The advantages of this method are as follows: (1) the treatment is non-odorous, non-greasy, and non-messy; (2) the bed-clothes or underclothes are not stained; (3) it is not expensive—each case costs about a penny for a course of treatment; (4) treatment is standardized at two days' duration; (5) it dispenses with the trouble of having clothes disinfected, thereby avoiding hospital treatment; (6) recurrences are few; (7) supervision is unnecessary; (8) baths are unnecessary.

The disadvantage of the method is that some patients complain of a burning sensation in the region of the scrotum and penis after four or five applications. Three or four days after starting the treatment there may be a very mild excoriation of the affected area, particularly the scrotum, and a scaling and slight exudation of serum may appear. This, however, does not incapacitate the patient, and within a week it usually disappears without treatment. The complication is probably due to the strength of the solution. Since using a half-strength solution on a new series of cases the excoriation has been observed in a very much milder form in only 3 cases out of 50. This development was seen in 8 cases in Class A, 15 cases in Class B, and 12 cases in Class C. In spite of this complication patients frequently make such remarks as: "The best night's sleep for a fortnight"; "This should have been used years ago" (this patient was treated three times previously with sulphur ointment); and "Good stuff, this: it does stop the itching."

I should like to express my thanks to Lieut.-Colonel J. F. W. Meenan, R.A.M.C., whose patience and kindly encouragement have contributed towards the completion of the above investigations. To Lance-Corporal A. Murdoch, R.A.M.C., my gratitude is due for his careful help, which has greatly assisted me in compiling these results.

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SUBCUTANEOUS LIGATURE OF VARICOSE VEINS

BY

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The ability to treat varicose veins by injection of sclerosing solutions is now an accepted part of a practitioner's therapeutic equipment. Unfortunately there are many cases which need something more drastic than injection alone. A positive Trendelenburg sign usually means that ligation of the saphenous vein will be required, either in the thigh or at the saphenous opening.

The methods described by recent writers are not applicable widely enough, as they require the use of an operating theatre, and many patients are unable to stay away from their work in order to attend hospital. For some time I have been trying to evolve a technique which would allow ligation of a varicose vein to be performed with a minimum of complication in the consulting-room. The method now used will be described.

Method of Ligation

The instruments required are one 2-cm. syringe, one perineal needle, strong silk or silkworm-gut, 2% novocain solution, and sclerosing solution as preferred (5% sodium morrhuate solution in my own case). The patient usually sits, but occasionally a standing position allows the vein

to be found more easily. At the highest point where the vein can be clearly defined the skin is prepared and an intradermal injection of 0.2 c.cm. of novocain is made on each side of the vein. The wheals should be one to one and a half inches apart. The perineum needle threaded with silkworm-gut is now passed through one wheal, under the vein, and out through the other wheal. In some of the early cases the vein was accidentally transfixed, but this appears to be of little consequence apart from the bruising that results. If this mishap is suspected the needle should be left in position until the rest of the treatment has been completed. Transfixion of the vein can be easily avoided by inserting the needle for an inch or so in a direction parallel to that of the vein, and then changing the direction across the course of the vein. The suture is drawn through and the ends are left loose.

A sclerosing injection is now made at the level of the suture, the ends of which are then tied firmly over a tightly rolled pad of gauze. In the earlier cases rubber tubing was used instead of gauze, but the increased elasticity caused the ligation to cut through the skin and leave a scar. A strip of elastoplast is applied over the gauze pad. The whole operation takes about two minutes to complete. The veins below the ligation require injection also, but quite small amounts of sclerosing solution will suffice, as the downward current of blood has been checked. These additional injections can be left over until the stitch is removed, which is done on the fourth day.

After tying the ligation it is pleasing to demonstrate that the vein is now empty. This can be done by getting the patient to contract and relax his calf muscle several times or, more simply, by "milking" the vein downwards. The demonstration is quite effective if the case is a suitable one for the method.

