

pregnancy, at or about the fifth month, I made it out very distinctly in a case in my own practice. It obviously must have occurred to an enormous extent in a case related by Chevalier, in which post-mortem Caesarean section was performed under the impression that the pregnancy had advanced to term, but only a three months' fetus was found, imbedded in coagula which distended the uterus to the size of a nine months' gestation.¹ Labor pains may be entirely absent. If present, they are generally feeble, irregular, and inefficient.

Differential Diagnosis.—The only condition, beside ordinary syncope, likely to be confounded with this form of hemorrhage, is rupture of the uterus, to which the intense pain and profound collapse induce considerable resemblance. The latter rarely occurs until after labor has been some time in progress, and after the escape of the liquor amnii; whereas hemorrhage usually occurs either before labor has commenced, or at an early stage. The recession of the presentation, and the escape of the fetus into the abdominal cavity, in cases of rupture, will further aid in establishing the diagnosis.

Prognosis.—The prognosis, when blood escapes externally, is, on the whole, not unfavorable. The nature of the case is apparent, and remedial measures are generally adopted sufficiently early to prevent serious mischief. It is different with the concealed form, in which the mortality is very great. Out of Goodell's 106 cases, no less than fifty-four mothers died. This excessive death-rate is, no doubt, partly due to the fact that extreme prostration often occurs before the existence of hemorrhage is suspected, and partly to the accident generally happening in women of weakly and diseased constitution. The prognosis to the child is still more grave. Out of 107 children, only six were born alive. The almost certain death of the child may be explained by the fact that, when blood collects between the uterus and the placenta, the fetal portion of the latter is probably lacerated, and the child then also dies from hemorrhage.

Treatment.—In this, as in all other forms of puerperal hemorrhage, the great hæmostatic is uterine contraction, and that we must try to encourage by all possible means. The first thing to be done, whether the hemorrhage be apparent or concealed, is to rupture the membranes. If the loss of blood be only slight, this may suffice to control it, and the case may then be left to Nature. A firm abdominal binder should, however, be applied to prevent any risk of blood collecting internally, as there is nothing to prevent its filling the uterine cavity after the membranes are ruptured. Contraction may be further advantageously solicited by uterine compression, and by the administration of full doses of ergot. If hemorrhage continue, or if we have any reason to suspect concealed hemorrhage, the sooner the uterus is emptied the better. If the os be sufficiently dilated, the best practice will be to turn without further delay, using the bi-polar method if possible. If the os be not open enough, a Barnes bag should be introduced, while firm pressure is kept up to prevent uterine accumulation. Should the collapsed condition of the patient be very marked,

¹ Journ. de Méd. Clin. et Pharm., tom. xxi. p. 368.

the mere shock of the operation might turn the scale against her. Under such circumstances it may be better practice to delay further procedure until, by the administration of stimulants, warmth, etc., we have succeeded in producing some amount of reaction, keeping up, in the meanwhile, firm pressure on the uterus. Should the head be low down in the pelvis, it may be easier to complete labor by means of the forceps.

CHAPTER XV.

HEMORRHAGE AFTER DELIVERY.

Its Importance.—Hemorrhage during, or shortly after, the third stage of labor is one of the most trying and dangerous accidents connected with parturition. Its sudden and unexpected occurrence just after the labor appears to be happily terminated, and its alarming effect on the patient, who is often placed in the utmost danger in a few moments, tax the presence of mind and the resources of the practitioner to the utmost, and render it an imperative duty on everyone who practises midwifery to make himself thoroughly acquainted with its causes, and preventive and curative treatment. There is no emergency in obstetrics which leaves less time for reflection and consultation, and the life of the patient will often depend on the prompt and immediate action of the medical attendant.

Frequency of Post-partum Hemorrhage.—Post-partum hemorrhage is one of the most frequent complications of delivery. I do not know of any statistics which enable us to judge with accuracy of its frequency, but I believe it to be an unquestionable fact that, especially in the upper ranks of society, it is very common indeed. This is probably due to the effects of civilization, and to the mode of life of patients of that class, whose whole surroundings tend to produce a lax habit of body which favors uterine inertia, the principal cause of post-partum hemorrhage. In the report of the Registrar-General for the five years from 1872 to 1876, 3524 deaths are attributed to flooding. The majority of these must have been caused by post-partum hemorrhage, although some may have been from other forms.

Fortunately, it is, to a great extent, a preventable accident. I believe this fact cannot be too strongly impressed on the practitioner. If the third stage of labor be properly conducted, if every case be treated, as every case ought to be, as if hemorrhage were impending, it would be much more infrequent than it is. It is a curious fact that post-partum hemorrhage is much more common in the practice of some medical men than in that of others; the reason being that those who meet with it often, are careless in their management of their

patients immediately after the birth of the child. That is just the time when the assistance of a properly qualified practitioner is of value, much more so than before the second stage of labor is concluded; hence, when I hear that a medical man is constantly meeting with severe post-partum hemorrhage, I hold myself justified, *ipso facto*, in inferring that he does not know, or does not practice, the proper mode of managing the third stage of labor.

Causes.—The placenta, as we have seen, is separated by the last pains, and the blood, which in greater or less quantity accompanies the foetus, probably comes from the utero-placental vessels which are then lacerated. Almost immediately afterward the uterus contracts firmly, and, in a typical labor, assumes the hard cricket-ball form which is so comforting to the accoucheur to feel. (See Plate V.) The result is the compression of all of the vascular trunks which ramify in its walls, both arteries and veins, and thus the flow of blood through them is prevented. By referring to what has been said as to the anatomy of the muscular fibres of the gravid uterus, especially at the placental site (p. 62), it will be seen how admirably they are adapted for this purpose. The arrangement of the vessels themselves favors the hæmostatic action of uterine contraction. The large venous sinuses are placed in layers one above the other, in the thickness of the uterine walls, and they anastomose freely. When the superimposed layers communicate with those immediately below them, the junction is by a falciform or semilunar opening in the floor of the vessel nearest the external surface of the uterus. Within the margins of this aperture there are muscular fibres, the contraction of which probably tends to prevent retrogression of blood from one layer of vessels into the other. The venous sinuses themselves are of a flattened form, and they are intimately attached to the muscular tissues. It is obvious, then, that these anatomical arrangements are eminently adapted to facilitate the closure of the vessels. They are, however, large, and are destitute of valves; and if contraction be absent, or if it be partial and irregular, it is equally easy to understand why blood should pour forth in the appalling amount which is sometimes observed.

