Placenta accreta

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OBJECTIVE: We sought to review the risks of placenta accreta, increta, and percreta, and provide guidance regarding interventions to improve maternal outcomes when abnormal placental implantation occurs.

METHODS: Relevant documents were identified through a search of the English-language literature for publications including ≥1 of the key words "accreta" or "increta" or "percreta" using PubMed (US National Library of Medicine; January 1990 through January 2010); with results limited to studies involving human beings. Additional information was obtained from references identified within selected articles; from additional review articles; and from guidelines by organizations including the American College of Obstetricians and Gynecologists. Each included article was evaluated according to study design and quality in accordance with the scheme outlined by the US Preventative Services Task Force.

RESULTS AND RECOMMENDATIONS: Abnormal placentation–encompassing placenta accreta, increta, and percreta–is increasingly common. While randomized controlled trials and large observational cohort studies that can be used to define best practice are lacking, strategies to enhance early diagnosis, enhance preparation, and coordinate peripartum management can be undertaken. Women with a placenta previa overlying a uterine scar should be evaluated for the potential diagnosis of placenta accreta. Women with a placenta previa or "low-lying placenta" overlying a uterine scar early in pregnancy should be reevaluated in the third trimester with attention to the potential presence of placenta accreta. When the diagnosis of placenta accreta is made remote from delivery, the need for hysterectomy should be anticipated and arrangements made for delivery in a center with adequate resources, including those for massive transfusion. Intraoperatively, attention should be paid to abdominal and vaginal blood loss. Early blood product replacement, with consideration of volume, oxygen-carrying capacity, and coagulation factors, can reduce perioperative complications.

Key words: accreta, cesarean hysterectomy, increta, placenta percreta, postpartum hemorrhage

Introduction

Placenta accreta occurs when all or part of the placenta attaches abnormally to the myometrium. Three grades of abnormal placental attachment are defined according to the depth of invasion:

Accreta. Chorionic villi attach to the myometrium, rather than being restricted within the decidua basalis.

Increta. Chorionic villi invade into the myometrium.

Percreta. Chorionic villi invade through the myometrium.

Among patients with a histologic diagnosis of abnormal placental invasion, 81.6% of cases were placenta accreta, 11.8% of cases were placenta increta, and 6.6% were placenta percreta in 1 observational study.[1] In this document, the general term "placenta accreta" will refer to all 3 grades of abnormal placental attachment (placenta accreta, increta, and percreta) unless otherwise specified.

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Because of abnormal attachment to the myometrium, placenta accreta is associated with an increased risk of heavy bleeding at the time of attempted placental delivery. The need for transfusion of blood products is frequent, and hysterectomy is commonly required to control life-threatening hemorrhage. Examples of complications associated with placenta accreta include: (i) damage to local organs (eg, bowel, bladder, ureters) and neurovascular structures in the retroperitoneum and lateral pelvic sidewalls from placental implantation and its removal; (ii) postoperative bleeding requiring repeated surgery; (iii) amniotic fluid embolism; (iv) complications (eg, dilutional coagulopathy, consumptive coagulopathy, acute transfusion reactions, transfusion-associated lung injury, acute respiratory distress syndrome, and electrolyte abnormalities) from transfusion of large volumes of blood products, crystalloid, and other volume expanders; and (v) postoperative thromboembolism, infection, multisystem organ failure, and maternal death.[2,3] The exact incidence of maternal mortality related to placenta accreta and its complications is unknown, but has been reported to be as high as 6-7% in case series and surveys.[4,5]

What are the risk factors for placenta accreta? (levels II and III evidence)

The reported incidence of placenta accreta has increased from approximately 0.8 per 1000 deliveries in the 1980s to 3 per 1000 deliveries in the past decade.[6-11] An important risk factor for placenta accreta is placenta previa in the presence of a uterine scar.[9,12,13] Hung et al,[14] in a multivariable analysis, found that although placenta previa was an independent risk factor for placenta accreta (odds ratio [OR], 54; 95% confidence interval [CI], 18–166), prior uterine surgery without an associated previa was not (OR, 1.5; 95% CI, 0.4–5.1). The in-

