



CODEN [USA]: IAJPBB

ISSN: 2349-7750

**INDO AMERICAN JOURNAL OF  
PHARMACEUTICAL SCIENCES**<http://doi.org/10.5281/zenodo.2392565>Available online at: <http://www.iajps.com>

Research Article

**INCIDENCE, RISK FACTORS, MANAGEMENT, AND PROGNOSIS OF  
PLACENTA PREVIA; A REVIEW OF RECENT LITERATURE**

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<sup>1</sup>King Abdulaziz University<sup>2</sup>Jordan University of Science and Technology<sup>3</sup>Ibn Sina National College<sup>4</sup>PHC Ministry of Health Dammam<sup>5</sup>Maternity and Children Hospital in Maddingah<sup>6</sup>Unaizah College of Medicine (UCM)<sup>7</sup>Dallah hospital \_ Namar<sup>8</sup>Hamdard College of medicine and dentistry, Hamdard University<sup>9</sup>Medical university of Warsaw (Poland)<sup>10</sup>Royal College of surgeons in Ireland**Abstract:**

**Introduction:** The term 'placenta previa' is used to describe a case in which the placenta is implanted in the lower part of the uterus leading to covering of the endocervical os.

**Aim of work:** In this article, we aim to provide an approach toward the diagnosis, management, and treatment of placenta previa being a leading cause of morbidities and mortalities among mothers.

**Methodology:** We did a systematic search for placenta previa using PubMed search engine and Google Scholar search engine. The terms used in the search were: placenta previa, abnormal placentation, classification of placenta previa, management of placenta previa, and diagnosis of placenta previa.

**Conclusions:** The most common and classic presentation of placenta previa is vaginal bleeding any time at pregnancy. Transvaginal ultrasound is usually the diagnostic modality of choice to diagnose and assess placenta previa, as it provides accurate measurements of the relation between the placenta and the endocervical os. Placenta previa can be associated with severe hemorrhage that can be recurrent and refractory to treatment, leading to hysterectomy. Therefore, cesarean section is recommended in most cases to prevent the occurrence of hemorrhages and bleeding.

**Keywords:** placenta previa, abnormal placentation, hemorrhage

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Please cite this article in press Hajar fahad Alghamdi et al., **Incidence, Risk Factors, Management, and Prognosis of Placenta Previa; a Review of Recent Literature.**, *Indo Am. J. P. Sci.*, 2018; 05(11).

**INTRODUCTION:**

Abnormal placentation of the placenta can result in several different conditions according to the site of placentation. The clinical picture, severity, management and prognosis differ among these conditions, but they all share their association with significant morbidity and mortality. These conditions include placenta accrete, vasa previa, and placenta previa, and all of them can be associated with severe complications. In fact, risk of hysterectomy because of placenta accreta has been significantly increasing in the recent years in several regions of the world<sup>1</sup>. Moreover, placenta accrete can be associated with severe loss of blood that can be as high as 5 liters, leading to death in up to 7% of cases.

The term 'placenta previa' is used to describe a case in which the placenta is implanted in the lower part of the uterus leading to covering of the endocervical os. Previously, placenta previa used to be classified as marginal, partial, and complete according to the size of blockage of the endocervical os by the placenta. More recently, the introduction and routine use of the transvaginal ultrasound led to improvements in exactly localizing the edges of the endocervical os and the edges of the placenta, which led to changing the classification into only marginal and partial, as transvaginal ultrasound helped us realize that in any case of placenta previa, the placenta can never totally overlie the endocervical os<sup>2</sup>. Cases of placenta previa that result in antepartum bleeding are responsible for over 2.3% mortality. Moreover, placenta previa associated with vasa previa can be associated with more than 60% mortality to the fetus [3]. However, recent advances in radiology led to the development of advanced ultrasound techniques that helped in the early diagnosis and management of placenta previa, in attempts to achieve improved outcomes for both the mother and the baby.

In this article, we aim to provide an approach toward the diagnosis, management, and treatment of placenta previa being a leading cause of morbidities and mortalities among mothers.

**Methodology:**

We did a systematic search for placenta previa using PubMed search engine (<http://www.ncbi.nlm.nih.gov/>) and Google Scholar search engine (<https://scholar.google.com>). Our search also looked for classifications, diagnosis, management and treatment of placenta previa. All relevant studies were retrieved and discussed. We only included full articles.

