REVIEW ARTICLE

Placenta Percreta: A Review Of Literature

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ABSTRACT

Background: *Placenta percreta is a very rare but serious complication of pregnancy. Diagnosis is difficult. Uterine perforation and invasion into adjacent organs makes life threatening haemmorrhage inevitable. Management is usually based on intraoperative findings from case reports.*

Method: *Literature on clinical decisions, diagnostic and treatment modalities were critically reviewed using PUBMED and MEDLINE computerized search. Additional Information was also obtained by cross referencing, texts and journals in the medical library of University of Nigeria.*

Results: *Most of the literature was from developed countries with very little report from our environment. There was lack of comprehensive management plan in most textbooks.*

Conclusion: *Rare complications are usually very difficult to manage due to lack of experience .It is thus important to identify the patients at risk, attempt to make antenatal diagnosis and involve experienced obstetricians in management.*

KEYWORDS: *Placenta percreta; Haemorrhage; Experienced Obstetrician.*

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INTRODUCTION

Placenta percreta is a very rare but life threatening complication of pregnancy. It can present in any of the trimesters and can mimic several intrabdominal emergencies. It thus poses very difficult diagnostic problems, even in highly equipped centres. Due to this rarity, the experience and expertise in diagnosis and management is lacking, especially in our environment. A comprehensive computerized search via MEDLINE and PUBMED was conducted using the key words "placenta percreta", "placenta praevia" .Additional information was obtained through cross-referencing and from text books. Most texts lacked comprehensive management plan, thus modalities for management have mostly been based on information from case reports. There is paucity of literature from our local environment. In this review, published reports and articles on the incidence, pathophysiology, predisposing factors, clinical presentations, diagnostic tools, treatment and complications were critically analyzed. As this situation almost always presents with massive blood loss necessitating the transfusion of many units of blood, management of patients averse to blood transfusion is also highlighted.

Pathophysiology

The placenta is an endocrine organ, which apart from producing hormones permit exchange of oxygen, nutrients and waste products between maternal and fetal blood. The fetal portion develops from the chorionic frondosum, the area of the chorionic villi nearest the developing embryo, whereas the maternal part develops from the decidua basalis, the portion of the endometrium deep to the chorionic frondosum[1]. During placentation, the trophoblast progressively invades the endometrium down to the decidua basalis. However there is a line of cleavage which makes placental separation possible through the spongy layer of the decidua. Undue invasiness of the trophoblast or reduced resistance of the maternal tissue result in the placenta extending beyond the decidua basalis. The term 'accreta' is generally applied to this state. The term 'increta' is used when invasion extends up to the muscle and the term 'percreta' involves invasion to or beyond the serosa[2].

Incidence

The incidence of these placental abnormalities ranges from 1:544-1:93,000 deliveries[3-5]. Over the past 40 years however the incidence has increased 10 fold, perhaps secondary not only to a true increase in incidence but to a better case reporting[6,7]. The increasing rate of caesarean section worldwide also contributes to the changing incidence.

Aetiological Consideration

Surgical procedures that interfere with the ability to form decidua have been implicated. These include hysterotomy, myomectomy and uterine curettage[8,9]. There is also a well-documented association between previous caesarean section, placenta praevia and placenta accreta[10-12]. The defective decidua formation and the thinness of the lower segment make this area of the uterus an easy prey for trophoblastic invasion. There is a linear increase in the risk of placenta accreta in patients with placenta praevia, which is 5% in an unscarred

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uterus, 24% with one previous caesarean section and 67% with four previous caesarean sections[10]. Studies have also implicated advanced maternal age, high gravidity and multiparity[5,13]. Other risk factors include Ashermans syndrome and submucous fibroids.

Clinical Presentation

The clinical presentation varies widely. Every practitioner should identify predisposing factors and attempt to make a diagnosis before complications occur. In the first trimester, it may present as vaginal bleeding, mimicking threatened miscarriage. Associated abdominal pain usually occurs with imminent uterine rupture (mimicking ectopic pregnancy).Complete uterine rupture in the first trimester, presenting with abdominal pain and shock has been reported in a patient with previous uterine scar[14]. Uterine rupture has also occurred in a patient with no previous scar[15].

The second trimester may be associated with unexplained abdominal pain, spontaneous rupture and life threatening haemorrhagic shock[16-23]. Spontaneous rupture occurring in the third trimester causes antepartum haemorrhage mimicking abruptio placentae[24].

Invasion of the bladder wall may lead to urinary frequency, dysuria and haematuria[25-29]. Intestinal involvement has also been reported[30], and could cause haematochezia.

Diagnosis

Placenta percreta poses a very difficult diagnostic problem especially in our environment with limited facilities and expertise. Where facilities are available, diagnosis can be made with three-dimensional ultrasound, colour Doppler and magnetic resonance imaging (MRI)[31-33].

