PREMATURE SEPARATION OF THE PLACENTA.*

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By premature separation of the placenta is meant the partial or complete separation of the previously normally implanted placenta, at any time before the completion of the second stage of labor. By normal implantation is meant implantation of the placenta in the uterus above the point later developed as the contraction ring of Schroede,—that is in the fundus or either cornu. A placenta may have been normally implanted, subsequently separate and prolapse, and later become reimplanted as a partial or total previa, with the latter diagnosis at the time of delivery.

The condition has been known since the time of Hippocrates, and by most of the older writers on obstetrics, but it has not been sharply distinguished from placenta previa until recent years. In fact, the differential diagnosis is often difficult and sometimes impossible until discovered by post-natal inspection of the placenta itself.

Frequency. Analysis of the statistics of hospitals and those given by writers on the subject vary within very wide limits. It is therefore impossible to make any definite statement as to the frequency of the condition. The reason for this variation in figures is due to individual inaccuracy of different observers, first, in diagnosing the condition, and second, in making sharp distinction between the premature separation and placenta previa. The following table is prepared from statistics where the condition was accurately diagnosed from the fact that separation led to definite characteristic symptoms.

HOSPITAL	CASES OF LABOR	SEPARATIONS	RATIO
Sloan Maternity	5,900	57	1 to 104
Dublin Rotunda	6,453	70	1 to 92
New York Lying-in	10,000	0	
Chicago Lying-in	15,000	43	1 to 348
Chicago Lying-in (later)	3,600	6	1 to 600
Providence Lying-in ...	914	7	1 to 130

Most writers state the ratio as one case in five hundred, but there is no doubt that it occurs more frequently. The figures above give a general average of one in two hundred and fifty-five cases and these all diagnosed. Judging by the frequency of placental disease and clots found postpartum one would almost es-

timate that separation occurred at least in part, in about one out of every fifty cases. Careful observation of the clinical cases of antepartum hemorrhage together with minute inspection of every placenta delivered will again revise these figures in time, and no doubt show that premature separation of the placenta is a common condition.

Etiology. Previous observers have assigned all sorts of conditions, both systemic and local, as being the etiological factor of the separation before the second stage of labor is complete, principal among them being endometritis, syphilis, uterine infarcts, and true placental disease. The evidence in many reported cases shows only coincident complicating disease without any pathological basis for blaming such disease as the causative factor. True endometritis is only caused by the pus forming organisms, and such an endometritis is also usually puerperal, the result of introducing pyogenic bacteria by the vagina through faulty technique in delivery. Conceivably such bacteria might be introduced during pregnancy, by dirty instrumentation, pelvic examination or even coitus. Then the bacteria migrating back of the membranes could set up an inflammatory process back of the placenta on the uterine wall, causing a separation. Local pyemia from a distant focus might lead to similar condition, the organisms traveling in the maternal circulation.

It is a well known fact that the gonococcus rarely, if ever, attacks the uterine mucosa, except in the cervical portion. It produces an endocervicitis not an endometritis. The fundus uteri is extremely resistant to the gonococcus, but even assuming that this organism led to inflammation of the fundus, it is unreasonable to suppose that a subsequent pregnancy could lead to a normal implantation in the beginning, but to placenta previa, partial or complete, or immediate abortion. The tubes are most often affected of all the internal organs of generation, and the same holds true of tuberculosis. Syphilis, according to most pathologists, attacks by preference the portio cervicalis, setting up an endocervicitis, never an endometritis. Even if true gummata were present in the endometrium,—a condition rarely met with post mortem,—it is doubtful if the ovum would be normally implanted in the beginning, on account of the unfavorable condition for its settlement in the body of the uterus.

