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Abnormal Placentation: Placenta Previa, Placenta Accreta and Vasa Previa - An Overview

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Abstract: ***Aberrations in the normal development of the placenta include placenta previa or low - lying placenta, placenta accreta and vasa previa. Prenatal diagnosis is critical since any of these illnesses can have a significant impact on labour, birth, and the third stage management. In recent years, there has been a surge in the occurrence of these placental abnormalities, with the increase in the LSCS (Lower Segment C - Section) rate regarded to be a significant cause of this phenomena. Early identification of impaired placental implantation can be obtained by combining a comprehensive risk assessment with modern advances in ultrasonography. Pathologies involving the insertion of the umbilical cord are also a source of concern. The atrophy of sections of the growing placenta causes velamentous cord insertion, which is an abnormality in the insertion site of the umbilical cord. Because Wharton's jelly does not protect the blood vessels of the umbilical cord in this state, the amniotic membranes are more likely to rupture. A velamentous insertion of the umbilical cord in which blood vessels are present over the cervical os (Cervical Orifice) is known as a vasa previa. The foetus may suffer devastating consequences if these blood veins rupture during childbirth. This article provides a review of epidemiology, clinical importance, pathophysiology, diagnosis and management options for this condition, thus providing safe, effective care and management.***

Keywords: Placenta Accreta, Placenta Previa, Vasa Previa, Rupture, Velamentous cord insertion, Hemorrhage.

Search strategy and Study Selection:
The search of literature review was using PubMed (a web - based database). Placenta previa OR Low - lying placenta AND placenta accreta AND vasa previa were the key words in the search strategy. The search was limited to the English language, but there were no time limits because there're a few articles published each year. Reviews and research were also used to compile the literature. To acquire a quick overview of the publications, we utilized the PRISMA flowchart.

1. Introduction

The placenta is often known as the "tree of life. " It is an organ of metabolism, respiration, and excretion for the developing foetus when it is operating normally. An aberrant placental implantation, on the other hand, can turn a normally scheduled birth into an emergency situation. Pathologies of the placenta and cord insertion, such as a morbidly adherent placenta, placenta previa, and vasa previa, were once thought to be uncommon in obstetric treatment. The rise in caesarean rates has unintentionally resulted in an increase in several hitherto uncommon conditions [1 - 4]. Endometrial damage, which can occur as a result of operations including curettage, endometrial ablation, myomectomy, and assisted reproductive technologies, might result in incorrect placenta implantation in a later pregnancy [2, 3, 5, 6]. All pregnant women are routinely assessed for conditions that could cause problems during labour and delivery by a skilled practitioner. Identification of women who may be at risk for placental and cord diseases is critical. The goal of this article is to give all doctors who offer prenatal care and attend births a complete grasp of the pathophysiology, dangers, and management of these diseases.

Normal Placental Development
About one week after fertilization, the blastocyst will start to implant into the uterine wall. Trophoblastic cells, located on the outer surface of the blastocyst, will initiate the formation of the placenta. The developing embryo usually implants in the upper portions of the uterus, and the placenta develops in the endometrial bed directly beneath it. As the pregnancy progresses, the trophoblastic cells continue to differentiate into the different layers of the placenta. Tiny projections known as villi extend into the endometrium as the placenta matures. It is within these villi that the transfer of nutrients occurs between the maternal and fetal blood flow. There are several different types of placenta transport mechanisms, which allow for the transfer of oxygen and chemical substances required for fetal development without the fetal blood coming in direct content with the maternal blood. The placenta is fully formed by 18 to 20 weeks' gestation and continues to grow throughout the pregnancy [2, 5]. A simple separation of the placenta at the time of birth is dependent on this normal implantation process.

Previa Placenta Definition
Placenta previa is one of the placental problems that can develop during pregnancy. It occurs when the placenta fully or partially covers the internal os (cervical orifice). Whereas the normal placenta often resides in the upper uterine region [2] [7]. The majority of morbidity and mortality due to postpartum hemorrhage occurs by placenta previa [8]. This condition makes vaginal birth considerably more difficult, which is why caesarean delivery is preferred. Generally, four

kinds of placenta previa exist:

Types	Definition
Complete placenta previa	Placenta completely covers the internal OS.
Partial placenta previa	Placenta partially covers the internal os. Thus, occurs only when the internal os is dilated to some degree.
Marginal placenta previa	Placenta which reaches the internal os, but does not cover it
Low - lying placenta	Placenta which extends into the lower uterine segment but does not reach the internal os.

