ABRUPTIO PLACENTÆ

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THE term "*abruptio placentæ*" (from the Latin "ab" and "rumpere", meaning to break away from) is nowadays rather generally applied to that condition formerly referred to as "accidental hæmorrhage", and refers to those cases where uterine bleeding occurs from separation of the placenta from its normal situation; *i.e.*, separation from a site above the upper zone of dilatation.

Frequency.—From the following figures it will be seen that the experiences of various clinics show marked differences in the frequency of this condition:

Hospital	*Cases of Labour*	*Separation*	*Incidence*
Sloan Maternity	20,000	212	1.06%
New York Lying-in ..	100,000	254	.254%
Rotunda	6,453	70	1.08%
Providence Lying-in..	914	7	.765%

Holmes of Chicago states that the clinical incidence is somewhere about one case in 500, and of pathological interest in about one in 200 cases.

Etiology.—Four main divisions of placental separations based on etiological differences, may be recognized.

(a) *Traumatic.*—Trauma is undoubtedly a factor in many cases. History is sometimes obtained of intended or accidental violence to the mother, occasionally of some particular over exertion, which would be, conceivably, sufficient cause for placental separation. There is little doubt, however, that in many cases where there is a history of only some slight trauma, there are co-existent pathological changes at the utero-placental site. Passage of large catheters or bougies for induction of labour may cause placental separation, but this would doubtless be recognized before serious consequences, if in careful hands.

Where a true or relatively short cord is present, late in the second stage of labour, the placenta may be pulled from its insertion, but here the obstetrician will be able to deal quickly with the situation without serious consequences to mother or child. The sudden emptying of a large hydramnion causing a negative pressure within the uterus, the loosening of the placenta sometimes seen after the delivery of the first twin, and intra-uterine manipulation during labour, may be included as possible causes under this heading.

(b) *Localized pathological changes at the* utero-placental site.—Under this heading may be mentioned such conditions as infarctions of the uterus due to emboli; any mechanical condition cutting off the circulation to a part of the uterine wall; uterine tumours exerting mechanical pressure, and thus by altering the fœtal and maternal circulatory relations, leading mechanically to separation of the placenta, and such placental diseases as syphilis and tuberculosis, which may lead to fatty and amyloid degeneration. Infarctions and cystic degenerations of the placenta may also be mentioned.

(c) *Systemic evidences of toxæmia with pathological changes, in the kidney, uterus and placenta.*—Minute hæmorrhages are usually noted in these cases between the muscle fibres and fasciculi, and in addition inflammatory and degenerative changes may be seen in the uterus and placenta; albumin and casts are found in the urine, with œdema and increased blood pressure.

Eclampsia is three or four times more frequent in primiparous women, premature detachment of the placenta is particularly a disease of multiparous women. Coincident eclampsia and detachment is comparatively rare. In 328 collected cases mentioned by Holmes, coincident eclampsia was noted in only 1.8 per cent. Willson reports six instances in sixty-nine cases, or 8.6 per cent. I have been unable to find any observation to the effect that the characteristic lesions produced in the liver by eclamptic poison, have been found in cases of *abruptio placentæ*.

(d) *Maternal systemic diseases.* — Chronic nephritis, Basedow's disease, arterio-sclerosis, and the hæmorrhagic diathesis, have been mentioned by various observers as causes. Burgess of Montreal reports an occasional case seen during the influenza epidemic of 1918. It is often very difficult to say whether such conditions are coincidental, or are causative factors. Arterio-sclerosis for instance, is usually a slowly developing disease, with clinical manifestations after the child-bearing period. Very high blood pressure in the child-bearing years is usually an accompaniment of some toxæmia. Hæmorrhagic diathesis has, however, been reported in four cases, in two of which there has been a definite history of hæmophilia.

Types of varieties.—The detachment may be either (a) partial or (b) complete. Partial separation may take place either centrally, or at the margin, and no definite rule can be given as to which cause or causes may be operative in one, and not in the other. In central separation, the bleeding may be totally concealed, being confined between the placenta and the uterine wall, with the placental margin intact in its attachments. Where the separation is extensive, the counter-pressure exerted by the fœtus and amniotic sac is not sufficient to mechanically act as a tampon and prevent the escape of blood from the uterine sinuses. For this reason the patient is in grave danger of bleeding to death, or more likely of dying from shock and hæmorrhage. If, however, the hæmorrhage in the central variety is small, indicating only a small detachment, and the patient is in labour, the loss of blood may not be sufficient to cause anxiety.