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What is erroneously termed endometritis by many gynecologists is really a gland hypertrophy due to congestion. It occurs normally premenstrually and is essentially a normal physiological process. A somewhat similar congestion might be set up by extraneous factors such as tumors exerting a mechanical pressure, and thus by altering the maternal and foetal circulatory relation mechanically lead to a separation of the normally implanted and firmly attached placenta. Inasmuch as we know that fibromyomata which have been previously unrecognized may take on a rapid growth in pregnancy, such a condition might logically be considered as a predisposing cause for the placental separation. I have not, however, seen such a case reported in the literature. Infarction of the uterus probably occasionally occurs, subsequent to the formation of the placenta, as a result of emboli or other mechanical conditions cutting off the circulation to a part of the uterus and its mucosa. This would cause a separation. Arteriosclerosis has been reported to have caused a separation through a circulatory disturbance at the foetal maternal junction. It would doubtless be rare because marked arteriosclerosis is a gradual disease and gives symptoms only as a result of a long standing chronic process. It is extremely unlikely that such a condition should occur in the uterine vessels between the time of normal implantation of the ovum, and parturition. Such serious arteriosclerosis at the time of conception would probably prevent a normal implantation.

It would seem that most of these causes of premature separation of the placenta assigned to constitutional disorders might be dismissed. Perhaps it is fair to admit the possibility of infarction of the uterus, arteriosclerosis, and tumors as predisposing causes, but they are undoubtedly so rare, if they occur at all, to be only of academic interest.

In the pathological conditions of the placenta itself, there are true predisposing causes of its separation. In chronic diseases like syphilis and tuberculosis, the placenta may be the seat of the characteristic lesions. Definite tubercles and gummata have been frequently observed. Such cases may also lead to fatty and amyloid degenerations of the placenta. The most potent and common cause of placental disease is hemorrhage from rupture of the placental sinuses. The blood may escape either on the

foetal or maternal surface. More often and serious, however, is the case when the blood sinuses rupture directly into the parenchyma of the placenta, causing the so-called "placenta apoplexy." This results in clotting, organization, and later scar formation, which scar tissue may contract and, exerting pressure on the placental margins, weaken their attachment or even that of the entire tissue. Again, without evident rupture of a sinus, parts of the placenta may become infiltrated with blood and present the characteristics of a true infarct, which may later be replaced by a fibrous tissue or undergo a true degeneration, thereby extensively damaging the placenta so as to interfere with its function as well as seriously weaken its attachment to the decidua basalis. Tumor formation and cystic degeneration are of occasional occurrence. The latter does not properly enter this discussion, for we know it leads to the formation of the so-called "hydatidiform mole,"—a well recognized condition with a distinct train of symptoms and results. I have not seen a true case of premature separation reported to be the end result of cystic degeneration.

Four cases are on record of premature separation of the placenta occurring coincidentally with the hemorrhagic diathesis in the mother. In two of these cases there was a family history of true hemophilia. The relation of the one condition to the other has not been perfectly explained, but Barchat in analyzing one of the latter cases post mortem says, "The findings in such placentas suggest a toxic influence from the products of foetal metabolism, evidences of which were also present in other organs."

While coincident maternal systemic disease often occurs with a premature separation, no direct casual relation can actually be assigned to it, except in those rare reported cases which have been already referred to.

Of the local causes, trauma is the most often recorded and also the most important factor. But in spite of the fact that it plays a very large part, separations must often be the result of only the very severe traumas. While exact data as to the pressure or tension necessary to remove a well implanted placenta are lacking, it is, of course, a well known and frequently encountered fact in obstetrical practice; the placenta may be so firmly adherent to the uterine wall that it is dislodged only

with great difficulty and sometimes requires manual removal. It is a common experience to have some trouble in delivering a placenta even when exerting extreme extrauterine pressure by the method of Crede. Such pressure, if exerted previous to labor, would lead, no doubt, in many cases to a premature separation. On the contrary, the average traumas during pregnancy are rarely as forceful, and it is therefore unreasonable to presume that they alone are responsible for early detachments.

But in those cases in which the placenta is already extensively damaged by pathological disease, a very slight trauma may be the deciding factor in the separation. Holmes makes the more exact distinction when he enumerates slight trauma plus placental disease as one, and severe trauma as another cause. That severe traumas in the form of accidental or intended violence to the mother from external sources are a common cause is shown by the number of cases reported in which such a history was obtained, especially when post partum examination of the placenta shows no inherent long standing pathological process. Typical of these traumas are kicks, and blows, and in some cases the mechanical over exertion of the mother, especially if she is nearly at full term.

Irregular uterine contractions have been mentioned as a possible source of the detachment. Mechanically this is conceivable, but there are in almost every pregnant uterus some irregularities of uterine contraction, whereby more pressure is exerted in one direction or at one point than at others, but these differences are very slight, and frequently equalized at the placental site by the mere mechanical fact of the presence of the placenta.

