

Second. After the local bath, apply caustics in solution or in paste, and continue them until the virulent ulcer has been transformed into a simple wound.

Third. When this effect has been procured, and in the interval of making the caustic applications, apply dressings of weak antiseptic powders. These should be continued until the wound has been cicatrized.

Besides this, advise rest, and remove every condition that will cause any irritation of the sore. If the patient is weak, of course use tonics.

Thus the rapid and complete destruction of the ulceration by caustics, antiseptics, rest, and tonics is the sum total of the treatment of soft chancre.

Gynecology and Obstetrics.

POST-PARTUM HEMORRHAGE; ITS USUAL CAUSES AND TREATMENT.

CLINICAL LECTURE DELIVERED AT THE PHILADELPHIA POLYCLINIC HOSPITAL.

BY EDWARD P. DAVIS, A.M., M.D.,
Professor of Obstetrics in the Philadelphia Polyclinic.

GENTLEMEN,—The subject of which I shall speak to-night will be better understood if we first inquire what are the factors which prevent serious hemorrhage after normal labor; and the study of these factors will assist us in understanding the reasons for, and the treatment of, hemorrhage.

A potent agent in preventing the escape of blood in all portions of the body is the condition of the blood itself; its peculiar property of coagulation may be taken as a great safeguard against hemorrhage. You will remember that this property becomes apparent only when a solution of continuity occurs in some one of the tissues of the body; thus, in health, blood circulates freely through the vessels, but should a vessel be wounded or injured by the formation of pathological products within its walls, coagulation readily occurs. The blood of the pregnant woman is especially fitted for coagulation by the increased amount of fibrin which develops as gestation proceeds, so that although the separation of the placenta produces an open wound of considerable size, yet the blood which oozes from this wound coagulates in the healthy woman more efficiently than in the patient in the non-pregnant condition.

Again, the arrangement of the muscular fibres of the uterus is such as to provide an efficient series of constricting bands for the sinuses left patent at the separation of the placenta. "These living ligatures" are ordinarily most efficient, and exist in the same perfec-

tion in no other organ of the body. Further, the lining membrane of the uterus, although normally the seat of periodic hemorrhage, still is possessed of a certain firmness and resisting power which in health prevents the oozing of blood after the uterus is empty. A pathological condition of this membrane, however, removes this resisting power, and a gradual and even serious leakage of blood may result. There are certain mechanical conditions which predispose to the cessation of hemorrhage after normal labor. In many cases the uterus becomes anteverted and even anteflexed, and considerable compression is exercised upon the vessels which traverse the anterior and lateral portions of the uterus. Again, the conditions in the patient's general circulation are markedly changed by the delivery of the child and its appendages; it is as if, in a system of water-pipes through which fluid is forced by a central engine, a considerable area were to be removed from the circuit, and at the same time a considerable amount of the circulating fluid were to be withdrawn. The natural inference would be to reduce the propelling power of the central engine, and this cutting off of steam and lowering of pressure are seen very clearly by the sudden fall in the frequency and force of the heart-beats after labor. During labor, the general activity of the muscular system is so great that the heart shares the vigorous contractions of other muscles. So soon as delivery has occurred, a period of comparative quietude ensues, in which the heart-beat is very greatly diminished. The nervous system, which during labor is in a condition of general activity, rapidly passes into a state of repose, and thus the stimulus to increased circulation is removed. All of these factors, when taken together, constitute a most perfect provision for the avoidance of hemorrhage in the normal patient.

The occurrence of post-partum hemorrhage can be naturally referred to some perversion or lack of the factors which usually render this complication impossible; thus, a depraved condition of the blood predisposes to post-partum hemorrhage. Profound anæmia, the result of long-continued infection by the germ of malaria, the disordered blood which is peculiar to syphilitic infection, and the rapidly disintegrated blood which is present in acute infectious diseases, such as typhoid or small-pox, all predispose to the occurrence of hemorrhage; thus, a woman who aborts during an acute infection is especially liable to severe hemorrhage.

The most common and immediate cause of post-partum hemorrhage lies in the failure of the muscular fibres of the uterus to contract and to close the sinuses left open by the separation of the placenta.