The *marginal variety,* except in some of those traumatic forms caused by bougies and internal manipulation, in all probability is caused in the first place by a small central hæmorrhage, which, as it increases, causes the blood to gradually separate a portion of the placenta towards the margin, and, in the marginal attachment where least resistance can be found, and escape into the vagina and becomes visible and external. External hæmorrhage does not always occur, however, when the margin of the placenta has been separated, for the pressure of the membranes against the uterine wall, may be so firm as to prevent the blood escaping into the vagina. The pressure of free blood and clots may break through the membranes and escape into the amniotic sac, and remain entirely concealed, if that portion of the membranes over the internal os is still unbroken. In complete detachment, the entire placenta is separated from the uterine wall, leaving all the sinuses open. Hæmorrhage here, of course, is severe, and may at least be visible in part, unless the placenta prolapses to cover the internal os. In these cases the child dies promptly, and the mother's life is in great danger.

Cases occur where there is moderate external or revealed haemorrhage, and very considerable internal and concealed bleeding, where for mechanical reasons, only a small amount of blood finds its way into the vagina. Thus it would be well to classify these cases of bleeding as *absolutely* concealed, or *relatively* concealed. The external bleeding should be recognized merely as a diagnostic sign of internal bleeding.

Clinical course.—There are mild cases of *abruptio placentæ* with moderate or little pain, or perhaps only a vague feeling of distress or fullness in the abdomen, few constitutional symptoms, and a little revealed or external bleeding which soon stops. Labour is very often rapid and the placenta is expelled together with more or less blood clot.

Again, however, the onset may be sudden and stormy. The condition of the patient is evidently different from what it had been previously to that moment, whether labour has set in or not. Labour may set in very suddenly with severe, sharp, pain, described sometimes as "tearing" in character. If the patient has had previous labours, she notes the difference between these early pains and those she remembers in former labours. They are more like the severe pains of the second stage, but more irregular and at shorter intervals. The character of this pain will depend more on the suddenness of the ac-

cumulation of blood and the rapidity with which distension of the uterus and stretching of the peritoneum takes place than on the amount of blood poured out. The patient shows anxiety and is restless. On examination, the degree of dilatation of the os and the effacement of the cervix is less than would be expected from observing the character of the uterine contractions. In addition to the exaggerated onset of labour, there are very severe colicky pains, lasting from a few seconds to two or three minutes. The pain is sometimes localized to the placental site. The uterus frequently is painful on palpation and there is likely to be difficulty in outlining the fœtus. Violent fœtal movements may or may not be noted in these cases where there has been sudden separation of a large portion of the placenta; in such cases the active movements may be attributed to the throes of the child due to its sudden asphyxia. Where the separation is slow and the accumulation of blood takes place slowly, the child dies quietly. Some of the babies do not die so much of asphyxia as of hæmorrhage, due to the tearing of one or more of the enlarged vascular villi of the chorion which project into the depressions of the decidua vera. The patient complains of faintness and vertigo, and is very likely to be nauseated and vomit. The nausea and vomiting are reflex in character, probably dependent on splanchnic irritation due to the sudden anatomical changes in the uterus, and the separation or splitting of the uterine peritoneum. Systemic signs of hæmorrhage soon manifest themselves. These are sensations of dizziness and faintness increasing to loss of consciousness, colourless mucous membranes and skin, thready rapid pulse, cold perspiration and respiratory signs of air hunger. Such symptoms should not be mistaken for a "heart attack", or for the accompaniments of a mere gastric upset or intestinal colic. Signs of uterine hæmorrhage will be present. An intelligent patient will sometimes realize herself that the abdomen seems larger. If the attending obstetrician has seen the patient recently, he will probably note that the uterus appears higher in the abdomen. When the placenta is situated in the front or on the side of the uterine wall, irregularity of contour may be noted on palpation, or even be visible to the eye. This will occur in those cases where the bleeding has been considerable and the margin of the placenta is still adherent to the uterus.

The following mechanical factors will result in absolutely concealed bleeding: (a) Adherent periphery of the placenta with central separation. (b) Membranes so firmly united to the wall of the uterus that the blood is retained in circumscribed areas. (c) Presenting part completely shutting off any way of escape of blood through the cervix. (d) Atresia of the cervical canal. (e) Occasionally the membranes may rupture allowing the blood to escape into the amniotic sac.

Where there is external bleeding, this is of course a positive sign of internal hæmorrhage, and the case is recognized as one of relatively concealed hæmorrhage.

Coagulation of blood may take place so rapidly that thrombosis at the site of the bleeding occurs, and with it, cessation of hæmorrhage. This might be termed a chemical, rather than a mechanical factor. The tone of the uterine muscle influences to a great degree the length of time an absolutely concealed hæmorrhage remains such. If good uterine contractions occur, resulting from the stimuli of the foreign body, the early escape of blood from the uterus will be noted. Symptomatically, except for the one visible evidence, there is no difference between absolute concealment and relative concealment. The external bleeding is merely a diagnostic sign hitherto absent.