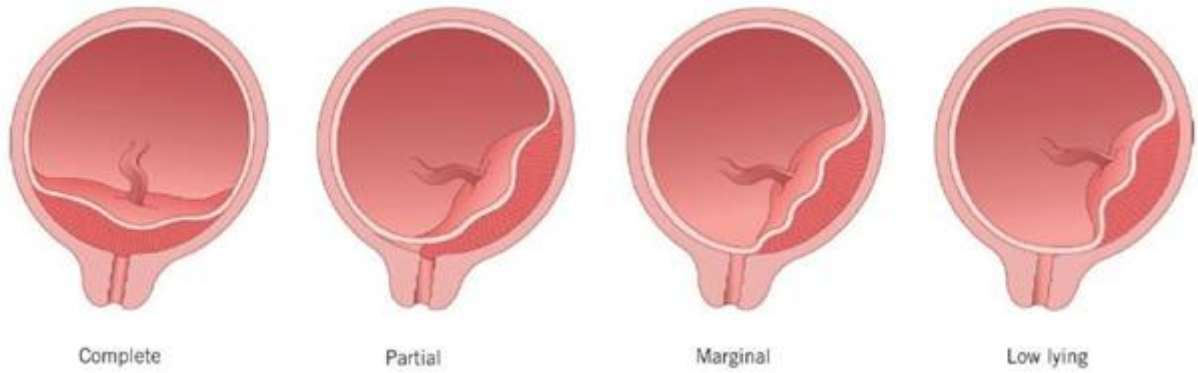

Figure 1: Types of Placenta previa.

Illustration: John Yanson. Oyelese. Placenta Previa, Accreta and Vasa Previa. Obstet Gynecol 2006.

Epidemiology

Between 1979 and 1987, a survey of the US population revealed an annual incidence of placenta previa of 4.8 per 1, 000 births (0.48 percent) [9]. Placenta previa occurs in between 0.3 and 2% of third - trimester pregnancies and has become more frequent reason for increased caesarean sections to happen. [8] [10] [11].

Clinical significance

Antepartum bleeding, hysterectomy, morbid placental adherence, intrapartum haemorrhage, postpartum haemorrhage, blood transfusion, septicaemia, and thrombophlebitis are some of the morbidities associated with placenta previa [12]. As a result of recurrent bleeding and many hospitalizations throughout the third trimester patient may experience mental distress. Placenta previa is also associated with risk factors of preterm delivery, perinatal death and has significant morbidity and mortality in related studies [13]. Eventually, this placental issue is associated with a higher risk of congenital abnormalities [13]. Pregnant women who have a history of delayed maternal age (i. e., more than 35 years of age), multiparity, smoking, curettage, cocaine use, or caesarean section (s) are at risk for placenta previa [14]. Maternal age and placenta previa interactions have been associated with an increased risk of uterine surgery or reproductive therapy [15]. Cigarette smoking includes nicotine and carbon monoxide, both of which serve as potent vasoconstrictors of the placental arteries, impairing placental blood flow which results in abnormal placentation [16]. In the second or third trimester, sexual activity, vaginal examination or labour can all result in painless vaginal bleeding [17]. Massive bleeding can be avoided by a digital inspection. A retrospective analysis study of 724 women diagnosed with placenta previa concluded that after adjusting for known confounding factors (race, gestational diabetes, preeclampsia and a single umbilical artery) there was no indication of foetal growth limitation [18].

Pathophysiology

The placenta previa or low - lying placenta, fully or partially covers the cervix. A low - lying placenta's border should be within 2 to 3.5 centimetres of the internal os [19]. In marginal placenta previa, the placental boundary is within 2cm of the internal os [19]. Nearly 90% of placentas were shown to be low lying, a condition that will resolve during the third trimester due to placental migration [20] [21]. There is no explanation for why some placentas implant in the lower uterine section rather than the fundus. The placenta develops preferentially toward a more vascularized fundus (trophotropism), whereas the placenta that covers a less vascularized cervix may cause uterine atrophy [22]. In situations of partial uterine atrophy, a succenturiate lobe may form. The apparent movement of the placenta may be a result of the development of the lower uterine region.

Another possible mechanism which depends on the level of pressure in the uterine arteries. Normally, the uterine arteries run parallel to the uterine wall, supplying oxygen to the uterine muscle. Uterine arteries and veins can infiltrate and cross the uterine wall during pregnancy, supplying blood and other nutrients necessary for embryonic development. When placenta previa occurs, the placenta attaches to the cervix as a low - lying placenta. During labour, when the cervix dilates and effaces to expand the delivery canal [7]. At this time, the placenta begins to detach from the cervix, but due to the low lying position of the placenta, pressure is placed on the uterine arteries, which are tugged on one side by the placenta and on the other side by the uterine wall. As a result of the increased pressure, arteries burst and inevitable bleeding begins [7].

