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Maternal and Perinatal Outcome in Abruptio Placenta

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I. Introduction

Placental abruption, defined as the premature separation of the placenta, complicates approximately 1% of births. Although some degree of placental separation often occurs when there is a placenta previa, these cases are not conventionally considered abruptions in the true sense. Abruption may be "revealed," in which case blood tracks between the membranes and the decidua, and escapes through the cervix into the vagina . The less common "concealed" abruption occurs when blood accumulates behind the placenta, with no obvious external bleeding. Finally, abruption may be total, involving the entire placenta, in which case it typically leads to fetal death, or partial, with only a portion of the placenta detached from the uterine wall. Abruption may be implicated in up to 10% of preterm births. The risk to the fetus depends on both the severity of the abruption and the gestational age at which the abruption occurs (Fig. 1), whereas the danger to the mother is posed primarily by the severity of the abruption

STUDY SELECTION

The purpose of this review is to describe the epidemiology of placental abruption with particular emphasis on its incidence,and risk factors and to present an evidence-based approach to the diagnosis and management of the condition, with consideration of the severity of the abruption and the gestational age at which it occurs

Although placental abruption is an important cause of spontaneous preterm birth, it is also often an indication for iatrogenic preterm delivery. Premature separation of the placenta before delivery may deprive the fetus of oxygen and nutrition, leading to long-term handicap among survivors. A case– control study of 29 neonates, delivered after abruption, at a median gestational age of 29 weeks, found that 34% of them developed cystic periventricular leukomalacia, a 10-fold increase over controls. Similarly, the rate of intraventricular hemorrhage among the abruption cases was higher than that of controls.

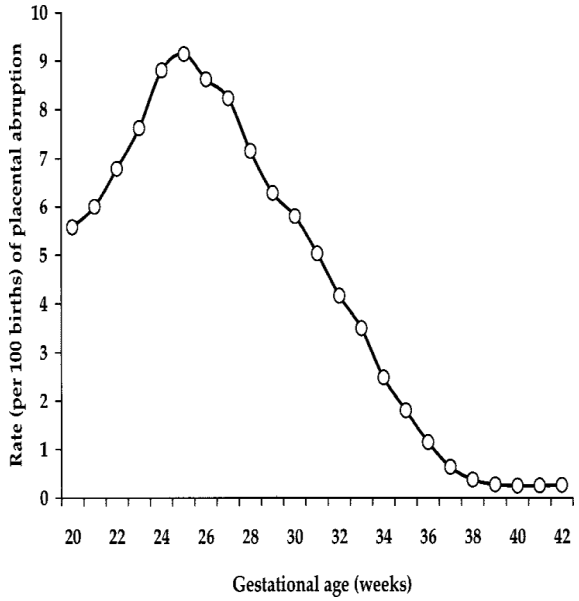


Fig. 1. Rates of abruption across gestation,

INCIDENCE OF PLACENTAL ABRUPTION

Several epidemiologic cohort studies have found that placental abruption complicates approximately 1% of deliveries. However, when Bernsichke and Gille performed pathologic examination of 7,038 consecutive placentas, they found evidence of abruption in 3.8%. Similarly, in the

U.S. Collaborative Perinatal Project, a prospective cohort study of 55,908 pregnancies, Niswander and Gordon found evidence of abruption in 2.12% of pregnancies. When the diagnosis of abruption is made by examination of the placenta by the pathologist, the majority of cases are noted to have had an unremarkable obstetric history. Thus, there is significant discrepancy between the rates of diagnosis of abruption between clinicians and pathologists.Because cases of abruption diagnosed solely on the basis of pathology examination typically have no obvious clinical consequences,we would recommend that obstetricians reserve the term "abruption" for those cases diagnosed on clinical grounds. An obvious exception to this rule would be cases of pregnancies with an adverse outcome in which examination of the placenta by the pathologist reveals evidence of an otherwise unrecognized abruption. Interestingly, the incidence of abruption is highest at 24–26 weeks gestation, and drops precipitously with advancing gestation

RISK FACTORS FOR ABRUPTION

Risk factors for placental abruption are summarized in Table1 .Other risk factors include trauma,thrombophilias,dysfibrinogenemia,hydramnios,advanced maternal age, and intrauterine infections.There is a dose–response relationship between the number of cigarettes smoked and the risk of abruption. At least 2 recent population-based retrospective cohort studies have indicated that women who have a cesarean first birth have an increased risk of placental abruption in a second pregnancy when compared with women who had a vaginal first birth.

