THE TREATMENT OF PLACENTA PREVIA BY PROPHYLACTIC BLOOD TRANSFUSION AND CESAREAN SECTION

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As one glances over the recent literature of placenta previa, he must be impressed with the fact that while the most disastrous methods of treatment have been largely eliminated from practice, there has otherwise been very little change in the general attitude of the medical profession toward these cases. To be sure the practical elimination of the accouchement forcé has reduced the present day mortality considerably, but with the exception of the cases treated by this method the average maternal mortality of twenty years ago was as low as it is today, namely, 10 per cent or more in all cases and about 25 per cent in cases of central placenta previa alone. Placenta previa continues to be one of the most serious problems of obstetrics.

Death from placenta previa is usually due to postpartum hemorrhage. Seldom does death result in a case undelivered and in which no intrauterine manipulation has been performed.

There are two underlying factors in the etiology of postpartum hemorrhage in cases of placenta previa: (1) the condition of the patient at the time of delivery, and (2) the method of delivery.

The problem of the treatment of placenta previa is about as clear cut as any problem in obstetrics. It is solely one of hemorrhage and the treatment resolves itself into, (1) the replacing of lost blood to the patient, and (2) delivering the patient in such a manner as will cause the least loss of blood during delivery and the least danger of postpartum hemorrhage.

In practically all discussions of the treatment of placenta previa, attention is given solely to the relative merits of the numerous operative procedures which have from time to time become popular, the accouchement force, Braxton-Hicks version, bag, placental forceps, vaginal hysterotomy and abdominal cesarean section. Too little consideration is given to the fact that the amount of blood which has been lost by the patient previous to delivery is quite as important as the method of delivery and has a very definite bearing on the ability of the patient to withstand the delivery and on the problem of postpartum hemorrhage which is in most cases the cause of death.

In this connection let me emphasize the fact that in cases of postpartum hemorrhage, a definite vicious circle may be established inasmuch as the loss of blood may be sufficient to cause atony of the uterus, while the atony causes further hemorrhage. The atony of the

uterus may even be such that uterine packing will have little effect in controlling bleeding. Such a uterus will not respond to drug stimulation; in fact, the only hope of breaking the vicious circle thus established lies in blood transfusion. The effect of blood transfusion in producing uterine contraction is very remarkable. However, when the patient is in such a state of shock that the uterine muscle has entirely lost its contractile power, the question of restoring this function is sometimes problematical. No one wishes to be confronted with such a problem. The longer we practice the more surely must we be convinced that the only dependable treatment of postpartum hemorrhage is that of prevention.

There is no doubt whether that in the past there has been too great haste in delivering patients with placenta previa. Physicians have been so impressed with the idea that in the presence of antepartum hemorrhage the uterus must be emptied that they too often resort to a method of delivery when the patient has no chance whatever of surviving it. No attempt is made to determine whether or not an additional loss of several hundred cubic centimeters of blood, which must surely take place in any method of emptying the uterus, will be sufficient to send the patient into shock, or if you wish, establish the vicious circle previously mentioned. There must be greater deliberation to meet the requirements of the case in hand.

We would urge the more general use of the prophylactic blood transfusion, that is, transfusion given previous to the delivery so that the danger of postpartum hemorrhage from atony of the uterus may be avoided. Our experience has shown conclusively that if sufficient blood is given by transfusion before the delivery the type of postpartum hemorrhage just described will seldom occur.

Inasmuch as the patient may continue to lose blood it is of course important that there shall be no prolonged interval of time between the blood transfusion and the delivery. The ideal manner of carrying out this procedure is to have two teams in action, one for the transfusion and one for the delivery. While in most cases the two procedures are performed almost simultaneously it is our rule not to commence the delivery until the greater part of the blood has been given and in the most serious cases we take time to estimate the patient's condition after the first transfusion and thus determine whether or not she will require a second transfusion before the delivery. Estimation of the patient's ability to withstand the delivery is based upon the history and observation of loss of blood, the general appearance and apparent condition of the patient, and above all the blood pressure and the red blood count. No patient is delivered who has a red count below three million and a blood pressure below 90 to 100 systolic and 60 diastolic, until blood transfusion has been given.