Ultrasonography: In the first trimester, especially in a patient with a previous caesarean delivery, a sac lying in the lower segment on a scan at 10 weeks or earlier suggests accreta[34]. As pregnancy advances, extension of highly vascularized placenta to the myometrium, abnormal placenta- sub placental complex and vascular flow through the myometrium are suggestive of diagnosis[32]. In gray scale ultrasonography, features such as loss of hypoechoic retro placental zone, and irregular serosa could be demonstrated[35].

Additional sonographic observations include, prominent large or multiple placental venous lakes and periuterine vascularity, progressive thinning and disappearance of the retroplacental hypoechoic zone on sequential examinations[36]. Abnormal bulging of placental tissues towards the bladder cavity and arcuate arteries within the bladder is also highly suggestive[37]. The desire to achieve reasonable degree of accuracy, has led to the development of various modifications[38]. Among all these findings, the presence of multiple linear irregular vascular spaces within the placenta (placental lacunae) was the diagnostic sign with the highest positive predictive value[39].

In the use of ultrasonography with doppler, identification of abnormal blood flow in the myometrium contiguous with the placenta, placental lacunae, loss of decidua clear zone between the placenta and myometrium or complete loss of myometrial zone may indicate abnormal placentation[35].

Magnetic Resonance Imaging (MRI): On some occasions, information obtained by ultrasound is inconclusive, particularly in differentiating accreta and percreta. On other occasions, additional anatomical information on placental invasion, vascularization, and the actual state of the uterine and bladder walls may be needed. In these cases, MRI provides precise anatomic images and is indispensable when conservative uterine treatment is planned. Disruption of uterine-bladder interface and focal exophytic masses contribute to diagnosis[40]. Thinning of the uterine wall is also a significant MRI contribution to diagnosis[35]. These tools though important in diagnosis have poor predictive value[40].

Other Diagnostic Tools: Placenta percreta may also be suggested by unexplained elevated maternal serum alpha fetoprotein[8,41]. This is however unreliable as it is associated with several gynaecologic and obstetric conditions. Cystoscopy, sigmoidoscopy and laparoscopy can aid diagnosis but biopsy should be avoided. Selective angiography of the uterine vasculature may be considered.

Management

Management could be medical or surgical, with a conservative or radical approach. Although antenatal identification is a significant factor that affects outcome in these patients, uterine rupture with severe intraperitoneal haemorrhage, necessitating transfusion of many units of blood could still occur[16-23]. When the diagnosis is made antepartum, potential complications and alternative treatment should be discussed.

Immediate Management: When an early diagnosis is made, one may consider termination by

hysterotomy with consultation regarding the need for possible hysterectomy. Dilatation and evacuation should be avoided irrespective of the gestational age as uncontrollable bleeding necessitating hysterectomy may be encountered[8]. Medical induction is also not advocated as the zone of myometrial invasion and destruction is weak and the uterus may rupture in the process. Immediate intervention is also indicated when uterine rupture occurs. Exploratory laparotomy should be done but definitive surgery will depend on intraoperative findings, experience of the surgeon, parity, desire to preserve reproductive and menstrual functions, cultural and religious idiosyncrasies. In a patient who has completed her family, the easiest and quickest thing to do is subtotal hysterectomy. In a non praevia placenta percreta, wedge resection and conservation of the uterus has proved successful[42].

Expectant Management: In expectant management, the antepartum course of the pregnancy may be hazardous. Prolonged hospitalization may therefore be necessary and should be considered in all patients at 30-32 weeks gestation. During this period, plans for delivery can be finalized and therapies to enhance lung maturity administered. At least, four units of crossmatched blood should be available. Patients should be transferred to centres with appropriate equipment and expertise. A consultant obstetrician and gynaecologist should primarily manage the case. The consultant anaesthetist and haematologist should also be informed. Delivery by caesarean section may be considered at 34-35 weeks because the incidence of antepartum haemorrhage appears to increase markedly at 36 weeks[8].

The methods of intraoperative management are limited to case reports and depend on intra-operative findings[8].The selection of the surgical approach should depend on availability of resources and personnel, extent of involvement of adjacent tissues, experience of the surgeon and patient's preference. Uterine incision should be located away from the percreta and placental margins to minimize bleeding. The transfundal approach has been used succesfully[43].