Numerous case– control, cohort, and population based studies have attempted to determine the association between abruption and thrombophilias.Retrospective case– control studies that have examined the frequency of thrombophilias among women with abruption have mostly found increased rates of thrombophilias. Conversely, those that have compared rates of abruption between thrombophilias and controls have generally found no significant differences. Prochaczka and colleagues, in a retrospective case– control study of 102 women with abruption,failed to show any difference in incidence of factor V Leiden carriage status between the cases and controls.Secondary analysis of a large National Institutes of Health–funded prospective cohort study also failed to find an association between maternal and fetal factor V Leiden carrier status and placental abruption in women with no history of thromboembolism. Mean levels of homocysteine are higher among patients with abruptions that among controls.

Bleeding in early pregnancy carries an increased risk of abruption in later pregnancy. An elevated second- trimester maternal serum alpha-fetoprotein may be associated with an up to 10-fold increased risk of placental abruption. Similarly, notching of the uterine artery waveform in the second trimester, a marker of impaired uteroplacental blood flow, carries an increased risk of abruption.

Perhaps the greatest determinant of abruption risk, however, is an abruption in a prior pregnancy.The recurrence risk of abruption in subsequent pregnancies was quantified by Ananth and colleagues in a meta-analysis. The risk increased 15- to 20-fold in subsequent pregnancies when an earlier pregnancy was complicated by abruption. The relative risk of recurrence was less than9 in only one of the 11 studies examined

Abruption: Based on Published Studies

	Evidence	
Risk Factors	Strength	RR or OR
Maternal age and parity	+	1.1–3.7
Cigarette smoking	++	1.4–2.5
Cocaine and drug use	+++	5.0–10.0
Multiple gestations	++	1.5–3.0
Chronic hypertension	++	1.8–5.1
Mild and severe preeclampsia	++	0.4–4.5
Chronic hypertension with preeclampsia	+++	7.8
Premature rupture of membranes	++	1.8–5.1
Oligohydramnios	+	2.5–10.0
Chorioamnionitis	++	2.0–2.5
Dietary or nutritional deficiency	+/–	0.9–2.0
Male fetus	+/–	0.9–1.3

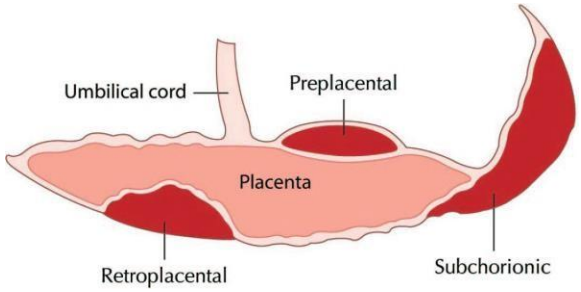
RR, relative risk; OR, odds ratio.
These estimates are the ranges of RR or OR found in independent studies.
Reprinted from Yeo L, Ananth CV, Vintzileos AM. Placental abruption. In: Sciarra J, editor. Gynecology and obstetrics. Vol 2. Hagerstown (MD). Lippincott, Williams & Wilkins; 2003. © 2003 Lippincott Williams & Wilkins.

TABLE 1

DIAGNOSIS

Clinical

The diagnosis of abruption is a clinical one and the condition should be suspected in women who present with vaginal bleeding or abdominal pain or both, a history of trauma, and those who present in otherwise unexplained preterm labor. The differential diagnosis includes all causes of abdominal pain and bleeding.These include placenta previa, appendicitis, urinarytract infections, preterm labor, fibroid degeneration,ovarian pathology, and muscular pain.



Ultrasonography

The ultrasonographic appearance of abruption depends to a large extent on the size and location of the bleed as well as the duration between the abruption and the time the ultrasonographic examination was performed. In cases of acute revealed abruption, the examiner may detect no abnormal ultrasonographic findings. Nyberg and colleagues, in a retrospective cohort study of images in 57 cases of abruption, found that the ultrasonographic appearance of abruption in the acute phase was hyperechoic to isoechoic when compared with the placenta. Later on, as the hematomas resolved, they became hypoechoic within 1 week and sonolucent within 2 weeks.In some cases, only a thickened heterogenous placenta could be seen. Thus, it is important to realize that abruption may have a variety of ultrasonographic appearances. The placenta may "jiggle" when sudden pressure is applied with the transducer, the so-called "jello" sign. Glantz and colleagues, in a retrospective cohort study, found that the sensitivity, specificity, and positive and negative predictive values of ultrasonography for placental abruption were 24%, 96%, 88%, and 53%, respectively.