Blood transfusion in obstetric practice is largely an emergency procedure. Haste is usually required and therefore such accuracy as will insure against the slightest delay which may arise from errors in technic. We, therefore, consider this procedure to be one highly specialized and worthy of the services of one member of the staff who has devoted much time to the perfection of details, not only of the technic of the transfusion itself but of blood reactions. Thus at the Cleveland Maternity Hospital, blood transfusion is under the direction of Dr. W. R. Barney, whose painstaking study of the possibilities and also the dangers of transfusion, and whose perfection of the technic have been of inestimable value in the development and success of our present policy.

In the delivery of cases of placenta previa there is a very noticeable tendency to adhere to the so-called conservative methods. By the conservative method is invariably meant delivery through the pelvis with the aid of the bag. This method of delivery with its slow dilatation is undoubtedly more conservative than the accouchement force, but has it stood the test? Is it really conservative? It certainly has not been the means of reducing the mortality to a degree which is at all gratifying. To be sure, in many cases in which the bag has been used the mortality was due to the fact that blood transfusion was not performed. However, it may be said that in some cases the fatality could be attributed directly to the method of delivery. Deep tears in the cervix may be, but unfortunately are not always, avoided by this method, but whether the cervix be torn or not, the placental site of the uterus is stretched and traumatized to some extent.

If the placenta is situated in the lower segment and over the os, there is enough muscular tone in that segment to control bleeding if the os remains closed and there is no trauma of the placental site. Evidence of this is seen in the clinical fact that after cesarean section for placenta previa there is no additional danger of postpartum hemorrhage when the uterus contracts well. However, in many cases in which the os has been dilated and the area of placental attachment has been stretched or torn, the insufficiently contractile lower segment of the uterus is unable to cope with the additional hazard and there is postpartum bleeding even though the fundus seems to be firm and in some cases even though there is no apparent tear in the cervix. (The condition seems somewhat similar to that which has been described as a paralysis of the placental site.) There is the greatest degree of postpartum safety in those cases in which the lower uterine segment has been left undistended and there has been practically no dilatation of the os.

Some years ago my attention was called to this fact by a case which is not in the list of cases reported with this paper. I shall mention it briefly.

Marginal placenta previa. Voorhees bag inserted, controlled bleeding perfectly and dilated the cervix. Fetal head followed the bag into the cervix and also controlled bleeding until it had passed through the cervix. Low medium forceps delivery. Cervix inspected and no tear observed. Postpartum hemorrhage. Uterus and vagina packed with gauze. Subcutaneously packing did not control hemorrhage. Saline given also intravenous saline with adrenalin. Preparation made for blood transfusion. Patient died before transfusion could be given. Cause of death was undoubtedly bleeding from the placental site.

In the article on placenta previa by Brodhead and Langrock in the January 1927, number of *Surgery, Gynecology and Obstetrics,* I noted two similar cases in the list of fatalities which I quote, as follows:

CASE 7.—A multipara at term with central placenta previa was treated by a de Ribes bag and version. Because of the parity of the patient, the use of the bag followed by version was the conservative plan of treatment. This patient bled to death because of continued hemorrhage from the placental site, which might have occurred even though cesarean section had been the procedure chosen. At autopsy no cervical laceration or uterine rupture was found.

CASE 9.—An viii-para at term with central placenta previa was treated by version. The case was unfavorable in that she had bled profusely before admission to the hospital. Although a conservative podalic version was done, there being no further hemorrhage during delivery, the patient died of continued bleeding from the placental site. A postmortem revealed an intact cervix and uterus.

These cases are, I think, typical of what may happen when a method of delivery is used which requires dilatation of the cervix. To be sure, this sort of hemorrhage is seen in only a small percentage of the cases so delivered, but certainly occurs in enough of them to account for a considerable number of the deaths which are reported. It is not seen in cases delivered by cesarean section. Why then do we continue to use the more complicated and more treacherous methods of delivery through the pelvis instead of the more conservative abdominal cesarean section?

