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PLACENTA PRAEVIA

A Review of 200 Cases

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IN the eight-year period from 1946–1953, 200 patients with placenta praevia were admitted to the Royal Maternity Hospital, Belfast. The management of these patients in the antenatal period and at delivery has followed closely the principles outlined by Macafee (1945) in his original paper which were based on experience gained in the personal supervision of a series of 174 cases. The treatment in the present series has been carried out, not by any one individual, but by various members of the consultant staff, obstetric tutors and registrars. In this way, an opportunity arises for strict evaluation of Macafee's principles of management; if the latter are sound they should be applicable by all experienced obstetricians with equally successful results.

CLINICAL GROUPING

The patients were grouped according to which of the following degrees or types of praevia were present:

First degree (Type 1). The greater part of the placenta lies in the upper segment of the uterus, only the lower edge of the placenta extending into the lower segment.

Second degree (Type 2). The lower edge of the placenta extends as far as the margin of the internal os. This degree is further sub-divided into Type 2 anterior and Type 2 posterior according to whether the placenta is attached mainly to the anterior or posterior uterine wall, these different locations having a bearing on the

prognosis and on the method of treatment to be adopted.

Third degree (Type 3). The placenta completely covers the closed internal os but only partially so when the os is well dilated.

Fourth degree (Type 4). The lower uterine segment is covered almost completely by placenta.

In the clinical grouping of patients who were admitted with ante-partum haemorrhage, only those in whom the placenta was palpated in the lower uterine segment at vaginal examination, or noted to be implanted on the lower uterine segment at Caesarean section, were classified under the diagnosis of placenta praevia.

It must be admitted that this rigid standard of classification is far from satisfactory and this for two reasons:

(a) The possibility of excluding some cases of Type 1 placenta praevia. In the 8-year period under review, 34 patients each with a history of one or more episodes of painless vaginal haemorrhage in the later weeks of pregnancy were admitted to the hospital in labour; excessive bleeding was not present during labour, vaginal examination was therefore unnecessary and the mothers were delivered of 34 live infants *per vias naturales*. Examination of the placenta and membranes in each case was suggestive of Type 1 placenta praevia, and, although a high proportion of these cases undoubtedly were placenta praevia, they could not be included in the present series as the diagnosis had not been

confirmed accurately by vaginal examination. The exclusion of cases of this nature will lead to an unduly high proportion of major degrees of praevia in any series where the above standards of classification are adopted.

(b) The difficulty of making an accurate distinction between Type 3 and Type 4 praevia. This difficulty may be present even when the placental site is exposed at Caesarean section, and classification will then largely depend on the whim of the operator. In actual practice, the same treatment is employed for both degrees and much is to be said for combining them into one single group.

The numbers of the various types in the series are shown in Table I.

ONSET OF HAEMORRHAGE

The average onset of bleeding was governed to a large extent by the degree of praevia, and ranged from the 34th week in the major types to the 37th week in the minor. In 27 cases haemorrhage occurred at or before the 30th week of pregnancy, and of these the placenta was Type 1 in 1, Type 2 anterior in 1, Type 2 posterior in 2, Type 3 in 14 and Type 4 in 9 patients.

Thirty-six patients merit special mention as they serve to illustrate a common and often dangerous feature, namely, that a placenta may be praevia, even of major degree, without giving rise to bleeding during pregnancy. In this type of case the diagnosis is made when there is severe bleeding at the onset of labour, at operation, or with more serious consequences at vaginal examination undertaken for some other obstetric

complication, e.g., pre-eclamptic toxæmia prior to induction. In the 36 patients the placenta was Type 1 in 9, Type 2 anterior in 2, Type 2 posterior in 10, Type 3 in 9 and Type 4 in 6 patients.

MANAGEMENT

In the patients who were admitted at an early stage of pregnancy, for example, before 34 weeks, every effort was made to reduce foetal mortality from prematurity by prolonging the pregnancy to the 37th or 38th week provided this did not jeopardize the safety of the mother. This policy of expectant or conservative treatment was based on the realization that the initial haemorrhage in placenta praevia is seldom severe provided vaginal examination has not been carried out. In the present series, with the exception of 2 cases, bleeding either had ceased on arrival at hospital, or did so within a few hours after admission. The 2 cases mentioned illustrate the risk associated with vaginal examination; both had been examined at home and massive haemorrhage had resulted; on admission to hospital the patients were severely shocked and collapsed and required blood transfusion and operation; in each case bleeding was due to disturbance of a Type 4 placenta praevia and both infants were stillborn.