Holmes states that "the one pathognomonic sign invariably present, in all true cases of *ablatio placentæ*, whether they be absolutely or relatively concealed, is the expulsion of old clots, and perhaps old blood, with the child and placenta."

Uterine consistency has been described by many authors as being of a board-like hardness, and the impression gained from many text-books has been that this is a more or less diagnostic sign. This is true in a small percentage of cases, but in many the consistency is "boggy" and quite flaccid. Just as in normal pregnant uteri at term, there is great variableness in the consistency of the uterine wall, so in abruption of the placenta, the consistency may range anywhere from extreme hardness to marked flaccidity. Shock is prominent, especially in those cases where distension of the uterus has been rapid, and may be due to the sudden

change in size of the uterus, the stretching and separation of the muscle fibres and peritoneum. Possibly the cause may be largely due to irritation of the sympathetic nervous system reflexly. The acute anæmia contributes to the shock.

I have been unable to get much evidence from reported cases, as to how great a factor increased systolic blood pressure is in these cases. Only, of course, where one has had blood pressure readings prior to the placental separation, can one be guided in forming an opinion. Often the blood pressure is not high. When high readings are noted, signs of toxæmia are very likely to be present.

Diagnosis.—Great stress should be laid on the recognition of evidences of systemic blood loss as shown by the facies, thready rapid pulse with decreasing tension, dyspnœa, and the usual signs of air hunger. Repeated blood counts and hæmoglobin estimations where they are possible to obtain, and the diagnosis is at all in doubt, will be of great value. Other symptoms such as nausea, faintness, pains, abnormal uterine consistency, may be regarded as less important evidence of the condition. Undue hardness of the uterus is regarded by some as a very good sign of the toxæmic variety. Toxæmic symptoms such as œdema and high blood pressure, if noted, may aid in the diagnosis. These, however, may be so influenced by the hæmorrhage incidental to the placental abruption, that one might readily be lead to believe them to have been entirely absent.

A careful history will almost always rule out the acute abdominal emergencies. Placenta prævia can usually be diagnosed from the history, from the fact that the bleeding is always painless and irrespective of trauma, and a low implanted placenta can be felt on internal examination. Rupture of the uterus occurs during labour, the uterus no longer contracts and probably no presenting part can be felt. The tear in the uterine wall may itself be detected bimanually, and the fœtus and uterus may even appear to be separate entities.

Prognosis.—In the very mild cases referred to the prognosis is good for both mother and child. In all other cases, however, it is much worse for the child than for the mother. Some authorities go so far as to say that practically all the babies will die, but this would appear to depend altogether on the severity of the symptoms and the degree of placental separation. Generally speaking, the greater the difficulties encountered in obtaining quick delivery, the poorer the prognosis for the mother. For this reason, cases already in labour should show a better maternal mortality rate. The anæmia induced is a predisposing cause of post-partum infection. Probably of greater importance in the prognosis, than the method of treatment, is the early recognition of the condition, and the promptness with which suitable treatment is begun. A diagnosis not made in the absolutely concealed cases until they have been converted into relatively concealed cases exposes the patient to increased danger.

A uterus which will respond quickly to the stimuli, setting up good contractions, will aid in the early delivery of the child, and will improve the prognosis. On the other hand, a very flaccid uterus which does not respond to the stimuli resulting from the abruption, may allow a great amount of blood to accumulate within its walls, and lead very quickly to a fatal ending. An extremely tense uterus in the absolutely concealed type, will aid in producing sufficient intra-uterine pressure to equalize that of the blood pressure at the site of the hæmorrhage, thus checking the bleeding, and allowing coagulation to take place. On the size of the sinuses opened will depend the degree of bleeding, even more than on the degree of placental separation. The greater the separation, however, the more likely is the baby to die from asphyxia.

Treatment.—Proper ante-natal care will accomplish much in preventing toxæmia which appears to be an etiological factor in many of the most severe cases. Radical treatment in all cases of placental abruption, is not indicated.

Milder types.—Some authors recommend that even these types should be delivered as expeditiously as possible, lest a mild one suddenly becomes severe. However, a great many cases where the loss of blood has been insufficient to cause any systemic symptoms and where the separation of the placenta has been insufficient to cause appreciable change in the character of the fœtal heart tones, and in whom the visible signs of fresh bleeding have ceased,

may be treated expectantly and allowed to go into labour normally, or if labour has commenced, allowed to terminate normally. It is preferable, however, that such cases should be in hospital, where proper treatment might readily be given, should at any time serious symptoms develop.

