ON HÆMORRHAGIA, AND ITS TREATMENT BY STORING AND BY INTRAFUSION: WITH CASES.

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COMPARATIVELY few of the operations which the surgeon is called upon to perform imperatively demand of him immediate operative treatment. In most cases, ample time is afforded for preparation, and, if need be, for deliberation too. To this rule, a most marked exception is the treatment of hæmorrhagia, the exigencies of which often call for instant action. And not only on the surgeon is this demand made; for the physician, at the shrine of duty, is required here to forget the too carefully defined line which divides medicine from surgery, and to act expeditiously. With the treatment of hæmorrhagia, therefore, be it idiopathic, be it symptomatic, or be it traumatic, every practitioner should be perfectly familiar. With the special treatment for the arrest of particular hæmorrhages, based, as it is, on principles with which we all, of course, are acquainted, I have in this paper nothing to do. My reference is to the general effects of hæmorrhagia—effects which often threaten to extinguish life; and to the means at our disposal in prophylaxis and in treatment.

So widely differing are the conditions induced by sudden hæmorrhagia, as contrasted with those produced by protracted hæmorrhage, that the management of the one differs very materially from that of the other. In the first, we are met by a syncope which threatens to be fatal; in the second, by the sequelæ of anæmia. Now, the syncope in the first class of cases appears to be instituted by nature for the very purpose of mitigating the evil. Were it not for the loss of vaso-motor tension, which is a sequela of the suspension of the functions of the brain, vascular tension would quickly complete the work of depletion to a stage beyond all hope. But the very first effect of acute hæmorrhage on the functions essential to vitality is cerebral anæmia, and then follows vascular flaccidity, with dynamic incompetency of the heart. To intelligently meet this state of things, our attention must be directed to the brain; for it is there alone that we must look for a reassertion of vital conditions.

Undoubtedly, by transfusion, a recuperation of nature's forces may be effected. Without by any means wishing to disparage that operation, I wish to point out how it is that, by the introduction into the circulation of about five or six ounces of fluid, all the functions of life reassert themselves, not with a transient stimulation, but generally with a sustained vitality, and this after perhaps pints of blood have been lost; and to show how this object may be attained by other means—means which are within the skill of every practitioner, which are immeasurably more facile, which are, in at least some cases, quite as satisfactory in result, and which are free from the difficulties and dangers which are incident to transfusion. A patient, after extreme hæmorrhage, is found to be pulseless, cold, yawning, gasping for air, jactitating, and so on. The pulselessness, of course, is evidence that the heart has ceased to propel blood; but how is this? Simply because it has no fluid on which to contract. Not that it has not power to contract, but that its contained fluid is insufficient to effect the closure of the mitral valve. Normal rhythmical respiration has given place to spasmodic gasping, because the arrest of the processes of oxidation and assimilation has deprived the respiratory centre of the force which it is its province to direct to the muscles of inspiration. Coincident with a deficiency of oxygen in the blood, we ever find an excess of carbonic acid, the natural stimulant of this centre; and here is seen the cause of the gasping, and of the imploring for more air, which is invariably heard when the hæmorrhage has not been so sudden as to cause syncope, evidences of increased stimulation with diminished power. The coldness of the surface indicates not only an arrest in the development of animal heat, and the effect of a lessened blood-supply, but also the driving of surface-blood to more vital parts; this is effected by the vaporisation of the sweat which very generally accompanies this condition, a process necessarily involving the rendering latent of so many thermal units, partly derived from the immediately contiguous atmosphere, and partly from the external parts of the body. Now all this comes about by the loss of blood-pressure; but this diminished tension is not in proportion, as might be supposed, to the loss of blood. If the hæmorrhage have been protracted, the vascular system will have greatly accommodated itself to its new condition; if sudden and profuse, dilatation—I use the term in its passive sense—of the vascular system is a resultant of the absence of vaso-motor tension. And if a sudden dilatation of the mesenteric vessels can, and does

sometimes, produce syncope, how much greater an effect may we look for when the whole vascular system is atonic, even without taking into account the diminution in the volume of fluid contained? This passive dilatation has the effect of storing in the vascular system blood which, under other conditions, would have been lost. We see, then, that nature endeavours to minimise the evil by pouring blood from unimportant parts to those which are essential to life, and by retarding the draining through patent vessels by, as it were, storing blood under a very low tension. On these lines is based the practice I have adopted, with a success so complete, that I wish to recommend it to your attention.

