

of well-being and grandiose delusions may be associated with either psychoses and both are not infrequently associated with crime. In both there may be facial and lingual tremors, the pupils in either disease may be unequal and sluggish. Argyll-Robertson pupils and primary optic atrophy favour general paralysis, and although presumptive evidence of cerebrospinal syphilis, have been associated, although rarely, with other conditions such as alcohol. Jelliffe and White quote a case reported by Nonne<sup>1</sup> in which it was demonstrated to be due to alcohol; syphilis was excluded by four negative reactions, optic neuritis by careful ophthalmological examination, and the light reflex returned upon the withdrawal of alcohol. The facial expression may be lost in either condition, and the slurred speech of the paralytic is not always easy to differentiate from the thick hesitating speech of the alcoholic. Epileptiform attacks may occur in either, the tendon-jerks may be exaggerated, unaffected or lost in both. In general paralysis the plantar reflexes become extensor, sooner or later, unless they disappear altogether, as in the tabetic form of the disease. An extensor plantar reflex may be the only physical sign present, and when coupled with mental symptoms may assure an early diagnosis. Hallucinations are more common in alcoholic cases. Fear or apprehensiveness suggests alcoholism. Either may improve markedly, following upon institutional treatment. The differential diagnosis can be determined by examination of the cerebrospinal fluid, but it is immaterial as far as criminal responsibility is concerned. For if the symptoms cause a person to be so affected that he does not know what he is doing or that what he does is wrong, he is thereby irresponsible, whether the cause be alcohol or syphilis.

## THE TECHNIQUE OF TREATMENT OF VARICOSE VEINS, OF HÆMORRHOIDS, AND OF BLOOD TRANSFUSION

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VARICOSE veins and hæmorrhoids are pathological conditions constantly occurring in practice, and until recent years have given considerable anxiety as to the correct line of treatment to be adopted or advised. Such treatment was generally palliative or operative, but the institution of the treatment by injection has given a remedy which is to a great extent curative without the disadvantage of operative procedures.

### VARICOSE VEINS.

The treatment of varicose veins consists of injecting some sclerosing substance into the lumen of the veins with the object of producing a thrombosis. Many such substances have been used, but in this country the quinine and urethane solution and sodium salicylate solutions are the most favoured. I use the latter, as I am of opinion that, although the sodium salicylate solution produces a definite cramp at the time of injection the subsequent discomfort is much less than with quinine. 20 per cent., 30 per cent. and 40 per cent. solutions of sodium salicylate are employed. The solution is prepared by dissolving the sodium salicylate in distilled water, filtering and boiling for three to five minutes to sterilize it. Too prolonged boiling produces discoloration due to oxidation, but it seems to me to make very little difference. Variation in the strength of the solution is due to the fact that in some cases 20 per cent. will not produce the desired effect and then resort must be to the more concentrated ones, 40 per cent. invariably producing thrombosis. Injections are given

<sup>1</sup> *Neurol. Centralbl.*, 1915, Nos. 7-8.

at weekly intervals with an initial dose of 4 c.c. of 20 per cent. solution and subsequent doses of 7·8 c.c. It is an advantage to inject the veins in as consecutive an order as possible, commencing at the lowest part, but avoiding the foot, as here the veins subside a great deal during the treatment and sometimes do not require treatment at all by the time the whole tract has been injected. Injections are given to within 3 or 4 in. of the saphenous opening. The patient is made to sit on the edge of a couch in dealing with veins below the knee, and for those above the knee the patient stands during the introduction of the needle. A 10-c.c. Record syringe having been filled with the requisite amount of solution, the site of injection prepared with spirit, a clean needle is introduced into the vein, avoiding as far as possible prominent varices, as here the wall is so thin and inelastic that escape of fluid may occur into surrounding tissues during injection. When blood flows freely from the needle the latter should be advanced a little further into the vein so as to be certain that the end of the needle is wholly in the lumen of the vein. The patient now lifts the leg on to the couch and adopts a recumbent posture, there being little or no danger of the needle moving during this manœuvre. The syringe is now attached, the vein proximal to the needle gently stroked to empty it, and the injection slowly proceeded with. Should there be any sign of a lump appearing at the site of injection, or the patient complain of immediate pain, the needle must be immediately withdrawn as it is not wholly within the vein and the fluid is escaping into the surrounding tissues. Towards the end of the injection the patient nearly always complains of a cramp-like pain along the distribution of the vein; this lasts about a minute, and I take it to be indicative of a good result from the injection, as when this pain is absent the resulting thrombosis is usually unsatisfactory. The needle is now withdrawn and firm pressure is applied to the site of injection for a few minutes to prevent

