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Review Article

**PLACENTAL ABRUPTION****Noha Gomaan Alghamdi<sup>1</sup>, Zaker Mohammed Khoj<sup>2</sup>, Rawan Obaid Alguthami<sup>3</sup>, Ghofran Bader Al -Saif<sup>4</sup>, Anmar Abdulfattah Ismail Alkhudhari<sup>2</sup>, Muruj Salah Filfilan<sup>2</sup>,****Shahad Abdulaziz Aloufi<sup>3</sup>**<sup>1</sup> Dar Al Uloom University<sup>2</sup> Umm Alqura University<sup>3</sup> Ibn Sina National College<sup>4</sup> Abqiaq General Hospital**Abstract:**

**Introduction:** Premature separation of placenta is called placental abruption. They are classified as revealed and concealed. It occurs in about 1% of pregnancies and has a relatively high mortality and morbidity for mother as well as the fetus.

**Aim:** In this review we aim to understand the pathophysiology, diagnosis, and management of placental abruption.

**Methodology:** we conducted this review using a comprehensive search of MEDLINE, PubMed and EMBASE from January 1970 to March 2017. The following search terms were used: placental abruption, bleeding in pregnancy, hemorrhage, management of placental abruption

**Conclusion:** Placental abruption continues to be an important cause of significant maternal and fetal morbidity and mortality and is highly determined by the gestational age. Management can vary from conservative to immediate cesarean section, and close monitoring is crucial.

**Keywords:** placental abruption, bleeding in pregnancy, hemorrhage

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## INTRODUCTION:

When a placenta that is normally implanted separate prematurely, this is known as placental abruption. In some cases of placenta previa, a separation of the placenta occurs to some degree. However, this is not considered true abruption. In abruption cases, blood may leak and escape from the uterus, into the cervix and then to the vagina. These cases are called 'revealed abruption' and are the more common. The other less common type is called 'concealed abruption'. In this later type, blood stays and accumulates and does not cause any gross bleeding. Some cases of abruption involve the whole placenta, which can potentially lead to the death of the fetus; this is called total abruption. When only a part of the placenta is involved and detached, this is called 'partial abruption' [1].

As much as 1% of pregnancies can be complicated by placental abruption, making it a very common cause of bleeding from the vagina during the third trimester of pregnancy. Moreover, it is associated with relatively high rates of maternal and fetal morbidity and mortality. The severity of the abruption affects both maternal and fetal outcomes. However, gestational age at presentation only affects fetal outcomes. A history of a prior abruption, drug abuse, smoking, gestation with twins, trauma, thrombophilias, intrauterine infections, preeclampsia, premature rupture of membranes, advanced maternal age, and hydraminos, are all considered important predisposing factors that significantly increase the risk of developing placental abruptions. The risk of fetal death is highest when abruption involves half the placenta or more. placental abruption is clinically diagnosed, with limited role to imaging studies [2; 3].

## METHODOLOGY

### • Data Sources and Search terms

We conducted this review using a comprehensive search of MEDLINE, PubMed and EMBASE, from January 1970 to March 2017. The following search terms were used: placental abruption, bleeding in pregnancy, hemorrhage, management of placental abruption

### • Data Extraction

Two reviewers have independently reviewed the studies, abstracted data and disagreements were resolved by consensus. Studies were evaluated for quality and a review protocol was followed throughout.

This study was done after approval of ethical board of King Abdulaziz University.