My notes of two cases, in the first of which I practised intrafusion alone; in the second, both storing and intrafusion, will sufficiently illustrate the *modus operandi*.

CASE I.—M. H., aged 39, was attended at her fifth accouchement by a midwife. A messenger requested me to see her immediately, as she was "flooding." The nature of the case suggested my including two of Martin's bandages in my bag. On reaching the cottage, which was about two miles from my home, I found the door open, and a death-like looking head resting on a pillow on a chair by the side of the low bed, with the object of approaching the door, to satisfy the craving for more air. Examination revealed a dilatable os, with a placenta attached all around it. The presentation could not be made out at this stage.

I forced one finger through the placenta; then passed two fingers, carefully tearing the opening as they entered the uterus. A foot was then grasped and brought down through the placenta, and delivery easily accomplished, the placenta immediately following the head. From the previous hæmorrhage my patient was almost moribund; and now, from the superimposed shock, she was to all appearance dying. Nearly half a pint of brandy had been given her, with no effect but the welling up, rather than vomiting, of a large quantity of fluid. As rapidly as possible I very tightly ran up my Martin's bandages from the feet to the top of the thighs, and in the same way bandaged both arms with strips hastily torn from one of the sheets. The immediate effect was the evidence of renewed vitality. A few deep irregular spasmodic inspirations were followed by more rhythmic breathing, then by ability to swallow, and soon afterwards by thirst, and the evidences that the absorption of liquids was going on.

My patient recovered. Care, very great care, must be exercised in removing the bandages. The process must be carried on slowly, and in proportion to the amount of fluid that has been absorbed. It is well, also, for some time after their removal, to keep both the arms and legs elevated somewhat above the trunk.

CASE II.—The second case to which I shall refer is that of K. R., aged 25, who had been in labour for twelve or fourteen hours at the time when I was called in consultation. Three or four doses of ergot had been given her, without any appreciable effect. The very slight and irregular pains were not, so far as palpation could detect, accompanied by any uterine contraction. The patient had lapsed into "powerless labour." There was complete uterine atony.

A tourniquet was placed at the top of each thigh, with sufficient tightness to secure both the arterial and venous vessels. I applied the long forceps, and delivered.

The plan of turning, and delivering by the feet, is, in these cases, both physiologically and practically, wrong. It may be necessary to alter the position of the child, but the change effected should be from an unnatural to a natural position. If the head do not present, it should be made to present; and if the natural forces be inadequate to delivery, then the forceps should be applied. I have said that, in the second case, the long forceps was used. Pallor, sighing, and syncope, were the accompaniments of excessive flooding after delivery. When the hæmorrhage was arrested—an object attained with the greatest difficulty—she lay pulseless, with sunken features, half open glassy eyes, open mouth, and was, to all appearance, dying. I removed the tourniquets, and applied bandages, as in the previous case; but to the legs only, and in that way intrafused the whole of the blood normally contained in the lower extremities to those more vital parts which had been drained, and, at the same time, shut off its return through the femorals. The effect was almost instantaneous, and as complete as it was rapid. The cadaverous pallor disappeared. She soon spoke, and asked for drink, and the absorption of fluids went on so rapidly, that, within two hours, a case of impending death from hæmorrhage was transformed into one of simple anæmia.

Now, in these cases, and I think they may fairly be taken as typical ones, we see how all that could be desired can, with great facility, and with, I believe, perfect safety, be attained.