If uterine action be firm, regular, and continuous, the vessels must be sealed up and hemorrhage effectually prevented. This fact has been doubted by many authorities. Gooch was the first to describe what he called "a peculiar form of hemorrhage" accompanying a contracted womb. Similar observations have been made by other writers, such as Velpeau, Rigby, and Gendrin. Simpson says, on this point, that strong uterine contractions "are not probably so essential a part in the mechanism of the prevention of hemorrhage from the open orifices of the uterine veins as we might *à priori* suppose."¹ With regard to Gooch's cases, it has been pointed out that his own description proves that, however firmly the uterus may have contracted immediately after the expulsion of the child, it must have subsequently relaxed, for he passed his hand into it to remove retained

¹ Selected Obstetric Works, p. 234.

clots, a manœuvre which he could not have practised had tonic contraction been present. In some of these cases the hemorrhage has been found to come from a laceration of the cervix. Of course, blood may readily escape from a mechanical injury of this kind, although the uterus itself be in a satisfactory state of contraction; and the possibility of this occurrence should always be borne in mind. Instances of the successful treatment of this variety of post-partum hemorrhage by sutures applied to the lacerated cervix have been related by Pallen and others.

Although, then, we may admit that post-partum hemorrhage is incompatible with persistent contraction of the uterus, it by no means follows that the converse is true. On the contrary, it is not uncommon to meet with cases in which the uterus is large, and apparently quite flaccid, and in which there is no loss of blood. Alternate relaxation and contraction of the uterus after delivery are also of constant occurrence, and yet hemorrhage, during the relaxation, does not take place. The explanation no doubt is, that immediately after the birth of the child there was sufficient contraction to prevent hemorrhage, and that, during its continuance, coagula formed in the mouths of the uterine sinuses, by which they were sufficiently occluded to prevent any loss when subsequent relaxation occurred.

In all probability both uterine contraction and thrombosis are in operation in ordinary cases; and we shall presently see that all the means employed in the treatment of post-partum hemorrhage act by producing one or other of them.

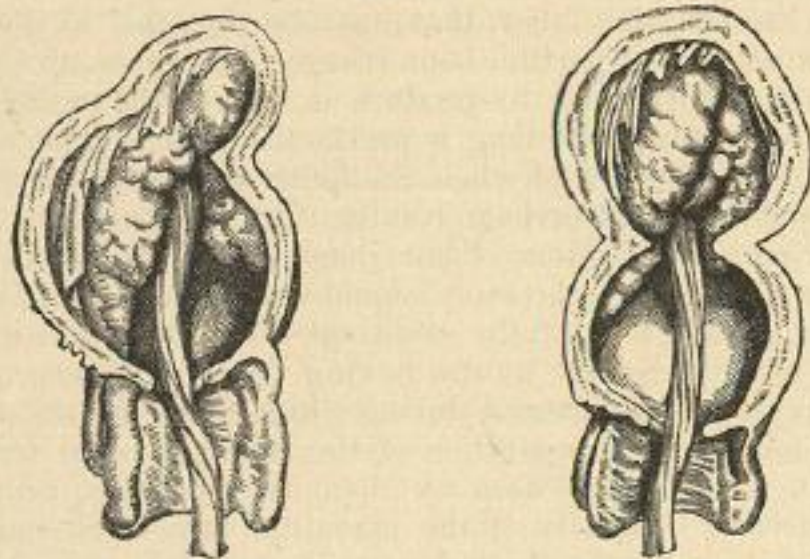
Uterine inertia after labor, then, may be regarded as the one great primary cause of post-partum hemorrhage; but there are various secondary causes which tend to produce it, one of the most frequent of which is exhaustion following a protracted labor. The uterus gets worn out by its efforts, and when the foetus is expelled, it remains in a relaxed state, and hemorrhage results. Over-distention of the uterus acts in the same way. Hence hemorrhage is very frequently met with when there has been an excessive amount of liquor amnii, or in multiple pregnancies. One of the worst cases I ever met with was after the birth of triplets, the uterus having been of an enormous size. Rapid emptying of the uterus, during which there has not been sufficient time for complete separation of the placenta, often tends to the same result. This is the reason why hemorrhage so frequently follows forceps delivery, especially if the operation have been unduly hurried; and it is one of the chief dangers in what are termed "precipitate labors." The general condition of the patient may also strongly predispose to it. Thus it is more often met with in women who have borne families, especially if they be weakly in constitution, comparatively seldom in primiparæ; and for the same reason that after-pains are most common in the former, namely, that the uterus, weakened by frequent childbearing, contracts inefficiently. The experience of practitioners in the tropics shows that European women, debilitated by the relaxing effects of warm climates, are peculiarly prone to it, and it forms one of the chief dangers of childbirth amongst the English ladies in India.

Another important cause of post-partum hemorrhage is partial and irregular contraction of the uterus. Part of the muscular tissue is firmly contracted, while another part is relaxed, and the latter very often the placental site. This has been especially dwelt on by Simpson. He says: "The morbid condition which is most frequently and earliest seen in connection with post-partum hemorrhage, is a state of irregularity and want of equability in the contractile action of different parts of the uterus—and, it may be, in different planes of the muscular fibres—as marked by one or more points in the organ feeling hard and contracted, at the same time that other portions of the parietes are soft and relaxed."

One peculiar variety, which has been much dwelt on by writers, and is a prominent bugbear to obstetricians, is the so-called *hour-glass contraction*. This in reality seems to depend on spasmodic contraction of the internal os uteri, by means of which the placenta becomes encysted in the upper portion of the uterus, which is relaxed. On introducing the hand, it first passes through the lax cervical canal until it comes to the closed internal os, with the umbilical cord passing through it, which has generally been supposed to be a circular contraction of a portion of the body of the uterus.

Encystment of the placenta, however, although more rarely, unquestionably takes place in a portion only of the body of the uterus (Fig. 153). Then apparently the placental site remains more or less

FIG. 153.



Irregular contraction of the uterus, with encystment of the placenta.

paralyzed, with the placenta still attached, while the remainder of the body of the uterus contracts firmly, and thus encystment is produced.

