POST-PARTUM HAEMORRHAGE

WITH SPECIAL REFERENCE TO PARTIAL DETACHMENT OF THE PLACENTA*

BY

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No discussion on post-partum haemorrhage can be attempted without careful consideration of the mechanism and physiology of the third stage of labour. I will therefore confine myself chiefly to haemorrhage which occurs during this stage—that is, before delivery of the placenta.

The placenta is formed by the union of the chorion frondosum and the decidua basalis, and is therefore composed of both maternal and foetal elements. Recent research by Spanner, and by my colleague Dr. Ninian Falkiner (1939), shows that the maternal arterial blood enters the placenta at the base of each cotyledon, and that this blood is drained away by the circular sinus, and thence to the uterine veins—that is, that the entire venous (maternal) drainage of the placenta is situated only in the marginal zone. This probably accounts for the firmer attachment of the periphery of the placenta.

The placenta is most commonly situated on the anterior or posterior uterine wall, rarely on the lateral wall or fundus. When it separates, the line of cleavage is through the spongy layer of the decidua. When the child is expelled the size of the uterus diminishes rapidly, its walls getting thicker and shorter in all directions. The placenta also conforms to a certain extent to this movement, and becomes shorter and thicker, but as it does not possess the elastic properties of the uterus its power to contract is limited. After a period of quiescence the contractions recur, and the placenta buckles and is forced off the uterine wall. As the periphery is more firmly attached than the central portion the latter first becomes detached. Blood from the divided maternal vessels is poured out behind the detached portion and forms the retroplacental haematoma. Subsequent contractions effect the complete separation of the placenta, the central foetal surface of which is forced downwards, and eventually into the relaxed uterine segment and the vaginal vault, stripping the membranes off the uterus by a process of invagination. I am convinced that this, the method of Schultz, is the normal method of separation, certainly in Dublin. Freeland, in 1914, noted that in 82.5 per cent. of 2,700 labours in the Rotunda Hospital the Schultz mechanism occurred. My own observations confirm these findings. In cases of Caesarean section I have for some years allowed time for the placenta to separate normally instead of removing it at once manually, except, of course, in cases where the uterine incision had passed through the placental site. I therefore had ocular demonstration that the Schultz method was the mechanism by which an undamaged and undisturbed placenta separated. It is particularly well seen in the lower segment section, as the contractile portion of the uterus is uninjured. I adopted this technique, as I was satisfied that by waiting a reasonable time for normal separation blood loss is avoided. For the success of this mechanism it appears to be essential that the centre of the placenta be detached first and that all the periphery be detached at the same time, probably owing to a uterine contraction forcing the retroplacental haematoma outwards in all directions.

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Management of the Third Stage of Labour

In Dublin the third stage is treated in the most conservative manner possible. In approximately two-thirds of the normal cases the fundus is not touched after delivery until the signs of placental separation are present; in the remaining third the fundus is controlled manually, but no massage is allowed. In cases following an operative delivery the fundus is usually controlled. In the Rotunda Hospital the placenta is delivered, in normal cases, in the left lateral position; in the other two hospitals the placenta is delivered in the dorsal position. Oxytocic drugs are not administered as a routine until the placenta is delivered. Injection of the umbilical cord with saline is practised when the placenta is retained and expression, without anaesthesia, has failed. It appears to be successful in about 33 per cent. of cases, but in my opinion should not be relied upon in the presence of haemorrhage.

What results are derived from this conservative treatment? I will give you the figures in terms of manual removal of the placenta rather than in those of post-partum haemorrhage, as the latter is a variable term and includes the traumatic variety. For three years the figures are: deliveries, 28,749; manual removals, 147; (0.5 per cent.). Abortions and miscarriages are excluded, but patients delivered in the hospital district are included.

Types of Post-partum Haemorrhage

Post-partum haemorrhage is of three distinct types: (1) placental site haemorrhage, due to premature separation of the placental margin; (2) true atonic haemorrhage, where there is no bleeding till after delivery of the placenta; (3) traumatic haemorrhage, where the bleeding comes from lacerations in some part of the birth canal. Haemorrhage occurring during the puerperium is not being discussed.