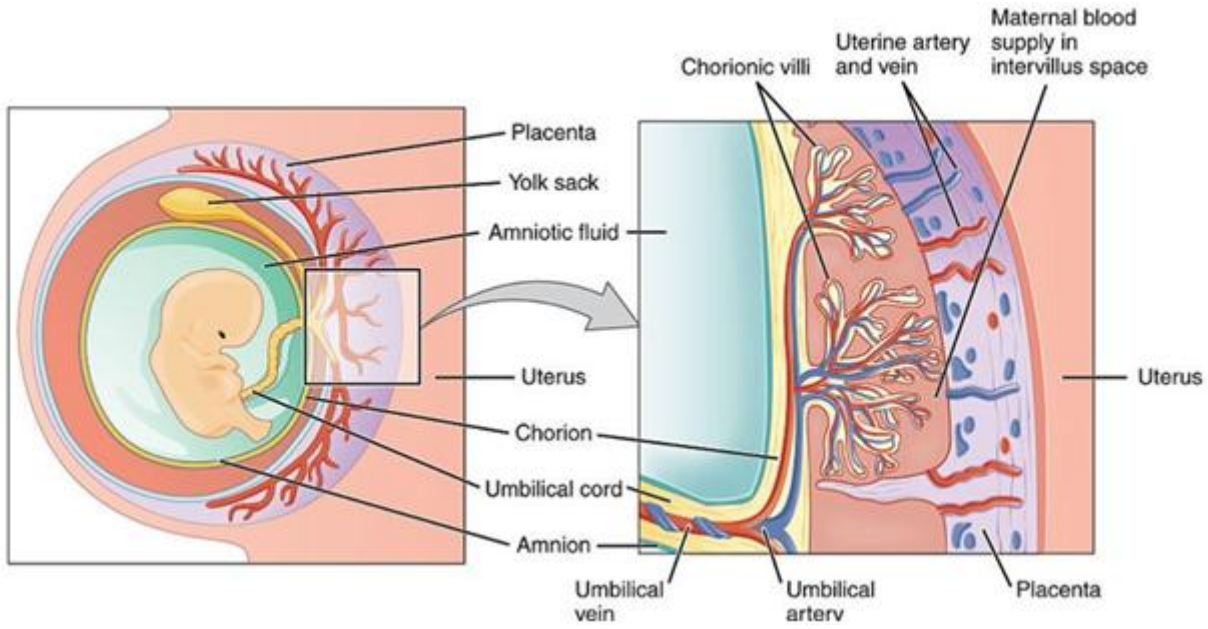

Figure 2

Approach to Diagnosis

Around 70% of individuals with a low - lying placenta will present with typical clinical symptoms of painless bleeding in the late second or early third trimester. However, 20% of patients will have painful bleeding, most likely as a result of uterine contractions and 10% will experience no bleeding prior to delivery. Late pregnancy (beyond the age of 35 years) might result in an unstable laying or malpresentation due to placenta previa. Early standard sonography can detect placenta previa in an asymptomatic woman during the second trimester [2]. While transabdominal sonography is frequently used to detect the placenta, it is imprecise in recognising placenta previa [23, 24]. Numerous studies have demonstrated that transvaginal sonography is more accurate than transabdominal sonography in detecting placenta previa [23, 24]. False - positive and false - negative diagnoses of placenta previa using transabdominal sonography occur at rates ranging from 2% to 25%. In research by Smith et al [23], anatomic features necessary for accurate identification were missed in 50% of instances in 131 women suspected of having a placenta previa using transabdominal sonography.

Numerous factors contribute to the advantages of transvaginal sonography versus transabdominal sonography:

1) Because the transabdominal technique requires bladder filling, the front and posterior walls of the lower uterine segment become closer together, giving the appearance of a previa.
2) Because vaginal probes are closer to the region of target and are more often used than transabdominal probes, they produce higher - resolution pictures.
3) Typically, the transabdominal method is ineffective in photographing the internal cervical os and the lower placental border. The location of the internal operating system is assumed rather than defined.
4) When using the transabdominal method, the foetal head may block pictures of the lower placental border, resulting in an insufficient view of a posterior placenta previa.