These irregular contractions of the uterus are by no means so common as our older authors supposed. When they do occur, I believe them almost invariably to depend on defective management of the third stage of labor. "The most frequent cause," says Rigby,¹ "is from over-anxiety to remove the placenta; the cord is frequently pulled at,

¹ Rigby's Midwifery, p. 225.

and at length the os uteri is excited to contract." While this is being done, no attempts are probably being made to excite the fundus to proper action, and, therefore, the hour-glass contraction is established. Johnstone¹ has pointed out that in a large proportion of cases ergot has been given before the expulsion of the placenta. Duncan says of this condition: "Hour-glass contraction cannot exist unless the parts above the contraction are in a state of inertia; were the higher parts of the uterus even in moderate action, the hour-glass contraction would soon be overcome."² If placental expression were always employed, if it were the rule to effect the expulsion of the placenta by a *vis à tergo*, instead of extracting it by a *vis à fronte*, I feel confident that these irregular and spasmodic contractions—of the influence of which in producing hemorrhage there can be no question—would rarely, if ever, be met with. It is to be observed that, even in these cases, it is not because the uterus is in a state of partial contraction, but because it is in a state of partial relaxation, that hemorrhage ensues.

Placental Adhesions.—Adhesions of the placenta to the uterine parietes may cause hemorrhage, especially if they be partial and the remainder of the placenta be detached. The frequency of these has been over-estimated. Many cases believed to be examples of adherent placenta are, in reality, only cases of placenta retained from uterine inertia. The experience of all who see much midwifery will probably corroborate the observation of Braun, that "abnormal adhesion and hour-glass contraction are more frequently encountered in the experience of the young practitioner, and they diminish in frequency in direct ratio to increasing years."³ The cause of adhesion is often obscure, but it most probably results from a morbid state of the decidua, which is produced by antecedent disease of the uterine mucous membrane; then the adhesion is apt to recur in subsequent pregnancies. The decidua is altered and thickened, and patches of calcareous and fibrous degeneration may be often found on the attached surface of the placenta. Most frequently the placenta is only partially adherent; patches of it remain firmly attached to the uterus, while the rest is separated; hence the uterine walls remain relaxed and hemorrhage frequently follows. The diagnosis and management of these very troublesome cases will be found described under the head of treatment (p. 441).

Finally, I think it must be admitted that there are some women who really merit the appellation of "Flooders" which has been applied to them, and who, do what we may, have the most extraordinary tendency to hemorrhage after delivery. I do not think that these cases, however, are by any means so common as some have supposed. I have attended several patients who have nearly lost their lives from post-partum hemorrhage in former labors, some who have suffered from it in every preceding confinement, and I have only met with two cases in which the assiduous use of preventive treatment failed to avert it. In these (one of which I have elsewhere published in detail⁴), in spite

¹ Glasgow Med. Journ., 1887, vol. xxvii, p. 188.² Researches in Obstetrics, p. 380.³ Obst. Journ., 1873-74, vol. i, p. 89.⁴ Braun's Lectures, 1869.

of all my efforts, I could not succeed in keeping up uterine contraction, and the patients would certainly have lost their lives were it not for the means which modern improvements have fortunately placed at our disposal for producing thrombosis in the mouths of the bleeding vessels. The nature of these rare cases requires further investigation; possibly they may, to some extent, be the subjects of the so-called hemorrhagic diathesis.

The loss of blood may commence immediately after the birth of the child, before the expulsion of the placenta, or not until some time afterward, when the contracted uterus has again relaxed. It may commence gradually or suddenly; in the latter case it may begin with a gush, and in the worst form the bedclothes, the bed, and even the floor, are deluged with the blood which, it is no exaggeration to say, is pouring from the patient. If now the hand be placed on the abdomen, we shall miss the hard round ball of the contracted uterus, which will be found soft and flabby, or we may even be unable to make out its contour at all. If the hemorrhage be slight, or if we succeed in controlling it at once, no serious consequences follow; but if it be excessive, or if we fail to check it, the gravest results ensue.

There are few sights more appalling to witness than one of the worst cases of post-partum hemorrhage. The pulse becomes rapidly affected, and may be reduced to a mere thread, or it may become entirely imperceptible. Syncope often comes on—not in itself always an unfavorable occurrence, as it tends to promote thrombosis in the venous sinuses. Or, short of actual syncope, there may be a feeling of intense debility and faintness. Extreme restlessness soon supervenes, the patient throws herself about the bed, tossing her arms wildly above her head; respiration becomes gasping and sighing, the “besoin de respirer” is acutely felt, and the patient cries out for more air; the skin becomes deadly cold, and covered with profuse perspiration; if the hemorrhage continue unchecked, we next may have complete loss of vision, jactitation, convulsions, and death.

Formidable as such symptoms are, it is satisfactory to know that recovery often takes place, even when the powers of life seem reduced to the lowest ebb. If we can check the hemorrhage while there is still some power of reaction left, however slight, we may not unreasonably hope for eventual recovery. The constitution, however, may have received a severe shock, and it may be months, or even years, before the patient recovers from the effects of only a few minutes' hemorrhage. A death-like pallor frequently follows these excessive losses, and the patient often remains blanched and exsanguine for a long time.

Preventive Treatment.—The preventive treatment of post-partum hemorrhage should be carefully practised in every case of labor, however normal. If the practitioner make a habit of never removing his hand from the uterus after the birth of the child until the placenta is expelled, and of keeping up continuous uterine contraction for at least half an hour after delivery is completed, not necessarily by friction on the fundus, but by simply grasping the contracted womb with the palm of the hand and preventing its undue relaxation, cases of post-

partum flooding will seldom be met with. As a rule we should not, I think, apply the binder until at least that time has elapsed. The binder is an effective means of keeping up, but not of producing, contraction, and it should never be trusted to for the latter purpose. If it be put on too soon, the uterus may relax under it, and become filled with clots without the practitioner knowing anything about it; whereas, this cannot possibly take place as long as the uterine globe is held in the hollow of the hand. I have seen more than one serious case of concealed hemorrhage result from the too common habit of putting on the binder immediately after the removal of the placenta. I believe also, as I have formerly said, that it is thoroughly good practice to administer a full dose of the liquid extract of ergot in all cases after the placenta has been expelled, to insure persistent contraction and to lessen the chance of blood-clots being retained *in utero*.

