OBSTETRICS IN GENERAL PRACTICE

Ante-partum Haemorrhage—2

JAMES SCOTT,* M.D., F.R.C.S.ED., F.R.C.O.G.

In the first part of my article on ante-partum haemorrhage (A.P.H.) I discussed warning signs and preventive measures. Here I propose to consider the correct emergency management of the condition.

On first seeing a case of ante-partum haemorrhage occurring in the home the doctor may conclude at once from a cursory examination that the cause is abruptio placentae or placenta praevia, but frequently the cause will be in doubt. Deliberation on causation is not a useful exercise. Whatever the mechanism of haemorrhage, the most important thing from the patient's point of view is to ensure that at the earliest possible moment

FIG. 1.—Diagrammatic representation of the three pathological types of A.P.H.

she is brought within the availability of a blood transfusion service, an operating theatre, and all the other resources of a fully equipped maternity hospital. In most cases the correct procedure is to give a sedative-analgesic such as pethidine 100 mg. by intramuscular injection and arrange immediate transfer to hospital by ambulance. It must be appreciated that the only type of hospital appropriate to receive such cases is a *major* maternity hospital with full facilities, including resident staff.

* Department of Obstetrics and Gynaecology, University of Leeds.

Obstetric Flying Squad

In some cases where the initial blood loss has been heavy and has produced maternal shock the question may arise whether the Obstetric Flying Squad (O.F.S.) should be called. It is hard to give categorical advice about this, for, unlike the situation with post-partum haemorrhage, the amount of benefit which the patient may obtain from the O.F.S. service is strictly limited. For example, to control the torrential haemorrhage which sometimes occurs with placenta praevia, caesarean section at the earliest opportunity is life-saving; attempts at blood replacement prior to this may be futile and the delay can jeopardize life. In abruptio placentae, blood transfusion is unlikely to make a great contribution to improving the patient's condition unless combined with amniotomy and other measures designed to bring about speedy termination of the abortion process, which can be satisfactorily performed only in hospital.

For these reasons it is often preferable to get the patient into hospital immediately rather than delay until she has been visited by the O.F.S. At Leeds Maternity Hospital, out of 186 attendances by the O.F.S. from 1959 to 1961 only four were for ante-partum haemorrhage. During the same period 137 ante-partum haemorrhage cases were admitted directly to the hospital—without a single fatality. At Princess Mary Maternity Hospital, Newcastle, on the other hand, out of 157 O.F.S. attendances in 1960, 15 were for A.P.H. and at the same time 142 cases of A.P.H. were admitted directly to hospital. The only fatality occurred in a case attended by the O.F.S. While this in itself is of no significance, such figures clearly represent different hospital policies, and a practitioner would be wise to ask the local maternity hospital whether direct admission or attendance by the O.F.S. is favoured in such circumstances.

Treatment after Admission

No matter what the type of haemorrhage blood replacement by transfusion is always indicated if there has been more than a slight loss or if there is any degree of shock. Other measures depend upon the type of haemorrhage.

Abruptio Placentae

In the case with frank clinical abruption the usual treatment in hospital is (1) liberal blood transfusion; (2) sedation; (3) vaginal amniotomy (artificial rupture of the membranes); and (4) oxytocin infusion.

The first and third measures are the most important. Amniotomy encourages the onset of labour and reduces the uterine tension which contributes to two of the complications of abruption most liable to cause maternal death. These are (a) renal cortical necrosis, possibly mediated through the utero-renal reflex, and (b) coagulation failure, which results from thromboplastin released from the damaged placental site into the general circulation causing intravascular conversion of all