Though transvaginal sonography is more precise than transabdominal sonography, it may also results in fewer false - positive diagnoses [24]. As a result, the rate of placenta previa is significantly reduced when transvaginal sonography is utilised instead of transabdominal sonography [25]. Lauria and colleagues observed a placenta previa rate of just 1.1 percent at 15–20 weeks using regular transvaginal sonography, which is substantially lower than the 15–20 percent second trimester placenta previa incidence previously reported using transabdominal sonography [26]. Numerous studies have demonstrated the safety of transvaginal sonography in identifying placenta previa [27]. However, this imaging method does not result in increased bleeding. Translabial sonography has been recommended as an alternative for transvaginal sonography and has been proven to be more effective in locating the placenta than transabdominal sonography [28]. Transvaginal sonography, on the other hand, is a highly accurate, safe, and well - tolerated imaging technique. According to different research [25 - 28], the majority of placentas in the lower uterine segment during the second trimester will no longer in the cervix region by the time the baby is born. The amount to which the placenta covers the internal os during the second trimester can have an effect on the baby's survival to term. The later in pregnancy a diagnosis of placenta previa is obtained, the more probable it will persist until birth [26]. Women who have a low - lying placenta at 20 weeks that does not extend over the internal os at term do not have placenta previa and do not require further sonographic tests to confirm placental position. On the other hand, a low - lying placenta in the second trimester increases the chance of developing a vasa previa, and so an ultrasonography should be conducted later in the pregnancy to rule it out.

2. Management

Historical treatment for suspected placenta previa included a vaginal examination and if confirmed, an emergency surgical birth. It was thought that the mother's first bleed (which typically occurs in the early third trimester) was deadly. According to MacAfee et al. [29], preterm birth due to placenta previa was the primary cause of infant death,

which may be significantly decreased with effective expectant management and delivery as close to maturity as feasible.

Women who have bleeding during the second trimester of pregnancy should undergo a sonographic examination (ideally transvaginal) to determine the position of the placenta prior to doing a digital examination. In the presence of a placenta previa, a digital vaginal examination can result in catastrophic haemorrhage and should be avoided [11]. If a woman with placenta previa is experiencing significant bleeding or uterine contractions, she should be hospitalised. Blood should be drawn through one to two wide - bore intravenous cannulas for a full blood count, type and screening. At least four units of suitable packed red blood cells and coagulation factors must be kept ready to immediately access from the blood bank. Women who are Rh negative should be given Rh immune globulin. A Kleihauer - Bettke test for fetal - maternal transfusion should also be conducted in Rh negative women, since the mother may require increased doses of Rh immune globulin.

According to preliminary data [30], tocolytic treatment may be beneficial for women who are experiencing contractions due to placenta previa. Contractions can result in cervical effacement and alterations in the lower uterine region, which can result in bleeding and further contractions, forming a vicious cycle confirmed with the study conducted by Sharma et al. [31]. They conducted a small randomised clinical study using the alpha - adrenergic ritodrine and observed that women who took ritodrine had significantly longer pregnancies and normal birth weights than those who took a placebo.

Similarly, Besinger et al. [30] reported that using intravenous magnesium sulphate and/or oral or subcutaneous terbutaline was related with a longer pregnancy and a increased birth weight in women with symptomatic placenta previa compared to not using tocolytics in a retrospective analysis. Thus, when both mother and baby are stable, it is appropriate to use tocolytics prudently in women with placenta previa who are undergoing contractions. To promote foetal lung development, steroids should be administered to pregnant women between the ages of 24 and 34 weeks, typically during hospitalisation for bleeding.

A meeting with a neonatologist should be scheduled for the patient and her family to discuss the infant's postnatal care. In women who had a caesarean birth or uterine surgery, a thorough ultrasound should be conducted to rule out placenta accreta. Preterm delivery is the leading cause of perinatal mortality in placenta previa, which is why it is recommended to continue the pregnancy as long as possible. If no maternal or foetal risk exists prior to 32 weeks of pregnancy, moderate - to - severe bleeding can be actively treated with blood transfusions rather than delivering the baby [32].

After 48 hours of no sign bleeding, the patient may be considered for discharge if she resides in an environment conducive to outpatient therapy. The patient must have access to a phone, to be accompanied at all times by an adult who is accountable and reside within a reasonable distance of a hospital. If she feels blood or contractions, she should get to the hospital immediately. Despite the lack of evidence demonstrating the advantages of abstaining from intercourse and strenuous activity, common sense requires that they be avoided. Similar to bedrest, which is commonly prescribed, there is no evidence that it is beneficial.

Placenta Accreta/Percreta/Increta Definition

Placenta accrete refers to the aberrant attachment of the placental trophoblast to the uterine myometrium; it is also referred to as morbidly adherent placenta.

Placenta accreta: A placenta accreta occurs when the chorionic villi get in touch with the myometrium.

