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SUBCUTANEOUS INJECTIONS OF LIQUIDS IN ACUTE HÆMORRHAGE.*

BY T. J. CROFFORD, M. D., MEMPHIS, TENN.

Having recently read the report of a series of cases from Guy's Hospital, London, and another from the Johns Hopkins Hospital of this country, in which intravascular injections of a saline solution were practiced in acute hæmorrhage, causes me to report some experiences which I have been having for the past few years and to put forward the advocacy of a method simpler than intravascular transfusion for supplying the system with fluid to take the place of the blood which has been lost. I refer to the subcutaneous injection of fluids in quantities sufficient to supply the deficiencies or sufficient to tide the patient over the crisis. The method I have adopted has served the purpose well, and is briefly described as follows:

Make a saline solution of two, four, or six per cent. of common salt in an ordinary water pitcher, pour this into an ordinary fountain syringe, into the end of the tube of which an aspirator needle has been inserted. While the water is running out through this needle thrust it through the skin into the cellular tissue of the flank or back of the patient. It will be observed that several ounces or a pint of fluid will have been deposited under the skin in quite a short while. The position of the needle can now be shifted to another location without fully withdrawing it and another quantity of fluid deposited. This can be done several times, till a quart or more of the fluid has been injected without withdrawing the point of the needle from the original puncture made in the skin.

It will be argued that the intravascular injection is directly into the circulation, and is consequently, on account of its immediate

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effect, the better applicable to the crises of the acute hæmorrhages which need transfusion most. This may be the case where the necessary apparatus and an experienced operator is at hand and ready to do the operation of transfusion. In other words where you are looking for a hæmorrhage and have prepared for it beforehand, it may be best in certain cases, but this has not been the case in any of the cases of hæmorrhage with which it has been my misfortune to deal.

When we consider the simplicity of the method which I have above described, that no instruments beyond a fountain syringe and an aspirator needle are required, no operation beyond passing this needle through the skin into the cellular tissue; then when we consider the rapidity with which the fluid is absorbed after hæmorrhage, it is very evident that this method is the most feasible and therefore the most applicable, in by far the greater number of cases encountered, whether surgical, obstetrical or medical varieties of hæmorrhage be met with.

I have put the method to test in quite a number of cases, but to avoid tediousness I shall report only three, these being quite sufficient to show its efficiency as well as the ease and certainty with which it can be got to work in emergencies.

Case I.—Mrs. V., aged thirty-five, was operated upon May 19, 1893, for huge pus-tubes, likely of long standing, firm and universal adhesions. Upon enucleation the hæmorrhage was very great, in spite of my best efforts to control it. By the time the hæmorrhage was under control, the incision stitched up, and the patient placed in bed, it was found that the pulse had failed at the wrist. Considerable quantities of a saline solution were thrown under the skin. In a short while she rallied and made ultimately a good recovery.

Case II.—Mrs. L., aged thirty, had a tedious delivery on the morning of June 5, 1894. After the child and placenta were expelled she was found to be flowing profusely. A very few moments later she was quite blanched and the pulse had failed at the wrist. The clots were quickly turned out of the uterus and it was irrigated with hot bichloride apple vinegar. With the same syringe a large quantity of mildly saline fluid was injected into the cellular tissue of the back and flank. She rallied nicely and before twenty-four hours was up her pulse was 84 beats per minute and of fairly good volume. Recovery perfect.

Case III.—Mrs. M., aged forty, was delivered on September 25, 1894. A terrific hæmorrhage immediately followed. The uterus was

emptied and she was at once irrigated with a hot bichloride solution. No abatement of the hæmorrhage followed. The uterus was then irrigated with hot bichloride apple vinegar, with still no abatement of the hæmorrhage. The patient was now very much exhausted. The circulation was very feeble. The pulse was 140 at the wrist. The uterus was again quickly emptied and thoroughly packed with iodoform gauze, which controlled the hæmorrhage perfectly. A large quantity of saline solution was injected into the flanks and back and in a very short while the circulation was restored. Her successful progress was uninterrupted from this time on.

In all probability the first two cases would have died without the transfusion. The third case would likely have recovered without it, but she rallied much more quickly and progressed much more satisfactorily with it. It will be remembered that a large percentage of the patients who die from hæmorrhage rally somewhat and then die some hours or even a day or two later from cardiac exhaustion, incident to the lessened blood pressure.

The operation as above described, if it can be called an operation, is so simple that any assistant or nurse can attend to it, while the surgeon or obstetrician is completing his work. No patient who has lost any considerable quantity of blood should be allowed to go without it, especially if the stomach is not in a condition to absorb fluid.

When death takes place on account of the sudden withdrawal of a large quantity of blood from the circulation, it is because the heart fails to act. The heart fails to act because there is a sudden fall in the blood pressure, which is its continuous direct stimulus.

The diminished blood pressure is relieved within certain limits by the vaso-motor system of nerves stimulating the blood-vessels to contract, thereby adapting the vascular apparatus to the lessened volume of blood.

If the hæmorrhage is sufficiently slow for the vaso-motor contraction of the blood-vessels to keep pace with it, then life can be sustained with a proportionately small quantity of blood.

From the foregoing the interdependence between the blood, the vascular apparatus and nervous system is apparent. The indications, then, are first, to stop the hæmorrhage; second, to increase the volume of the circulating medium; third, to sustain the heart and nervous system during the crisis.

It will be remembered that the middle coat of the blood-vessels contains both non-striated muscular fibers and yellow elastic tissue,

the former predominating in the small and the latter in the large vessels. In algid congestions there is a recession of the blood into the large vessels in the interior of the body, leaving a diminished quantity in circulation. It is possible for one to die with all the symptoms of hæmorrhage, the blood being poured into the large vessels instead of upon the ground. The remedy for present relief of the two conditions would, theoretically, be the same.