the available fibrinogen to "fibrils" or a soluble form of fibrin, thus leaving the blood incoagulable. Blood transfusion is also instrumental in preventing ischaemic renal damage by maintaining the circulating red cell mass, and, of course, ensures that the patient is in a better position to withstand any post-partum haemorrhage. In recent years blood has been given on a much more liberal scale in cases of abruption, and it is probable that this has contributed to the greatly improved maternal mortality figures. (Only 44 maternal deaths occurred from this cause in England and Wales in 1958-60 compared with 78 in the 1952-4 period.) With these two complications in mind, all patients with placental abruptions should have careful records kept of fluid balance and repeated checks made of the coagulation mechanism. The treatment of established renal failure is a separate problem which has to be tackled after the haemorrhage has been arrested, and other than avoiding fluid overloading is not a concern during the period of active haemorrhage. If coagulation failure develops, fibrinogen replacement is sometimes indicated and is given either as reconstituted fibrinogen or as triple-strength plasma.

The mere fact that abruption can be confidently diagnosed clinically means that there has been considerable concealed blood loss and justifies the transfusion of a minimum of two pints (1.1 litres) of blood regardless of the patient's general condition. The blood-pressure is a notoriously unreliable guide to the extent of blood loss in these cases as a severe degree of vasospasm or capillary bed blockage is a common response to the abruption, leading to elevated readings.

Usually, with the measures outlined, vaginal delivery is rapidly achieved. The most dangerous stage of labour is the third, and the management described later must be rigorously applied. Frequently the placenta has been completely separated by the abruption, and foetus and placenta are delivered simultaneously.

Caesarean section has possibly a small (though hotly disputed) place in the management. The baby is nearly always dead in the severe case, and for the mother vaginal delivery is safer than caesarean section. If the child is still alive it may sometimes be felt that a caesarean section would be justified in the remote hope that it will survive. Unfortunately, most such babies if born alive die in the early neonatal period, often displaying the pulmonary distress syndrome of the newborn.

Placenta Praevia

If the case is obviously one of placenta praevia the management depends upon the duration of the pregnancy and the extent of the haemorrhage. If the pregnancy is of less than 37-38 weeks' duration, the usual aim is to allow it to continue until the baby has grown to a size which will give a reasonable chance of survival *ex utero*. This policy, introduced by Macafee,¹ has done more than anything else to reduce the foetal mortality in placenta praevia, which was mainly due to prematurity. The Macafee regime requires, for safety, strict adherence to several vital principles. From the time of the initial diagnosis of placenta praevia until delivery the patient must remain in a fully equipped and staffed maternity unit. This means one in which blood is immediately available for transfusion, in which full facilities for caesarean section exist, and in which there is, continuously throughout the 24 hours, a member of staff available to perform immediate caesarean section should this prove necessary. All steps necessary must be taken to correct any anaemia that may be present in view of the likelihood of further haemorrhage.

This all sounds a very simple procedure, but in practice it can tax to the limits the combined resources of obstetrician, midwives, family doctor, and social service staff. If a woman who already has a large family is found to have a placenta praevia at 28 weeks, the likelihood is that some time in the next ten weeks she will rebel against her incarceration in hospital,

especially as she probably feels in the best of health. Yet, strong as the temptation may be to allow such a patient home from hospital undelivered, it must be resisted, for any departure from firmness on this point is to risk the life of the patient. Catastrophic haemorrhages are not very common in hospital, and the fact that the doctor has not seen one recently, or ever, may lead to weakening of his resolve. At home, however, the risks of bleeding occurring, in many cases probably precipitated by sexual intercourse, as well as the risk of it proving fatal, are much greater.