## PATHOPHYSIOLOGY

Placental abruption pathophysiological mechanisms

are not well known in most cases. Abruption starts as a hemorrhage at the decidua-placental interface. Some theories suggest the presence of vasoconstriction of small vessels immediately prior to the apparent placental separation. Moreover, the decidua vessels may be thrombosed which will cause necrosis and further hemorrhage. However, abruption in most cases presents acutely. Another possible etiology is trauma causing shearing force which will eventually cause the separation of the placenta. This mechanism is more likely to be responsible in cases of uterine decompression that follows rupture of membranes, or the delivery of a twin. In mothers who abuse cocaine, the constriction of vessels may be the responsible trigger of the separation of the placenta. However, solid evidence supports the theory that in most cases, this separation causing abruption seems to be the result of chronic process that usually starts as soon as the first trimester [4]. A published cohort that included more than 34,000 women concluded that the presence of low levels of pregnancy-associated plasma protein A in the first trimester was associated with higher risk of developing abruption. Another case series that included twelve patients with placental abruption found that seven cases (58%) lacked sufficient placental implantation. Similar changes have been seen in pregnant females with preeclampsia, which led to the assumption that placental abruption and preeclampsia may have similar etiologies. In fact, many cases of abruption develop in pregnant females who had already developed preeclampsia. Another important association is the association between abruption and growth restriction. This association indicates that uteroplacental insufficiency may also contribute to the pathophysiology of placental abruption. Moreover, researchers have found significantly higher rates of chronic pathological lesions in placentas that later developed abruption when compared to controls [5]. A previous cohort also confirmed the association of impaired uteroplacental blood flow (measured by Doppler waveform of the uterine artery) and the later development of abruption. Therefore, it was strongly agreed that uteroplacental blood flow insufficiency significantly contributes to the etiology of abruption. Another event that was found to associate with the development of abruption is bleeding in the first or second trimesters of pregnancy. Women who suffered abruption that ended with preterm labor were found to have old placental bleeding when their placentas were biopsied. These findings support the assumption that thrombin is strongly involved in the pathology of abruption and spontaneous preterm labor [1].

When abruption occurs acutely, the fetus will suffer from significant lack of oxygen and nutrients. If left untreated, this will eventually lead to fetal death. This bleeding will lead to the activation of the coagulation cascade with the later consumption of factors, and subsequent development of disseminated intravascular coagulopathy (DIC). The risk of this fatal complication increase significantly with large separations of the placenta. DIC will cause hemorrhage which will also cause more consumption of factors, and this will continue in a vicious circle [6]. Couvelaire uterus is a boggy beefy uterus that is seen when this bleeding occurs in the myometrium. Pathological examination following abruption at the maternal side of the placenta will show the presence of fresh clots. On the other hand, late examination will likely show fibrin deposits or infarction. Microscopic evaluation of these cases was found to show hemosiderin-laden macrophages and the presence of villous hemorrhage [7].

#### Diagnosis

The clinical presentation of placental abruption may vary according to the underlying mechanisms. This variation may range from asymptomatic abruption, or minimal insignificant vaginal bleeding, to massive hemorrhage and the development of DIC. In most cases, vaginal bleeding is present, and is associated with non-reassuring fetal heart rates (indicating the presence of fetal demise), back pain, tetanic contractions, and hypertonic uterus. Some cases may also have spontaneous rupture of membranes. The absence of vaginal bleeding cannot rule out the presence of placental abruption. The reason is that up to 20% of cases may have concealed retro-placental bleeding. The classical presentation of a case of placental abruption is a women with mild bleeding that started progressively in the third trimester of pregnancy (or late in the second trimester) with the presence or absence of uterine contractions, back pain, and/or non-reassuring fetal heart rates [8].

Placental abruption is usually clinically diagnosed, with later confirmation when evaluating the placenta following delivery. Imaging modalities (e.g. ultrasound) are of low sensitivity and provide an unreliable method for the detection of abruption. In fact, many cases with obvious clinical presentation of abruption have negative ultrasound findings. However, performing an ultrasound is still necessary to rule out placenta previa and to possibly show the exact site of a large hemorrhage. In some mild cases of placental abruption, diagnosis may not be discovered until delivery when placenta is grossly examined. It is important to know, when examining the placenta that the gross findings of placental abruption do not develop immediately and will likely

take some time [9].

When the abruption is severe, even high quality maternal and fetal care is still associated with high rates of maternal and fetal complications. Rare cases of placental abruption can end with maternal death. More common complication include hemorrhage (that may be severe and require transfusion), DIC, and infections. When Couvelaire uterus is found, hysterectomy may be required [10].