creasing incidence of placenta accreta is likely multifactorial, but partly due to factors such as the increasing number of cesarean deliveries, particularly since the areas of abnormal placental invasion are almost always in the area of the previous hysterotomy.[9,11,12] In a large prospective observational study that considered the number of prior cesarean deliveries and presence or absence of placenta previa, the risk of placenta accreta was 0.03% for those at their first cesarean delivery if there was no placenta previa, remained <1% for women having up to their fifth cesarean delivery, and increased to 4.7% for those having their ≥6th cesarean delivery (Table 1).[11] Alternatively, if placenta previa was present, the risk of placenta accreta was 3% at the first cesarean delivery and increased to 40% or more at the third cesarean delivery. Women with either an anterior or posterior placenta previa are at increased risk for placenta accreta and this risk increases markedly when the placenta overlies a uterine scar.[12] Additional reported risk factors for placenta accreta include maternal age and multiparity, other prior uterine surgery, prior uterine curettage, uterine irradiation, endometrial ablation, Asherman syndrome, uterine leiomyomata, uterine anomalies, hypertensive disorders of pregnancy, and smoking.[8,9,13,15-19] Although these and other risk factors have been described, their actual contribution to the frequency of placenta accreta remains unknown.

How is placenta accreta diagnosed? (levels II and III evidence)

When the antepartum diagnosis of placenta accreta is made, it is usually based on ultrasound findings in the second or third trimester. Sonographic findings that may be suggestive of placenta accreta are summarized in Table 2 and some common features are demonstrated in Figure 1.[20-24]

Twickler et al[20] reported the presence of myometrial thickness <1 mm or large placental lakes to be suggestive of placenta accreta. The presence of both findings together carried a high positive predictive value (72%). Alternatively, Wong et al[1] suggested that disruption of the placental-uterine wall interface and the presence of vessels crossing this area were the most valuable predictive criteria. These latter investigators reported 89% sensitivity and 98% specificity using a composite scoring system including 6 sonographic findings. Recently, the presence of "numerous coherent vessels in the basal view" on 3-dimensional power Doppler has been suggested to have a 97% sensitivity, 92% specificity, and positive predictive value of 76%.[24] However, the number of patients with placenta accreta included in these studies was small and there is not uniform agreement regarding which factors are most accurate in the diagnosis of placenta accreta.

Although there are isolated case reports of placenta accreta being diagnosed in the first trimester or at the time of abortion <20 weeks' gestational age, the predictive value of first-trimester ultrasound for this diagnosis remains unknown.[5,25,26] Ultrasound in the first trimester should not be used routinely to establish or exclude the diagnosis of placenta accreta. Alternatively, because of their associations with placenta accreta, women with a placenta previa or "low-lying placenta" overlying a uterine scar early in pregnancy should undergo follow-up imaging in the third trimester with attention to the potential presence of placenta accreta.

Studies evaluating magnetic resonance imaging for confirmation or exclusion of placenta accreta have yielded conflicting results.[21,27] Current evidence that routine magnetic resonance imaging scanning of patients with sonographically suspected placenta accreta improves pregnancy management or outcomes is lacking. Magnetic resonance imaging may be helpful if ultrasound is inconclusive or if there is suspicion that the placenta has invaded the parametrium or surrounding organs.[21,28] Although some have reported the use of cystoscopy and sigmoidoscopy in the evaluation of selected patients with suspected placenta accreta, their routine use is unnecessary.

TABLE 1
Frequency of placenta accreta according to number of cesarean deliveries and presence or absence of placenta previa[11]

Cesarean delivery	Placenta previa	No placenta previa
First (primary)	3.3	0.03
Second	11	0.2
Third	40	0.1
Fourth	61	0.8
Fifth	67	0.8
≥Sixth	67	4.7

SMFM. Placenta accreta. Am J Obstet Gynecol 2010.

Are laboratory markers useful in identifying placenta accreta? (level III evidence)

At present, no analyte is considered a necessary component in the workup in women with suspected accreta. Elevated second-trimester maternal serum alpha-fetoprotein has been associated with placenta accreta and it has been suggested that there is a direct relationship between the extent of invasion and the elevation of this analyte.[5,29] Hung et al[14] found a maternal serum alpha-fetoprotein >2.5

TABLE 2
Sonographic findings that have been associated with placenta accreta

(1) Loss of normal hypoechoic retroplacental zone[15]

(2) Multiple vascular lacunae (irregular vascular spaces) within placenta, giving "Swiss cheese" appearance[21-23]

(3) Blood vessels or placental tissue bridging uterine-placental margin, myometrial-bladder interface, or crossing uterine serosa[1]

(4) Retroplacental myometrial thickness of <1 mm[15]

(5) Numerous coherent vessels visualized with 3-dimensional power Doppler in basal view[24]

SMFM. Placenta accreta. Am J Obstet Gynecol 2010.