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# PLACENTA ACCRETA SPECTRUM DISORDERS

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## INTRODUCTION

Placenta accreta spectrum is one of the most morbid conditions obstetricians will encounter. The incidence of placenta accreta was reported to be 1 in 4027 deliveries in 1970 but recent data, from 1987 to 2002 shows the current incidence of placenta accreta to be 1 in 533 deliveries.[1,2] This increase is likely secondary to the rising rate of caesarean from 5% of all deliveries in 1970 to 32.8% in 2010.[3,4] The condition poses dramatic risk for massive haemorrhage and associated complications such as consumption coagulopathy, multisystem organ failure, death and surgical complications such as injury to bladder, ureters and bowel. Most women require multiple blood transfusions and many require admission to ICU. Relevant documents were identified through a search of the English-language literature for publications including one of the key words "accreta" or "increta" or "percreta" using PubMed (US National Library of Medicine; January 1990 to february 2018). Additional information was obtained from references identified within selected articles and from guidelines by organizations including the American College of Obstetricians and Gynecologists, Royal College Of Obstetricians and Gynecologists and International Federation of Obstetrics and Gynecology.

## DEFINITION

Placenta accreta is a term used when an abnormal, firmly adherent placenta implants with some degree of invasion into the uterus. It occurs as a consequence of partial or complete absence of the decidua basalis and defective formation of the Nitabuch (fibrinoid) layer. The classification of adherent placenta is based on the degree of invasion :-*Accreta*: placental villi are attached to the myometrium. *Increta*: invasion of the placental villi into the myometrium. *Percreta*: placenta villi fully penetrate the myometrium, including cases breaching the serosa and invading surrounding structures such as bladder, broad ligament or bowel.[5]

## RISK FACTORS

Women who have myometrial damage from a previous cesarean delivery and a subsequent pregnancy with placenta previa or implantation of the placenta over the prior uterine scar are at a increased risk of Placenta Accreta Spectrum disorders(PAS). The risk for placenta accreta in a patient with placenta previa and prior cesarean delivery increases with number of previous caesarean deliveries. Silver and colleagues[6] reported the risk for the first, second, third, fourth, and fifth or greater caesarean delivery to be 3.3%, 11%, 40%,61%, and 67%. Previous caesarean delivery alone, without previa, is also an independent risk factor for accreta with increasing incidence associated with increasing number of caesareans: 0.2% for the first, 2.1% with the fourth, and up to 6.7% with the sixth or greater. In addition, placenta previa alone without previous uterine surgery is associated with a 1% to 4% risk of accreta.[1,6] Advanced maternal age is also a reported independent risk factor for accreta with the risk increasing for every year beyond 20 years of age.[2] Additional risk factors include uterine surgery like myomectomy, metroplasty, submucosal fibroid, uterine artery embolization, endometrial ablation, dilation and curettage, specially ashermans syndrome.[1,2,6–8]

## PATHOPHYSIOLOGY

In normal pregnancy, trophoblast invades the endometrium until they reach Nitabuch's layer (spongiosus layer of the decidua). Upon reaching this layer, cytotrophoblasts cease invasion and begin to differentiate into the placental tissue. Abnormal placentation occurs when cytotrophoblasts invade decidualized endometrium, and do not encounter the normal signal to stop invasion. Instead, trophoblasts continue their invasion to an abnormal degree.[5]

## DIAGNOSIS

The gold standard is documentation of abnormal trophoblastic invasion of the myometrium on histopathology. However, this is only possible when a hysterectomy is performed. Studies have shown that placenta accreta spectrum disorders remain undiagnosed before delivery in half to two-thirds of cases.[9] Maternal mortality and morbidity are reduced when women with PAS disorders, deliver in a centre of excellence by a

multidisciplinary care team. Transfer to such centre, relies on accurate prenatal diagnosis. The mainstay of prenatal diagnosis for abnormal placentation remains ultr asonography with magnetic resonance imaging (MRI) being used only as an adjunct in indeterminate cases.

**ULTRASOUND**

Ultrasonography is a relatively inexpensive and widely available imaging modality and should be the first line for the diagnosis of PAS disorders. In general, gray-scale ultrasonography predicts abnormal placentation with a sensitivity of 77%- 86%, specificity 96% - 98%.The incorporation of CDI has enabled better visualization of the uteroplacental circulation. Ultrasonographic findings suggestive of placenta accreta are as follows: Presence of multiple placenta lacunae(sensitivity 93%); Interruption of the posterior bladder wall-uterine interface(sensitivity 20%,specificity 100%); Obliteration of the clear space between the uterus and placenta(sensitivity80%); hypervascularity of the adjacent bladder wall and myometrial thickness <1 mm.[10,11]

**MRI**

The sensitivity and specificity of MRI in diagnosing accreta varies between 75% - 100% and 65% to 100% respectively.[12] Two meta-analyses have found that the diagnostic value of ultrasound imaging and MRI in detecting placenta accreta is comparable.[12,13] Therefore, MRI is not recommended as a routine screening test. It is advised when findings are inconclusive on ultrasonography and in suspected percreta.[10]

**MANAGEMENT**

The standard of care for suspected placenta accreta is planned caesarean hysterectomy with the placenta left in situ. It decreases blood loss significantly. Over the last two decades, a variety of conservative options for the management of PAS disorders have evolved, each with varying rates of success.[14] Current guidelines suggest a multidiscriplinary approach. Delivery in a hospital with the needed resources and expertise which includes a fully stocked blood bank, anaesthesiologists experienced in the care of critically ill obstetric patients and surgeons with training in accreta.