Another and more definite cause for detachment may be attributed to those cases in which there is a true or relative abnormally short cord. In such cases separation would not occur until well along in the progress of labor and would not, therefore, lead to serious results to either mother or child if dealt with by a skilled obstetrician.

Also the negative pressure, produced by the sudden evacuation of an acute hydramnios may result in a separation.

To tabulate the causes of the condition under discussion, we may sum up as follows:

Predisposing Causes.

1. Arteriosclerosis.
2. Infarction Uteri.
3. Tumors.
4. Placental Disease.
 1. Fatty and Amyloid degeneration.
 2. Syphilis.
 3. Tuberculosis.
 4. Infarction.
 5. Tumors.

Direct Causes.

1. Trauma.
2. Short Cord.
3. Rapid evacuation of hydramnios.
4. Irregular uterine contractions (possibly).

Types. Placental detachment may be either partial or complete, and of the partial separations, the union with the uterine wall may be broken either centrally or marginally, as regards the placenta.

Which of these types takes place is determined by the causative factors that have occurred in the individual case, and no definite law can be laid down as to which of our series of causes or which combination may lead to any specific type of separation. The clinical course of the condition in its diagnosis, prognosis, and treatment, and the amount and character of the hemorrhage depends upon the anatomical type of the separation, and the obstetrician cannot size up the case and institute appropriate treatment, unless he be aware of the pathological possibilities. The all important fact clinically, is whether the hemorrhage is external or concealed or both.

In pure central detachment of the placenta, the bleeding is always totally concealed, for it does not have access to the uterine cavity, being retained between the placenta and the subjacent uterine wall by the still patent marginal attachment of the placenta. This is one of the most fatal types, if the separated area be large, for the counter pressure exerted even by a large foetus and a large unruptured amniotic sac is not sufficient to act as a mechanical tampon to prevent the escape of the uterine blood from the opened sinuses. The patient may readily bleed to death in this way, if the condition is not discovered and the uterus promptly emptied. On the other hand, if the central separation be small, and if labor is at hand, no serious loss of blood may follow, although with the increasing hemorrhage

behind the placenta, there is great danger that the resulting pressure will cause a more extensive parting.

Such a result, if carried further, will result in a part of the blood wedging its way out to the edge of the afterbirth, detaching the weakest part of the margin, when the blood will escape into the uterine cavity. This is probably the mechanism by which the second type, marginal separation, is produced, with its accompanying external and visible hemorrhage. In this type we are not dealing with such a serious condition, for, naturally enough, the true state of affairs is discovered early, and remedial measures begun. External hemorrhage does not always result, however, for the blood may be retained by the pressure of the foetal membranes against the uterine wall, and the bleeding continue concealed with all of the symptoms of internal hemorrhage. Or, on the other hand, the free blood may, through its own pressure or that of formed clots, break through the foetal membranes near their attachment to the placenta and escape into and mingle with the amniotic fluid, still being completely concealed, if that portion which presents at the os be still intact.

A third type of detachment is that in which the entire placenta is stripped off of its uterine attachment, leaving all of the sinuses open. Under such conditions one would expect at least some visible hemorrhage, especially if the membranes have ruptured. Often there is, but there is just as often the added factor of the prolapse of the loose placenta which, falling over the internal os, acts as a cover, and the blood behind is thereby retained.

Naturally enough, the rapidly collecting blood tends by its ever increasing pressure more and more firmly to impact the placenta in its abnormal position. Of course in such case, the child dies promptly, and the mother's life is in imminent danger.

Not only may the hemorrhage be external and visible, or internal and concealed, but a combination of both may occur in which a part of the blood escapes into the vagina and a part remains behind, collecting and increasing in amount. It is therefore a fallacy to judge as to the treatment of the case by the amount of hemorrhage that is observed upon examination. This combination of both external and internal hemorrhage may result from a partial separa-

tion provided that it involves the margin of placental attachment. Strictly central separations never lead to external hemorrhage.