More severe types.—Treatment in these might well be considered from the standpoint of whether or not the patient is in labour. When a woman apparently in normal labour suddenly begins to bleed, one thinks immediately of the premature separation of a normally situated placenta, of a low insertion of the placenta, of a torn cervix or possibly of ruptured uterus. Internal examination will reveal whether the bleeding may be accounted for by tearing of the cervix or by the presence of placenta prævia. Sometimes the placenta may be low in the uterus but cannot readily be reached with the fingers. Here, however, rupturing the membranes will be good treatment for *abruptio placentæ* or placenta prævia, for in the former, labour will be facilitated, and in the latter, pressure from the presenting part will soon control the bleeding. If the bleeding continues, and particularly if the fœtal heart tones rapidly become slow or irregular, *abruptio placentæ* should be diagnosed, and the indication will be to deliver the child as rapidly as possible.

Where the placental separation takes place following the birth of the first twin, or on the too sudden emptying of a polyhydramnion, or during version, or extraction, delivery should be just as rapid as possible, both in the interests of the babe and the mother.

The main indications in the treatment of *abruptio placentæ* may be stated as follows: (1) The uterus must be emptied as early as possible. (2) The hæmorrhage must be controlled. (3) The anæmia and shock must be relieved. Since the child is almost always lost in the severe forms, the best treatment will be that which empties the uterus most quickly, with least danger to the mother.

In considering the best method for emptying the uterus, our decision will be guided in the largest measure, by the condition of the cervix. If the patient is in early labour and the cervix is pretty well effaced and is partly dilated, complete dilatation may be carried out manually, and if the head is engaged, forceps applied, or if not engaged, version and extraction done. Where manual dilatation is attempted in these cases, the endeavour should be to accomplish this with as little laceration as possible, and with as little additional shock as may be to the patient. Where the child is known to be dead, the operation of craniotomy is preferred by some, to the use of forceps.

Where little effacement of the cervix has taken place, but there is sufficient dilatation of the os to admit two fingers, the membranes should be punctured, a colpeurynter inserted and filled with sterile water, six to eight ounces. The upper two thirds of the vagina is then tightly tamponed with medicated gauze, or better still, as done in the Rotunda in Dr. Tweedy's time, with dry sterile cotton pledgets. Counter-pressure over the abdomen may then be obtained by the use of the Spanish windlass —an abdominal binder which is twisted very tight from the side by means of a stout stick. De Lee has recommended fluid extract of ergot in twenty-minim doses every two hours, being the only instance where he recommends this drug while the ovum is still in the uterus. Pituitary extract in four-minim doses, repeated as indicated, also may be used to stimulate uterine contractions. Large initial doses should not be given lest too violent contractions lead to rupture of an already weakened uterine wall.

Should the cervix be tightly closed and abdominal section for different reasons be entirely out of the question, the membranes should not be ruptured, but the cervix and vagina tightly tamponed and counter-pressure obtained as referred to previously. When sufficient dilatation has taken place, rupturing the membranes, the colpeurynter and manual dilatation will complete the preparation of the cervix for delivery. With a tightly closed cervix, however, with hæmorrhage still going on, Cæsarean section will probably be the operation of choice, and if the uterus does not promptly contract and maintain this condition with the help of massage, ergot and pituitary extract, hysterectomy may be necessary in order to prevent further bleeding. These are severe cases, where bleeding from the uterus after the operation is over, may be quite sufficient to turn the scales against the patient's

recovery. Vaginal Cæsarean section, while done by some successfully, is likely to prove very difficult on account of the small space in which to work and the obscuring of the field with blood.

If the placenta does not immediately follow the delivery of the child, and cannot be expressed by the Crede manœuvre, it must be removed manually without delay, together with all the clotted blood within the uterus, and then tamponade of uterus and vagina carried out.

Saline transfusions, as early as possible after diagnosis of severe bleeding has been made, should be carried out, followed later by blood transfusions. The time for carrying out the blood transfusions will depend a good deal on the condition of the patient, and the facility with which a suitable donor can be obtained. Horse serum may be tried. When the pain is very severe at the onset and the patient very restless, morphia gr. 1/6 may be required.

Occasionally a woman may be seen for the first time in deep shock, and any operative measures would appear to offer nothing but disaster. In such cases—and these are usually ones which have not been accurately diagnosed early, and given the early suitable treatment so necessary—it may be wiser to try and control the bleeding with tamponade and counter-pressure, and treat the shock with heat, saline and blood transfusions, and stimulants as indicated. If in spite of these measures, however, bleeding keeps up, operative procedures will be imperative.

It is well in all severe cases to explain the seriousness of the situation to the family, and when possible, consultation should be sought.

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