leakage. Finally a collodion dressing is applied.

During the ensuing week there is discomfort in the leg, but rarely sufficient to interfere with the patient's daily duties. The length of the thrombosis obtained varies, but on the average it is 2 to 4 in.; in some cases it is as much as 8 to 10 in., whilst in one case of mine the whole saphenous tract thrombosed, which, though alarming at the time, seemingly produced no untoward symptoms beyond a dull pain in the leg. Sometimes there is a reaction around the vein; there may be bruising and in more extensive thromboses some redness of the skin. The presence of varicose ulceration does not contra-indicate injections, unless there is a concomitant varicose eczema, or the ulcer is very dirty. In all cases with ulceration the ulcer is first treated to get it clean, the eczema cleared up and then injection can be proceeded with. In these cases I first inject the veins at a distance from the ulcer and then work down towards it; I find that by the time the veins in the vicinity need injection the ulcer presents a much cleaner surface and contamination is much less likely to occur; and if it does, embolism is minimized as the proximal length of vein has been occluded. A great number of varicose ulcers will heal after the veins have been treated; some however will not do so, the factor preventing their doing so being fibrosis of the base which limits their blood-supply. Clinically it is the ulcer which is fixed to underlying structures which fails to heal after injection treatment.

*Contra-indications to treatment.* — *Pregnancy*, where it is better to leave the treatment until after delivery, palliative measures being used meanwhile. *Deep thrombosis* from phlegmasia, typhoid or other causes, as it is obviously wrong to produce a thrombosis in the superficial veins which are carrying on the functions of the deep ones. *Phlebitis*, which is practically always infective in origin, and to produce a thrombosis in this condition would predispose to embolism.

*Skin infections*, which would also predispose to a septic thrombosis and possible embolism.

*Intra-abdominal tumours.* The cause should of course be removed before treatment of the veins is undertaken.

*Complications. Pulmonary Embolism.*—This complication has not occurred in my own series of cases, but the risk has been put at between 1 in 5,000 and 1 in 6,000, small enough when one considers a risk of 1 in 300 after operation. Half of the cases of embolism have been ascribed to injecting veins in the presence of phlebitis.

*Local Necrosis of the Skin.*—This occurs only when any quantity of injection fluid has escaped into the subcutaneous tissue, and when it does occur is very troublesome, taking six to eight weeks to treat. Small quantities produce anything from a red indurated area to a blister.

#### HÆMORRHOIDS.

In considering the treatment of hæmorrhoids by injection it is hardly necessary to stress the point that the causative factor should be ascertained, and that such conditions as carcinoma of the rectum or sigmoid, cirrhosis of the liver, pregnancy, &c., should be ruled out before proceeding with the injections. It is a sound dictum that hæmorrhoids occurring in a person of over 40 years without previous trouble should be regarded with suspicion, especially in relation to a carcinoma low down in the colon.