A word as to the rationale of the treatment. It may appear sur-

prising that the small quantity of blood contained in the limbs, after acute hæmorrhage, is adequate, when intrafused into the trunk, to rekindle the vital energies, and that to a degree apparently so out of proportion to the vital value of the quantity of fluid. Not at all more surprising, however, is it than that the transfusion of five or six ounces of blood can accomplish the same object. The effect in each case is produced in precisely the same way. The objective symptoms of acute hæmorrhagia are concurrent with diastaltic paralysis, dynamic incompetency of the heart, and an almost total absence of blood-tension.

Now, suppose that this is the result of the loss of four or five pints of blood, no one would think of transfusing four or five pints of fluid, with the object of again establishing that blood-tension, the loss of which was the cause of all the mischief. Our immediate object, to the end that an arterial and venous tension approaching the normal may be brought about, is the re-establishment of the function of absorption. These operations are not intended to supply a quantity of blood adequate to the maintenance of the functions essential to life, but their office is to vitalise the organs of absorption, to which organs alone we must look for replenishing the vascular system, and it is effected somewhat in this fashion. The heart ceases to propel blood, because none is available for propulsion. By intrafusion, the abdominal arteries are charged with arterial blood from the femorals, whilst five or six ounces are forced along the inferior vena cava, which, then passing through the right heart, and through the capillaries of the lungs, reaches the greater circulation.

The process of oxydation in the brain is at once resumed, and nerve-tension is evidenced by diastaltic excitation, resulting in contraction of the arteries on their fluid contents, and consequent increase of vascular tension. But this could not be maintained, were it not that the renewed tension and circulation of arterial fluid in turn bring into action the functions of the stomach and intestines, by the exercise of which functions even pints of fluid may again be taken into the circulation in a very short time. Thus, before the vaso-motor system has exhausted its tensile influence, an approach to permanent adequate, if not normal, blood-tension is renewed, and the case is resolved into one of anæmia. The point, therefore, to which I particularly wish to draw attention is this: that it is not the comparatively small quantity of fluid directed to the vital centres which accomplishes the ultimate objects of the operation. It is not that five or six ounces of fluid in any adequate way replace the pints that were lost. It is simply that the transient vascular tension is effective in opening those channels through which the vascular system is ever replenished, and which were practically closed; for, if absorption were not suspended, then there would be no indication for the operation.

Now, if the addition of a quantity, bearing so small a proportion to the amount lost, is an efficient factor in bringing about a vital proportion of fluid, there is no reason whatever why, instead of deriving that fluid from without, we should not avail ourselves of the residue in the body; and especially so as, in the most desperate case, there still remain several ounces of blood in the patient's limbs. Practically, by the intrafusion of the whole of this blood from the extremities to the vital centres, and the consequent lessening of the circuit, that which would have passed along the subclavians is diverted into the carotids, increasing the supply to the brain; and that which would have travelled through the femorals is utilised in the abdominal circulation. Under this new condition of things, the absorption of fluids from the intestines and from the stomach is again active, and the immediate effects of loss of blood pass away.

These remarks apply with additional force where intrafusion is practised in conjunction with storing, for a fair blood-tension is immediately attained, and a rapid circulation, oxydation, and deoxydation, follow the limitation of the circuit.

Finally, the points I wish to demonstrate are these.

1. The fatal syncope of profuse hæmorrhage is the direct result of passive dilatation of the vessels.
2. The practical effect of intrafusion or transfusion is vaso-motor stimulation, leading to vascular tension, and resulting in absorption.
3. The importation of new fluid, by venous injection, although strikingly indicated in cases in which a toxic condition of the blood threatens to extinguish life, may, with great advantage, be substituted by the operation which I designate intrafusion, which is infinitely less formidable, thoroughly scientific, easy of accomplishment, quite within the dexterity of every general practitioner, entirely free from the dangers, real and imaginary, which attend the fusion of new fluid into the circulatory system, and which fully and most satisfactorily accomplishes the restoration of the essential functions of life to an active vitality.