These are the precautions which should be used in all cases alike; but when we have reason to fear the occurrence of hemorrhage, from the history of previous labors or other cause, special care should be taken. The ergot should be given, and preferably in the form of the subcutaneous injection of ergotine, before the birth of the child, when the presentation is so far advanced that we estimate that labor will be concluded in from ten to twenty minutes, as we can hardly expect the drug to produce any effect in less time. Particular attention, moreover, should then be paid to the state of the uterus. Every means should be taken to insure regular and strong contraction, and it is advisable to rupture the membranes early, as soon as the os is dilated or dilatable, to insure stronger uterine action. If any tendency to relaxation occur after delivery, a piece of ice should be passed into the vagina or into the uterus. Should coagula collect in the uterus, they may be readily expelled by firm pressure on the fundus, and the finger should be passed occasionally up to the cervix, and any which are felt there should be gently picked away.

We should be specially on our guard in all cases in which the pulse does not fall after delivery. If it beat at 100 or more some ten minutes or a quarter of an hour after the birth of the child, hemorrhage not unfrequently follows; and hence it is a good practical rule, which may save much trouble, that a patient should never be left unless the pulse has fallen to its natural standard.

Curative Treatment.—As there are only two means which Nature adopts in the prevention of post-partum hemorrhage, so the remedial measures also may be divided into two classes: 1. Those which act by the production of uterine contraction. 2. Those which act by producing thrombosis in the vessels. Of these the first are the most commonly used; and it is only in the worst cases, in which they have been assiduously tried and have failed, that we resort to those coming under the second heading.

The patient should be placed on her back, in which position we can more readily command the uterus, as well as attend to her general state. If the uterus be found relaxed and full of clots, by firmly grasping it in the hand contraction may be evoked, its contents expelled, and further hemorrhage at once arrested. Should this fortu-

nately be the case, we must keep up contraction by gently kneading the uterus, until we are satisfied that undue relaxation will not recur.

The powerful influence of friction in promoting contraction cannot be doubted, and nothing will replace it; no doubt it is fatiguing, but as long as it is effectual it must be kept up. No roughness should be used, as we might produce subsequent injury, but it is quite possible to use considerable pressure without any violence.

Another method of applying uterine pressure has been strongly advocated by Dr. Hamilton, of Falkirk, and it may be serviceable where there is a constant draining from the uterus, and a capacious pelvis. It consists in passing the fingers of the right hand high up into the posterior cul-de-sac of the vagina, so as to reach the posterior surface of the uterus, while counter-pressure is exercised by the left hand through the abdomen. The anterior and posterior walls of the uterus are thus closely pressed together.

During the time that pressure is being applied, attention can be paid to general treatment; and in giving his directions to the bystanders the practitioner should be calm and collected, avoiding all hurry and excitement. A full dose of ergot should be administered, and if one have already been given, it should be repeated. We cannot, however, look upon ergot as anything but a useful accessory, and it is one which requires considerable time to operate. The hypodermic use of ergotine offers the double advantage, in severe cases, of acting with greater power, and much more rapidly, than the usual method of administration. It should, therefore, always be used in preference. An aqueous solution of ergotinine, $\frac{1}{2}$ of a grain in 10 minims, has been highly recommended by Chahbazain, of Paris, as acting more energetically, and, it has seemed to me,¹ has had a good effect.

The sudden flow will probably have produced exhaustion and a tendency to syncope, and the administration of stimulants will be necessary. The amount must be regulated by the state of the pulse and the degree of exhaustion. There is no more absurd mistake, however, than implicitly relying on the brandy bottle to check post-partum hemorrhage. In the worst cases absorption is in abeyance, and brandy may be poured down in abundance, the practitioner believing that he is rousing his patient, while he is, in fact, only filling the stomach with a quantity of fluid which is eventually thrown up unaltered. I have more than once seen symptoms, produced by the over-free use of brandy in slight floodings, which were certainly not those of hemorrhage. I remember on one occasion being summoned by a practitioner, with a view to transfusion, to a patient who was said to be insensible and collapsed from hemorrhage. I found her, indeed, unconscious; but with a flushed face, a bounding pulse, a firmly contracted uterus, and deep stertorous breathing. On inquiry I ascertained that she had taken an enormous quantity of brandy, which had brought on the coma of profound intoxication, while the hemorrhage had obviously never been excessive.

The hypodermic injection of sulphuric ether is a remedy of great

¹ Obst. Trans. for 1882, vol. xxiv. p. 286.

value as a powerful stimulant in cases in which exhaustion is very great. It has the advantage of acting rapidly, and of being capable of administration when the patient is unable to swallow. A fluid drachm may be injected into the nates, or thigh, and the injection may be repeated as the state of the patient may require.

The window should be thrown widely open, to allow a current of fresh cold air to circulate freely through the room. The pillows should be removed, the head kept low, and the patient should be assiduously fanned. It is often found to be useful to raise the feet of the bed on blocks of wood, or books, so as to have the head lower than the pelvis. This will favor the current of blood to the head, and lessen the tendency to syncope.

If bleeding continue, or if it commence before the placenta is expelled, the hand should be carefully and gently passed into the uterus, and its cavity cleared of its contents. The mere presence of the hand within the uterus is a powerful inciter of uterine action. When the placenta is retained it is the more essential, as the hemorrhage cannot possibly be checked as long as the uterus is distended by it. During the operation the uterus should be supported by the left hand externally, and, by using the two hands in concert, the chances of injuring the textures are greatly lessened.

Treatment of Hour-glass Contraction.—If the so-called "hour-glass contraction" be present, or if the placenta be morbidly adherent, the operation will be more difficult, and will require much judgment and care. The spasmodic contraction of the inner os in the former case may generally be overcome by gentle and continuous pressure of the fingers passed within the contraction, while the uterus is supported from without. By this means, too, further hemorrhage can in most cases be controlled until the spasm is sufficiently relaxed to admit of the passage of the hand.