Injection treatment consists of injecting into the piles the B.P. 20 per cent. solution of carbolic acid in glycerine. A satisfactory diagnosis having been made, a Kelly's anal speculum is very gently introduced into the anal canal to the full extent; there is need for gentleness, because these patients complain of spasm afterwards, especially if much force is used in the introduction. The obturator is withdrawn, and with a good light, or preferably with a light attachment which can be fixed to the speculum, the

speculum is slowly withdrawn until the bunch of hæmorrhoids bulges into its inner end; by gently pushing the speculum back a fraction of an inch, the hæmorrhoids are made to properly engage, and at the same time the cutaneous margin is excluded from the field of operation, an important point, as injection of the fluid subcutaneously is very painful, and in one case led to thrombosis of the peri-anal veins. A special syringe, or an ordinary hypodermic syringe, with a long, fine needle, having been filled with 20 per cent. glycerine acid. carbolici, the needle is thrust into the centre of the pile, parallel with the long axis of the canal, so as to avoid the sphincters, another cause of pain, and 5 minims of the solution are now injected; the needle, however, is not withdrawn for about a minute, so as to decrease the hæmorrhage which otherwise might be fairly free from the puncture. The lowermost pile is first injected, then the lateral ones, then the uppermost, thus avoiding obscuring the site of its puncture with blood from the previous injections. Injections are carried out at weekly intervals until a satisfactory result is obtained. The immediate result is very satisfactory, the bleeding usually stops, pruritus disappears, and the piles are less liable to prolapse on defæcation. In an uncomplicated case there is no pain or discomfort. The contra-indications are chronically prolapsed and ulcerating piles. If chronically prolapsed piles, which cannot be reduced and retained, are injected, they are very prone to thrombose, and an operation is nearly always necessary. Ulcerated piles should not be injected owing to the risk of spreading infection to the portal vein. External piles are of course not amenable to injection, and when these are marked operation is indicated, as the patient will continue to complain of the external piles even though the internal ones may be cured.

The bowels must of course be regulated to give at least one easy and copious action a day, so as to keep the rectum empty; a

bowel action after each meal attains this end more perfectly if it can be managed.

### BLOOD TRANSFUSION.

There are many and varied methods of blood transfusion, but the citrate method is the safest and simplest, and for these reasons it is the method I now employ. The objection that is raised to the citrate method is that in cases of hæmorrhage from, for example, a gastric ulcer, the blood transfused will not act as a coagulant; this, however, is not upheld in practice. It has been shown that as soon as the blood enters the circulation the citrate is thrown out of action and has no further effect in retarding coagulation. Citrated blood is certainly quite as effective as uncitrated blood in stopping hæmorrhage.

I use a Robertson transfusion bottle, fitted with a rubber cork, which has three glass tubes passing through it, two long ones reaching to the bottom of the bottle to which are attached lengths of rubber tubing with metal ends fitting the needles and cannulæ, and a short one to which is attached a Higginson's syringe for pumping and aspirating, a piece of rubber tube being fixed on to the valve end so that it can be used for aspirating. The cork is fixed in the bottle by a metal clamp to prevent it blowing out. The needles are wide bored bleeding needles with a short bevel, the cannulæ are made of silver, the distal ends of which are of uniform size for about  $\frac{1}{2}$  in.; this facilitates entering the veins in small children under 1 year. A 3·8 per cent. solution of sodium citrate is used and is prepared by dissolving the citrate in distilled water, filtering and boiling for ten to fifteen minutes and then cooling.

The recipient is now grouped and a suitable donor is selected. A safe and simple method of testing compatibility in an emergency is to mix a few drops of blood from donor and recipient with some citrate on a slide; if agglutination does not take place then the bloods are compatible;

agglutination does not necessarily indicate incompatibility as both sets of corpuscles are present, and if the attendant donors are the only ones available it is then necessary to group out properly with Group II and III sera; if the donor's corpuscles agglutinate with both sera then the donor is Group I; if with II only then he is I or III; if with III only I or II; if with neither then he is Group IV.