Placental Site Haemorrhage

The immediate cause of the haemorrhage here is failure in the normal mechanism of placental separation, resulting in detachment of part of the placental margin before the central area has separated, with consequent escape of the retroplacental haematoma and loss of its important wedge action. Along the line where partial detachment has occurred the maternal vessels are held open and continue to bleed, full retraction of the uterine muscle being prevented by the portion of the placenta still attached. The uterus now finds difficulty in separating the remainder of the placenta, and the continued loss of blood will eventually produce atony.

Causes of Partial Separation

A large number of conditions, such as twins, hydramnios, fibroids, low implantation of the placenta, and short cord, predispose to partial separation of the placenta; but the majority of cases fall into two groups: (1) those following spontaneous delivery—and here the cause is generally ill-advised handling of the uterus and attempts at expressing the placenta before it has entirely separated; (2) those following prolonged operative delivery, where the condition may be due to a combination of the effects of the anaesthetic and mechanical interference with the placenta. In addition there are two conditions which perhaps need special mention. First, morbidly adherent placenta: this is a rare condition with us, and, of course, only causes haemorrhage when parts of the placenta are unusually firmly attached. Secondly, certain women

apparently suffer from spontaneous partial detachment of the placenta immediately after delivery, without any known cause, this occurring in successive pregnancies.

According to Reich (1939) pituitary extract administered during labour predisposes to partial detachment of the placenta or its retention by means of an "hour-glass" contraction. This opinion is also expressed in the Report on the Maternal Morbidity and Mortality in Scotland.

Signs and Symptoms

On the whole it is comparatively rare that the onset of bleeding of this type is sudden and severe. It is most likely to be gradual: just a little bleeding is noticed at the vulva. The fundus is found to be above the level of the umbilicus; the placenta is thought to be separated, and attempts at expression are made. A quantity of clot is expressed, but the placenta is still retained. The bleeding appears to stop and further time is given for separation, and the whole process is repeated, perhaps several times. Now the bleeding becomes more profuse and continuous and the patient's general condition undergoes marked deterioration. The situation becomes alarming and, perhaps for the first time, the person in charge realizes the true nature of the condition. On being called in to deal with this type of case one is invariably told that the patient was quite well until five minutes before sending for help, it having been overlooked that the collapse was due to the cumulative effect of the blood loss. One of the traps of post-partum haemorrhage is that bleeding without injury may not produce any alteration in the patient's appearance or pulse until a large quantity has been lost. Up to a point the loss is compensated for by vasomotor control, but when the limit of compensation has been passed the patient's collapse may be sudden and profound.

In clinics (Stander, 1936) where the blood loss post partum is measured as a routine anything over 500 c.cm. is classified as post-partum haemorrhage; in a severe haemorrhage a patient will lose 1,500 c.cm., and recoveries following a loss of 2,500 c.cm. have been recorded, but they are rare.

Treatment of Bleeding in Third Stage of Labour

Treatment of this haemorrhage is complicated by the retention of the placenta, but before starting any active treatment for its removal the patient's general condition must be carefully considered. It is not uncommon to be called in to a case where the patient is in a state of collapse from haemorrhage but where, at the moment, the bleeding has stopped. In these circumstances every effort should be directed towards restoring the patient by means of saline, intravenous or submammary; transfusion, if such be possible; warmth; morphine; raising the foot of the bed; and, perhaps, bandaging the limbs. No attempt, however, should be made to remove the placenta until the patient's general condition has improved. Manual removal when undertaken on a collapsed patient is a very dangerous operation. That the saline may raise the blood pressure and restart the haemorrhage is a risk which must be faced. If the saline be withheld, the patient may die in the collapsed condition.

Where the patient is bleeding it is imperative that the treatment be directed primarily to check the haemorrhage; therefore the uterus must be emptied. It is essential to have a complete scheme in one's mind and to be able, where necessary, to go from step to step with speed and confidence. The following scheme is used: (1) Pass a catheter; (2) rub up the uterus and express the

placenta by the Dublin method; (3) express the placenta by Credé's method; (4) give an anaesthetic and express the placenta by Credé's method; (5) manually remove the placenta; stop the anaesthetic; give oxytocic drugs; (6) bimanual massage; (7) hot intra-uterine douche; (8) pack the uterus.