Signs of Adherent Placenta.—There are no very reliable signs to indicate morbid adhesion of the placenta, previous to the introduction of the hand. The following are the symptoms as laid down by Barnes, any of which might, however, accompany non-detachment of the placenta unaccompanied by adhesion: "You may suspect morbid adhesion if there have been unusual difficulty in removing the placenta in previous labors; if during the third stage the uterus contracts at intervals firmly, each contraction being accompanied by blood, and yet, on following up the cord, you feel the placenta *in utero*; if, on pulling on the cord, two fingers being pressed into the placenta at the root, you feel the placenta and uterus descend in one mass, a sense of dragging pain being elicited; if during a pain the uterine tumor does not present a globular form, but is more prominent than usual at the place of placental attachment."¹

Treatment of Adherent Placenta.—The artificial removal of an adherent placenta is always a delicate and anxious operation, which, however carefully performed, must of necessity expose the patient to the risk of injury to the uterine structures, and of leaving behind por-

¹ Obstetric Operations, p. 440.

tions of placental tissue, which may give rise to secondary hemorrhage or sapræmia. The cord will guide the hand to the site of attachment, and the fingers must be very gently insinuated between the lower edge of the placenta and the uterine wall; or, if a portion be already detached, we may commence to peel off the remainder at that spot. Supporting the uterus externally, we carefully pick off as much as possible, proceeding with the greatest caution, as it is by no means easy to distinguish between the placenta and the uterus. At the best, it is far from easy to remove all, and it is wiser to separate only what we readily can than to make too protracted efforts at complete detachment. When it is found to be impossible to detach and remove the whole or a great part of the placenta, we cannot but look upon the further progress of the case with considerable anxiety. The retained portions may be, ere long, spontaneously detached and expelled, or they may decompose and give rise to fetid discharge and septic infection. Such cases must be treated by antiseptic intra-uterine injections, so as to lessen the risk of absorption as much as possible; but until the retained masses have been expelled, and the discharge has ceased, the patient must be considered to be in considerable danger. In a few rare cases, there is reason to believe that considerable masses of retained placental tissue have been entirely absorbed. It is difficult to understand so strange a phenomenon, but several well-authenticated cases are recorded in which there seems no reason to doubt that the retained placenta was removed in this way.¹

Various means are used for exciting uterine contraction by reflex stimulation. Amongst the most important of these is cold. In patients who are not too exhausted to respond to the stimulus applied, it is of extreme value. But, to be of use, it should be used intermittently, and not continuously. Pouring a stream of cold water from a height on the abdomen is a not uncommon, but bad practice, as it deluges the patient and bedding in water, which may afterward act injuriously. Flapping the lower part of the abdomen with a wet towel is less objectionable. Ice can generally be obtained, and a piece should be introduced into the uterus. This is a very powerful hæmodynamic, and often excites strong action when other means fail. I constantly employ it, and have never seen any bad results follow. A large piece of ice may also be held over the fundus, and removed, and reapplied from time to time. Iced water may be injected into the rectum. A very powerful remedy is washing out the uterine cavity with a stream of cold water, by means of the vaginal pipe of a Higginson's syringe carried up to the fundus. Another means of applying cold, said to be very effectual, is the application of the ether spray, such as is used for producing local anaesthesia, over the lower part of the abdomen.² All these remedies, however, depend for their good results on the fact of the patient being in a condition to respond to stimulus; and their prolonged use, if they fail to excite contraction rapidly, will certainly prove injurious. Rigby used to look upon the

¹ See an interesting paper by Dr. Thrush on "Retention of the Placenta in Labor at Term," Amer. Journ. of Obstet., 1877, vol. x, pp. 339, 306.
² Griffiths: Practitioner, 1877, vol. xviii, p. 176.

application of the child to the breast as one of the most certain inciters of uterine action. It may be of service after the hemorrhage has been checked, in keeping up tonic contraction, and should therefore not be omitted; but we certainly cannot waste time in inducing the child to suck in the face of the actual emergency.

Intra-uterine injection of hot water, at a temperature of from 100° to 120°, has been highly recommended as a powerful means of arresting post-partum hemorrhage, often proving effectual when all other treatment has failed.^[1] The number of published cases in which it has proved of great value is now considerable. The late master of the Rotunda, Dr. Lombe Atthill, has recorded sixteen cases² in which it checked hemorrhage at once, in many of which ergot, ice, and other means had failed. He speaks of it as especially useful in those troublesome cases in which the uterus alternately relaxes and hardens, and resists all our efforts to produce permanent contraction. Its superiority to cold water has been well shown by Milne Murray³ by means of experiments on pregnant and non-pregnant rabbits, which proved that while cold applications produce a temporary contraction, when applied for any length of time they rapidly exhaust the excitability of the uterine muscle, while the reverse effect is produced when hot water is used. My own experience of this treatment is very favorable. I have now used it in many cases, in some of which the tendency to hemorrhage was very great, and in every instance it has at once produced strong uterine action and instantly checked the flow. It is, moreover, much more agreeable to the patient than cold applications. It is advisable to add a few drops of creolin to the hot water, which is in itself a good antiseptic, and is said to be also a powerful styptic. I think it cannot be doubted that we have in these warm irrigations a valuable addition to our methods of treating uterine hemorrhage.

The late Dr. Earle pointed out⁴ that a distended bladder often prevents contraction, and to avoid the possibility of this the catheter should be passed.

Since 1887 plugging the uterine cavity with iodoform gauze, or, when this is not at hand, with pledgets of cotton-wool soaked in carbolic solution, has been thoroughly advocated in Germany, chiefly by Dührssen,⁵ but since the publication of his paper a large number of successful cases have been published⁶ in which this treatment has been adopted, so that it must be admitted as a useful resource in certain intractable cases. It seems to act in two ways: first, by exciting energetic and continuous uterine contractions; and next, by direct pressure on the bleeding part. In applying the plugs, the patient should be placed on her back, the cervix drawn down with a volsella, and long strips of gauze passed up to the fundus with ovum forceps, until the uterine cavity is completely packed. The vagina should be subsequently plugged with pledgets of cotton-wool soaked in glycerin or carbolic water and dusted with iodoform. The plugs may be

[1] The proper temperature is 115°. Water at a temperature of 100° has a tendency to favor the hemorrhage.—Ed.]

² Lancet, February 9, 1878.

³ Earle: Flooding after Delivery, p. 163.

⁴ See Year-book of Treatment, 1891.

⁵ Edin. Med. Journ., 1886-87, pp. 131, 215.

⁶ Volkmann'sche Sammlung, No. 347.

allowed to remain in the uterus from eight to twelve hours, by which time all risk of recurrence of the hemorrhage will be at an end. I have no personal experience of this treatment, but the evidence in its favor is strong. It is clearly one which can only be resorted to in very intense cases of hemorrhage when all other means have failed. It will obviously be essential to carefully watch the uterus, to make sure that blood is not escaping into and distending its cavity above the plug. If the uterine cavity should be only partially or ineffectually filled, concealed internal hemorrhage might very readily be going on without the practitioner's knowledge.