A recent experience served well to reinforce personal conviction on the necessity for strictness. A patient of high parity had been admitted to hospital when approximately 30 weeks pregnant with an ante-partum haemorrhage, obviously due to placenta praevia. The bleeding ceased and conservative management in hospital was instituted in the hope of prolonging the pregnancy to a stage at which the foetus would stand a reasonable chance of survival. Domestic pressures made the patient soon appeal for her discharge, and, despite all arguments, invoking the aid of all possible social services, and explaining very explicitly to herself and her husband the risks involved, she eventually insisted upon "signing herself out." It so happened that, having done this, she had no clothes available in which to go home, and she was forced to spend another night in hospital. While asleep in the early hours of the following morning she had a torrential vaginal haemorrhage with instant collapse; the baby died and her life was saved only by immediate caesarean section accompanied by massive blood transfusion under pressure. Had she been at home the haemorrhage would almost certainly have proved fatal. A further point which this case emphasizes is that massive painless bleeding from a placenta praevia may occur in the night; if the patient is deeply asleep it may fail to wake her, and it is therefore advisable to avoid giving strong sedatives. The lives of such patients can be saved by the whole-hearted co-operation of hospital staff, midwifery staff, family doctor, social services, and relatives directed to keeping the patient contented during the period of what seems to her unjust detention in hospital while feeling perfectly well.

Once the pregnancy has advanced to 37-38 weeks, or if the first haemorrhage occurs then, opinion differs as to whether vaginal examination under anaesthesia should be performed, followed by caesarean section if a major degree of placenta praevia is encountered, or a decision made on the available evidence without vaginal examination to perform elective caesarean section. In minor degrees of placenta praevia, vaginal amniotomy may be sufficient to allow the head to control any bleeding by pressing on the placental edge. Manoeuvres such as bipolar version and traction with Willett's forceps on the foetal scalp have little place in modern obstetrics conducted in areas in which hospital facilities are available.

Indeterminate A.P.H.s

In indeterminate cases the nature of the haemorrhage is not clear in the initial stages, nor is the blood loss usually of an extent to cause serious concern. In all cases the usual assessment is made of the general condition and blood is taken for grouping, cross-matching, and haemoglobin determination. Further action depends on the maturity of the pregnancy. If this seems to be at least 37-38 weeks, induction of premature labour by vaginal amniotomy is usually regarded as wise. The baby is almost certainly quite mature enough by this time to survive *ex utero*. As for the placenta, the chances are that it has been to some extent damaged by the haemorrhage and its functional reserve reduced; there is also the possibility that further, more serious haemorrhage will occur. If there is the slightest doubt that the bleeding may be due to placenta praevia, the amniotomy should be done in theatre under anaesthesia. A blood transfusion should be running and full preparations made for immediate caesarean section should this be necessary.

In other cases, in which the maturity is less than 37 weeks, conservative management is indicated. The patient is kept strictly at rest in bed and a sedative given, such as sodium "amytal" (amylbarbitone) 1½ gr. (97 mg.) every six hours, in the hope that bleeding will cease, which it usually does. Any anaemia is corrected, and after the patient has been free from bleeding for four or five days an attempt is made to determine the source of bleeding. The possibility of a degree of placenta praevia is always the first thing to be excluded, and this may be done with moderate certainty by abdominal palpation. If this is equivocal then some form of placentography may be employed to confirm that the placenta is low lying. Even if none of the signs are present, the placenta may still be praevia if it is of the thin membranaceous type, and some feel that placentography is also desirable even if none of the physical signs of placenta praevia are evident. If, however, the history and physical signs both point clearly to placenta praevia, there is no point in subjecting the mother and her baby to placentography.

Placental Localization

The techniques for placental localization involve the use of (a) x-rays or (b) radioactive isotopes.

X-ray Methods

One advantage of the several methods of localizing the placenta by the use of x-rays is that pictures of the foetal skeleton are obtained and gross skeletal abnormalities may be detected. Knowledge of such defects may have a bearing on the ultimate management of the case.

Positional Method

In this technique x-ray films are taken which may show deviation of the presenting part from its natural position in relation to the pelvis, which could be due to a placenta praevia. More detailed information may sometimes be obtained by injecting radio-opaque material into the bladder or amniotic cavity (cystography and amniography) and by manual pressure on the presenting part in an attempt to close any apparent gap between it and the pelvis. This method has several disadvantages. It is not reliable until the later weeks of pregnancy, when it is least needed. It does not positively localize the placenta; it merely shows that there is or is not a space between foetal and pelvic bony landmarks which *could* be occupied by a placenta praevia of normal thickness. A placenta of abnormal thinness could easily be missed. The strongest criticism of the technique is that it reveals very little that it is not possible to elicit by means of careful abdominal palpation.