Credé's Method of Expression

Failure is often due to bad technique. The method is designed to squeeze the partially adherent placenta off the uterine wall, and to achieve this the uterus must be retained in the abdominal cavity, where it can be grasped and compressed by both hands. The uterus should only be forced downwards into the pelvis when the placenta has left it. Traction on the cord as an accompaniment to this manœuvre is to be condemned: it greatly increases the risk of tearing the placenta, and occasionally causes an acute inversion of the uterus. Attempts with Credé's method should not be too prolonged, as it is very liable to produce shock. Should the manipulation fail, the bleeding is usually increased. Where the patient is stout or resistant, an anaesthetic may turn failure into success.

Manual Removal of the Placenta

For this operation an anaesthetic is desirable. Both spinal and gas-and-oxygen are recommended, but outside a well-equipped hospital these are rarely practicable. Light general anaesthesia, chloroform or ether, may be used—just enough to keep the patient relaxed. Excess of anaesthetic will interfere with contraction of the uterus. The anaesthetic should be stopped at the earliest possible moment, generally when the hand has been successfully introduced into the uterus and the placental edge found.

The general technique is a familiar one, but there are some points worthy of mention. For example, gloves. Personally I wear boiled gloves, and do not find in them any disadvantage in separating the placenta. Where there is no time to boil gloves they may be put on dry, washed in soap and water, and sterilized in an antiseptic solution. Theobald, in 1924, showed that this was quite an effective method of sterilization and that it is easier to obtain surgical cleanliness of a smooth rubber glove than of a relatively rough hand. With regard to antiseptic precautions in general, the most rigorous care must be taken, but taken without undue delay. It is rightly held that it is useless to save a patient's life from post-partum haemorrhage only to lose her from sepsis later on. On the other hand, it is of no value to have produced a nice sterile field only to find that the patient is a corpse. There are occasional cases where the bleeding is so rapid that its immediate control must outweigh all other considerations. However, one precaution can always be taken: the gloved hand should be immersed in antiseptic lotion and, straight from that, inserted into the vagina.

Once the placenta is reached there is rarely any difficulty in separating it. Morbid adhesion of the placenta is uncommon, and placenta accreta, where there is no line of cleavage at all between the placenta and the uterine wall, is extremely rare. In domiciliary practice, where sterile towels are not available, the operator must remember that his left hand is now dirty, and this fact should dominate his technique for all other operations in the scheme.

When the placenta is removed the bimanual massage of the uterus should be carried out vigorously. It is a most powerful way of stimulating uterine contraction, and is performed by ante-flexing the uterus, with the left hand, over the right hand, in the vagina. In my experience this

method gives better results than when the right hand is inserted in the uterus. Should the bleeding continue, a hot intra-uterine douche is given. It is best done with a return-flow catheter, which should be passed by sight, exposing the cervix by means of a posterior speculum and ring forceps on the anterior lip. Ring forceps are preferable to bullet, which are apt to tear the cervix. Should the necessary instruments not be available the return-flow catheter may be passed by touch, using the right hand as a posterior speculum and guiding the catheter into the cervix with the tips of the fingers. This method is not so clean. Occasional tragedies have occurred through the douche being too hot.

If the operator be dissatisfied with the haemostasis obtained with the douche, the next step is to pack the uterus. If a ring forceps and posterior speculum have been used in giving the douche, then the stage is set and the packing can be carried out quickly and cleanly, using a uterine plugging forceps to pass the gauze so that it touches nothing but the speculum and the inside of the cervix; otherwise the pack must be introduced by the right hand and be pushed up into the fundus by the fingers. The latter is an efficient method of packing the uterus tightly and is free from the danger of instrumental perforation, but it is not nearly so clean. The material used for packing is iodoform gauze, 6 inches wide and long enough to pack the uterus with one piece. For domiciliary practice the jars of moist impregnated gauze put up by various firms are very satisfactory. A jar of such gauze should always be carried by anyone practising obstetrics; it will not be wanted often, but when it is it will be wanted very badly indeed. I never feel happy with a maternity case unless I know that plugging is available.

The pack should not be allowed to remain in the uterus for more than twenty-four hours, and in a great many cases may be removed in about eight hours. This applies only to those cases in which the haemorrhage was not of traumatic origin. Some authorities maintain that packing the uterus is worse than useless, stating that the uterus will stretch almost indefinitely with packing. This is not our experience, and if the patient dies from haemorrhage without having been packed the thought that packing might have saved her cannot be avoided.