The terms used in the search were: placenta previa, abnormal placentation, classification of placenta previa, management of placenta previa, and diagnosis of placenta.

**Pathology:**

In placenta previa, the endocervical os is covered by the placenta either partially or completely. Problems start to occur following the dilatation of the cervix and the effacement of the lower segment of the uterus. This will result in bleeding as the placenta will separate. Localization of the exact site of the placenta is achieved using transvaginal ultrasound, which will also visualize the location of the placenta in association with the internal endocervical os. Placenta previa is called marginal when the inferior edge of the placenta is within two centimeters of the endocervical os [4].

Most symptomatic cases of placenta previa will resolve spontaneously before the third trimester of pregnancy, making it unnecessary to diagnose the condition until the third trimester of pregnancy. The only exception for this is the presence of a complete previa, which can be diagnosed even during the second trimester. Therefore, it is not acceptable to diagnose a placenta previa in a patient with bleeding during the first trimester of pregnancy. On the other hand, during the first trimester or the second trimester, the term 'low-lying placenta' is appropriate of use, despite its limited significance clinically<sup>2</sup>. Studies estimate that more than 90% of cases of low-lying placenta will spontaneously resolve as the patient reaches the third trimester of her pregnancy.

The use of ultrasound is preferred, however, in most cases to completely assess the location of the placenta in relation to the cervix, and to measure the exact distance between the endocervical os and the edge of the placenta [1].

**Incidence and Risk Factors:**

It is estimated that out of 200 full term pregnancies, one pregnancy will have placenta previa [5]. A meta-analysis on placenta previa cases between 1966-2000 concluded that the overall prevalence of placenta previa is about 4 per 1000 full term deliveries<sup>6</sup>. Until now, no evidence on the exact cause of placenta previa is present. However, some researchers suggest that the presence of damages to the uterine wall, as a result of curettage for example, can be related to the later development of placenta previa. Other factors that were found to be associated with this include prior endometrial surgeries, and multiple pregnancies<sup>4</sup>. In addition, some researchers suggest that the recent increases in the cesarean delivery rates

led to a significant increase in the rates of placenta previa. In fact, a study has found that undergoing a cesarean section will lead to double the risk of developing placenta previa in a later pregnancy [7].

Another factor that has been found associated with developing placenta previa is older age at pregnancy. Reports have suggested that females older than forty years are at a 5% higher risk of developing placenta previa. Smoking, abortions, multiparity, and Asian race have all been found to increase the risk of placenta previa for up to double the risk [8]. Even a threatened abortion has been found to be associated with significant increases in the risk of developing placenta previa. Interestingly, placenta previa itself has been associated with increasing risks of fetal abnormalities, mental retardation, and increased infant mortality [8].

#### **Clinical Implications:**

Placenta previa can lead to the development of several complications and morbidities in both the mother and the fetus. Some of these complications are a result of the hemorrhage that occurs in placenta previa. In fact, pregnant females who have placenta previa have ten times the risk of having bleeding throughout their pregnancy [9]. It is not well understood how exactly this bleeding occurs, but it seems to be related to the placenta being separated from the beneath decidua as a result of uterine contractions, effacement, dilation of the cervix, and increased gestational age [9].

This bleeding that follows placenta previa will lead to a higher risk of needing transfusion. Moreover, it is associated with a significant risk of hysterectomy, and severe hemorrhage leading to admission of the mother at the intensive care unit. Thrombophlebitis, septicemia, and death can also occur in severe cases of placenta previa [10].

When it comes to complications and morbidities in the fetus, most fetal comorbidities in placenta previa cases are indirectly caused due to pre-term delivery and prematurity. A previous study on United States females found that up to 27% of pregnant women with placenta previa would deliver between the 34<sup>th</sup> and the 37<sup>th</sup> week, and up to 17% of pregnant women with placenta previa would go into labor before the 34<sup>th</sup> week of gestation [11]. Moreover, fetal mortality can be three to four times higher in placenta previa cases<sup>11</sup>.