This failure of muscular action may result from a deficient development or impaired condition of the muscular substance itself; thus, a woman whose general muscular development is very deficient is predisposed thereby to hemorrhage. Again, a woman who has borne a number of children, and in whom the muscular structure of the uterus has become thinned by repeated increase and retrograde change, is especially liable to post-partum hemorrhage. Again, a woman who receives during labor a severe shock to the nervous system, or whose nervous system is exhausted by long and difficult labor, is very likely to suffer from paresis or paralysis of the uterine muscle and post-partum hemorrhage. It sometimes happens that the uterine muscle, although healthy, becomes so completely exhausted as to fail utterly to respond to appeals for contraction.

Disease of the lining membrane of the uterus, endometritis, often occasions the most persistent and intractable hemorrhage; there may be present contraction of the muscular substance, the uterus may be emptied of its contents, and yet a persistent oozing of blood occurs which threatens the safety of the patient. Such a woman is very liable to septic infection, either directly from without, or from the absorption of diseased tissue in the endometrium.

A patient who has been safely delivered, but who is the victim of sudden and profound excitement, may suffer from post-partum hemorrhage; in these cases the usual slowing of the circulation does not take place, but the heart, roused to increased activity by nervous impressions, causes a flow of blood from the site of the placental tissue.

The frequency of post-partum hemorrhage has been greatly lessened as a better knowledge of the physiology of labor has become common; thus, it is rare to see in the hands of intelligent obstetricians and in well-appointed hospitals a case of serious post-partum hemorrhage. I have never seen a patient die from this cause, although I have observed serious cases. The method of delivering the placenta by expression has had much to do with this favorable condition of affairs. When time is given to the uterus to separate the placenta by the formation of a thin but extensive clot, and when the uterus, from twenty minutes to half an hour after the delivery of the child, is gently but firmly compressed from before backward in the median line, the placenta is usually expelled without difficulty, and its expulsion is followed by a condition of uterine contraction which rarely relaxes. If, however, an effort is made to expel the placenta immediately after the birth of the child, failure is not uncommon, because the placenta has not become partially or wholly separated. By such ineffectual efforts the uterine

muscle is exhausted, and relaxation after the delivery of the placenta is favored.

Again, the more common use of anæsthetics during labor, preventing exhaustion of the nervous system, relieving the patient of mental pain and distress, favors a better action of the uterus, and thereby a more efficient contraction after labor. A better understanding of the use of the forceps has resulted in diminishing post-partum hemorrhage. By a knowledge of pelvimetry, the obstetrician becomes aware of conditions which render the proper use of the forceps impossible, and is able to spare the patient useless and exhausting manipulation. On the other hand, the wide diffusion of the knowledge of the advantages and methods of securing axis-traction, with the common use of improved instruments, enables the obstetrician to interfere promptly and successfully where a continuance of labor would strongly predispose to post-partum hemorrhage. I may illustrate this remark by describing the following case. A young woman of ill-developed general physique had a tedious first labor; although the pelvis was of normal size, and the child not too great to enter the pelvic brim, the head delayed at the brim of the pelvis from failure in the mother's expulsive effort. When exhaustion seemed imminent, the attending obstetrician applied the Tarnier forceps, and delivered a living child without especial difficulty; the placenta was normally delivered, and the patient seemed doing well. Some eight or ten hours after delivery she was observed to be faint and pallid; there was no external hemorrhage. When her physician arrived, he found the birth-canal filled with clotted blood; when the clots were removed, a profuse hemorrhage occurred from the relaxed and distended uterus. The patient succumbed to syncope and sudden anæmia in half an hour. Here the mistake lay in not employing the forceps as soon as progress had definitely ceased during the labor; if the uterus had not been allowed to become thoroughly exhausted, secondary relaxation and fatal hemorrhage would, in all probability, not have occurred. The intelligent use of the forceps is, then, a distinct factor in preventing post-partum hemorrhage. I need but mention that a faulty method of delivering the placenta, sometimes met with among midwives and ignorant practitioners, not infrequently causes severe hemorrhage. Pulling upon the cord and inversion of the uterus are flagrant examples of such wrong practice. Certainly, as knowledge becomes better diffused, these fatalities must steadily diminish.