The length of time conservative treatment could be carried out with safety was determined mainly by the degree of praevia. In Types 3 and 4, repeated haemorrhages were common and often a sudden severe loss, following several small episodes or leading to a disturbance in the foetal heart rate, compelled operative interfer-

TABLE I

200 Cases	..	..	..	..	..	Primigravida	..	..	..	36	Multipara	..	..	164
Stillbirths	..	..	..	..	10									
Neonatal Deaths	..	..	..	..	14									
Maternal Mortality	..	..	..	..	Nil									

Type	Number	Average Onset of Haemorrhage	Per cent carried beyond or delivered after 36 weeks	Blood in pints
1	35	37 weeks	86.2	6
2 anterior	14	37 weeks	85.7	1
2 posterior	38	36½ weeks	89.5	8
3	66	34½ weeks	78.1	32
4	47	34 weeks	61.2	30

ence at an earlier stage than was desired. It must also be emphasized that many patients carried out their own expectant treatment at home until several episodes of bleeding finally forced them to seek medical advice.

During the period of waiting the patients' blood group and Rhesus factor were determined, the red cell count and haemoglobin level estimated at frequent intervals, and a speculum examination performed to exclude a local origin for haemorrhage. From 1952 soft tissue and displacement radiography to determine the placental site has been a routine investigation in all patients who are admitted with antepartum haemorrhage. The technique and results of this investigation in the diagnosis of placenta praevia in patients admitted to the Royal Maternity Hospital are shortly to be published. As a final investigation a "straight" X-ray is taken to exclude foetal abnormality. Seventy-five patients were treated by conservative measures and in this group the praevia was Type 1 in 4, Type 2 anterior in 3, Type 2 posterior in 13, Type 3 in 34 and Type 4 in 21 cases.

In patients who were admitted after the 37th week of pregnancy nothing was to be gained from further delay and treatment was deferred merely to determine the patient's blood group and to exclude foetal abnormality by X-ray. On completion of the investigations the patient was examined in the operating theatre, the diagnosis confirmed by vaginal examination and the treatment appropriate to the type of praevia instituted.

METHODS OF TREATMENT

The various methods of treatment employed in the different degrees of praevia are shown in Table II.

Type 1. In the earlier years of the period under review patients with Type 1 praevia were treated by artificial rupture of the membranes once the foetus was considered sufficiently mature to permit survival. In later years it has been the policy once diagnosis has been confirmed by vaginal examination to allow the patient to come into labour spontaneously and to reserve artificial rupture of the membranes for those patients who have more than a minimal loss of blood during labour.

It will be noted that 13 of the 35 patients with Type 1 praevia were treated by lower uterine segment Caesarean section. This high figure requires explanation; in 4 cases operation was undertaken for disproportion, in 4 for severe toxæmia, in 3 for prolapsed cord through a poorly dilated cervix, and in 1 on account of a history of difficult confinements; in the remaining case moderate bleeding persisted after artificial rupture of the membranes and foetal distress became manifest.

Type 2 anterior. Although artificial rupture of the membranes usually is sufficient to control haemorrhage in this degree of praevia, it will be noted that no less than 10 of the 14 patients were treated by Caesarean section. This high operative figure again demands explanation; operation was performed for disproportion in 2 cases, for diabetes in 2, for severe toxæmia in 1, for persistent transverse lie in 1, for prolapsed cord in 1, for poor obstetric history in 1, and on account of successful vaginal repair for stress incontinence in 1 case. In the remaining case foetal distress followed artificial rupture of the membranes. In 2 of the 10 patients there was no history of vaginal bleeding during pregnancy and the placenta praevia was diagnosed for the first time at operation.

TABLE II

Treatment	Type 1	Type 2 anterior	Type 2 posterior	Type 3	Type 4	Per Cent of Total
Nil	8	1	1	—	—	5.0
Artificial rupture of membranes	13	2	11	—	—	13.0
Artificial rupture of membranes and Willett's forceps	1	—	—	2	—	1.5
Version	—	1	3	5	—	4.5
Classical section	—	2	1	7	6	8.0
Lower uterine section	13	8	22	52	41	68.0

Type 2 posterior. Treatment and method of delivery in this degree were governed by the findings on vaginal examination. If the foetal head was engaged in the pelvis, or could be made to engage, artificial rupture of the membranes was the treatment of choice. Thereafter a frequent check was kept on the foetal heart for warning of compression by the foetal head of an umbilical cord inserted at the lower edge of the placenta. This complication occurred in 2 cases both of whom were delivered by Caesarean section immediately foetal distress was noted. In patients where the foetal head was above the pelvic brim and could not be made to engage, Caesarean section was performed. Version was undertaken in 3 cases where the infant was dead or considered too premature to survive. Of the various types of praevia, Type 2 posterior was the most difficult to treat and demanded considerable experience and judgment.

Types 3 and 4. All cases of Type 4 and the majority of Type 3 were treated by Caesarean section, either classical or lower segment. In the Type 3 group artificial rupture of the membranes and application of Willett's forceps was employed in 2 patients, and version in 5 where the baby was dead or unduly premature.