Placenta increta: A placenta increta occurs when the chorionic villi indulge into the myometrium.

Placenta percreta: This condition develops when chorionic villi penetrate the uterine wall, the uterine serosa and may adhere to adjacent pelvic organs such as the colon, bladder or uterine ligaments. The most often involved extrauterine organ is the bladder.

Numerous studies in the literature make no distinction between the three forms of improperly adherent placentas since each type has the same risk of life - threatening maternal haemorrhage and is treated similarly. Unless otherwise specified, the word "placenta accreta" refers to the three different forms of abnormal placental implantation discussed in this article.

Epidemiology

Placenta accrete occurs around 1 in 4000 births in the 1970s, 1 in 2500 deliveries in the 1980s, and 1 in 533–730 deliveries more recently [33–35].

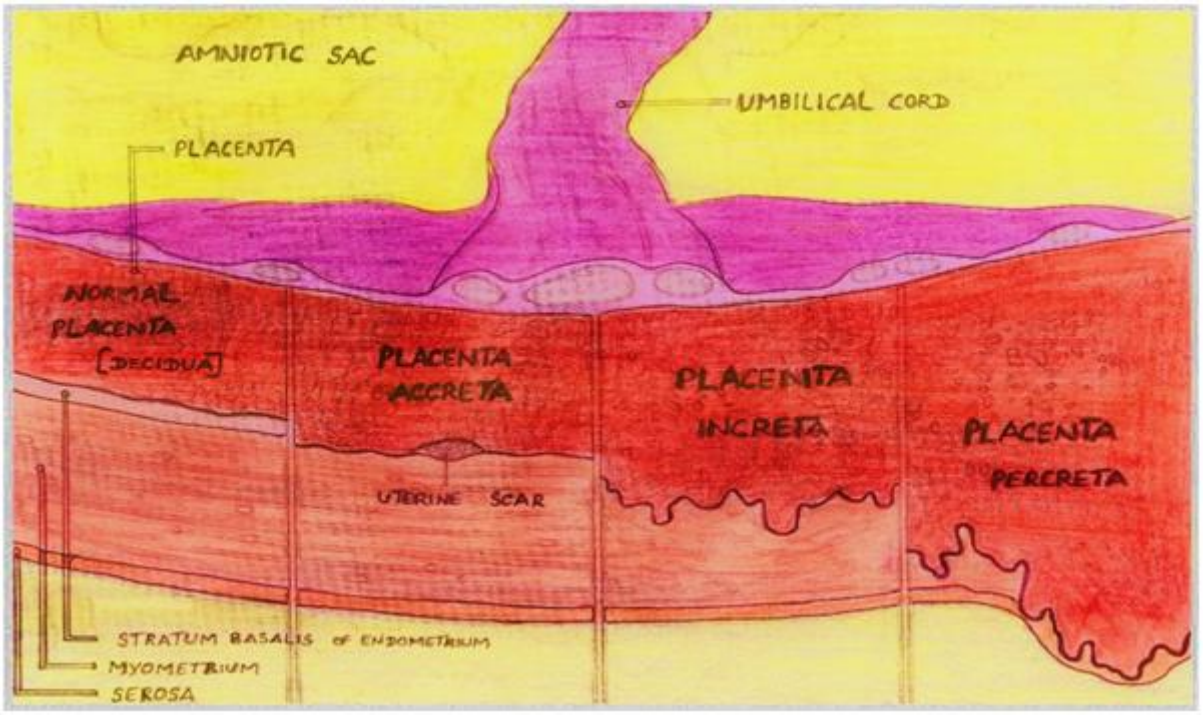

Figure 3: Anatomy of Placenta accreta/ increta/ percreta. a) Placenta accreta (attachment of the placenta to the myometrium without intervening decidua) b) Placenta increta (placental trophoblast invasion of the myometrium) c) Placenta percreta (invasion through the myometrium, serosa and into surrounding structures).

Clinical Importance

Placental accrete may result in significant obstetric haemorrhage, which can result in complications such as disseminated intravascular coagulopathy, hysterectomy, surgical damage to the ureters, bladder or other viscera, adult respiratory distress syndrome, renal failure or even death [36]. On average, women with placenta accrete lose between 3, 000 to 5, 000 mL of blood during delivery [36]. In several centres, placental accrete has been the leading reason of caesarean hysterectomy [37]. In rare circumstances, placenta accrete can result in spontaneous uterine rupture during the second or third trimester, resulting in potentially fatal intraperitoneal haemorrhage. Minor degrees of placenta accrete may occur, resulting in somewhat greater postpartum bleeding, but may not necessitate the intensive care frequently required with more widespread placenta accrete.