As regards the symptoms of post-partum hemorrhage, I will not detain you with a repetition of the classical picture. I may mention,

however, some symptoms upon which you may base an estimation of the imminence of such hemorrhage: most significant of these are the rapidity and the character of the pulse. It has been well said that a pulse above one hundred, after labor, should awaken suspicion in the mind of the attending obstetrician. A rapid compressible pulse should certainly put the practitioner upon his guard. The most frequent physical signs of hemorrhage are the presence of blood about the patient, and the relaxed condition of her uterus. In place of the hard, semi-globular body at the brim of the pelvis, the well-contracted uterus, the hand pressing upon the abdomen finds an indefinitely outlined, doughy tumor, whose boundaries cannot be clearly detected. Such a condition of the pulse as has been described should at once lead to a careful palpation of the abdomen, and to ascertaining the size and consistence of the uterus. The appearance of blood beneath and about the patient should not be waited for to establish a diagnosis of hemorrhage. It is not infrequent to observe cases of concealed post-partum hemorrhage in which no blood may emerge, and yet a profuse bleeding occur within the uterus. Such may be diagnosticated by the condition of the pulse and of the patient's abdomen. Symptoms of lesser importance are the patient's pallor, her thirst, restlessness, dimness of vision, and sensation of lack of air. In cases where bleeding occurs from a diseased endometrium, the condition of the pulse and continuous oozing of blood may be the only symptoms recognizable. Where hemorrhage occurs from lacerations of the genital tract, the uterus may be well contracted and still profuse bleeding be going on. In these cases, again, the only symptoms to be observed are the flow of blood, the rapid pulse, and the patient's general condition of acute anæmia.

The treatment of post-partum hemorrhage consists in remedying those disordered conditions which produce a hemorrhage. First in order of time should be the effort to control as rapidly as possible the contractions of the uterus; the hand should seek the patient's abdomen, and rapid but gentle friction should be made over the fundus. It is to be noted that the uterus will contract more promptly under light but rapid friction than from deeper but slower manipulation. So soon as the uterus is felt to contract, it may be gently but firmly grasped in the hand of the obstetrician, the thumb resting in the median line of its anterior surface, while the fingers cover the posterior wall. Care should be taken to exercise compression in the median line, as the ovaries which are enlarged during pregnancy may be compressed if the hand slips to one or other side, causing sudden and

severe shock. If the practitioner be without assistance, he may inject into the skin of the abdomen, or deeply into the thigh, one or two hypodermatic syringefuls of a solution of ergotin, or fluid extract of ergot. Having cleansed the hand which is not holding the uterus, it should then be introduced into the birth-canal, and if a mass of clot is found filling the vagina and cervix, this clot should be at once removed. If the cervical canal is patulous, the fingers may be inserted to the fundus, and any portion of retained placenta or membranes removed. It is not well to scrape the uterine wall free of clot, for a thin layer of coagulated blood is always to be found closing the sinuses at the site of the placental tissue. If the attending physician can procure the materials for an injection of hot antiseptic fluid, such an injection may now be given to advantage. Boiled water at a temperature of 110° F., a saturated solution of boracic acid, a two-per-cent. solution of creolin or carbolic acid, a one-per-cent. solution of thymol, or a solution of sodium chloride and sodium bicarbonate added to boiled water in sufficient quantity to give a saline taste,—any one of these as most convenient may be employed. The quantity should be several quarts. Such an injection is best given with a fountain syringe, and if the mouth of the uterus is open no intra-uterine catheter is absolutely necessary for such an injection. A free return-flow can be obtained with a simple nozzle, or with the rubber tube of a fountain syringe without a nozzle. An ordinary case of post-partum hemorrhage will yield promptly to such treatment; should, however, the bleeding recur, a strip of iodoform gauze, four inches wide and four feet long, should be carried to the fundus. The uterus should be lightly tamponned with the gauze, a very moderate amount being left within its cavity, and the rest packed with moderate firmness about the cervix and os. If gauze is not at hand, a strip of clean old linen dipped in boiling water may be used instead. This method, to be successful, requires that not too much gauze be used, the strip without doubling being often sufficient; that the strip of gauze or cloth be carried to the fundus, and that violence in introducing it be carefully avoided. There is no one expedient so efficient as this when the uterus has been emptied of clots. If the physician has the assistance of a nurse or intelligent person, the hot intra-uterine injection may be very conveniently employed. In many cases, however, he must dispense with this, and then the prompt use of the tampon, after the hand has emptied the uterus of clots, is of inestimable service.