#### **Prenatal Diagnosis:**

Transvaginal ultrasound must be performed in any pregnant female with a suspected placenta previa, in

order to accurately assess the placenta and its relation to the endocervical os. The use of transabdominal ultrasound can provide placental fundus visualization, but still it is not as accurate and conclusive as transvaginal ultrasound. Some studies have claimed that transvaginal ultrasound may be associated with high risk of bleeding. However, no solid evidence is present to support this claim, and later studies all proved the safety of transvaginal ultrasound, especially when performed by an experienced clinician [4]. Another technique is the performance of transabdominal ultrasound associated with translabial imaging, which will improve the results of transabdominal ultrasound.

One limitation of using transabdominal ultrasound it's the association of this technique with overdiagnosis of low-lying placenta cases, which increases even more if imaging is conducted with an empty bladder<sup>4</sup>. Transvaginal ultrasound, on the other hand, may not provide accurate results in the first two trimesters, as it is not able to accurately detect the position of the placenta in relation to the endocervical os [12]. However, the positive predictive value of transvaginal ultrasound in diagnosing placenta previa increases significantly when the patient reaches the third trimester of pregnancy [13].

As a rule, accuracy of screening for placenta previa increases as pregnancy progresses. This means that imaging within 20-22 weeks of pregnancy, for example, is associated with more accurate diagnosis that imaging within 13-15 weeks of pregnancy. This is also because that most of early cases of placenta previa will spontaneously resolve as pregnancy continues [13]. When ultrasound imaging shows the edge of the placenta to be thick, this will be associated with higher risk of placenta previa persistence until delivery [14].

When an ultrasound confirms the presence of a placenta previa early in pregnancy, it is important to perform a follow-up imaging at the 32<sup>th</sup> week to confirm the presence of placenta previa and assess the current position of the placenta. Another follow up imaging should be considered at week 36 to plan delivery. Pregnant females who had a prior cesarean section were found to have higher risk of developing placenta previa that will persist until the time of delivery<sup>15</sup>.

#### **Antepartum Management:**

When pregnancy reaches the 36<sup>th</sup> week and the presence of placenta previa is confirmed, the appropriate definitive management is delivery. This is also the case when there is excessive bleeding

placenta previa, or the life of the fetus becomes in danger. Otherwise, clinicians should first attempt conservative treatment modalities, which have been proven to be safe and effective in prolonging pregnancy for about four weeks after the onset of bleeding [13].

It is also important to administrate betamethasone as it will aid in achieving maturity of the lung, when bleeding occurs before the 34<sup>th</sup> week. The use of tocolytics is still debatable when bleeding is present. Some studies have suggested that they are associated with improved outcomes regarding pregnancy duration. However, later studies showed that they led to the development of significant side effects including severe tachycardia in the mother, which can affect physiological responses during the delivery. Therefore, more recent is needed in this area to reach solid conclusion, taking into consideration the risks, benefits, and cost-effectiveness of tocolytics when they are used in symptomatic placenta previa cases [16].

For any pregnant woman who presents with bleeding, conservative management should be followed by strict follow-up for at least 48 hours after bleeding stops. If bleeding does not recur within 48 hours, and patient returns to a stable normal status, treatment can be safely continued as an outpatient [17]. In order for a pregnant woman with placenta previa to be discharged from hospital, she must become asymptomatic, with stopping of the bleeding, and disappearance of abdominal pain. After discharge, activity should be limited to prevent the recurrence of bleeding. Moreover, access to telephone and services must be readily available for the patient for emergency cases [17].

In general, there is a risk of 60% that the bleeding recurs later in these patients resulting in hospital readmission. Therefore, despite sufficient management, these patients remain at a high risk of early delivery with having infants with low weight [17]. Some studies have suggested measuring the length of the cervix to predict the risk of bleeding recurrence.

Some recommend the mother to decrease activity, avoid sexual intercourse, and bed rest to decrease the risk of bleeding recurrence. However, no solid evidence is present to support these recommendations. The use of cervical cerclage was also not associated with clear benefits in preventing bleeding in pregnant females with placenta previa [4].