Clinical Course. The clinical course of the condition under discussion may be described as follows: The onset is always abrupt, and sharply demarcated from the previous condition of the patient, whether or not she has normally begun labor. If labor has not already begun, it is suddenly and stormily begun by extremely sharp rending pains much more severe than usual, and the multiparous patient will often volunteer the remark that she has never experienced such severe early labor pains. They simulate more the pains of the latter part of the second stage, but are rather more irregular. The intervals are much shorter than one would expect. The patient is suddenly changed in her attitude of fortitude to one of anxiety, and is in the most agonizing labor. Even though she has previously begun labor the change is just as marked, and while apt to be mistaken for the onset of the second stage, a keen observer will notice the abnormal intensity of labor. Vaginal examination, too, will put the attendant on his guard, for the amount of dilatation of the os and effacement of the cervix is far less than would be expected from an observation of the character of the uterine contractions, both subjective and objective.

This characteristic onset is a very valuable diagnostic point, and so striking as to be almost unmistakable. At any rate, it should serve to put the obstetrician on his guard and stimulate him to look for further evidence of a premature placental separation, especially if corroborated by the relatively slight dilatation, and apparently slow progress.

Along with the generally tumultuous labor pains there are exacerbations of excruciating pain of a colicky character lasting from a few seconds to two or three minutes. Sometimes there is localized pain, and if present, it is most likely to be at a point where tender asymmetry is observed in the abdominal tumor. This point of asymmetry while not definite or of itself pathognomonic of the condition, may usually be found upon careful observation, and palpation over it will elicit a boggy-like feeling, giving the sensation of a spongy mass, gradually shading off to the firmer consistence of the surrounding abdominal wall. The general feel of the abdomen is one of extreme tenseness,—much

more so than that of the normal belly of the full term pregnant patient.

The patient herself may subjectively feel an increasing distention, with or without a great increase followed by a great decrease of foetal motion. As labor progresses one's attention is drawn to the restlessness of the patient. She gives the impression of impatience for labor to terminate and seems to be fearful of the result, with a sense of impending disaster. Vertigo and syncope follow. She is nauseated and vomits. Gradually the symptoms and signs of hemorrhage and its associated shock supervene, depending on the extent and severity of the bleeding. There may be precordial distress, air hunger, and abnormal thirst, going on to drowsiness and coma, and finally death. One can judge somewhat of the extent of the hemorrhage by the tension and rapidity of the pulse, and the old rule holds that when the hemorrhage is serious the pulse is affected. In the end, the whole picture is one of internal concealed hemorrhage combined with that of collapse.

The picture described is much the same whether or not there is visible hemorrhage, but the latter naturally facilitates the diagnosis and therefore the prognosis and treatment.

Diagnosis. The diagnosis of premature detachment of the placenta is of course of vital importance to both mother and child and is one of the cases where inaccurate observation, careless examination, or general lack of interest may easily lead to a fatal result to both. The condition can be easily overlooked in its early stages if the bleeding is entirely concealed and the diagnosis not made until too late. In such a case, the danger signals which stand out preëminently are: 1, A history of trauma plus the statements of the mother as to the onset of labor, and her subjective sensations regarding foetal motion and viability; 2, the physical examination, showing a large tense abdominal wall with assymetry and localized tenderness, coupled with a boggy sensation on palpation; 3, the stormy character of the labor; 4, the signs of hemorrhage, especially the pulse rate; and 5, the gradual rising of the height of the fundus of the uterus. With these symptoms and signs, especially if grouped, one's suspicions should be enough aroused to find the precise cause.

If hemorrhage antepartum is visibly present, a positive diagnosis can be made by ruling out

placenta previa and rupture of the uterus, by examination,—the only conditions to be confused. Rupture occurs during labor. Placenta previa rarely shows signs before the onset of labor. Premature detachment occurs during pregnancy and initiates labor. In rupture of the uterus, no presenting part is felt, the uterus no longer contracts, and often the rent itself can be felt bimanually, and occasionally the child and uterus can be felt as separate entities. Placenta previa is not present if there be no antepartum hemorrhage, and is easily felt either partly or totally encroaching on the internal os.

In cases where there is no visible bleeding, the diagnosis is more difficult, for here we have the added factors of the many acute abdominal conditions met with surgically, such as local or general peritonitis, from any of their causes, abdominal and pelvic inflammatory conditions, tumors, especially ovarian cyst with twisted pedicle, renal calculi, and even pancreatitis, cholecystitis, and referred pain of pneumonia.