Oxytocic Drugs

The danger of giving these drugs before the uterus is empty is that they may produce irregular contraction and make the subsequent removal of the placenta more difficult. Therefore we do not use them until exploration of the uterus has proved the absence of any "hour-glass" contraction. Pituitary extract 10 units and ergometrine 0.5 mg. are given by intramuscular injection. In ergometrine Professor Chassar Moir and his co-workers have given us a very powerful drug, which can be administered by the intramuscular or the intravenous route. Given in the latter way it acts with great rapidity, but for the man working alone the intravenous route is not always practicable, whereas the nurse can give an intramuscular injection. The ergometrine can be repeated, if required, and is free from the undesirable side-effects sometimes associated with pituitary extract. There is no doubt that the profession is under a debt of gratitude to Chassar Moir for his work in this field.

Now, with the bleeding arrested, the doctor can turn his attention to the restorative measures mentioned above. The administration of intravenous saline and glucose or saline and gum is a routine measure in hospital, but in

domiciliary practice this is not so easy. Submammary saline, however, is easy to give, needs the minimum of apparatus, and is of great value as a restorative. If blood be available, transfusion will of course improve the patient's condition more quickly than anything else, and in recent years great advances have been made in the ease with which blood can be obtained. As a life-saving measure adequate amounts of blood must be used. In carrying out this scheme in the presence of active haemorrhage speed is essential, and valuable time is often wasted in arriving at a decision to remove the placenta manually and to pack the uterus.

True Atonic Haemorrhage

In this type the bleeding starts a variable time after delivery of the placenta; there is no bleeding in the third stage itself. The haemorrhage is often sudden and severe, and is apparently due to lack of retraction of the uterus. It is a dangerous type, as the severity of the bleeding may cause collapse and even death before help can be obtained. It may occur after perfectly normal labours, but is more common after difficult deliveries, necessitating the use of prolonged anaesthesia. In this connexion I would like to suggest that, whenever possible, the repair of extensive perineal lacerations should be postponed till the third stage is completed and the uterus firmly contracted. A further anaesthetic can then be safely administered.

Treatment.—The placenta being away, oxytocic drugs may be given at once. Indeed, many advise administration of such as a routine practice when the placenta is expelled. I think it certainly should be done where the patient has had an anaesthetic. A large number of cases require nothing more than this, together with abdominal massage of the uterus, but if the bleeding continues the treatment is the same as in the first type of haemorrhage discussed, after the placenta has been removed.

Traumatic Haemorrhage

The bleeding may arise from lacerations in any part of the genital tract, the most serious type resulting from lacerations of the cervix which involve the vaginal vault or spread up into the lower uterine segment. In most cases the diagnosis is made by observing that the bleeding still continues when the uterus is firmly contracted. Sometimes, however, it closely mimics the other types of haemorrhage, as the blood collects in the vaginal vault or even in the uterus and comes away in gushes or large clots when the uterus contracts or when efforts are made to express the placenta. It most commonly occurs after an operative delivery, but may happen, and be surprisingly severe, following an apparently normal and spontaneous labour. Haemorrhage due to partial separation of the placenta and traumatic haemorrhage not infrequently occur together, the result of the same train of events—a difficult operative delivery. Here, it is almost inevitable that the traumatic origin of the haemorrhage will be overlooked for some time. It should be suspected, and the genital tract thoroughly inspected, following deliveries of this type.

Treatment.—Where the laceration can be exposed in its entirety stitching will control the haemorrhage, but where the laceration extends into the vaginal vault or the lower uterine segment, the laceration, the uterus, and the vagina should be packed. It is impossible to reach the top of the laceration of this type with certainty, and time should not be wasted in trying. The placenta, of course, must

be removed before packing. As the portion of the pack which is actually in the rent controls the haemorrhage by pressure, caution must be exercised in its removal.

Conclusion

According to the investigations into the causes of maternal mortality, post-partum haemorrhage is responsible for 7.5 per cent. of the deaths in New York, 6.3 per cent. in England and Wales, and 3.9 per cent. in Scotland. In addition, it is a factor in deaths classified under shock, sepsis, placenta praevia, etc. Every effort should be made to reduce this mortality by:

1. Treatment of anaemia during the ante-natal period.
2. Refraining from interference with the normal uterine action during the third stage.
3. Realizing the danger of attempting delivery through the partially dilated cervix.
4. Early recognition of the failure of the normal mechanism of placental separation.
5. Having adequate equipment prepared to deal with the haemorrhage rapidly; particularly where the history or the patient's general condition suggests the likelihood of bleeding.