Compression of the abdominal aorta is highly thought of by many Continental authorities, but it is little known or practised in this country. It has been objected to by some on the theoretical ground that the hemorrhage is chiefly venous, not arterial, and that it would only favor the reflux of venous blood into the vena cava. Cazeaux points out that, on account of the close anatomical relations between the aorta and the vena cava, it is hardly possible to compress one vessel without the other. The backward flow of blood, therefore, through the vena cava may also be thus arrested. There is strong evidence in favor of the occasional utility of compression. Its chief recommendation is that it can be practised immediately, and by an assistant, who can be shown how to apply the pressure. It is most likely to prove useful in sudden and severe hemorrhage, and, if it only control the loss for a few moments, it gives us time to apply other methods of treatment. As a temporary expedient, therefore, it should be borne in mind, and adopted when necessary. It has the great advantage of supplementing, without superseding, other and more radical plans of treatment. The pressure is very easily applied, on account of the lax state of the abdominal walls. The artery can readily be felt pulsating above the fundus uteri, and can be compressed against the vertebrae by three or four fingers applied lengthwise. Baudelocque, who was a strong advocate of this procedure, stated that he had, on several occasions, controlled an otherwise intractable hemorrhage in this way, and that he, on one occasion, kept up compression for four consecutive hours. Cazeaux believes that compression of the aorta may have a further advantageous effect in retaining the mass of the blood in the upper part of the body, and thus lessening the tendency to syncope and collapse. If an aortic tourniquet, such as is used for compressing the vessel in cases of aneurism, could be obtained, it might be used with advantage in such cases.

If a battery is at hand the faradic current may be used, and it is said to be a very powerful agent in inducing uterine contraction, one pole being introduced into the uterus, the other applied over it through the abdominal parietes.

When the hemorrhage has been excessive, and there is profound exhaustion, firm bandaging of the extremities, by preference with Esmarch's elastic bandages if they can be obtained, may be advantageously adopted, with the view of retaining the blood as much as possible in the trunk, and thus lessening the tendency to syncope. As

a temporary expedient in the worst class of cases it may occasionally prove of service.

[Lives of patients *in extremis* have been saved by the expedient of raising the body of the woman and lowering her head, so as to turn the current of blood toward the brain. This may have to be repeated several times in the treatment of a case where attacks of syncope indicate it. A bladder containing ice may be held under the hand of the operator over the abdomen and above the fundus uteri, and compression made upon the uterus and aorta at the same time. In one case I was forced, by the long-continued inertia of the uterus and the tendency to a return of hemorrhage, to keep up this form of compression for six and a half hours. The hand of the operator should be protected by a compress of flannel, or he may have an attack of local neuralgia, or possibly rheumatism, in his arm.—ED.]

Supposing these means fail, and the uterus obstinately refuses to contract in spite of all our efforts—and, do what we may, cases of this kind will occur—the only other agent at our command is the application of a powerful styptic to the bleeding surface to produce thrombosis in the vessels. "The latter," says Dr. Ferguson,¹ alluding to this means of arresting hemorrhage, "appears to be the sole means of safety in those cases of intense flooding in which the uterus flaps about the hand like a wet towel. Incapable of contraction for hours, yet ceasing to ooze out a drop of blood, there is nothing apparently between life and death but a few soft coagula plugging up the sinuses." These form but a frail barrier indeed, but the experience of all who have used the injection of a solution of perchloride of iron in such cases proves that they are thoroughly effectual, and their introduction into practice is one of the greatest improvements in modern midwifery. Although this method of treating these obstinate cases is not new, since it was practised long ago in Germany, its adoption in this country is unquestionably due to the energetic recommendation of Dr. Barnes. The dangers of the practice have been strongly insisted on, and with a degree of acrimony that is to be regretted, but I know of only one published case in which its use has been followed by any evil effects. Its extraordinary power, however, of instantly checking the most formidable hemorrhage has been demonstrated by the unanimous testimony of all who have tried it. As it is not proposed by anyone that this means of treatment should be employed until all ordinary methods of evoking contraction have failed, and as, in cases of this kind, the lives of the patients are of necessity imperilled, we should be fully justified in adopting it, even if its possibly injurious effects had been much more certainly proved. It is surely at any time justifiable to avoid a great and pressing peril by running a possible chance of a less one. Whenever, therefore, we have tried the plans above indicated in vain, no time should be lost in resorting to this expedient. No practitioner should attend a case of midwifery without having the necessary styptic with him. The best and most easily obtainable form of using the remedy is the "liquor ferri perchloridi

¹ Preface to Gooch "On Diseases of Women," p. xlii. New Sydenham Society, 1859.

fortior" of the London Pharmacopœia, which should be diluted for use with six times its bulk of water. This is certainly better than a weaker solution. The vaginal pipe of a Higginson's syringe, through which the solution has once or twice been pumped to exclude the air, is guided by the hand to the fundus uteri, and the fluid injected gently over the uterine surface. The loose and flabby mucous membrane is instantaneously felt to pucker up, all the blood with which the fluid comes in contact is coagulated, and the hemorrhage is immediately arrested. I think it is of importance to make sure that the uterus and vagina are emptied of clots before injection. In the only cases in which I have seen any bad symptoms follow, this precaution had been neglected. The iron hardened all the coagula, which remained *in utero*, and sapremia supervened; which, however, disappeared after the clots had been broken up and washed away by intra-uterine antiseptic injections. After we have resorted to this treatment, all further pressure on the uterus should be stopped. We must remember that we have now abandoned contraction as a hæmostatic, and are trusting to thrombosis, and that pressure might detach and lessen the coagula which are preventing the escape of blood.

Other local astringents may be eventually found to be of use. Tincture of matico possibly might be serviceable, although I am not aware that it has been tried. The styptic properties of creolin have already been mentioned. Dupierris has advocated tincture of iodine, and has recorded twenty-four cases in which he employed it, in all without accident, and with a successful issue. Penrose¹ strongly recommends common vinegar, which has the advantage of being always readily obtainable. He speaks highly of its hæmostatic effect. He soaks a clean handkerchief in it, and introduces it by the hand into the uterine cavity, and squeezes it over the endometrium. He says: "The effect of the vinegar flowing over the sides of the cavity of the uterus and vagina is magical. The relaxed and flabby uterine muscle instantly responds. The organ assumes what is called its gizzard-like feel, shrinking down upon and compressing the operating hand, and in the vast majority of cases the hemorrhage ceases instantly." This is certainly worth trying before the iron solution, which is not, as we have seen, devoid of certain risks.