If one were to analyze critically any list of fatalities from placenta previa, he could write across the histories of a large number of them the words, "Should not have been delivered without blood transfusion." Across the histories of nearly all the rest he could write, "Should have been delivered by cesarean section."

The accompanying table is a summary of the cases of placenta previa treated at the Cleveland Maternity Hospital.

I have divided them into two series, one previous to January 1, 1922, and the other from January 1, 1922, to the present time, because, during the time covered by the latter series, there was a somewhat more definite practice of making use of the prophylactic blood transfusion in cases of severe hemorrhage. While simultaneous blood transfusion and cesarean section were first performed by us in 1912, in the latter series a more careful estimation was made of the patient's condition to determine the advisability of transfusion. During this

SERIES A. CASES PREVIOUS TO 1922

45 cases delivered	Central placenta previa		23	
	Marginal placenta previa		22	
Method of delivery	Cesarean section		27	
	Bag and podalic version		17	
	Forceps		1	
Maternal deaths 5 or 11.1 per cent	1. On 13th day. Intestinal obstruction (?)			
	2. Hemorrhage, no transfusion			
	3. Hemorrhage, no transfusion			
	4. Hemorrhage, transfusion after cesarean section			
	5. Hemorrhage, 3 postpartum transfusions			
Fetal mortality	Stillborn	8	17 or	37.3%
	Died	9		

SERIES B. CASES SUBSEQUENT TO 1921

56 cases delivered	Complete placenta previa		25	
	Partial placenta previa		10	
	Marginal placenta previa		21	
Method of delivery	Cesarean section		40	Cases
	Podalic version		11	"
	Forceps		4	"
	Spontaneous		1	"
Prophylactic blood transfusion and cesarean section			12	"
Maternal death		1 or	1.78%	
Fetal mortality	Stillborn	10	18 or	32.1 %
	Died	8		
Cases requiring blood transfusion			12.4 %	
Cases delivered by cesarean section			71.4 %	

period, therefore, transfusion was not used as a measure of last resort but as a means of precaution where there was the least doubt as to the patient's ability to survive delivery.

In Series "A" one of the maternal deaths was due to an abdominal complication which possibly could not have been avoided. The other four deaths, however, were due to postpartum hemorrhages and could very likely have been prevented in view of our subsequent policy of prophylactic blood transfusion. In Cases 2 and 3 no blood transfusion was given, while in Cases 4 and 5 blood transfusion was performed after the delivery when there was found to be profuse postpartum bleeding on account of atony of the uterus.

Undoubtedly there was too great haste in delivering these patients without preliminary blood transfusion and the loss of blood caused by the delivery so depressed the patient that the uterus entirely lost its contractile power; so much so that even blood transfusion did not restore it. These cases show that the patient needs the greatest stimulation from transfusion at the time when the uterus is emptied; that there may be an immediate contraction of the uterine muscle which will prevent further loss of blood. They also illustrate the futility of blood transfusion in some cases when given after the patient is much exsanguinated.

Series "B" represents the results of our present plan of treating placenta previa. The first cesarean section for placenta previa which I performed was at the Cleveland Maternity Hospital in 1907. The

contrast between this method of delivery and the methods which I had previously used, namely, the accouchement force and later the Voorshees bag, was so striking that I published an article in the *Cleveland Medical Journal* advocating cesarean section as the best method of delivery in cases of central placenta previa and well-marked partial placenta previa. There were very few cases in the literature at that time and of course my argument in favor of cesarean section was not based upon any statistics of my own but upon the underlying principles involved. For some years afterward we performed cesarean section in the cases of complete placenta previa and in those in which the placenta overlapped a considerable part of the os, while the cases of lesser degree were treated by what we then erroneously thought to be the more conservative method of delivery through the pelvis. A realization of the danger of uncontrollable postpartum hemorrhage due to disturbance of the placental site even though there was no apparent tear in the cervix, as before discussed, gradually led to a more definite policy of performing cesarean section as a procedure of choice and really as a conservative procedure. Thus, in all cases of placenta previa whether central or marginal in which the cervix is practically undilated, cesarean section is now performed. This plan is based largely on the principle that the closed os and undisturbed placental site are most important factors in the prevention of postpartum hemorrhage in such cases.