BLOOD TRANSFUSION

The total amount of blood used before, during and after delivery was 77 pints, or less than a third of a pint per patient (Table I). Transfusion rarely was required during the antenatal period and even 3 or 4 episodes of bleeding were usually of small amount and not sufficient to lower the haemoglobin level to a dangerous degree. The majority of transfusions were given during Caesarean section in patients with Types 3 and 4 praevia when excessive bleeding frequently occurred. As a rule the bleeding originated in the large venous sinuses in the uterine wall or in the placental bed. A third uncommon but much more serious and alarming cause of haemorrhage was due to partial adherence of the placenta to the lower uterine segment rendering its complete separation and removal an extremely difficult undertaking. This hazard was encountered in 3 patients, 2 with Type 3 and 1 with Type 4 praevia; in each case the

blood loss was considerable, 1 patient requiring 8 pints and the others 4 pints of blood during and after operation.

RESULTS OF TREATMENT

In the series, 201 infants were delivered and of these 10 were stillborn and 14 died in the neonatal period resulting in a gross foetal mortality of 11·9 per cent. One stillbirth due to hydrops foetalis was eliminated giving a corrected foetal mortality of 11·3 per cent. Two stillbirths were due to foetal abnormality, namely, anencephaly and hydrocephaly, but in view of the well recognized association of placenta praevia and foetal malformation, these infants were not eliminated. The maternal mortality was nil.

As previously stated, 75 patients (37·5 per cent) were treated by conservative measures for periods varying from 2–10 weeks; in this group there were 2 stillbirths and 6 neonatal deaths, giving a foetal loss of 16 per cent—a remarkably low figure when it is considered that 86·6 per cent of the 75 patients had a major degree of praevia, often with bleeding at an early stage in pregnancy.

The results of the various methods of treatment and the details of the stillbirths and neonatal deaths are set out in Tables III and IV. Apart from the 3 stillbirths associated with gross foetal abnormality, 3 infants were dead on admission to hospital, 2 died from intra-partum asphyxia and 1 from exsanguination following tearing of a vasa praevia at artificial rupture of the membranes. In the remaining case, internal version of a 7 pounds 8 ounces baby was carried out in a patient with a Type 2 posterior praevia—a gross error in judgment.

In the neonatal group, 4 of the 11 premature babies who were delivered by Caesarean section died from atelectasis. This is a disappointingly high proportion and serves to show one of the main hazards to the premature infant when delivered by this method.

Severe anaemia and foetal death from blood loss as a result of incision into an anteriorly situated placenta during lower uterine segment Caesarean section have been noted by several observers. Butler and Martin (1954), in a series

TABLE III
Results of the Various Methods of Treatment

Treatment	Number of Cases	Stillbirths	Neonatal Deaths	Percentage of foetal loss
Nil	10	1	1	8.3
Artificial rupture of membranes	26	1	—	4.2
Artificial rupture of membranes and Willett's forceps	3	—	1	4.2
Version	9	5	—	20.8
Classical section	16	2	2	16.7
Lower uterine section	136	1	10	45.8

TABLE IV

Type	Stillbirths	Neonatal Deaths
1	Normal delivery; intra-partum death. 5 pounds 6 ounces. Intra-uterine asphyxia.	—
2 anterior ..	—	L.U.S.C.S. at 38 weeks, 3 pounds 14 ounces. Died 11 hours later. Atelectasis.
2 posterior ..	Version. Baby dead on admission. Macerated. Hydrops foetalis.	Normal delivery at 37 weeks. 4 pounds 2 ounces. Died 6 hours later. Prematurity.
	Version. Intra-partum death. 7 pounds 8 ounces. Intra-uterine asphyxia.	—
	Version. Baby dead on admission. Hydrocephaly.	—
	A.R.M. Death from exsanguination due to ruptured vasa praevia. 7 pounds 7 ounces.	—
3	Version. 4 pounds 3 ounces. Anencephaly.	Classical Caesarean section at 40 weeks. 4 pounds 11 ounces. Died 8 hours later. Atelectasis.
	Version. 3 pounds 8 ounces. Intra-partum asphyxia.	L.U.S.C.S. at 34 weeks. 5 pounds 4 ounces. Died 8 hours later. Atelectasis.
	—	L.U.S.C.S. at 36 weeks. 6 pounds 2 ounces. Died 36 hours later. Atelectasis.
	—	L.U.S.C.S. at 30 weeks. 4 pounds 12 ounces. Prematurity.
	—	L.U.S.C.S. at 38 weeks. 3 pounds 12 ounces. Prematurity.
	—	Spontaneous onset of labour at 31 weeks. Application of Willett's forceps. 4 pounds 9 ounces. Prematurity.
4	C.C.S. at 36 weeks. Baby dead on admission. 10 pounds 1 ounce.	C.C.S. at 32 weeks. 4 pounds 4 ounces. Died 24 hours later. Prematurity.
	C.C.S. at 34 weeks. Patient collapsed on admission and foetal heart not heard. 5 pounds 8 ounces.	L.U.S.C.S. at 32 weeks. 4 pounds 12 ounces. Died 24 hours later. Prematurity.
	L.U.S.C.S. at 32 weeks. Patient collapsed on admission. Foetal heart not heard. 4 pounds.	L.U.S.C.S. at 39 weeks. 5 pounds 3 ounces. Died 48 hours later. Atelectasis.
	—	L.U.S.C.S. at 34 weeks. 5 pounds 4 ounces. Died 3 hours later. Intracranial haemorrhage.
	—	L.U.S.C.S. at 31 weeks. 4 pounds 3 ounces. Died 12 hours later. Prematurity.
	—	L.U.S.C.S. at 28 weeks. 2 pounds 4 ounces. Died 4 hours later. Intracranial haemorrhage.