In young nulliparous patients or those who wish to preserve reproductive function, the conservative approach is employed. After delivery of the baby, the umbilical cord should be ligated and cut as close as possible to the placental attachment and the placenta left in situ. Methotrexate 1mg/kg daily is administered post operatively until two consecutive undetectable human chorionic gonadotropin hormone assays are obtained[46]. Broad-spectrum antibiotics should be given and exploratory laparotomy is preformed if severe secondary postpartum haemorrhage or pelvic abscess occurs. Hysterectomy may then be the only life saving option. Other methods of preserving reproductive functions have been developed.Specialised surgical techniques which involve a large retrovesical and parametrial dissection, achieving haemostasis with selective vascular ligature or surgical myometrial compression, fibrin glue and poly glycolic mesh has been successfully used[47]. Other methods include uterine artery embolization using balloon catheters[48], and percutaneous coaxial microcoil embolization of pelvic arteries[49]. Conservative approach may also be necessary with extensive extrauterine extensions.

In the radical approach, the placenta and involved tissues are excised, especially in patients who do not wish to preserve reproductive functions. After delivery, the placenta should be left in situ and the uterine incision closed to minimize blood loss. Strategies to reduce blood flow to the placenta before attempting hysterectomy include internal iliac artery ligation, balloon occlusion and embolization of the internal iliac artery[44,45] and the use of argon beam coagulation[50].Extra uterine extensions may lead to surgical resections of the bladder, ureters and colon.

Earlier, reports showed a maternal mortality of 41.9% with conservative management and maternal mortality of 6.0% with hysterectomy[51]. Later reviews, showed no maternal mortality in patients treated with conservative methods[10].However, in more recent reviews, mortality is believed to range from 2%-7%[52,53].

Management of Placenta Percreta in the Jehovah's Witness.

This is a Christian sect founded in the late 1870s by Charles Russel and currently includes about 2.6 million members world wide. The refusal to receive blood has often resulted in conflict and controversy with the health professionals.

Complications of placenta percreta can lead to a life threatening haemorrhage. The additional challenge of refusing blood transfusion for religious reason requires the use of comprehensive blood conserving strategies. The Jehovah's Witness refuses blood because they believe that the Bible forbids the use of blood and its products. Managing a life- threatening condition in this sect will thus require extreme care and expertise. When the diagnosis is made, in a non-confrontational way, the risk of refusing blood transfusion should properly be

explained. All discussions should be well documented and informed consent obtained. If however massive haemorrhage occurs, they are entitled to change their mind about a previously agreed treatment plan. The opinion of the patient should always be respected, provided she is above 18 years and in stable mental state.

Strategies to avoid blood transfusion include the following

(a) Maximize blood production. This is achieved by adequate nutritional and micronutrient support including iron and other haematinics. Erythropoietin, which directly stimulates red cell production, has successfully been used[54].

(b) Reduce iatrogenic loss. This aims at reducing the quantity of blood collected for laboratory investigations since it has been shown that significant amount can be lost in this process[55]. Where facilities are available, microchemistry analyzers requiring only 1ml of blood should be used. If not, small samples should be drawn and a critical analysis of the necessity of each investigation undertaken.

(c) Minimize haemorrhagic loss. Intravenous crystalloids and colloids like haemacele or gelofusine should be used as plasma expanders. Some authors have successfully used normovolaemic[56] and hypervolaemic[57] haemodilution techniques before sugery. It is believed that any blood lost would contain fewer red cells per unit volume. Haemodilution also reduces blood viscosity, increases cardiac output and improves microcirculation[58]. The decision to perform hysterectomy should be taken early as any attempt at delay may lead to dire consequences. Strategies to minimize blood loss at surgery include aortic compression and pelvic artery embolization.Early ligation of the uterine arteries, which can be achieved by delaying the ligation of other pedicles after entering the abdomen until the uterine arteries have been ligated is also advocated. In addition, fibrinolytic inhibitors, aprotonin[59], tranexamic[60] or recombinant activated factor VIIa[61] have successfully been used to reduce bleeding. The medical staff must maintain a professional attitude and must not loose trust of the patients and relatives. It is psychologically distressing for staff to watch while a woman dies due to religious beliefs; however, in the event of death despite all care, relatives require support like any other bereaved family.

CONCLUSION

Placenta percreta, although rare results in significant mortality and morbidity associated with massive blood transfusions, infections and damage to adjacent structures. Previous endometrial damage is the leading predisposing factor. Thus every obstetrician managing pregnancy in a patient with previous endometrial damage should be cautious of abnormal placentation and all efforts should be made to localize the placenta antepartum[62]. This will minimize complications but does not eliminate the potential for adverse outcome. In our environment, antenatal diagnosis is difficult and often made intraoperatively.The fact that no randomized trial has been conducted makes no single management approach superior to the other.However, conservative management is a reasonable alternative in well selected haemodynamically stable patients. This allows for a planned preterm delivery with enough time to mobilize adequate ancillary support.

With the increasing rate of caesarean section world wide, the problem of placenta percreta is likely to become more common. Obstetricians should thus be ready to face this late sequalae of caesarean section.

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