The smaller number of cases in which cesarean section is not performed consists of those of lateral placenta previa in which the patient has been in labor, the os is considerably dilated, and the fetal head has descended sufficiently to control the hemorrhage by pressure.

No vaginal examinations are made in cases of antepartum hemorrhage. The diagnosis is based upon the history, the apparent bleeding, abdominal palpation and auscultation, and rectal examination. The elimination of vaginal examination and manipulation undoubtedly has been a most important factor in the reduction of maternal mortality. It is of course apparent that the differential diagnosis between central and marginal placenta previa is often not made before, but during operation. However, when cesarean section is performed it makes no difference which variety is present, the result being equally good in each. Postpartum hemorrage is rarely encountered when the condition of the patient is suitable for delivery, that is, when she has retained or has been given sufficient blood to insure uterine contraction. The uterus is not packed after cesarean section.

Prophylactic blood transfusion seemed to be indicated in about one-fifth of the cases. These naturally include the most serious cases. One typical case will serve to illustrate the possibilities of this method.

A multipara was brought to the hospital after a very profuse antepartum hemorrhage. Radial pulse could not be felt. Blood pressure could not be recorded. Blood count showed 1,500,000 red cells. Extreme pallor and air hunger. Transfusion of 500 c.c. of blood was immediately given. A fair radial pulse could then be felt. Blood pressure 80 systolic, while diastolic pressure was too low to be recorded. Red blood count 2,400,000. Patient still unfit for delivery. A second transfusion of 500 c.c. of blood was given and cesarean section performed just as the transfusion was completed. After the second transfusion the red blood count was 3,100,000, and the systolic blood pressure was over 100. There was no postpartum hemorrhage and the patient made an uncomplicated recovery.

The single death occurred late in the series, there having been fifty-three consecutive cases with no mortality. This case furnished more than a surgical problem. The husband of the patient absolutely refused permission to deliver or transfuse. He would not even allow typing of himself for use as a donor. Only after several hours of arguing and pleading and finally the demand of a priest, was permission given. The patient was practically moribund at that time. Two transfusions amounting to 1200 c.c. of blood were given and the patient was delivered by cesarean section. For one hour after delivery her condition seemed satisfactory with no evidence of hemorrhage. Then there was a sudden relaxation of the uterus with uncontrollable hemorrhage and death before a third transfusion could be given. It is evident that this patient could have been saved had delivery been performed when preparation was first made, five hours before the actual delivery. Two procedures could be suggested which might have prevented death even after the long delay. First in a case in which the patient is so nearly moribund before the transfusion it might be well to ligate the uterine arteries at the time of delivery. Second, in any case of postpartum hemorrhage, or a case in which there has been severe antepartum hemorrhage, the blood pressure should be taken postpartum at least every five minutes until the danger of hemorrhage is definitely passed, so that if there is a falling pressure another blood transfusion can be given before it is too late. A falling blood pressure is often the first evidence of bleeding during this period.

In conclusion emphasis should be laid upon the fact that while cesarean section is our method of choice in delivering cases of placenta previa, no method of delivery is safe in the more serious cases without prophylactic blood transfusion.

OSBORN BUILDING.

DR. ARTHUR H. BILL, Cleveland, Ohio, by invitation, read a paper on **The Treatment of Placenta Previa.** (For original article see page 523, September issue.)

DISCUSSION

DR. EDMUND B. PIPER, PHILADELPHIA, PA.—Dr. Bill should have differentiated between the ward cases and his own cases, watched from the beginning of their pregnancies and in labor. It has been my experience that the maternal mortalities are largely among ward cases where there is no record of the blood lost. I recall a case similar to the one he spoke of which emphasizes a point. The patient was easily delivered by version, with a partial placenta previa and a wide open cervix. Cesarean section was unnecessary in that case. Shortly after operation the patient was dead. She had not had a postpartum hemorrhage that would disturb the pulse of an ordinary individual. Dr. Bill stated, I think, that the cause of death in every case of placenta previa is postpartum hemorrhage. He spoke of bags as a conservative treatment. If one uses bags in central placenta previa, or the old method of pulling down one leg and using that as a tampon, it seems to me that the fetal mortality will be at least greatly increased; whether you will get better maternal results I do not know.

