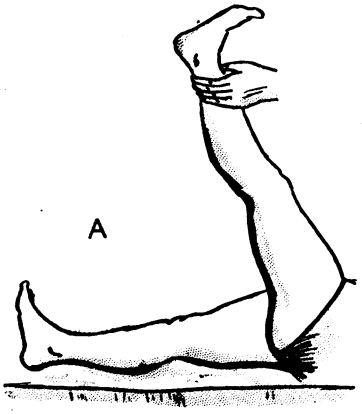
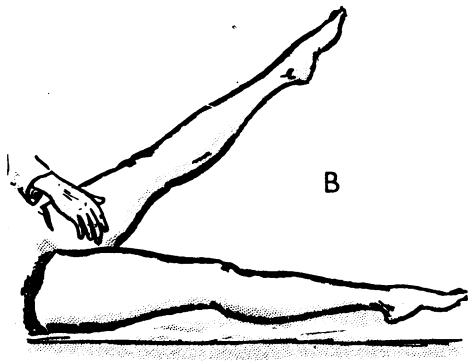
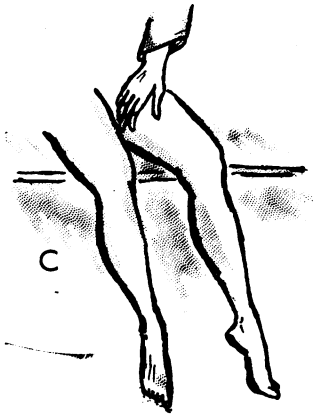


FIG. 2.—THE "BRODIE-TRENDELENBURG" TEST.

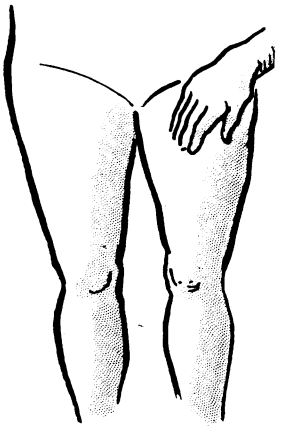
A. The patient is recumbent and the veins are emptied by raising the limb.



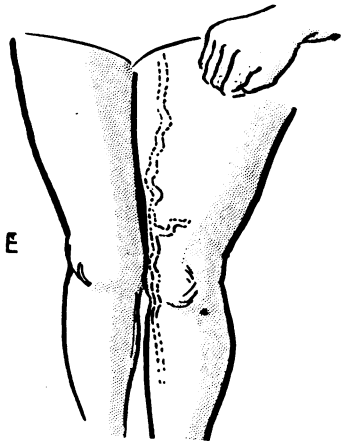
B. Pressure over the termination of the internal saphenous vein is applied.



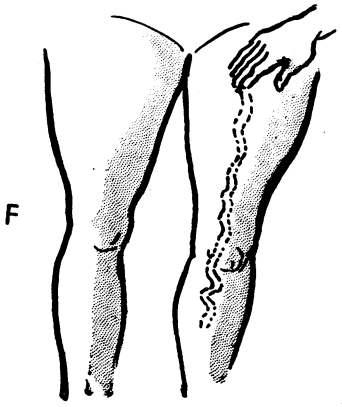
C. The patient sits whilst the pressure is maintained.



D. Pressure is kept up with the patient standing.



E. The digital pressure is released. Rapid filling of the vein from above indicates valve incompetency.



F. The test is repeated with the difference that the pressure is not removed from the region of the foramen ovale for at least 30 seconds. Filling of the veins during this time suggests an incompetency of the communicating veins connecting the deep and superficial systems. Such combined findings are referred to as a "doubly positive reaction."

oleate and quinine urethane solutions, used correctly, are the only sclerosants that are necessary at the present time for the injection treatment of varices.

Having made a proper selection of the case for injection therapy, and having decided the correct choice of sclerosant, it but remains to discuss the points most frequently raised regarding the technique of injection.

1. The position of the limb during injection.
2. The proper amount of sclerosant to be injected at each attendance.
3. The interval between injections and the number to be given at each sitting.
4. Practical points to be observed during the injection.
5. After-effects of injection and the treatment of the commoner complications. "Recurrences."
6. The injection of veins which require a special technique and some comments on the "twin injection."

Regarding the position of the limb during injection, I maintain that the most important point is to endeavour to introduce the sclerosant into the *empty* vein. The only advantage of injecting into a full vein is that it is easier to perform, and as a result the risk of an injection ulcer is less. The advantages of the empty vein technique are obvious, inasmuch as the solution injected does not become diluted by a pool of blood, a smaller thrombus is formed and recanalisation is therefore less likely, fainting from apprehension is minimised, and the cosmetic result is superior. Since it is difficult to estimate a correct dosage into a full vein, it is not uncommon to produce a gross thrombus formation with perivenitis and oedema. Small difficult veins have to be dealt with in the standing position, and in the intermediate type it is often necessary to call in the aid of a tourniquet in order to insert the needle into the vein lumen with accuracy.

The correct dosage of the solutions under discussion is essentially a matter of experience, and it is only possible to give a rough guide to the reader. Excessive dosage causes an excessive reaction which may extend to the communicating and deep veins. Too small a dose may cause a thickening of the vein wall without obliteration. The subsequent injection is made more difficult, and time is also wasted. At the first sitting a test dose should be given for two reasons: firstly so as to rule out the allergic patient, and secondly to determine the sensitivity of the vein to the sclerosant employed. Quite small doses are capable of producing a thrombosis of the popliteal vein when injected distal to the knee, and this disasterous result has been described by Atlas (1943) after the injection of a half c.c. dose of sodium morrhuate. As far as lithocaine is concerned, no toxic effect may be feared from as much as 6 c.c. As a test dose 2 c.c. may be given into a fair-sized vein, and the resulting thrombosis examined on the following day, so that further dosage may be estimated from the findings at that time. Mono-ethanolamine oleate should be used in a half c.c. first dose if all risk of general effect is to be minimised. As explained, this solution should be reserved for the thin walled small veins, which might lead to an injection ulcer if lithocaine were to be employed.

