

CIRCUMVALLATE PLACENTA AND ABRUPTIO PLACENTAE

(With a case report)

BY

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Introduction

Haemorrhages, either external, internal or combined, are a dreadful complication of pregnancy in its last trimester. Until 1664, all haemorrhages, occurring during pregnancy, were taken to be the effect of premature separation of normally situated placenta, viz. upper uterine segment. In 1776, Rigby was the first to enunciate that bleeding in the last trimester, from premature separation of placenta, may take place either above the lower segment or below. He put a special emphasis on this and designated one accidental haemorrhage in contradistinction to the unavoidable type.

Chantreuil, in 1801, first noted its association with proteinuria, which was thought, in 1885, by Winter to be associated with nephritis. In recent years F. J. Brown claims, as the result of experiments on pregnant animals, that acute or chronic nephritis is an important predisposing factor in the production of accidental haemorrhage, and toxæmia is the exciting cause.

Goodall in 1875 drew attention to the high mortality of patients with premature separation of placenta.

Holmes in 1901 suggested the term *ablatio placentae* and De Lee

abruptio placentae. Abruptio of the placenta means forcible breaking of the placenta from its normal site.

Our knowledge about the factor or factors in the causation of premature separation of a normally situated placenta is still far from perfect. Toxaemia of pregnancy lends its greatest support to this. Non-toxic separation of placenta is however by no means uncommon. The etiological factors, as such, have been broadly classified into toxic and non-toxic groups. Kellog and Hertig's pathological classification is very instructive, though its value in clinical practice is very much limited.

Moreover, the exact mechanism of premature separation is still the subject of varying controversy.

The association of circumvallate placenta with accidental haemorrhage in non-toxic groups has been greatly emphasised by various authors and the case under review also deals with the same; of course, it does not exclude the possibility of a patient with antepartum haemorrhage and circumvallate placenta having toxæmia of pregnancy or low lying placenta.

Williams was the first to describe this variety of placental abnormality in papers, but he did not attach any clinical importance to it, on the other

hand De Lee stated that circumvallate placenta has some clinical significance.

Sexton et al, in reviewing the cases of antepartum haemorrhage in Chicago Lying-in Hospital in a sixteen years' period noted that fifty-eight per cent of their cases of antepartum haemorrhage were of non-toxic group. In this large group they found some form of abnormal placental development with or without rupture of marginal sinus. In their series of circumvallate placentae, thirty-eight per cent had pathologic evidence of premature separation. They emphasised that many of the patients were in labour when first seen and explained that increased activity of the contracting and retracting uterus, in the presence of a placenta whose extrachorionic margin is in abnormal relationship to the degenerated decidua, is enough to initiate separation of the margin. Paalman and Verr in their description of circumvallate placenta have given the incidence of one in two hundred and eight deliveries. They are impressed by the high incidence of maternal haemorrhage, late abortions, premature labour and hydrorrhoea gravidarum. In their series twenty-one (51.2 per cent) patients bled, and of these eleven (26.8 per cent) had severe bleeding requiring transfusions.

Various etiological factors have been put forward to explain non-toxic accidental haemorrhage, viz. trauma, torsion of uterus, thrombosis of ovarian veins, traction of umbilical cord, endometritis and various dietetic deficiencies, but in most of the

cases these alleged etiologies can not be always correlated with the disease. It is quite reasonable to believe that some sort of placental abnormalities may have something to do in the causation of premature separation of placenta.

Case Report

On April 6 1955, at 6 p.m., a thirty year old married woman was admitted in Chittaranjan Seva Sadan (Women's Hospital). It was her sixth pregnancy and the gestation period was forty weeks. Her chief complaints were abdominal pain and vaginal bleeding. The former had begun 12 hours previously in the form of vague pain all over the abdomen, the latter had begun 2 hours before entering hospital as a moderate flow along with passage of clots. No history of trauma could be elicited.

Obstetric History.

The patient's previous five pregnancies were almost uneventful and all had terminated at forty weeks with spontaneous delivery of living healthy babies, excepting the second which was dead born; the cause of death could not be ascertained.

General Examination.