Hemorrhage from Laceration of Maternal Structures.—A word may here be said as to the occasional dependence of hemorrhage after delivery on laceration of the cervix or other injury to the maternal soft parts. Duncan has narrated a case in which the bleeding came from a ruptured perineum. If hemorrhage continues after the uterus is permanently contracted, a careful examination should be made to ascertain if any such injury exist. Most generally the source of bleeding is the cervix, and the flow can be readily arrested by swabbing the injured textures with a sponge saturated in a solution of the perchloride.

¹ Trans. Amer. Gyn. Soc., vol. iii, p. 148.
² This remedy was used as a uterine injection with signal effect in a case of violent post-partum hemorrhage by a French surgeon in country practice in the days of Astruc, who wrote of it in 1765 (*Maladies des Femmes*, vol. iv, p. 227).—Ed.]

Secondary Treatment.—The secondary treatment of post-partum hemorrhage is of importance. When reaction commences, a train of distressing symptoms often show themselves, such as intense and throbbing headache, great intolerance of light and sound, and general nervous prostration; and, when these have passed away, we have to deal with the more chronic effects of profuse loss of blood. Nothing is so valuable in relieving these symptoms as opium. It is the best restorative that can be employed, but it must be administered in larger doses than usual. Thirty to forty drops of Battley's solution should be given by the mouth or in an enema. At the same time the patient should be kept perfectly still and quiet, in a darkened room, and the visits of anxious friends strictly forbidden. Strong beef-essence or gravy soup, milk, or eggs beaten up with milk, and similar easily absorbed articles of diet, should be given frequently, and in small quantities at a time. Stimulants will be required according to the state of the patient, such as warm brandy-and-water, port wine, etc. Rest in bed should be insisted on, and continued much beyond the usual time. Eventually the remedies which act by promoting the formation of blood, such as the various preparations of iron, will be found useful, and may be required for a length of time.

Under the head of Transfusion, I have separately treated the application of that last resource in those desperate cases in which the loss of blood has been so excessive as to leave no other hope.

Secondary Post-partum Hemorrhage.—In the majority of cases, if a few hours have elapsed after delivery without hemorrhage, we may consider the patient safe from the accident. It is by no means very rare, however, to meet with even profuse losses of blood coming on in the course of convalescence, at a time varying from a few hours or days up to several weeks after delivery. These cases are described as examples of *secondary hemorrhage*, and they have not received an at all adequate amount of attention from obstetric writers, inasmuch as they often give rise to very serious, and even fatal results, and are always somewhat obscure in their etiology and difficult to treat. We owe almost all our knowledge of this condition to an excellent paper by Dr. McClintock, of Dublin, who has collected characteristic examples from the writings of various authors, and accurately described the causes which are most apt to produce it.

We must, in the first place, distinguish between true secondary hemorrhage and profuse lochial discharge continued for a longer time than usual. The latter is not a very uncommon occurrence, and is generally met with in cases in which involution of the uterus has been checked—as by too early exertion, general debility, and the like. The amount of the lochial discharge varies in different women. In some patients it habitually continues during the whole puerperal month, and even longer, but not to an extent which justifies us in including it under the head of hemorrhage. In such cases prolonged rest, avoidance of the erect posture, occasional small doses of ergot, and, it may be, after the lapse of some weeks, astringent injections of oak-bark or alum, will be all that is necessary in the way of treatment.

True secondary hemorrhage is often sudden in its appearance and serious in its effects. McClintock mentions six fatal cases, and Mr. Bassett,¹ of Birmingham, has recorded thirteen examples which came under his own observation, two of which ended fatally.

The causes may be either constitutional, or some local condition of the uterus itself.

Constitutional Causes.—Among the former are such as produce a disturbance of the vascular system of the body generally, or of the uterine vessels in particular. The state of the uterine sinuses, and the slight barrier which the thrombi formed in them offer to the escape of blood, readily explain the fact of any sudden vascular congestion producing hemorrhage. Thus mental emotions, the sudden assumption of the erect posture, any undue exertion, the incautious use of stimulants, a loaded condition of the bowels, or sexual intercourse shortly after delivery, may act in this way. McClintock records the case of a lady in whom very profuse hemorrhage occurred on the twelfth day after labor, when sitting up for the first time. Feeling faint after suckling, the nurse gave her some brandy, whereupon a gush of blood ensued, "deluging all the bedclothes and penetrating through the mattress so as to form a pool on the floor." Here the erect position, the exquisite pain caused by nursing, and the stimulating drink, all concurred to excite the hemorrhage. In another instance the flooding was traced to excitement produced by the sudden return of an old lover on the eighth day after labor. Moreau especially dwells on the influence of local congestion produced by a loaded condition of the rectum. Constitutional affections producing general debility and an impoverished state of the blood, probably also may have the same effect. Blot specially mentions albuminuria as one of these, and Saboia states that in Brazil secondary hemorrhage is a common symptom of miasmatic poisoning, and can only be cured by change of air and the free use of quinine.²

Local Causes.—Local conditions seem, however, to be the more frequent factors in the production of secondary hemorrhage. These may be generally classed under the following heads:

1. Irregular and inefficient contraction of the uterus.
2. Clots in the uterine cavity.
3. Portions of retained placenta or membranes.
4. Retroflexion of the uterus.
5. Laceration or inflammatory state of the cervix.
6. Thrombosis or hæmatocele of the cervix or vulva.
7. Inversion of the uterus.
8. Fibroid tumors or polypus of the uterus.

The first four of these need only now be considered, the others being described elsewhere.