In the differential diagnosis of such conditions an accurate and complete history is very essential, and upon that alone the choice may be made in most cases. Complete and thorough physical examination, with all the appropriate laboratory methods, is ideally desirable, but often impracticable from the very nature of the emergency. However, the fact remains that no pains should be spared, often with the aid of a competent consultant, to make an early and prompt diagnosis.

Acute hydramnios might sometimes be confused with placental detachment, but the former occurs to give symptoms earlier in pregnancy, often before pregnancy is even positively diagnosed. Hydramnios does not give the symptoms of hemorrhage, rather those of shock.

Prognosis. The prognosis is of course always much worse for the child than for the mother. Some writers go so far as to say that for the baby it is absolutely bad, but that depends upon the time and extent of the separation. In cases of complete detachment, the chances of birth of a viable child are practically nil, for in spite of a fortunate early diagnosis, and rapid delivery, the foetal circulation must of necessity be cut off for a sufficient time to produce death. The mother's chances, too, are poor in such case, for there is a very large area of bleeding surface exposed, and brisk hemor-

rhage is apt to go on without adequate clotting, until mechanical methods of control can be instituted. If, on the other hand, the placental separation is slight, and especially when the bleeding is visible, the chances of life and recovery are good for the mother, though still dubious for the child. Here, of course, we have the added factor in determining prognosis, that being the condition of the cervix. Should the lesion occur before term, or before active labor has taken place, the difficulty of operatively dilating a rigid cervix will be unfavorable regarding the outcome to mother and child, but if labor is already well along and the dilatation considerable, the prognosis is proportionately better. It frequently happens that, at the very last minute of the second stage, the presence of a short or badly twisted cord will literally tear the placenta from its attachment. Birth being at hand, the prognosis for the child is perfectly good, and that for the mother not necessarily serious or troublesome. Clinically it amounts simply to a shortened third stage.

The fact should not be forgotten that there may be no visible hemorrhage, perhaps even a slight detachment, but a long continued ooze will have the same fatal result. Also, resulting anemia from any obstetrical hemorrhage is a marked predisposing cause for infection.

Prophylaxis. An understanding of the causes of this condition gives us a clue to the prophylactic measures which will lead to its prevention. Chief among these controllable factors to avoid is therefore trauma, either slight or severe. This includes the trauma from over-exertion on the part of the mother as well as avoiding those amusements and occupations which may lead to personal injury. An understanding and interest on the part of the attendant in insisting upon the proper hygiene of pregnancy is naturally the best prophylaxis. Too great emphasis cannot be placed on the importance of the avoidance of coitus during pregnancy. More and more are we coming to realize that this is a powerful cause in predisposing to pathological labor. It should be the rule of serious obstetrics to emphasize the avoidance of this danger.

Treatment. Whenever premature detachment of the placenta is diagnosed, it is a situation that demands active measures of treatment. That means as rapid delivery of the patient as is consistent with her condition and environment. In order to accomplish this there must

usually be some sort of operative interference, and here is where sane judgment is so important. Naturally, excluding other factors, the average operator will select those methods in which he is most skillful. Generally the operation of choice is manual dilatation of the cervix followed either by high forceps, or version and breech extraction. Manual dilatation means shock, and methods of combating it must be at hand, and naturally the dilatation should be slow, and careful to minimize as far as possible the shock. High forceps is not only difficult but always dangerous, even in the most skilled hands, whereas version has the same characteristics.

Should a positive diagnosis of foetal death be made, a destructive operation would probably give the best results in saving the mother.

Caesarian section, while theoretically an appropriate way out of the difficulty, is, in these cases, contraindicated. The patient who is bleeding, anemic, and in more or less shock, is a poor operative risk, to say nothing of the fact that previous vaginal examination should prevent Caesarian section on account of the great danger of infection.

Slow dilatation of the cervix with the Voorhees bag, is a relatively safe but slow method. I do not favor it in any case where there is hemorrhage, because one is inclined to get an impression of false security from the fact that, after introduction of the bag, bleeding is no longer visible.