Another point I gathered was that there is rarely postpartum hemorrhage following cesarean section. I think the indication for cesarean section in placenta previa depends not upon whether the patient is a multipara, but upon the condition of the cervix. If there is a dilated cervix you may succeed with a vaginal delivery, but I think true conservation is where there is no progress in labor and where cesarean section is electively done.

One thing Dr. Bill did not mention and I may be entirely wrong about it, but following the case I spoke of, I have made it a routine practice, just as in the vaginal delivery of a premature separation, to pack every case of placenta previa that is delivered through the vagina. Hemorrhage usually comes from the lower uterine segment.

DR. BENJAMIN P. WATSON, NEW YORK CITY.—The great difficulty in discussing the treatment of placenta previa and especially in attempting to lay down a definite routine is that cases differ so much in severity, and so much depends upon the time at which the case is seen and upon the way in which it may have been handled previously. There is not and never can be one standard form of treatment for all cases. One would like to know in any series of cases how many had been seen at first hand by the man who ultimately treated the case and how many had been handled in the hospital.

That discussion of alternative treatments is necessary is shown by the high maternal and fetal mortality obtaining in our obstetric hospitals. Along with Dr. Douglas Miller I made an analysis of the 279 cases in the Edinburgh Royal Maternity Hospital between the years 1914 and 1924. The maternal mortality was 8.9 per cent and the fetal 64 per cent. Munro-Kerr reported a series of 476 cases in the Glasgow Maternity Hospital with a maternal mortality of 11.5 per cent and a fetal mortality of 71.84 per cent. Miller, of New Orleans, in 40 cases reports maternal mortality 20 per cent, fetal 54 per cent. In the Boston Lying-in Hospital in a series of 151 cases occurring between 1915 and 1925 Kellogg found a maternal mortality of 8.25 per cent. In the five years from 1921 to 1926, 57 cases treated in the Sloane Hospital, New York, gave a maternal mortality of 7

TABLE II. SHOWING FETAL DEATHS IN TREATING EIGHTY CASES OF PLACENTA PREVIA

MODE OF DELIVERY	TOTAL FETAL DEATHS		DEATHS OF FETUSES ABOVE 45 CM. LENGTH	
Spontaneous delivery	4 (27%)		1 (8%)	
Bag	5 (100%)		2 (100%)	
		9 (43%)		3 (21%)
Breech extraction	3 (100%)		0	
Bag	4 (80%)		2 (66%)	
		7 (88%)		2 (66%)
	0			
Craniotomy	1 (100%)		0	
Cesarean section	2 (40%)		0	
Braxton Hick's version	1 (17%)		0	
Bag	3 (100%)		0	
		4 (33%)		
Potter's version	1 (17%)		0	
Accouchement forcé	1 (33%)		0	
Bag	9 (36%)		4 (20%)	
Pituitrin and bag	1 (100%)		0	
		12 (34%)		4 (14%)
Total	35 (44%)		9 (17%)	
Total bag cases	22 (54%)		8 (29%)	

DR. RUDOLPH W. HOLMES, CHICAGO, ILL.—Read and Mueller, many years ago, compiled an exceptionally large number of cases of placenta previa: the causes of death from both statistical studies were essentially the same: one-quarter died from antepartum hemorrhage, about one-half from postpartum hemorrhage, and a quarter from sepsis. These cases were accumulated early in the antiseptic days, therefore, sepsis was prevalent: in these later days the mortality rate, from better asepsis, and technic of delivery, has fallen enormously, yet the relative incidence from septic deaths has not varied from those early statistical studies.