Thus, ultrasonography will fail to detect at least one half of cases of abruption. However, a negative ultrasonogram does not rule out an abruption.Sholl identified ultrasonographic evidence of a clot in only 25% of abruptions,whereas Jaffe and colleagues found that ultrasonography identified only 50% of abruptions confirmed by pathology. Yeo and colleagues found, in a prospective cohort study of 73 patients presenting with vaginal bleeding in the second half of pregnancy,using 7 ultrasonographic parameters (mentioned below) that the sensitivity of ultrasound for placental abruption was 80%, whereas the specificity was 92%.37 Positive and negative predictive values were 95% and 69%,respectively. However, no other studies have replicated this accuracy for the ultrasonographic diagnosis of abruption.

Ultrasonography may also predict prognosis in abruption; Nyberg and colleagues, in a retrospective review of 69 cases of abruption, found that fetal mortality correlated with the ultrasonographically estimated percentage of abruption and with the location,with the worst prognosis occurring in retroplacental abruptions. An important role of ultrasonography in evaluation of bleeding in the second half of pregnancy is placental location; if there is a placenta previa, it makes it less likely that abruption is the cause of the bleeding.The ultrasonographer must be careful, though, not to mistake a clot over the cervix for placenta previa. The presence of a fundal placenta makes it unlikely that the mass covering the cervix is placenta. A clot may "jiggle"with movement of the fetus or ultrasoundtransducer.

Ultrasonographic Criteria for Diagnosis ofPlacental Abruption

1. Preplacental collection under the chorionic plate(between the placenta and amniotic fluid)
2. Jello-like movement of the chorionic plate with fetalactivity.
3. Retroplacental collection.
4. Marginal hematoma
5. Subchorionic hematoma
6. Increased heterogenous placental thickness (more than5 cm in a perpendicular plane)
7. Intra-amniotic hematoma

Adapted from Yeo L, Ananth CV, Vintzileos AM. Placental abruption. In: Sciarra J, editor. Gynecology and obstetrics. Vol 2.
*Hagerstown (MD): Lippincott Williams & Wilkins; 2003. ©2003 Lippincott Williams & Wilkins*positive Kleihauer-

Kleihauer-Betke Test

The Kleihauer-Betke test is frequently performed in women in whom abruption is suspected. There was no association between a positive test and abruption. Thus, the Kleihauer-Betke test has limited usefulness in the diagnosis of abruption. A negative test should not be used to rule out abruption, nor does a positive test necessarily confirm abruption.However, a Kleihauer-Betke test allows quantification of fetomaternal transfusion to guide dosingof Rh-immune globulin in Rh-negative women.

MANAGEMENT IN SUBSEQUENTPREGNANCY

Women with an abruption are at approximately ten- fold increased risk of abruption in a subsequent pregnancy. In addition, they are at increased risk of other adverse pregnancy outcomes, including preterm birth and preeclampsia. Although no interventions have been demonstrated to reduce this risk,some recommendations are possible. Women who smoke tobacco or use cocaine should be counseled on the adverse effects of exposure to these substances,and encouraged to quit before the next pregnancy.Hypertension should be controlled before and during the subsequent pregnancy. Although no clear benefit in reducing recurrent abruption risk has been demonstrated it is reasonable to treat women with inherited thrombophilias with thromboprophylaxis, as indicated,in subsequent pregnancies. Because patients with abruption have an increased risk of impaired uteroplacental perfusion in subsequent pregnancies, it is reasonable to consider serial growth scans every 4 weeks in the second half of pregnancy. In cases where the mother has had two or more prior abruptions amniocentesis for lung maturity and delivery at about 37 weeks gestation seems reasonable. weeks gestation seemsreasonable.

II. Conclusion

Placental abruption remains an important cause of perinatal mortality and morbidity. Perinatal mortality isdetermined by the severity of the abruption and the gestational age at which it occurs. Unfortunately neither accurate prediction nor prevention of abruption are possible at the present time. Despite advances in medical technology, the diagnosis of abruption is still a clinical one. When abruption does occur, there are some strategies that may help minimize the risks of morbidity and mortality associated with this condition.These include early recognition and prompt delivery in cases in which the fetus is mature and, in stable cases remote from term,conservative management to enable steroid administration, allow transfer to a center with facilities for care of the preterm infant,and in some cases, permit fetalmaturation before delivery. Finally, close attention tomaternal condition,with replacement of blood and bloodproducts as indicated, may improve outcomes for themother.

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