Soft Tissue Method

By this technique x-rays of low penetration are used to demonstrate the placental shadow. In many cases in late pregnancy this is aided by the fact that the placenta has undergone calcification. It is an extremely reliable method of placental localization, and, unlike the positional technique, involves positive localization. It is, however, dependent on first-class radiographic technique, and if this is lacking it merely involves unnecessary exposure to radiation.

Aortography

Following retrograde injection of radio-opaque dye through a catheter into the aorta, direct demonstration of the arterial blood passing through the placenta may be obtained by x-rays taken a short interval later. The method, though accurate, is

painful, and involves the double hazard of the dye injection plus radiation and has not been widely adopted in this country.

Isotope Placental Localization

By the injection of a radioactive isotope into the maternal circulation, followed by counting the intensity of radiation over the uterus, the site of the placenta may be localized (Fig. 2). The most satisfactory technique utilizes albumin labelled with radioactive iodine (^{131}I). This isotope has a short half-life (under two-and-a-half hours), and as a result the radiation involved is minimal and very much less than that involved in x-ray methods. Though not widely used at present, personal experience suggests that it is the best form of placentography available to-day.

Fig. 2.—Placentography performed using ^{131}I labelled serum albumin; the foetal trunk was lying transversely, as indicated, and the readings suggested that the placenta was implanted low down on the right side. Subsequent caesarean section confirmed the site.

If placenta praevia is diagnosed or the suspicion of it cannot be excluded, then management is that outlined under placenta praevia. If, on the other hand, the placenta can be convincingly demonstrated on the upper segment of the uterus, it may be considered safe to allow the patient home. Before doing so a speculum may be gently passed to exclude a cervical cause for the bleeding. Be it noted that speculum examination is *not* recommended initially—exposure of the pregnant cervix is difficult and could easily result in further bleeding if the placenta should be low lying; all too often a cervical polyp or vascular erosion is observed and the haemorrhage attributed to this, though the real source of the trouble has been a placenta praevia.

The commonest source of bleeding in the cases in this category proves to be the edge of a normally implanted placenta. In the American literature this is frequently referred to as "haemorrhage from the marginal sinus," an apparently suitable description but for the single drawback that the weight of anatomical opinion is against the existence of such a structure. This type of haemorrhage is particularly common if the placenta is circumvallate or "extra-chorial." In these placentae there is a fibrous ring round the edge of the chorionic plate which retracts, often causing repeated haemorrhages. The history of these repeated haemorrhages is, in fact, highly suggestive of placenta praevia, but all the physical signs are absent. Though the condition may be suspected antepartum, the diagnosis cannot be made with certainty until the placenta has been delivered and inspected. Fortunately, haemorrhages from this condition carry little risk to mother or baby.

Management of the Third Stage

"It's the A.P.H. that weakens and the P.P.H. that kills" is a true aphorism. Not only is the woman who has suffered

an A.P.H. likely to be relatively anaemic when she reaches the third stage of labour, there are also several factors which make it much more likely that she will have a post-partum haemorrhage. If she has suffered a placental abruption, the uterus, owing to intramuscular haemorrhages, may not contract and retract efficiently to control the blood loss. In addition, should this happen, or should there be any lacerations, bleeding may be aggravated by failure of blood coagulation. If the A.P.H. was due to placenta praevia, then post-partum bleeding may be excessive owing to the fact that the lower segment to which the placenta has been attached contracts and retracts less efficiently than does the upper segment.