An ounce of forethought may save pints of blood.

Summary

The paper deals with the mechanism of separation of the placenta, suggesting that the Schultz method, rather than the Matthews Duncan, is the normal one.

Post-partum haemorrhage is divided into three classes: (1) placental site haemorrhage; (2) true atonic haemorrhage, where there is no bleeding till after delivery of the placenta; (3) traumatic haemorrhage, where the bleeding comes from lacerations in some part of the birth canal.

Premature separation of the placenta may be held to be the cause of the first type of haemorrhage. Causes of the separation are discussed, and signs and symptoms described.

Treatment of this type of haemorrhage is considered in some detail, particularly with regard to manual removal of the placenta and packing of the uterus.

The other two types of haemorrhage are dealt with briefly, but attention is called to the difficulty which sometimes arises in the diagnosis of traumatic haemorrhage.

In conclusion, some suggestions are made for lowering the mortality from this condition.

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In conjunction with the fifteenth annual Congress of Anaesthetists in Philadelphia from October 16 to 20 there will be sessions of the International Anaesthesia Research Society, the International College of Anaesthetists, the Eastern Society of Anaesthetists, and the Philadelphia County Dental Society. During that week also there will be in progress the Clinical Congress of Surgeons. A preliminary programme has been issued. It may be obtained from the secretaries of the constituent societies, or from Dr. H. W. Featherstone, 54, Newhall Street, Birmingham, or Dr. J. H. T. Challis, Pond House, Firs Walk, Woodford Green, Essex. Anaesthesia clinics will be held in various hospitals, also special research demonstrations. One afternoon and the following morning have been set aside for papers on current researches in anaesthesia and analgesia, and there will be various papers and discussions on the problems relating thereto. The memorial address on October 17 will be devoted to the life and work of the late Dr. Louis H. Maxson.

PRE- AND POST-OPERATIVE TREATMENT OF HEPATO-BILIARY DISEASES

BY

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"A surgeon, unless he degenerates into a mere technician, must be a physician who operates."

—CONNELL.

Research in the last decade, especially concerning recurrent troubles after operation, has proved that there is practically no gall-stone disease where the liver is not affected to some degree. It must be stated that the stone formation in the external bile ducts is not always the primary pathological process, and that the liver is affected only in a secondary way. Hepatitis is often the primary change, and only followed by an affection of the external bile-duct apparatus and the gall-bladder. But obviously the changes in the external bile ducts, with all their complications and the immediate danger to life, become so outstanding and predominant that they must necessarily be the main object of treatment. On the other hand, medical treatment is from the very beginning, even when interrupted by surgical intervention, so important that the close co-operation of physician and surgeon should be considered from the outset of the disease. The expression "pre- and post-operative treatment" does not fully express the importance of the task of the physician and general practitioner. This close co-operation should be advocated from the very first also as regards the indications. We frequently observe a truly vicious circle concerning this important question. The physician advises an operation only if there is danger to life or where all conservative attempts have failed. Obviously the general state of the patient is then bad and the liver in a condition of latent or manifest insufficiency. The operative risk is great, the mortality high. This high mortality, on the other hand, makes the physician even more cautious, so that he advocates the operation only in an emergency. This vicious circle—high mortality, late indication; late indication, high mortality—should be broken either by the physician sending the patient to be operated on at an early stage of the disease or by the surgeon succeeding in improving the technique and lowering the operative mortality and thus convincing the physician of the efficiency of operative treatment.

The fate of our patients, not only regarding immediate recovery after operation but the chance to be free of all symptoms, depends to a large extent on the restoring of damaged functions of the liver. When reading the opening paper on the insufficiency of the liver from the surgical point of view, at the International Congress at Vichy in 1937, I was able to state that the majority of the disturbances of liver function in hepato-biliary diseases were due to hepatitis in the widest sense of the word. Therefore, the treatment of hepatitis from the very outset until a long time after the operation is one of the main tasks which we have to undertake. Another point is the choice of the most favourable time for operation. This concerns the important question of whether we must operate after the onset of the symptoms or whether there is a chance of improving the general state of the patient by medical treatment and postponing the operation until general conditions are more favourable. This point is especially important in the case of a mechanical occlusion of the common duct. It will be dealt with fully.