The patient was seen to be normally developed and in good general condition. There was no evidence of either anaemia or oedema. The blood pressure was 130 mm. systolic and 80 mm. diastolic. Pulse rate was 90 per minute and temperature was 98° F.

Per Abdomen.

The height of the uterus corresponded with the period of amenorrhoea. Sluggish painful contractions were felt. The baby was presenting by vertex, it was L.O.A. and the head was floating, foetal heart sounds were distinct and could be heard at the rate of 140 per minute. Tenderness on deep palpation could be elicited in upper uterine segment. The urine was free from albumin.

Speculum Examination.

Speculum examination showed the cervix tubular, os closed and the bleeding coming from inside the cervical canal. During the time of examination the bleeding was slight.

It is often difficult to determine the tenderness of uterus in cases of slight degree of placental separation along with labour pains, though in this case, however, there was slight tenderness, but emphasis could not be put on this and a provisional diagnosis of placenta praevia was made.

About two hours after her admission she started good pains with no further active bleeding. The presenting part was going down and was fixed in the brim; with further advancement of labour the presenting part was engaged; throughout the whole course the foetal heart sounds and blood pressure were constantly watched; there was no variation of either. The membranes ruptured spontaneously with discharge of blood-stained liquor amnii and within thirty minutes after rupture of membranes she gave birth to a healthy baby. Ten minutes after the birth of the child, placenta came out without any artificial aid. Thus the labour was over without any more loss.

Routine examination of the after-birth revealed circumvallate placenta with six to eight ounces of recent retroplacental clots.

Description of Placenta. A thick yellowish ring about one inch in diameter divided the foetal surface of placenta into outer two-third and inner one-third, the umbilical cord being inserted inside the ring, and the blood vessels strictly located within. The membranes were loosely attached to the placenta beyond the ring and could be stripped off easily, but the attachment of membranes proximal to the ring could not be separated. The amnionic and chorionic part of the membranes could be separated easily. The thickness of placenta was in no way different from the normal placental thickness. This description does not differ in any way from the description of circumvallate placenta in any text book (Fig. 1).

Microscopical Findings.

Section, from the yellowish ring portion, shows the picture of infolding of decidual tissue. The blood vessels were apparently normal.

Discussion.

The pathogenesis of separation of a normally situated placenta is uncertain or, if one prefers it, unknown.

The placenta is a highly vascular organ whose structure is frail, and its highly precarious villus attachment into the spongy layer of decidua is maintained chiefly by intrauterine pressure. Little is known about the choriodecidual relation and reaction. The association of abruptio placentae and antepartum haemorrhage with circumvallate placenta has been discussed recently, though various authors, past and present, noted its various other clinical bearings in obstetrics.

The incidence of circumvallate placenta is said to be about two per cent of all placentae. The ring formation on the foetal surface of placenta is said to be a variety of degeneration. Montgomery calls it a necrosis. The pathogenesis of ring formation is a question of singular difficulty; countless theories have sprung up only to be nullified as the result of further investigation.

It seems to me that a probable explanation would be that this ring formation is the pathologic manifestation of physiologic closing ring of Waldyer. During early development the area of chorion frondosum is limited by the formation of physiologic ring of Waldyer which in future

is characterised by the formation of a thick yellowish pathologic ring of circumvallate placenta. As this area is too restricted for the nutrition of the growing foetus, the peripheral villi grow outwards splitting the decidua basalis as a compensatory mechanism, thus dividing the foetal surface of placenta into a more vascular part proximally and less vascular distally. As a consequence of this, a circular area of degeneration just as a no man's land remains to indicate the boundary. The peripheral villi fail to establish firm attachment with the decidua and thus easy splitting of membranes of such placentae at the periphery is obtained.

The incidence of premature separation of placenta in different groups varies greatly in literature from centres all over the world. In O'donnel Brown's series of cases of accidental haemorrhage, seventy-two per cent were of toxæmic origin and twenty-six per cent were non-toxic. Dieckmann reports, from Chicago Lying-in Hospital, that sixty-nine per cent of cases were of toxæmic origin and thirty-one per cent were non-toxic. Sexton and his associates found forty-two per cent had toxæmia and fifty-eight per cent were of non-toxic origin.