Results

The first case was treated eighteen months ago and the result is still good. Most of the patients have been able to work during the period of treatment. They are well pleased with the result, and there is no scar. Out of a total of nearly 30 patients 3 have returned later to have the other leg treated in the same way. The majority of the patients had either been refused injection treatment elsewhere because of the large size of their veins or had been treated unsuccessfully. It should be more generally recognized that injecting sclerosing solution into a vein which contains blood under pressure will not cure the condition, and may produce an area of pigmentation, thus bringing the whole method into disrepute.

There was one partial failure in the series. In this case I could not define the vein above the knee and had to tie it at a point where venous pressure was fairly high. The vein became patent again in a few weeks, though in the interval large veins below the point of ligation were successfully sclerosed. This man had previously had his leg treated at several hospitals and is pleased with the result, but I regard it as a failure. He ought to have had the Trendelenburg operation.

The most satisfactory case was that of a woman aged 40, who had had bilateral varicose veins for twenty years. They were rather larger in diameter than the average thumb, and extended to the middle of the thigh. Subcutaneous ligation in both thighs and half a dozen injections have produced a perfect cosmetic result. After six months there are still a few tender nodules at the sites of large varicose dilatations, but her ulcer has healed, her legs look normal, and she can walk as far as she likes without trouble.

Complications.—One ulcer developed at the site of ligation. In this case the patient did not attend as instructed

for removal of his ligature, but allowed it to remain *in situ* for a fortnight. Where very large veins are tied a certain amount of periphlebitis occurs. I have seen no harm come of it, and an elastoplast bandage gives complete relief.

Summary

A simple and effective method of ligaturing varicose veins is described. No special apparatus or facilities are required, and no scar is produced.

Clinical Memoranda

Acute Crush Injury of Leg

In the case here reported there were delayed symptoms suggesting traumatic thrombophlebitis, followed by shock and, later, by renal insufficiency. It was successfully treated at the patient's home by four "elastoplast" bandages and two crêpe bandages.

CASE HISTORY

An A.F.S. man aged 41 was driving a motor-cycle combination while looking for incendiary bombs when he was suddenly struck by the off-side wing of a car driven by another A.F.S. man on similar duty. The former was wearing thigh-length rubberized gaiters, long stockings, socks, and strong boots. The inner side of his knee broke the gear lever and deeply indented the petrol tank. The inner side of his leg was crushed against the engine, and his boot broke the starting handle. He was taken to the casualty department of a hospital, but was sent home because he felt fairly well and had only a few abrasions.

First Day.—He complained of shooting pains extending from the inner side of the right ankle to the upper limit of the internal saphenous vein, a feeling of great heaviness, and a burning sensation on the surface of the skin. There was also numbness like that of a swollen finger when its base has been constricted. He was beginning to suffer from shock; his pulse was 120. There was gravitational staining of the skin of the thigh and buttock very much like the post-mortem variety. The leg was twice the circumference of the other and pitted on pressure. The skin below the knee was tense, glazed, and dull red. The posterior tibial veins had become superficial, enlarged, tortuous, tender, and firm as if thrombosis had occurred. This applied in lesser degree to the internal saphenous vein. There was a wheal 3 inches in length above the right knee, and a number of smaller ones, varying from 1/2 to 1½ inches, on the inner side of the leg below the knee. Over these extended several superficial abrasions which had faintly yellow sloughing bases. The veins below the knee were in contact with the surface of the wheals, and through the latter, elsewhere lacerations in the superficial and deep fascia could be palpated, and dark blood could be pressed to the surface from injured muscle fibres and deep veins. The shock was treated, and hot Gamgee fomentations were applied hourly to the whole leg.

Second Day.—He had an anxious expression and had begun to vomit. The pulse was slow and full, and the little urine passed was dark brown and scanty. The fomentations had given the leg and abrasions a more healthy colour, but the limb was more tense. A little black blood had appeared on the Gamgee tissue. Wool was placed round the knee and ankle and an elastoplast bandage was applied from the toes to the knee and another, in continuity, to the upper limit of the saphenous vein. This was followed by two crêpe bandages, which were to be reapplied when they became slack.