Simple rupture of the membranes may facilitate and hasten labor if the cervix is well dilated, but the rapid evacuation of amniotic fluid may result in a further loosening of the placenta. Of course where the cervix is already well dilated, operative and rapid delivery is easy and relatively safe.

Any method of relatively rapid delivery is then the appropriate treatment, after the method which under the individual circumstances seems wisest and safest, but a word of warning is not inappropos to the effect that here is one of the many cases where one must treat the patient, not the disease. Oftentimes it would be advisable to react the mother from shock, give stimulants, and intravenous salt solution, or better, transfusion previous to any operative method. In nine cases out of ten the child's life is already or must be sacrificed in order to save the mother.

Whatever the immediate treatment, one must

provide for the supplementary treatment after delivery. If born alive, the baby will be in pallid asphyxia, and very strenuous measures should be at hand for resuscitation. That means that a skilled consultant is almost a necessity, for one must simultaneously care for the mother, who may be in shock, or may have a fatal post partum hemorrhage. Post partum bleeding is common in these cases, and will frequently require packing of the uterus, for one must remember that there must already have been considerable loss of blood, and only a few ounces unnecessarily lost after birth, may turn the balance against the mother's recovery.

Conclusion. In conclusion, may I emphasize again the seriousness of the condition and the necessity for its recognition.

Premature detachment of the placenta stands out as an all-important cause of both foetal and maternal mortality in childbirth, and it is probable that it occurs much more often than we suppose. Progress is made in recognizing and eliminating such dangers and in aiding nature safely to consummate what should be a normal physiological process.

It is the accurate knowledge of such conditions as I have attempted to describe, coupled with prompt diagnosis and sane treatment, usually with adequate help, that will materially aid in the advancement of the art of obstetrical practice.

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Book Reviews.

The Principles of Mental Hygiene. By WILLIAM A. WHITE, M.D. 12 mo. pp. 323. The Macmillan Co., New York. 1917. Price, \$2.00.

The author proceeds to discuss the mental factors which have to do largely with social relations. The effects upon character of the interplay between the developments of the individual and the developments of society are discussed. The nature of emotional reactions to various problems are interestingly handled in such portions of the book as those on the treat-

ment of crime, and criminals, the scapegoat, and in regard to other aspects are taken up and contrasted with the intellectual type of reactions of civilized man. There is outlined the struggle of the individual between the same emotional and intellectual reactions in our complex modern social life, and the outlines of the bearings of these struggles upon mental disease, and some of the psychoneuroses.

The book is one of a clear and forceful writer, well acquainted with his subject, and is stimulating and suggestive and helpful to the thoughtful reader, even though one cannot follow the author in all details of his applications of the principles he describes.

Rest, Suggestion, and other Therapeutic Measures in Nervous and Mental Diseases. By FRANCIS X. DERCUM, A.M., M.D., Ph.D. 2nd Edition. Philadelphia: P. Blakiston's Son & Co. 1917.

The great experience of the author of this book and the simple and lucid style makes it one of the most readable books and one of the most useful that we have. The description of the use of the rest treatment for the various forms of mental and nervous diseases in which it is of advantage is particularly full and adequate, with careful attention to details, many of which are so often neglected, and the same is true of the treatment of the various methods of suggestion in their application, which in the case of the neurosis is of so much importance in the use of the rest treatment.

The handling of the treatment of the various mental diseases is also admirable, and we note with pleasure the introduction of some of the most recent methods, as, for instance, in the treatment of delirium tremens of Hogan's method of the use of hypertonic and glucose injections given intravenously.

The third part of the book, which treats of suggestion, takes up the subject very fully and adequately. The chapter on the mystic and religious methods of healing is both interesting and fair, both in the description of various forms in the past, as mesmerism, and also of those of the present day. The description of hypnotism, and the conclusions as to its usefulness are clear and convincing. Most neurologists of experience agree with the author that its field as a method of cure is very limited, as distinguished from its use as a means of investigation, or for the rapid relief from some particularly troublesome symptom.

The discussion of the method of psychoanalysis is quite complete, and the exaggerated claims of the followers of this form of pseudo-psychology in regard to its applicability to all fields of knowledge are well set forth in their proper light, and the warning of the possible evil effects of this method of treatment of the psychoneuroses is not amiss.