To sum up, all the published reports show a surprising variation in the proportion of cases of accidental haemorrhage in which toxæmia co-existed, the percentage varying from over eighty to under thirty per cent. This variation probably reflects differing criteria for the diagnosis of toxæmia but undoubtedly there

remains a considerable number of cases of accidental haemorrhage in which some cause other than toxæmia must be sought.

Rupture of marginal sinus has been claimed to be a not infrequent cause of such bleeding by Fish et al and Harris, but Hamilton and Boyd have failed to confirm the constant existence of such a sinus.

O'donnel Brown, in his reported series, has emphasised that purely accidental separation of a normally situated placenta in a non-toxic, non-hypertensive woman can precipitate shock, and albuminuria as a sequel may mislead one to diagnose a case of non-toxic accidental haemorrhage as a toxæmic one. He has not referred to placental abnormality but has mentioned that in non-toxic accidental haemorrhage there is a chorio-decidual etiological factor

Circumvallate placenta, as an etiologic factor of non-toxic abruptio placentae, has been greatly emphasised by Sexton et al and Paalman and Verr; also cases have been reported by Bander, Donnely and other authors.

Few words about the antepartum diagnosis of circumvallate placenta. Circumvallate placenta is possibly impossible to diagnose without examining the placenta. Paalman and Verr have mentioned the antepartum diagnosis in twelve of the forty-one cases of their series and they went so far as to label the cases as circumvallate placenta on the patient's chart prior to delivery. Hobbs' and Hunt's detailed symptomatic description led them to correct diagnosis.

The vascular changes in circumval-

late placenta have not been reported by previous authors and the case under review also does not give any vascular pathology to explain the abruption. As regards the causation of placental abruption, it has been suggested by Hertig that the "Integrity of vascular supply to placenta depends upon the integrity of placental site rather than upon any intrinsic strength of blood vessels themselves. It then becomes evident that dissolution of placental site will result in rupture of decidual sinusoids leading to placental separation". Sexton has designated the portion of placenta, distal to ring, as an "extra-chorionic" part. It has been mentioned already that this extra-chorionic part possibly develops late as a compensatory mechanism; consequently, the blood supply to this portion is less which aggravates the process. During or just prior to the onset of labour the intrauterine tension increases and this abnormally related part cannot cope with this and results in abruption. The association of circumvallate placenta with cases of premature separation of placenta as cause and effect has been emphasised rightly in recent years. It seems to me that a more scrutinising examination of placenta is desirable. It has been said to be not a common placental abnormality and as such is likely to be missed by the accoucheur.

Equally more scrutinising examination of placenta in cases of antepartum haemorrhage will be helpful in revealing the part it plays in causing such antepartum haemorrhage in cases of abruption placenta.

Summary

Accidental haemorrhage has been observed in a case of circumvallate placenta.

Probable pathogenesis of the development and its effect has been discussed.

Its role in non-toxic accidental haemorrhage has been emphasised.

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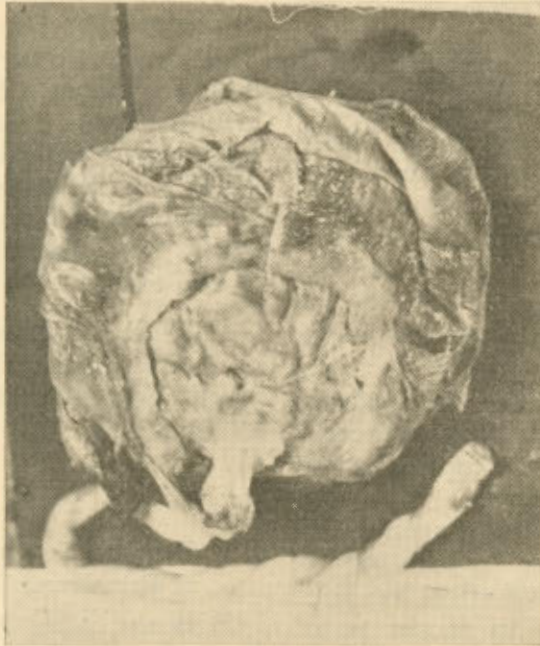


Fig. 1. Circumvallate Placenta.