Pathophysiology

The pathogenesis of placental accrete is yet unknown. Any condition or procedure that affects the endometrium is believed to cause a defect in the decidua, which may result in an invasive trophoblast developing into the endometrium [38]. A prior caesarean scar in the uterus stays avascular, initiating a series of metabolic processes that allow trophoblastic tissue from a subsequent pregnancy to penetrate deeper into the myometrium at the scar's site. The accretion of the placenta appears to set the scene for a pathologic implantation in which oxygen and nutrient transport across the fetal–maternal interface is severely compromised. On the other hand, the presence of placenta accrete is not associated with an increased risk of IUGR (Intra Uterine Growth Retardation) or foetal death [39]. A retrospective study of caesarean deliveries showed no significant difference in the risk of IUGR between 139 women diagnosed with placenta accrete and 34, 730 controls [38]. Low birth weight has been observed in neonates delivered following a difficult pregnancy complicated by placental accrete, although this has been linked to gestational age at delivery [38].

Approach to Diagnosis

Women who have significant clinical risk factors for placenta accreta spectrum (e. g., previa, previous caesarean birth, endometrial ablation, or other uterine surgery) should have their placenta accreta spectrum examined by a specialist [11]. Obstetrical sonography in the second or third trimester of pregnancy is the gold standard for prenatal diagnosis and the range of abnormalities consistent with placenta accreta is well defined [39]. Occasionally, the condition is detected during the first trimester, generally by the finding of an ectopic pregnancy in which the embryo becomes lodged in the myometrium of a prior caesarean scar. If such pregnancies are not terminated medically or surgically, placenta accretas can develop. When a high risk exists, ultrasonography in the second and third trimesters has been demonstrated to accurately identify placental accrete spectrum with high sensitivities and specificities. MRI (Magnified Resonance Imaging) has been shown to be beneficial in the diagnosis of posterior placenta previa or suspected bladder invasion [39]. MRI on the other hand, is expensive and requires specialised expertise of accreta diagnosis, which is not widely available. In two brief trials directly comparing the two screening techniques, MRI was shown to be inferior to ultrasonography [40] and did not improve diagnosis or outcome when compared to ultrasonography.

Management

A crucial problem in choosing the delivery time is to balance the new - born risks of preterm birth with early planned LSCS against the risk of bleeding or labour that requires an emergency. Due to the fact that the majority of patients with

placenta accreta spectrum have a placenta previa, postponing delivery to term decreases the risk of preterm while raising the likelihood of labour and haemorrhage. A decision analysis of women with placenta accreta and placenta previa indicated that delivery at 34 weeks of pregnancy was the best strategy for balancing maternal and infant risks [41]. In the absence of other evidence, scheduled delivery at 34 weeks gestation is considered as acceptable for asymptomatic women with clinical and imaging symptoms highly suggestive of placenta accreta spectrum. Women who have a history of preterm birth, bleeding or contractions are more likely to have an emergency delivery; hence, delivering before to 34 weeks of pregnancy may be prudent in situations of bleeding or suspected labour. Delivery can be delayed until 35 or 36 weeks in asymptomatic patients with placenta previa if clinical and imaging data suggest a low risk of placenta accreta spectrum. In all cases of planned preterm birth, glucocorticoids should be administered to the mother ie.12 mg of betamethasone intramuscularly 2 to 7 days before delivery and should be repeated 24 hours later to enhance foetal pulmonary lung maturity [41]. While these interventions make intuitive sense in women with placenta previa, their effectiveness has not been empirically established. Bed rest is also suggested for women who are bleeding, however it is unknown whether this has any influence on the result. While the majority of hospitals accept only women who are bleeding or on the approach of labour, some admit all women with the condition throughout the third trimester. Factors such as the woman's capacity to care for herself at home and the distance to the hospital may influence the woman's decision to stay in the hospital. Women suspected of having a placenta accreta spectrum should deliver at a facility equipped with the requisite expertise and experience [11]. Delivery at such clinics has been linked to a reduction in bleeding and other problems compared to normal care [11].

Maternal–fetal medicine, gynecologic surgery, gynecologic oncology, anesthesiology, transfusion medicine, interventional radiography, trauma and vascular surgery and urology are all examples of multidisciplinary expertise, as is the presence of intensivists, neonatologists, and specialised nursing personnel. It's important that the blood bank can manage large - scale transfusions of a variety of blood components. Although efficacy has not been demonstrated, employing a prenatal or preoperative checklist, team training and simulation is advised. Transfer of women who get a diagnosis of placenta accreta spectrum at the time of laparotomy to such a clinic, depending on distance, could be considered if hysterotomy is necessary [11].