**TIMING OF DELIVERY**

Complications related to blood loss are lower in nonemergent compared with emergent deliveries. This knowledge has led to planned late preterm (35–36 weeks) or early term (37 weeks) delivery as a mechanism to avoid emergency surgery.[15]

**INTRAOPERATIVE DIAGNOSIS**

Unfortunately, placenta accreta is not always diagnosed before the intrapartum period. Once an accreta is recognized, help should be summoned, which includes senior obstetricians, anaesthesiologists and blood bank specialists. Interventional radiologists and vascular surgeons should be considered. If the medical centre is not capable of management, consideration should be given to transfer the patients to an appropriate centre after stabilization for definitive therapy. This may require packing the abdomen to control bleeding, transfusions and medical stabilization of the patient.

**COMPLICATIONS OF SURGICAL MANAGEMENT**

Most common are massive haemorrhage which can lead to DIC, hypovolemic shock, and multiorgan failure. Others include cystotomy, ureteral damage and bowel injury. These complications often result in ICU admission (25%–50% of cases).

**SURGICAL TECHNIQUE**

The most conservative approach is proceeding to planned hysterectomy with no attempt to separate placenta. The abdominal incision must allow sufficient access to the uterus to choose a location for hysterotomy which shall be above the upper placental margin. Preoperative ultrasound can allow the team to visualize the upper placental margin. A low transverse skin incision that allows access to the lower half of the uterus may be adequate if the upper margin of the placenta does not rise into the upper segment of the uterus and no hysterectomy is planned. If hysterectomy is planned, a high upper-segment transverse uterine incision, more commonly a fundal transverse hysterotomy to be given. After the delivery, the cord is ligated and cut, the placenta is not delivered, and the edges of the vertical incision are quickly reapproximated for hemostasis. Adequate uterine tone is ensured.[16]

Planned delayed or secondary hysterectomy is an alternative surgical management strategy which is performed between 3 to 12 weeks postpartum. It may be undertaken where extensive invasion (percreta) of surrounding structures would render immediate cesarean hysterectomy extremely difficult. Allowing some resorption of the placenta, decrease in vascularity and involution of the uterus is postulated to facilitate later surgery. However, there is an associated risk of coagulopathy, hemorrhage, and sepsis during the interim period. Patients must be compliant with follow-up and resources should be available 24 hours a day to manage patients urgently if complications arise. This approach also allows for the postcesarean use of pelvic artery embolization.[17]

**ALTERNATIVE CONSERVATIVE THERAPIES**

Conservative management of abnormally adherent placenta defines all procedures that aim to avoid peripartum hysterectomy and its related morbidity and to preserve fertility. Strategies include leaving the placenta in situ, oversewing of the placental vascular bed, surgical devascularization, uterine vessel embolization, hysteroscopic resection of retained placental tissue and administering methotrexate.

## LEAVING PLACENTA IN SITU

By leaving a placenta in situ, one can expect a progressive decrease in blood circulation within the uterus, parametrium, and the placenta. This will result in secondary necrosis of the villous tissue and theoretically the placenta should progressively detach itself from the uterus and the percreta villi from the adjacent pelvic organs. The 2010 French multicentre study [19]included women over a 14-year period and reviewed 167 women treated with conservative methods. Success was reported in78% but there was a 28% overall rate of infection, 11% incidence of postpartum hemorrhage and 6% occurrence of maternal morbidity to include sepsis and 1 maternal death. Additional procedures like embolization, methotrexate, hysteroscopic resection of retained tissues have also been used to accelerate placental resorption. There are no randomized controlled trials comparing these different additional procedures.

## METHOTREXATE ADJUVANT TREATMENT

Only case reports and small case series with no control group have been reported. The low rate of trophoblastic cell turnover compared with that in early pregnancy indicates a much lower efficacy of methotrexate in late compared with early pregnancy. In addition, methotrexate exposes the patient to the risk of neutropenia or medullar aplasia. The use of methotrexate is not recommended until further evidence is available on its efficacy and safety.[19]

## PREVENTIVE DEVASCULARIZATION

Devascularization can be achieved by surgical or interventional radiology procedures, such as stepwise devascularization, internal iliac artery embolization, or balloon occlusion. Embolization before performing hysterectomy may reduce the risk of intraoperative blood loss and prophylactic devascularization may prevent the occurrence of secondary hemorrhage. Overall, these uterine-sparing procedures seem to be less effective in cases of PAS disorders.[20] Larger studies and randomized controlled trials are essential to demonstrate the safety and efficacy of prophylactic bilateral iliac balloon occlusion

## MONITORING

The residual villous tissue may require up to 6 months to be completely absorbed. In rare cases, a coagulopathy or septicemia may develop, requiring an emergent secondary hysterectomy. Measuring serum β-hCG on a weekly basis to check it falls continuously can reassure to some extent, but low levels do not guarantee complete placental resorption and so this should be supplemented by expert ultrasound imaging. The follow-up consultation should include a clinical examination (bleeding, temperature, pelvic pain), pelvic ultrasound (size of retained tissue) and laboratory tests for infection (leukocytes count, vaginal sample for bacteriological analysis).[18]

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