Relaxation of the uterus and distention of its cavity by coagula may give rise to hemorrhage, although not so readily as immediately after delivery, for coagula of considerable size are often retained *in utero* for many days after labor. The uterus will be found larger than it ought

¹ Brit. Med. Journ., 1872, vol. ii, pp. 215, 491.
² Saboia: Traité des Accouchements, p. 819

to be, and tender on pressure. Usually the coagula are expelled with severe after-pains; but this may not take place, and hemorrhage may ensue several days after delivery. Or there may be only a relaxed state of the uterus without retained coagula. Bassett relates four cases traced to these causes, and several illustrations will be found in McClintock's paper. Portions of retained placenta or membranes are more frequent causes. The retention may be due to carelessness on the part of the practitioner, especially if he have removed the placenta by traction, and failed to satisfy himself of its integrity. It may, however, often be due to circumstances entirely beyond his control; such as adherent placenta, which it is impossible to remove without leaving portions *in utero*, or more rarely placenta succenturia. In the latter case there is a small supplementary portion of placental tissue developed entirely separate from the general mass, and it may remain *in utero* without the practitioner having the least suspicion of its existence. Portions of the membranes are very apt to be left *in utero*. It is to prevent this that they should be twisted into a rope, and extracted very gently after expression of the placenta. Hemorrhage from these causes generally does not occur until at least a week after delivery, and it may not do so until a much longer time has elapsed. In four cases recorded by Mr. Bassett, it commenced on the tenth, twelfth, fourteenth, and thirty-second day. It may come on suddenly, and continue; or it may stop, and recur frequently at short intervals. In my experience retention of portions of the placenta is very common after abortion, when adhesions are more generally met with than at term. In addition to the hemorrhage there is often a fetid discharge, due to decomposition of the retained portion, and possibly more or less marked septic symptoms, which may aid in the diagnosis. The placenta or membranes may simply be lying loose as foreign bodies in the uterine cavity; or they may be organically attached to the uterine walls, when their removal will not be so easily effected.

Barnes has especially pointed out the influence of retroflexion of the uterus in producing secondary hemorrhage,¹ which seems to act by impeding the circulation at the point of flexion, and thus arresting the process of involution.

Treatment.—In every case in which secondary hemorrhage occurs to any extent, careful investigation into the possible causes of the attack, and an accurate vaginal examination, are imperatively required. If it be due to general and constitutional causes only, we must insist on the most absolute rest on a hard bed in a cool room, and on the absence of all causes of excitement. The liquid extract of ergot will be very generally useful in ʒj doses repeated every six hours. McClintock strongly recommends the tincture of Indian hemp, which may be advantageously combined with the ergot, in doses of ten or fifteen minims, suspended in mucilage. Astringent vaginal pessaries of matico or perchloride of iron may be used. Special attention should be paid to the state of the bowels, and if the rectum be loaded, it should be emptied by enemata. In more chronic cases a mixture of

¹ Obstetric Operations, p. 402.

ergot, sulphate of iron, and small doses of sulphate of magnesia will prove very serviceable. This is more likely to be effectual when the bleeding is of an atonic and passive character. McClintock speaks strongly in favor of the application of a blister over the sacrum. When the hemorrhage is excessive, more effectual local treatment will be required. Cazeaux advises plugging of the vagina. Although this cannot be considered so dangerous as immediately after delivery, inasmuch as the uterus is not so likely to dilate above the plug, still it is certainly not entirely without risk of favoring concealed internal hemorrhage. If it be used at all, the uterine cavity should be plugged with iodoform gauze as well as the vagina, and a firm abdominal pad should be applied, so as to compress the uterus; and the abdomen should be examined from time to time, to insure against the possibility of uterine dilatation. With these precautions the plug may prove of real value. In any case of really alarming hemorrhage I should be disposed rather to trust to the application of styptics to the uterine cavity. The injection of fluid in bulk, as after delivery, could not be safely practised, on account of the closure of the os and the contraction of the uterus. But there can be no objection to swabbing out the uterine cavity with a small piece of sponge attached to a handle, and saturated with tincture of iodine or with a solution of the perchloride of iron. There are few cases which will resist this treatment.

If we have reason to suspect retained placenta or membranes, or if the hemorrhage continue or recur after treatment, a careful exploration of the interior of the womb will be essential. On vaginal examination, we may possibly feel a portion of the placenta protruding through the os, which can then be removed without difficulty. If the os be closed it must be dilated with Hegar's dilators, and the uterus can then be thoroughly explored. This ought to be done under chloroform, as it cannot be effectually accomplished without introducing the whole hand into the vagina, which necessarily causes much pain. If the placenta or membranes be loose in the uterine cavity, they may be removed at once; or if they be organically attached, they may be carefully picked off. The uterus should at the same time, as long as the os remains patulous, be thoroughly washed out with creolin and water, or with a 1 in 2000 solution of perchloride of mercury, to diminish the risk of sapremia.

Retroflexion can readily be detected by vaginal examination, and the treatment consists in careful reposition with the hand, and the application of a large-sized Hodge's pessary.

CHAPTER XVI.

RUPTURE OF THE UTERUS, ETC.

Rupture of the uterus is one of the most dangerous accidents of labor, and until of late years it has been considered almost necessarily fatal and beyond the reach of treatment. Fortunately it is not of very frequent occurrence, although the published statistics vary so much that it is by no means easy to arrive at any conclusion on this point. The explanation is, no doubt, that many of the tables confound partial and comparatively unimportant lacerations of the cervix and vagina with rupture of the body and fundus. It is only in large lying-in institutions, where the results of cases are accurately recorded, that anything like reliable statistics can be gathered, for in private practice the occurrence of so lamentable an accident is likely to remain unpublished. To show the difference between the figures given by authorities, it may be stated that, while Burns calculates the proportion to be 1 in 940 labors, Ingleby fixes it as 1 in 1300 or 1400, Churchill as 1 in 1331, and Lehmann as 1 in 2433. Dr. Jolly, of Paris, has published an excellent thesis containing much valuable information.¹ He finds that out of 782,741 labors, 230 ruptures, excluding those of the vagina or cervix, occurred—that is, 1 in 3403.

Lacerations may occur in any part of the uterus—the fundus, the body, or the cervix. Those of the cervix are comparatively of small consequence, and occur, to a slight extent, in almost all first labors. Only those which involve the supra-vaginal portion are of really serious import. Ruptures of the upper part of the uterus are much less frequent than of the portion near the cervix; partly, no doubt, because the fundus is beyond the reach of the mechanical causes to which the accident can not unfrequently be traced, and partly because the lower third of the organ is apt to be compressed between the presenting part and the bony pelvis. The site of placental insertion is said by Madame La Chapelle to be rarely involved in the rupture, but it does not always escape, as numerous recorded cases prove. The most frequent seat of rupture is near the junction of the body and neck, either anteriorly or posteriorly, opposite the sacrum, or behind the symphysis pubis; but it may occur at the sides of the lower segment of the uterus. In some cases the entire cervix has been torn away, and separated in the form of a ring.

The laceration may be partial or complete, the latter being the more common. The muscular tissue alone may be torn, the peritoneal coat remaining intact; or the converse may occur, and then the peritoneum is often fissured in various directions, the muscular coat being unim-

¹ Rupture Utérine pendant le Travail, Paris, 1873.