In 1905 I collected all the available cases of cesarean section for placenta previa. The mortality was so high that I stated in my paper that cesarean section killed a woman in order that a baby might be saved: this statement was substantiated by a comparison of mortalities in women treated obstetrically. Of course this statement is no longer true: but at the time of writing that paper I was convinced that cesarean section was a mistake when applied to the placenta previa case. Today, I believe cesarean section is the only approved method of delivery under certain conditions obtaining in placenta previa. I still believe the old obstetric aphorism that we must consider the mother and largely disregard the welfare of the baby in placenta previa is as true now as when first stated: the hemorrhage from placenta previa is rarely evidenced at term, its usual appearance is from the sixth to eighth month, therefore, the premature babies are compromised before delivery takes place. Kuehn found that of some twenty-five babies born alive from placenta previa mothers only one was alive at the end of two years.

After all is said and done the incidence of placenta previa is very low: I have had only two cases in all my personal private practice. As we find them, placenta previas reach us through the clinic and consultation—as a result the women come to use untreated, mistreated, in exsanguination. The untreated patients are more amenable to our care than the mistreated ones, for they have not been contaminated by unclean hands.

Cesarean section has its definitely clear field: first, in all women who not only have the previa but have a contracted pelvis; secondly, in a complete previa in a primipara or multipara. A primipara with placenta previa even of a partial degree, is more wisely delivered from above; in a lateral previa I would hold that pure obstetric procedures are more appropriate. That obstetric procedures have their

due place in previa is evidenced by the fact that Stratz had 167 cases with one death, his fifty-fifth case.

The personal equation must always be one of the essential factors in determining whether this or that procedure shall be employed in a given case, and this is nowhere more important than in the treatment of placenta previa. Many consider the tampon as an obsolete procedure, but I am firmly convinced that it has its place, as a prophylactic measure when the woman must be transported a long distance over bad roads to the hospital, or in an hospital when an alarming hemorrhage occurs and one must wait until the operating room is "set up"; when blood transfusion is imperatively necessary, the tampon will give time for the woman to react.

DR. JOSEPH B. DE LEE, CHICAGO, ILL.—I would like to call attention to the fact that the loss of blood may not always be determined by the pulse rate, by blood pressure readings, or by the blood count. For temporary periods nature has a means of keeping these physical conditions at a stage that impresses one as being normal or near normal when, as a matter of fact, there is depletion which will show up after delivery.

My treatment of placenta previa is now reversed. It used to be unusual to do cesarean section in placenta previa; now it is exceedingly unusual not to do it. When a patient enters the hospital with a suspected placenta previa, if not at term, she is put to bed to rest, and morphine is given to stop the pains. If there is sufficient hemorrhage to justify interference the patient is prepared for every possible method of treatment, and we decide what method we shall use after the first examination. If her condition is not too bad she is sent to the x-ray room and a picture taken to see if there is monster. Dr. Greenhill has collected from the literature 46 cases of monstrosities in placenta previa. Of 16 monsters that we have had in the Chicago Lying-in Hospital, eight were associated with placenta previa.

Primipara whether they are young or old are always delivered by cesarean section. A central placenta previa always has cesarean section done. If the patient is a multipara and has many living children we may do a Porro operation. The most important decision, however, is not whether she is to have an abdominal delivery, but what form of abdominal delivery? The low cervical cesarean is so much safer than the classical cesarean that the indication for the operation is doubly strong when one is capable of doing it. In the classical operation the placenta has to be cut through in one-half of the cases and there is more or less severe hemorrhage until we get the baby out; with the low cervical, the placenta is normally above and we do not have to fear hemorrhage. However, in doing the low operation for placenta previa one has to go through the placenta if it is on the anterior wall. If it is on the posterior wall this is not necessary. The risks of hemorrhage are about the same for both methods. If the placenta is on the anterior wall the patient should be fortified with a transfusion, or salt solution, because sometimes the amount of hemorrhage is as great as in the classical cesarean and might be very dangerous.

Referring to Dr. Bill's patient who died, I think there are possibly two explanations: First, that the woman may have had a bleeding from a torn vessel in the placental site. Sometimes these can be sewed up with the low operation, but not in the classical. Secondly, the sutured uterus may have ruptured during an after-pain because no matter how well the uterus is sutured, it may burst in the classical cesarean section. There are 14 cases on record.