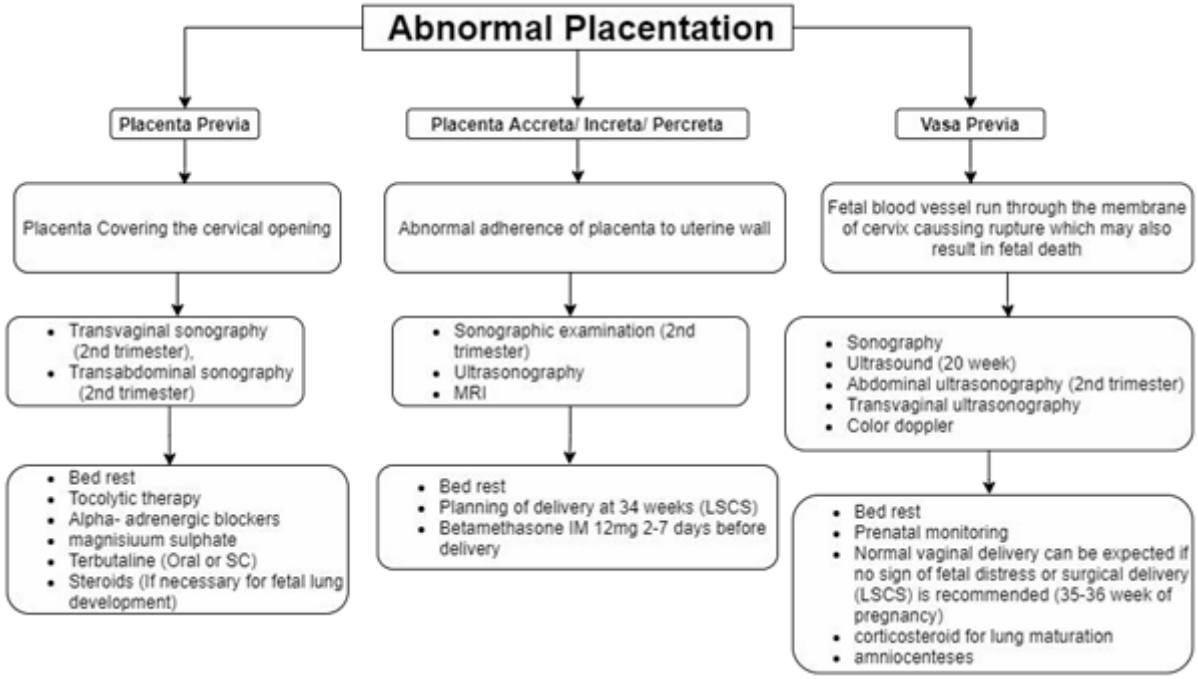

Figure 1: Comparative Analysis of Abnormal Placentation

Vasa Previa Definition

Vasa previa refers to foetal vessels that run through the membranes over the cervix and under the foetal presenting portion without being covered by the placenta or the umbilical cord [42]. The condition is produced by the velamentously cord being placed into the membranes rather than the placenta or by vessels running between the lobes of a placenta with one or more extra lobes [42].

Vasa previa is a condition that, if left untreated can result in a 60 percent perinatal death rate [42]. The problem is serious because when the membranes burst, either spontaneously or purposefully, the foetal vessels that run through the membranes are at danger of rupture as well, which can result in foetal exsanguination and death [42]. Because the foetal blood volume is just 80–100 mL/kg, even a little quantity of blood loss might be deadly to the baby. The presenting part's pressure on the exposed veins might induce embryonic hypoxia and death.

Epidemiology

Vasa previa affects around 1 in every 2, 500 births, according to estimates. A second - trimester low - lying placenta (even if the “low - lying” placenta or placenta previa heals in the third trimester) [43], pregnancies with accessory lobes, multiparity and pregnancies resulting from

in vitro fertilisation are other risk factors for the condition.

Clinical significance

In 0.1 percent to 1.8 percent of all pregnancies, velamentous cord insertion (VCI) occurs [44]. One in every 2500 new - borns is afflicted by vasa previa [41]. Although this condition is uncommon, it is essential to understand that a delayed prenatal diagnosis can potentially have deadly complications for the foetus. The insertion of a velamentous cord has been connected to foetal development and well - being issues. Pregnancies complicated by VCI were associated to 1.5 to 4 fold increased risks of preterm, low birth weight and babies undersized for gestational age in a review of more than 26, 000 births [44], among which there were 633 instances of velamentous cord insertion. An obstetric emergency is the existence of undiagnosed vasa previa. In a study of 155 instances with vasa previa the comparison of women who were identified antenatally and those who were not showed child survival rates was 97 percent and 44 percent respectively [44]. Maternal obesity, multiple gestations, smoking during pregnancy, placenta previa or low - lying placenta and assisted reproductive technologies are all risk factors for vasa previa and VCI [44]. Obesity has been linked to alterations in placental development and/or function. Assisted reproductive techniques have been proven to predispose women to VCI and low - lying placentas by generating uterine contractions from the entrance of an embryo implantation catheter [44].