The third-stage management is therefore critical in the case of the patient who has suffered an A.P.H. By administration of an oxytocic drug such as 0.5 mg. ergometrine maleate intravenously with the birth of the trunk, supplemented by oxytocin 5 units, if necessary, every effort is made to obtain maximal uterine contraction. If need be, these drugs may be repeated several times. At the same time an intravenous infusion should be running and cross-matched blood available, so that, if post-partum haemorrhage occurs, blood transfusion can be commenced immediately.

If despite these measures haemorrhage occurs and continues, bimanual compression of the uterus may be attempted after excluding traumatic causes for the bleeding. Although the possibility of coagulation failure has to be borne in mind, the most important factor in the control of post-partum blood loss is uterine retraction. Redoubling of the efforts to secure this usually pays the best dividends.

Very large doses of oxytocic drugs intravenously may be effective when the traditional doses have failed, and occasionally a hot intrauterine douche has a miraculous effect. Very rarely hysterectomy may have to be resorted to as the only means of controlling the haemorrhage.

I am indebted to Dr. B. M. Hibbard for the placentography and to Dr. G. N. Beck for reading the manuscript and making suggestions for its amendment in the light of his experience of obstetrics in general practice.

REFERENCES

- ¹ Macafee, C. H. G., *J. Obstet. Gynaec. Brit. Cwlth*, 1945, **52**, 313.
- ² Scott, J. S., *ibid.*, 1960, **67**, 904.

TO-DAY'S DRUGS

Drugs Acting on the Uterus

Drugs acting on the uterus may be divided into two groups, the stimulants and the relaxants. Of these the stimulants are by far the more important.

Stimulants of Uterine Contractility

The drugs commonly used to enhance uterine contractility are known as oxytocics. Of these ergot is by far the oldest member and it is appropriate to begin with it.

Ergot Alkaloids

Thirty or more years ago it was believed that *ergotoxine* and *ergotamine* were the essential substances in crude ergot. On the other hand it was known that these alkaloids were much slower in action than crude Ext. ergot. liq. The discrepancy was finally explained with the discovery of *ergometrine*,¹ which was shown to be the active principle on which the traditional effect of ergot depended. Ergometrine has since maintained its position as the most powerful oxytocic of all.

The effect of ergometrine is well established in five to seven minutes after intramuscular injection and in less than one minute after intravenous injection. A powerful tetanic contraction of the uterine musculature lasting one hour or more is the crowning feature of its effect and on this depends its reliability as a haemostatic. Methyl ergometrine, which is also available for clinical use, has a similar action but is a little slower.²

Clinical Applications

The paramount role of ergometrine is in the prevention and treatment of post-partum haemorrhage; in controlling bleeding it is unequalled. It should be injected 0.25 mg. intravenously (preferably) or 0.5 mg. intramuscularly at the first sign of bleeding. Alternatively it may be injected direct into the uterine muscle through the abdominal wall. Nowadays ergometrine

is commonly administered at the end of the second stage of labour as a prophylactic against post-partum haemorrhage.

If not given before delivery of the placenta, ergometrine may well be given intramuscularly immediately afterwards. In any event it is good practice to follow with a slower-acting preparation before the patient is left by the doctor or midwife or "goes down to the ward." For this purpose Tab. ergot. are as effective and cheaper than the slow-acting alkaloids. Though still frequently prescribed for the purpose, ergot does not accelerate involution. Its place is in the treatment of haemorrhage.

Ergometrine 0.5 mg. intravenously is also commonly used in the treatment of haemorrhage from abortion—but it is rather

ERGOMETRINE AND THE PUERPERAL UTERUS (External Recording)

FIG. 1.—External records comparing speed of action of (a) intravenous ergometrine, (b) intramuscular ergometrine with hyaluronidase, (c) plain intramuscular ergometrine.

FIG. 2.—External records comparing speed of action of (a) intramuscular oxytocin with ergometrine, and (b) intramuscular oxytocin. Note waning effect at 15 min. when tocograph slipped.