### **Delivery Considerations:**

Timing and method of delivery in cases of placenta previa remain to be a controversial issue. Some researchers suggest that cesarean section should be performed in any pregnant woman who has a placenta lying within two centimeters from the endocervix. This should be assessed and confirmed using transvaginal ultrasound, and within the third trimester of pregnancy. This suggestion is based on the fact that most of these women will later require cesarean section due to the proximity of their placenta from the endocervix [18].

On the other hand, when the placenta is located in more than two centimeters from the endocervix, the need for cesarean section decreases with more than 60% of women undergoing successful normal vaginal delivery<sup>18</sup>. In fact, the risk of bleeding during labor is less than 3% in these patients, making vaginal delivery an acceptable option.

However, the previously mentioned recommendations are based on studies where results could have been potentially biased, as physicians participating all these studies were not blinded to treatment, making it necessary to conduct more controlled studies before reaching solid conclusions.

In more severe cases of placenta previa, where the placental edge is within less than one centimeter of the endocervical os, there is a significant risk of bleeding before and during labor. In fact, the risk before labor in these patients can reach 30%. Moreover, most of these patients will suffer from severe bleeding during delivery which will necessitate a cesarean section [19].

According to the guidelines applied in the United Kingdom, females with placenta previa are still considered at high risk of bleeding, regardless of the site of placenta. Therefore, they recommend performing a cesarean section on these females, by experienced physician, due to high risk of developing complications [20]. On the other hand, guidelines in the United States do not necessitate the performing of cesarean section in these patients by an experienced physician. In fact, it is common there for these patients to be managed by junior residents.

When performing a cesarean section in women with placenta previa, it is recommended to perform a Kerr incision (low-transverse section). In addition, the clinician must immediately clamp the umbilical cord following delivery, especially in cases where placenta previa is anterior. This is because of the risk of blood loss that is caused by placental disruption during the

entry of the cesarean operation. Moreover, this risk of hemorrhage may necessitate the use of a vertical incision in some cases, especially when there is an associated malpresentation, as this will lead to a complete central placenta previa [19].

The use of inhaled anesthetic agents and general anesthesia during cesarean sections is known to lead to relaxation of the uterus. On the other hand, local anesthesia is found to cause relatively less intraoperative blood loss, and thus less rates of requiring blood transfusions [21].

In some cases, atony may lead to a severe hemorrhage after delivery from the site of placental implantation. These cases will require administration of several pharmacological agents to be controlled. In addition to pharmacological agents, some cases may require a B-Lynch suture, a local suture of the bed of the placenta, and/or a balloon tamponade within the uterus, to be able to stop the bleeding [22].

Cases where patients suffer from recurrent hemorrhages, or severe hemorrhages that are refractory to all lines of management, may require hysterectomy. Some author suggested the use of sterile gauzes packing in the uterus as attempts to stop refractory bleeding which occurs during a caesarian section in the setting of placenta previa. This method was suggested to be use as a safe and possibly effective measure especially in low-income countries [23].

Another possible measurement is the application of a topical gel with hemostatic activity to effectively control the lower uterine segment while performing laparoscopic surgery in patients with refractory hemorrhage following cesarean section and placenta previa [24].

Generally, it is recommended to perform an elective delivery in all pregnant females with confirmed placenta previa, before a severe hemorrhage occurs. The best option is to plan delivery when the patient reaches the 36<sup>th</sup> week of gestation. This has been found to be linked with favorable outcomes, and the fetus will have already matured by then. Generally, the risk of severe hemorrhage after the 36<sup>th</sup> week outweighs any other benefit or harm associated with delaying delivery further [25].

### CONCLUSIONS:

Placenta previa is known to be the inferior implantation of the placenta with covering the endocervical os. It is considered to be one of the abnormal placentation conditions and is known to be

related to significant morbidity and mortality if not managed properly. The most common and classic presentation of placenta previa is vaginal bleeding any time at pregnancy. However, a definitive diagnosis of placenta previa should not be made until the third trimester, as most cases will spontaneously resolve by the time of delivery. Transvaginal ultrasound is usually the diagnostic modality of choice to diagnose and assess placenta previa, as it provides accurate measurements of the relation between the placenta and the endocervical os. Placenta previa can be associated with severe hemorrhage that can be recurrent and refractory to treatment, leading to hysterectomy. Therefore, cesarean section is recommended in most cases to prevent the occurrence of hemorrhages and bleeding.

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