SURGICAL MEMORANDA.

DISLOCATION OF THE ULNA.

THAT dislocation of the ulna with fracture of its coronoid process is an accident rarely met with, makes one careful in his diagnosis, and suspicious of himself when he comes across a case which seems to him to point to an accident of this nature. I have at present under my care two cases of dislocation of the ulna, one of which I feel persuaded is associated with fracture of this process. It occurred in a woman eight and a half months gone in pregnancy, and was the result of a fall due to her tripping over the back of a chair as she was about to come down from a table. It is difficult to determine the part of the limb on which her weight came, but its whole inner aspect was much contused. The grounds on which I found my diagnosis are as follows. Reduction could not be effected by the ordinary method, as recommended by Sir Astley Cooper, but direct traction from the wrist brought it down easily. It, however, tended to return readily, nor could it be kept at all in position when bent to a right angle, so that it was found impossible to put it up in right angle splints; and I had to have recourse to a poroplastic splint, applied at an open angle to the anterior aspect of the limb.

Its difficulty of reduction in the ordinary way, the ready recurrence of the dislocation, and the impossibility of keeping it in position when at right angles, together with a feeling of crepitation over the front of the joint, seem to me to point to this dislocation being complicated with fracture of the coronoid process. There was no fracture of either condyle, nor displacement of the radius.

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STRANGULATED HERNIA: ASPIRATION: RECOVERY.

As the subject of aspiration is exciting much attention at present, the following case may be interesting.

On Christmas Day 1882, I was called in by Dr. Lawton to see a farmer, aged about 70, subject to a large right inguinal hernia. It was usually reducible, but on this occasion had become obstructed, and could not be returned, though Dr. Lawton had diligently and carefully applied the taxis, and tried all the usual accessories—enemata, fomentations, etc.—in the hope of overcoming the obstruction. The hernia was of great size, filling and distending the scrotum, and felt hard and tense from imprisoned flatus. This careful trial of the taxis having failed, it became evident that, unless relief were soon afforded, the patient would sink, as the symptoms of strangulation had been for some time becoming more urgent; yet the man was old and feeble, in bad health, and not likely to survive an operation. I therefore suggested aspiration of the flatus, and a renewed trial of the taxis. Dr. Lawton accordingly passed a small needle of the aspirator well into the distended gut, which soon became perceptibly more flaccid, and, on a further trial by manipulation, the gut slipped up at once. A draught containing twenty minims of tincture of opium was then given, a hot poultice applied over the groin, and absolute rest enjoined. Next day, the patient expressed himself as feeling well. Half a grain of opium was given morning and evening, to keep the bowels quiet; and, after a few days, recovery was complete, though it was difficult to keep up the hernia on account of the great size of the ring.

This case, and others like it which have been recorded, show how the escape of imprisoned flatus will sometimes permit the reduction of a hernia. Would it not, then, be well to have recourse to this simple procedure in all cases before operating? It can do no harm, if the needle be small; and, if it fail, the operation can at once be undertaken.

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THE TREATMENT OF PHIMOSIS BY DILATATION *A TERGO* AND ITS DANGERS.

IN the JOURNAL of November 22nd, Mr. Tannahill suggests that, for the cure of phimosis, "the orifice of the foreskin should, during micturition, be compressed with the finger and thumb until the urine exert pressure sufficient to cause pain by stretching the membranes," and apparently advocates the repetition of the process for weeks. The treatment seems to have been effectual; but one cannot help reflecting that the hydraulic pressure which is exerted upon the prepuce is exerted also, to the very same amount per square inch, upon the urethra and the walls of the bladder, and possibly through the whole urinary tract, although, as a rule, contraction of the bladder closes the ureters, and thus prevents damage to the kidneys. That obstruction in the urethra from stricture, and even spasm, will cause mortal