of 19 cases where the placenta was incised, found anaemia in 5 infants, 3 of whom required transfusion. Neligan and Russell (1955) also stress the high incidence of foetal anaemia in cases of this type; in their series of 20 patients, no less than 7 infants required transfusion. In the Royal Maternity Hospital series, although incision of the placenta was a frequent occurrence foetal anaemia was not noted. Stab incision into the lower uterine segment, protection of the placenta by the forefinger while extending the incision and rapid delivery of the infant will do much to prevent blood loss from the foetal circulation.

DISCUSSION

From 1932 the results in three series of cases of placenta praevia admitted to the Royal Maternity Hospital have been reviewed.

In the first series 76 patients were delivered between the years 1932 and 1936 with a maternal mortality of 2·6 per cent and a foetal mortality of 51·3 per cent. This high foetal mortality rate was in keeping with corresponding figures published from other centres and was attributed to two main causes (*a*) prematurity, the direct result of the concept that placenta praevia constituted an obstetric emergency which demanded immediate intervention, and (*b*) the methods of delivery, e.g., version, Willett's forceps, then employed.

The second series which may be regarded as a "test" series was that published by Macafee and comprised 174 cases delivered between the years 1937 and 1944 with a maternal mortality of 0·57 per cent, and a foetal loss of 23·5 per cent. Many valuable lessons were gained in the supervision of these patients and it was hoped that their future application would lead to a still further reduction in mortality.

The present, or third series, has realized this hope and it remains only to discuss briefly the five factors which have contributed so much to the results.

The first factor has been the very great help given by the general practitioners and midwives. With the exception of 2 patients the remaining 198 were admitted without a vaginal examination having been performed. Such cooperation and

foresight have played a major role in the improved maternal and foetal mortality figures recorded. It is disturbing indeed to note that Mills of Birmingham and Snaith of Newcastle as late as 1951 complain of the high frequency of this examination by practitioners in their areas. The danger cannot be over-emphasized; in Qureshi's (1953) series of 200 cases, 30 mothers died and of these no less than 24 had been examined vaginally before admission. Accurate diagnosis may be satisfying to the practitioner but it will assuredly weigh heavily against the mother and infant.

The second factor has been the policy of conservative treatment in those cases where the infant was unduly premature to permit delivery. Conservatism was one of the two broad principles of management which evolved from Macafee's test series. In the series reviewed above it was carried out in 37·5 per cent of patients with a foetal loss of 16 per cent, whereas in 1,353 patients collected from reports of 24 hospitals in Great Britain and Eire it is interesting to note that only 13·5 per cent were treated conservatively for a period of 2 or more weeks and this with a foetal mortality of 24·5 per cent. Is the time-honoured dictum of Jaggard—"there is no place for the expectant treatment of placenta praevia"—undergoing a slow and lingering death or simply has a small recurrence of bleeding precipitated hasty and ill-timed interference?

The third factor and the other broad principle evolved from the "test" series has been the extended use of Caesarean section for delivery, especially in those patients with major degrees of praevia. The advantages of Caesarean section to mother and child and the hazards associated with the older methods of version, Willett's forceps and vaginal packing, were stressed by Macafee in his original publication and are sufficiently recognized not to require further elaboration.

The fourth factor has been the great improvement in the blood transfusion service. The value of readily available blood in the resuscitation of maternal collapse due to severe haemorrhage is obvious. Without blood being at hand vaginal examination should never be attempted in any case of suspected placenta praevia.

The fifth and final factor has been the very great help afforded by the paediatric service. Many infants are premature and demand specialized care and attention—in the series reviewed no less than 48 infants were under 5 pounds 8 ounces in weight and of these 13, or 25·4 per cent, died in the neonatal period. When it is recalled that 11 of the 13 infants were delivered by Caesarean section with its increased hazard to the premature baby, this is a remarkably low foetal loss.

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