Lithocaine may be injected into several veins at the same sitting if time is a factor in treatment. The same applies to the use of the mono-ethanolamine solutions, where five c.c. in divided dosage is acceptable. The dosage should be worked out so as not to incapacitate the recipient, and to make the treatment as little unpleasant as is possible.

The main practical points worth noting as far as the injection is concerned are as follows. Firstly, use an ordinary record syringe with a central or eccentric nozzle. Avoid the many fancy types of syringe. Several sizes of needle are necessary, and I find the "evipan" needle to be most satisfactory. Approach the vein from as nearly a parallel angle as is possible, avoiding the acute angle, which tends to cause transfixion of the vein. See that the needle bevel is towards you, and that the needle point first enters the vein. Do not withdraw the needle for a few seconds after the injection. If the patient is not in the recumbent position, place the limb horizontally after withdrawing the needle, and do not disturb this position for five minutes. The puncture is conveniently sealed by means of "cellulose" tape applied over a piece of sterile wool. This substance has the advantage of allowing haemorrhage to be visible, and does not suffer from the keeping and occasional allergic defects of elastoplast. It is always best to bandage the limb after injection, and so aid in the formation of a smaller thrombus. In some cases this bandage is replaced by an elastoplast. Make sure when giving the injection that the ulnar surface of the hand holding the syringe is resting on the limb, so that there may be no movement of the needle, and so that a clear vision of the syringe contents may be obtained. Complications of treatment are all due to errors of technique, with the exception of pulmonary embolism and those cases to which reference has already been made, which give an abnormal response to a test dose of solution. It must be remembered that *no patient should be kept in bed after injection.* Should other factors necessitate this procedure, active movements of the legs should be instituted whilst recumbent.

Injection ulcers do not occur if a careful technique has been employed. Should one happen, however, the leg should be firmly supported by means of an elastoplast bandage, which should not be removed for a month. The ulcer is thus out of sight of the patient and operator, and usually heals without much trouble.

Leak ulcer does not occur if the needle is not removed too hurriedly after an injection, and if the limb is not allowed to be dependent after the sclerosant has been introduced. Oedema resulting from injection means interference with the deep vein system, and the only thing to do is to apply a firm supportive bandage.

Recanalisation of veins, as already explained, is less likely to occur following a proper technique on correctly selected cases. The term is often used to include, not only cases in which a new channel has formed in the vein, but also those cases which "recur" from the dilatation of fresh veins around the sclerosed vessel, or from the enlargement of small veins considered too small for injection at the original time of treatment.

When performing the twin injection, introduced nearly twenty years ago by Rodney Maingot, use three syringes. Inject the lithocaine first, flush the needle through with sterile water, and finally use the third syringe for the quinine injection. One puncture spot, speed of injection, and the recumbent position of the patient are important factors in the success of this valuable manœuvre which is reserved for resistant large veins.

The hard "Roller" veins which occur around the ankle joint need careful fixation before injection. They also require a relatively larger dose. "Hair" veins, or as they are sometimes called "Spider Bursts," should be attacked via the "Feeder" vein, which is usually present. Very small veins may be entered more easily by using a dental syringe and needle. A solution of froth made by shaking some mono-ethanolamine oleate in the syringe is a useful method of dealing with this type of vein, this manœuvre allows the operator to see the small bubbles coursing along the interior of the vein. Minim doses of mono-ethanolamine oleate may sometimes be injected perivenously in cases, with advantage such.

The injection of varices in association with varicose ulceration must be done with especial care, No injection should be given until gross sepsis associated with the ulcer has been cleaned up by means of supportive and other measures. The injection should be given as far away from the ulcer as is possible, and the limb enclosed in a firm elastoplast bandage as soon as the treatment has been given. Never inject the varices of the vulva, or those of a varicocele. If in doubt where the syringe contents are going to, stop injecting, and injection ulcers will be few and far between. All this advice appears too simple to warrant mention, but attendance in a vein clinic will soon show the reader that these elementary errors are frequent. Inject the right solution into the right type of case, and adopt the right technique, and recurrences and painful thrombi will become less common . . . and a valuable method of therapy will not receive unfair criticism.

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DISEASES OF THE SPINE AND SACRO-ILIAC JOINTS (Part II)

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Diagnosis

In order to make a correct diagnosis in the case of a patient complaining of back-ache it is necessary not only to know the anatomical structures of the area concerned, but also to know what pathological conditions may be found as the result of disease or faulty body mechanics of these parts. Thus we may fit into the jig-saw the patient's symptoms and patient's physical signs on examination.

Diseases of the Spine and Sacro-Iliac Joints to be remembered by the Examiner

Inflammatory Disease.—Lumbago and Fibrositis.

Traumatic.—Sprains, fractures of vertebrae, adhesions and subluxations of the sacro-iliac joints.

Mechanical or postural upsets.—Excessive lordosis or kyphosis caused by faulty posture or other disease.

Diffuse Spinal Disease.—osteoarthritis, ankylosing spondylitis, and Tuberculosis.

Oddments.—Referred pain from intra-abdominal or peripheral nervous lesions, e.g. adherent Duodenal ulcer, Herpes, etc.