Pathophysiology

The precise cause of VCI is unclear. Although the probable mechanism is during pregnancy, labour and delivery, Wharton's jelly protects the umbilical blood veins against compression and rupture. According to one concept, the placenta extends or develops in regions with excellent blood flow. Blood clot or any triggering factor affects regions of the placenta that have insufficient vascular profusion. As a result, neither placental tissue nor Wharton's jelly can protect a section of the umbilical blood vessels [41]. Abnormal cord insertion is associated to reduced placental development and function, which has an influence on the fetus's health and growth [45]. VCI and vasa previa have been related with preterm birth, low birth weight, and babies that are small for gestational age [44].

Approach to Diagnosis

Vasa previa and VCI can be detected by sonography during pregnancy. The objective of early identification is to avoid an intrapartum diagnosis of VCI or vasa previa, which can result in severe foetal haemorrhage and foetal or neonatal mortality. A 20 - week ultrasound should be performed to look for aberrant cord insertion, which is a critical element of a routine prenatal ultrasound assessment [46]. Although abdominal ultrasonography may clearly identify these anomalies, it can be difficult to view the umbilical cord in situations with a low - lying placenta, previa or maternal obesity. In such conditions transvaginal ultrasonography is suggested [46]. Color Doppler will aid in the identification of cord vessels at the cord insertion location [46]. In the second trimester, ultrasonography may identify vasa previa and VCI with a sensitivity of 67 percent and a specificity of 100 percent [47].

Management

The goal of clinical care for VCI and vasa previa is to discover these problems early in order to prevent the rupture of the umbilical blood vessels. Women who have been diagnosed with VCI or vasa previa should get extensive counselling, which includes an explanation of the illness and its consequences. With the help of partnering physicians, midwives (woman who has been trained to help pregnant women give birth to babies) are well prepared to care for women with VCI. Women who have been diagnosed with VCI will require thorough prenatal monitoring and serial ultrasound evaluations to ensure the health of their foetus [44]. A normal vaginal labour and birth can be expected if there are no signs of foetal distress. Because aberrant foetal heart rate patterns indicative of probable foetal distress can emerge during delivery, continuous foetal monitoring is recommended [48]. Antepartal care is comparable to placenta previa management in women who have been diagnosed with vasa previa. As indicated in their practise agreement with their partnering physician, the midwife can continue to care for these patients. If there hasn't been any bleeding, the mother can stay at home and continue her routine prenatal care [46]. If she notices any signs of labour, vaginal leakage or bleeding, she should contact her doctor right away. Women who had a bleeding episode or showing signs of premature labour should be admitted to the hospital until their baby is born [49]. For women who has been diagnosed with vasa previa, a surgical delivery is recommended. Because the exposed blood arteries are not covered by Wharton's jelly or placental tissue, a planned caesarean birth is advised before the onset of spontaneous labour, around 35 to 36 weeks of pregnancy. To assist in lung maturation, corticosteroids should be given prior to labour [44]. Late preterm births are neonates born at this gestational age and they have a higher risk of morbidity and mortality than full - term babies [50]. Respiratory illnesses, hypothermia, hyperglycemia and infection are all more likely in these babies [51]. For women who are hemodynamically stable and show no evidence of foetal distress, amniocentesis can be used to assess foetal lung maturity prior to an elective surgical birth [48]. Instead of being born prematurely, the foetus could be allowed to grow in the womb using this management strategy. The practitioner should be aware of the unusual potential that the patient has a previously undiscovered vasa previa in all labouring mothers. A vasa previa must be identified if foetal blood vessels are palpated in the amniotic membranes during a vaginal examination. To confirm the diagnosis, a transvaginal ultrasound can be used; however, rupture of the membranes should be avoided because injury to the cord vasculature can result in foetal exsanguination [47]. The sudden onset of bleeding after the rupture of the membranes, as well as variations in the foetal heart rate such as decelerations, bradycardia and a sinusoidal pattern, are the signs of ruptured foetal blood vessels [47]. If a vasa previa is detected, the collaborating physician should be notified at once and a LSCS should be planned.

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