Third Day.—There was a great improvement. The vomiting had ceased and there had been a larger flow of urine, which was of a much better colour. The circumference of the leg was considerably smaller, and two more elastoplast bandages were applied, followed by two crêpe bandages.

The patient was up in five weeks, when he complained of pain under the gluteus maximus. An elastic bandage was tried but proved uncomfortable, so the adhesive variety was again applied. A month later he returned to light duty wearing crêpe bandages.

Pathology.—The elastoplast bandages repaired the subcutaneous tears in the ilio-tibial band and the fascial planes, restored the normal circulation of the blood and lymphatics and through them the metabolic health of the muscles, and emptied and prevented the formation of pockets of blood clot whose autolysis under pressure and patchy necrosis were possibly responsible for the glomerular nephritis.

His legs had been healthy before the accident, and there was no family history of varicose veins. His weight had previously been stationary at 12 st. 7 lb.; two months after the accident it was 10 st. 2 lb.

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Local Sulphanilamide for Penetrating Wounds of Joints

In view of the increasing use of local applications of sulphanilamide it may be of some interest to record the following cases of wounds involving the knee-joint.

Case 1.—A spinster aged 58 was admitted to hospital as an air-raid casualty with an extensive third-degree burn of the buttocks and a gross laceration of the right knee. She was very shocked, but improved after a blood transfusion. It was not until ten hours after admission that she was fit for operation; it was then found that an irregular wound six inches long on the inner side of the knee communicated with the interior of the joint through a deficiency in the capsule, two inches long, beneath the patella. The wound had been temporarily packed with flavine gauze, but was extremely dirty, containing brick dust and fragments of clothing. As much contaminated tissue as possible was excised, the wound was irrigated with flavine solution and packed liberally with sulphanilamide powder, and the skin was lightly sutured. The leg was placed in plaster. The burns were treated with tannic acid. The patient was ill for the next few days, and a course of sulphapyridine was given by mouth, after which she gradually improved. The plaster was removed after three weeks; the greater part of the wound had healed by first intention, and the remainder was granulating well. There had been only a slight discharge of inoffensive pus. There was a little movement of the joint. The wound was again dressed with sulphanilamide powder and the plaster renewed. The plaster was removed permanently after a further three weeks, and at the end of eight weeks the wound was quite healed and there was painless movement at the knee to 35 degrees. The burn was granulating and will need skin-grafting.

Case 2.—A child aged 6 was knocked down by a lorry and was admitted to hospital with a dirty lacerated wound nine inches long on the inner side of the right knee crossing to the lateral side in front of the patellar ligament. At operation it was apparent that a large flap of skin and superficial fascia had been raised, and that there was a deficiency 2 cm. in diameter in the capsule of the knee-joint on the lateral side of the knee. The tissues contaminated with road dirt were excised as thoroughly as possible (this was unsatisfactory on account of the thinness of the flap) and the wound was packed with sulphanilamide powder and lightly sutured. The leg was placed in plaster after a small counter-incision had been made for drainage through the base of the skin flap on the outer side of the knee. Convalescence was uneventful, and when the plaster was removed seventeen days later the wound was found to be well healed. Four weeks after the accident there was a full range of painless movement in the knee, and the child walked and ran without a limp.

It is not always possible to excise all the contaminated tissue of a wound without making an excessive sacrifice of skin. In each case there was a penetrating wound of the knee-joint in a contaminated wound; in neither case was an effective debridement possible, and in neither case was there any evidence of infection developing in the joint. In the light of these and similar cases it seems that the topical application of sulphanilamide powder to dirty wounds marks a considerable advance in treatment, especially when combined with the well-established principles of surgical toilet and immobilization.

I am indebted to Mr. R. Lodge for permission to publish these cases.

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