The sterile apparatus is now fixed up and 10 c.c. of citrate solution per 100 c.c. of blood to be drawn off is now sucked into the bottle and the tube clipped to keep it full of citrate. The donor's arm is prepared with iodine and a sphygmotonometer bag is put on the arm and kept at 60 mm. Hg, as this ensures obliteration of the veins and not the artery. The vein is now chosen and if it does not stand out well a few sharp slaps over it will make it do so. A small weal of  $\frac{1}{2}$  per cent. novocain is made on the skin and an incision is made through the skin just large enough to admit the needle. Before introducing the needle care should be taken to see that everything is in working order and instruction should be given to someone to release the clip from the tube when told to do so. The needle is now inserted through the skin and then with a separate movement into the vein; if an attempt is made to go through skin and vein wall at the same time with such wide-bored needles, they not infrequently go through the vein completely and a hæmatoma forms immediately; in such an event it is better to abandon the arm and employ the other. When the needle is in the vein the tube is unclipped, junction with the needle effected and aspiration commenced, the bottle being shaken at intervals to ensure blood and citrate mixing. Generally it is necessary for the donor to clasp and unclasp a bandage in the hand to force the blood from the deep to the superficial veins, sometimes, however, the blood flows freely without this action. When the required amount of blood, 400 to 500 c.c., has been drawn

off, the manometer bag is emptied and the needle is withdrawn, the clip put on the tube and the pump changed round immediately. It is wise to do this as in early days I have made both mistakes, pumping blood out of the unclipped donor's tube and aspirating blood from the recipient.

The recipient's arm is prepared, and if the veins stand out reasonably well the needle can be introduced as in the case of the donor, but in cases of severe hæmorrhage they are too small and collapsed to render the method practicable, so a small quantity of  $\frac{1}{2}$  per cent. novocain is injected under the skin and a transverse incision about  $\frac{1}{2}$  in. long is made over the vein, the anterior aspect of which is exposed, the vein is not freed from its bed as this makes it too mobile. The vein is now grasped with a pair of fine-toothed dissecting forceps in the left hand and pulled up into the wound and so held until the cannula is introduced. The clip is now taken off the recipient's tube and a glance given to see that the pump is correct; a small nick is made in the wall of the vein with scissors and the cannula inserted into the vein and pushed well into the vein so that the dilated distal end of the cannula fills the hole in the vein and prevents leakage. Pumping is started to fill the tube with blood and connection made with the cannula. The blood should be run in slowly and a careful watch kept on the patient; at any sign of breathlessness or complaint of tightness in the chest the tube must be pinched until it passes off, then it may be recommenced. I take it that these symptoms are due to embarrassment of the right heart. Finally, care must be taken to pinch the tube before air bubbles reach the top of the glass tube. When the cannula is withdrawn a gauze swab is held over the vein and then skin is sutured with silkworm gut. I consider ligation of the vein unnecessary, as a dressing easily stops bleeding. In small children I use the internal saphenous vein where it lies over the internal malleolus, as this is more convenient than the arm, and

the quantity of blood for a baby under 1 year is 10 c.c. per 1 lb. body weight.

Transfusion can, of course, quite easily be carried out without the special apparatus. The donor can be bled with an ordinary bleeding needle into a sterile vessel containing citrate solution, and the blood can then be run into the recipient with a funnel, tubing and cannula, filtering the blood through sterile gauze; this takes a longer time than with the Robertson's bottle, and is more tedious, but it is quite as effective.

The reaction to transfusion of the patients varies; some have no upset at all and feel immediate benefit from the transfusion; others do not begin to feel the benefit for twenty-four to forty-eight hours afterwards. Sometimes patients have a very sharp reaction, with a rise of temperature, and maybe rigors; this is probably due to the citrate solution, especially if the solution is not freshly prepared, yeasts tend to grow in the citrate, and although it is boiled before using, a foreign protein is introduced into the blood-stream and produces protein shock.

The great advantage of the citrate method is that time is no great object, and if the transfusion is not going smoothly the blood will not clot before it is needed. The time factor, however, is most valuable in cases of myocardial weakness, and the blood needs to be run in very slowly. Another advantage of the time factor is that a donor can be bled two to two and a half hours away from the patient, and the blood will not coagulate before it is needed as long as a slight excess of citrate is used.

Hæmorrhoid Syringe: Allen and Hانبurys.

Light attachment for Kelly's Speculum: Genito-Urinary Co.

Robertson's Bottle and Cannula: J. Montague.