When the abruption is mild, the main cause of fetal affection is suggested to be prematurity, rather than the abruption itself. These neonates are usually born with low birth weight, anemia, hyperbilirubinemia, and/or fetal growth restriction. A large retrospective cohort of more than 50 thousands births concluded the association between abruption and stillbirth, with a risk of still birth that is about 9-fold higher in abruption. Moreover, abruption was associated with 4-fold higher risk of preterm birth, and 2-fold higher risk of neonatal growth restriction. Fetal mortality can reach 12% in cases of repeated abruption. The size and severity of placental abruption are proportionally related to the incidence of stillbirth. When the abruption involves more than half the placenta, the risk of stillbirth significantly increases [11].

#### Management

When the abruption is severe, the best management is to perform vaginal delivery, as long as there is no other complications and the mother is stable. This is the rule in all gestational ages. When the uterus is having strong contractions this will further make delivery easier. In cases of slow delivery, amniotomy can be done. Coagulopathy and hypovolemic shock can occur sometimes. In these cases, aggressive administration of coagulation factors and blood should be started immediately. Physicians should also place a Foley catheter with strict monitoring of urinary output. In cases of feto-pelvic disproportion, or mal-presentation, labor is not likely to progress easily, and a caesarean section will be a must to avoid other severe complications. If DIC develops, bleeding control will become extremely difficult, and thus the stabilization of patients is essential during and before the surgery. Following labor, the mother should be closely monitored with strict observation of blood loss, vital signs, and urinary output. Uterus should also be monitored closely for any increase in the size or bleeding. When the uterus is hypertonic, a hysterectomy may be needed. A complete blood count and coagulation profile should be routinely performed until the mother stabilizes [12].

When abruption is associated with preeclampsia, preeclampsia may not be apparent due to the hypovolemic state created by abruption, leading to severe untreated preeclampsia. Therefore, a high clinical suspicion for preeclampsia should be always considered in patients with placental abruption, especially when the cause of the abruption is not clear and identified. A close volume monitoring, with early detection of the disease will significantly improve outcomes [13].

When abruption present near term and the fetus is alive, delivery is immediately indicated. However, in some cases, vaginal delivery is associated with high maternal mortality. In these cases, which include the presence of fetal compromise, immediate cesarean delivery should be performed. If cesarean delivery was not performed early, total attachment and separation of the placenta may occur leading to severe, and possibly fetal, maternal and fetal complications. On the other hand, if maternal vital signs and fetal state are reassuring, expectant conservative vaginal delivery may be considered. However, strict monitoring of both the fetus and the mother should continue. In case of non-reassuring fetal heart rate, immediate cesarean delivery is performed. Also, the mother should be strictly observed for any concerning signs or events. In cases of preterm gestational ages (before 34 weeks), conservative management should be applied if the placental separation is partial. However, close monitoring of the patients should continue. Steroids also should be administrated to stimulate fetal lung maturity [14].

There is no rule for managing incidental asymptomatic abruption, and the ideal management largely depends on the clinical presentation. A thorough history should be taken along with a proper physical examination to detect the possible cause of the abruption and to be able to predict prognosis and possible complications. Any evidence of cocaine abuse, hypertension, trauma, and other concerning events should be taken into consideration. Delivery can be possible if the fetus is in term. However, when the fetus is preterm, conservative expectant management will be the target [15].

#### SCREENING FOR THROMBOPHILIAS

When there is no clear etiology for the abruption, pregnant patients should be screened for possible acquired or hereditary thrombophilias. Factor V Leiden, antithrombin III, Protein S deficiency, protein C deficiency, or prothrombin gene mutation, are all possible causes of the abruption. Any positive finding should be further taken into consideration and

confirmed. Treatment with aspirin and heparin is essential to protect later pregnancies. When patients are found to have methyl-tetrahydrofolate reductase deficiency, B6 and B 12 supplement should be administrated [16].

#### CONCLUSION:

Placental abruption continues to be an important cause of significant maternal and fetal morbidity and mortality. The severity of abruption affects both maternal and fetal prognosis. However, the gestational age affects mainly fetal prognosis. No reliable methods for prediction and prevention of placental abruption have been introduced. Despite medical advances, and developed imaging modalities, the diagnosis of an abruption case is still clinical. Early detection and proper management with delivery (either vaginal or cesarean) are essential to improve the prognosis of both the mother and the fetus. When the mother and fetus are stable, conservative management is a possible desired plan, along with the administration of steroids to stimulate lung maturity. Close monitoring and observation are still required.

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