If the uterus shows a persistent tendency to relax, it may be necessary for the obstetrician to remain beside the patient for some time;

the hand should rest lightly upon the abdomen, and when the uterus is felt to relax, it should be brought back to its condition of contraction by gentle massage. In cases of threatened hemorrhage it is well to delay the application of the binder until permanent uterine contraction has occurred. In obstinate cases the faradic current of electricity will sometimes secure and maintain uterine contraction when other means have failed. Thus, we recall a case in the person of an anæmic, weak multipara whose uterus refused to remain contracted; after the use of ergot, hot douches, the tampon, and massage, a brief application of the faradic current secured prompt and lasting contraction. One electrode should be placed over the uterus, the other over the spinal column at the lumbar region. The current should be as strong as the patient can conveniently endure, each application not usually occupying longer than half an hour.

When the uterus has ceased to bleed, the patient's general condition of anæmia demands attention. A familiar expedient of raising the foot of the bed is of value when efficiently carried out, but to place a few books beneath the bedpost, or several bricks, amounts to very little. The most efficient way of raising the foot of the bed in these cases is to place a small table beneath the foot-board; if the patient's hips are to be raised at all, they should be elevated very considerably, so that she lies with the head very much lower than the feet. The injection of hot whiskey and milk, an ounce of each, into the rectum is an efficient method of securing stimulation. The application of warmth to the surface of the body by hot bottles or hot bricks is also of use. The hypodermatic injection of stimulants is of great value; sulphate of strychnine in solution, in doses of one-twentieth to one-tenth, may be employed to great advantage. The hypodermatic syringe may be filled with ether several times, and its contents injected deeply into various portions of the trunk and lower limbs. Where the patient's nervous shock is profound, as evinced by restlessness and great cerebral depression, a hypodermatic injection of one-sixth of a grain of morphine and one one-hundred-and-twentieth grain of atropine will be found of decided value. Auto-transfusion by tightly bandaging the limbs from the extremities towards the trunk is a method worthy of use in severe and protracted cases. The application of heat to the cerebellum should not be neglected; thus a rubber bag filled with hot water, or a hot bottle carefully covered with flannel, should be placed beneath the nape of the neck, where it will give the patient a considerable degree of comfort and stimulation. Inhalations of oxygen are of great value in cases of profound anæmia; whether the forced respiration of the gas

under pressure benefits the patient, or whether the oxygen itself is responsible for improvement in the patient's condition, is not definitely known.

So soon as reaction occurs, the patient may be given a small quantity of hot water, by the mouth, containing brandy, whiskey, or wine. Freshly-made black tea, taken hot, to which has been added a teaspoonful of rum, forms a most stimulating and efficient beverage. Freshly-made black coffee, to which brandy has been added, is also useful. Such stimulants must be given in small quantities. All freshly-made and hot broths, koumys, and raw oysters are available forms of nutritious material which may be taken as soon as the patient's stomach tolerates the presence of food. While champagne may allay nausea and vomiting, it is far inferior in stimulating power to the substances already mentioned.

Post-partum hemorrhage has an allied danger besides death from acute anæmia and syncope, in the predisposition which a patient suffering from hemorrhage has to septic infection. It is well, then, to exercise the most scrupulous care in guarding against this complication; the physician's hands, whatever touches the patient, fluids used for injections, all should be most thoroughly cleansed, and in default of assistance, and when time cannot be spared, soap and hot water are quite sufficient in place of chemical antiseptics. The tampon of gauze may be allowed to remain twenty-four hours if necessary; a free serous discharge will commonly take place, the gauze draining from the uterus as it drains in the abdominal cavity. When it is removed, the vagina should be thoroughly washed out with bichloride solution, one to five thousand, and if the gauze presents the slightest odor of decomposition the uterus should be douched with a creolin solution, two per cent., and an iodoform suppository, containing sixty grains, should be placed within its cavity. Such suppositories may be made with cacao butter, or may be ordered after the following formula:

Iodoform, grs. lx;
Gum arabic,
Glycerin,
Starch, ãã grs. vi.
Make one suppository.

If, when the gauze is removed, a decided odor is present, the uterus should be curetted, thoroughly douched, and the iodoform suppository left within its cavity. The administration of small doses of quinine and iron and nux vomica, together with ergot, is useful when uterine

involution is tardy and deficient. Quinine may be administered to advantage as follows:

R Quininæ sulphat., ʒi;
Pep-in pur., gr. xx.

In capsules, twenty in number. One four times daily with food.

The use of pepsin with quinine in these cases is desirable to obviate nausea, which frequently is a distressing complication of septic infection. There are many cases in which quinine seems to stimulate uterine involution in a more marked degree than the administration of ergot. Where hemorrhage has been excessive and involution is retarded, the following will be found of decided advantage:

R Ferri sulphat. exsicc., gr. l;
Ext. nucis vom., gr. v;
Pepsin pur., gr. xx.

In capsules, twenty in number. One three or four times daily with food.

The convalescence of a patient after post-partum hemorrhage requires the most careful attention to nutrition. Feeding with small quantities of the most easily digested foods is indicated for a week or ten days. Then larger quantities at longer intervals may be substituted. Massage will be found a most useful adjuvant in securing proper involution of the uterus. The abdomen should not be included in this manipulation for the first week or ten days after delivery, the massage being confined to the extremities and back. After this, however, general massage will be found beneficial.

Among the agents not uncommonly employed in the treatment of acute anæmia is the injection into the connective-tissue spaces of a sterilized saline solution. The apparatus required is a hollow needle, considerably larger than the ordinary hypodermatic needle, a piece of rubber tubing two or three feet long, and a glass funnel. Water which has been boiled should be used, and sufficient sodium chloride and sodium bicarbonate added to this water to give it a faint saline taste. The needle, carefully sterilized, should be thrust to a depth of an inch and a half into the outer surface of the thigh, or the regions of the back, or diagonally in the abdominal wall, if the tissues are thick. As much of the fluid as can be induced to enter by gentle rubbing over the point of insertion should then be gradually poured into the funnel. Several ounces of fluid can be introduced in this manner without inconvenience, the resulting tumor, which is often as large as a goose-egg, disappearing readily under continued rubbing. The effect upon the pulse is

immediate and decided. Its frequency is slightly diminished, and its volume perceptibly increased. Such an injection may be repeated several times, if desired.

It may have been noted that nothing has been said regarding the employment of two agents for checking hemorrhage which are often recommended and available in domestic practice,—vinegar and ice. There can be no objection to swabbing the interior of the empty uterus with vinegar, or to squeezing the juice of a lemon upon its surface, if necessary; but in the experience of the writer the means advocated have been quite sufficient and seemed better calculated to afford prompt relief with antiseptic precautions. While acetic acid may be inimical to the growth of many bacteria, yet domestic vinegar is hardly an aseptic substance, nor is the ordinary lemon. The same criticism applies to ice, unless the ice has been especially prepared from sterile water. If we are to be consistent in following the light which bacteriology gives us, we shall do well to limit our employment of agents to those which we are reasonably certain may be made aseptic.

It should take but a few moments' reflection to demonstrate the extreme danger attending the use of preparations of iron in the bleeding uterus. It is but a few years since, in amputations where capillary oozing and secondary hemorrhage from small vessels threatened the patient's life, that surgeons occasionally had recourse to opening the flaps freely and smearing the surfaces with a preparation of iron. The usual results of this procedure were suppuration in these flaps and the death of the patient from pyæmia. The same danger exists in the use of iron in the uterine cavity. Small but firm coagula are formed which may be carried into the circulation, resulting in multiple embolism. If the solution employed be strong, necrosis of the cellular elements of the endometrium and uterine muscle follows the application of the iron, and an irritant necrosis is produced which readily causes suppuration. The employment of a non-irritating, aseptic tampon, such as iodoform gauze, should supersede entirely the employment of corrosive styptics.

Post-partum hemorrhage occurring from a wounded uterine artery or from a blood-vessel in the lower portion of the genital tract requires prompt surgical treatment. If the patient's strength permits and the circumstances are favorable, ligature by the curved needle and aseptic ligature material are indicated. If the patient is too weak to endure such manipulation, and the light be such that the vessel cannot be recognized, the application of hæmostatic forceps, or, better, the employment of the antiseptic tampon, should be chosen. Post-partum

hemorrhage from inversion of the uterus is amenable to treatment, first, by the prompt restoration of the uterus to its usual condition and location, or, if this be impossible, to compression by the tampon and a bandage.

In obstetric literature are found the records of a few remarkable cases of hemorrhage in which a radical operation, such as the removal of the uterus, has been performed for this complication. Such cases must necessarily be very rare, and yet conditions may arise, such as rupture of the uterus, followed by hemorrhage, in which an abdominal incision and the suture or extirpation of the uterus may be indicated. The perfection of obstetric surgery will render these operations comparatively successful if promptly and skilfully performed.