

Two Parturients with Placenta Accreta Spectrum (PAS) Undiagnosed by Ultrasound

Susanne S. Rupert, MD and Ferne Braveman, MD, University of Minnesota, Minneapolis, MN

Introduction

Placenta accreta involves abnormal adherence of the placenta to the myometrium instead of the decidua. Abnormal placental adherence can result in significant hemorrhage and severe maternal and neonatal morbidity and mortality. Ultrasound imaging, although helpful, does not identify a significant number of Placenta Accreta Spectrum (PAS) patients. Anesthesiologists and obstetricians must remain vigilant and prepare for significant hemorrhage even if ultrasound imaging does not indicate concern for PAS.

Case Presentations

Case 1:

39 year old G1P0000 at 35w1d risk factors for PAS:

- Placenta Previa
- In Vitro Fertilization
- Advanced Maternal Age

Anesthetic for the cesarean section was spinal. After delivery, the placenta was unable to be delivered with gentle traction and uterine massage. Resection with sharp dissection and cautery, oversewing the placental bed, and uterotonics and TXA administration were unsuccessful in controlling the bleeding. The patient became unstable, the massive transfusion protocol was activated, and the decision was made to proceed with hysterectomy. The spinal was converted to general anesthesia. QBL was 3100; 2-units PRBCs and 1-unit FFP were transfused.

Case 2:

31 year old G4P3003 at 36w3d, risk factors for PAS:

- Placenta Previa
- Previous Dilation and Curettage
- Multiparity

Cesarean section was performed under spinal. After delivery, the placenta was found to be attached to the anterior uterine wall, penetrating deep into the myometrium. The decision was made to proceed with hysterectomy and the spinal was converted to general anesthesia. QBL was 3105; 4 units PRBCs and 3 units FFP were transfused.

Both patients benefited from delivery at a SOAP Centers of Excellence hospital, good team communication, the prompt decision to perform a hysterectomy, and the availability of a hemorrhage cart with all needed supplies.

Discussion

One theory of the etiology of placenta accreta spectrum is a defect of the endometrial myometrial interface leads to failure of normal decidualization in the area of a uterine scar which allows abnormally deep placental anchoring villi and trophoblast infiltration. Placenta previa and previous cesarean section are the greatest risk factors for placenta accreta spectrum. Risk of placenta accreta is 3%, 11%, 40%, 61%, and 67%, for the first, second, third, fourth, and fifth or more cesarean, respectively.[1] The rate of placenta accreta spectrum with the need for hysterectomy is 0.7%, 0.4%, 0.9%, 2.4%, 3.5% and 9.0% for the 1st, 2nd, 3rd, 4th, 5th, and 6th or more cesarean sections. [1] Additional risk factors include prior uterine surgeries or curettage, Asherman's syndrome, advanced maternal age, multiparity, and In Vitro Fertilization (IVF).[2][3]

Placenta previa is the most important ultrasound abnormality associated with placenta accreta, present in 80%.[2] Other abnormalities include multiple placental vascular lacunae, loss of the normal hypoechoic zone, decreased retroplacental myometrial thickness, uterine serosa-bladder interface abnormalities, and extension of the placenta into myometrium, serosa, or bladder. Color doppler may facilitate diagnosis evaluating for turbulent lacunar flow, subplacental vascularity gaps, gaps in myometrial blood flow, and vessels bridging the placenta to the uterine margin.[2][4] In a systematic review and meta-analysis of 23 studies mainly evaluating patients with anterior placenta and history of prior uterine surgery, the sensitivity was 90.72% and specificity was 96.74%.[4] In a retrospective study in which observers were blinded to the clinical history the sensitivity was 53.5% and the specificity was 88.0%.[5] Although ultrasound examination is important, the absence of ultrasound findings does not preclude PAS and clinical risk factors are equally important.[2]

Generally, the most accepted approach to PAS is cesarean hysterectomy with the placenta left *in situ* after delivery of the fetus as attempts at placental removal are usually associated with significant hemorrhage. Uterine artery embolization may be utilized to decrease bleeding especially when continued fertility is highly desired or to help minimize bleeding with placenta percreta cases. Resuscitative Endovascular Balloon Occlusion of the Aorta (REBOA) has also been utilized to reduce massive hemorrhage which can occur with PAS.[2][6] When possible, antenatal diagnosis of PAS is highly desirable with delivery at a Level III or IV maternal care facility at 34-36 weeks gestation before the onset of labor or bleeding.[2]

References

- 1.Silver RM, et al. Maternal Morbidity Associated with Multiple Repeat Cesarean Deliveries. Obstet Gynecol 2006; 107:1226-32
- 2.Obstetric Care Consensus No. 7: Placenta Accreta Spectrum, Obstetrics & Gynecology: Dec 2018. Vol 132. Issue 6 p e259-e275
- 3.Salmanian B, et al. In Vitro Fertilization as an Independent Risk Factor for Placenta Accreta Spectrum. American journal of Obstetrics and Gynecology Oct 2020 p568.e1-5.
- 4.D'Antonio F, et al. Prenatal identification of invasive placentation using ultrasound: systematic review and meta-analysis. Ultrasound Obstet Gynecol 2013; 42: 509-517.
- 5.Bowman ZS, et al. Interobserver variability of sonography for prediction of placenta accreta. J Ultrasound Med 2014;33:2153-8
- 6.Ioffe YJM, et al. When the balloon goes up, blood transfusion goes down: a pilot study of REBOA in placenta accreta spectrum disorders. Trauma Surg Acute Care Open 2021;6 e000750.

Two Parturients with Placenta Accreta Spectrum (PAS) Undiagnosed by Ultrasound

Introduction

Placenta accreta involves abnormal adherence of the placenta to the myometrium instead of the decidua. Abnormal placental adherence can result in significant hemorrhage and severe maternal and neonatal morbidity and mortality. Ultrasound imaging, although helpful, does not identify a significant number of Placenta Accreta Spectrum (PAS) patients. Anesthesiologists and obstetricians must remain vigilant and prepare for significant hemorrhage even if ultrasound imaging does not indicate concern for PAS.

Case 1:

39 year old G1P0000 at 35w1d risk factors for PAS:

- Placenta Previa
- In Vitro Fertilization
- Advanced Maternal Age

Anesthetic for the cesarean section was spinal. After delivery, the placenta was unable to be delivered with gentle traction and uterine massage. Resection with sharp dissection and cautery, oversewing the placental bed, and uterotonics and TXA administration were unsuccessful in controlling the bleeding. The patient became unstable, the massive transfusion protocol was activated, and the decision was made to proceed with hysterectomy. The spinal was converted to general anesthesia. QBL was 3100; 2-units PRBCs and 1-unit FFP were transfused.

Case 2:

31 year old G4P3003 at 36w3d, risk factors for PAS:

- Placenta Previa
- Previous Dilation and Curettage
- Multiparity

Cesarean section was performed under spinal. After delivery, the placenta was found to be attached to the anterior uterine wall, penetrating deep into the myometrium. The decision was made to proceed with hysterectomy and the spinal was converted to general anesthesia. QBL was 3105; 4 units PRBCs and 3 units FFP were transfused.

Both patients benefited from delivery at a SOAP Centers of Excellence hospital, good team communication, the prompt decision to perform a hysterectomy, and the availability of a hemorrhage cart with all needed supplies.

Discussion

Etiology and Incidence

One theory of the etiology of placenta accreta spectrum is a defect of the endometrial myometrial interface leads to failure of normal decidualization in the area of a uterine scar which allows abnormally deep placental anchoring villi and trophoblast infiltration.

Placenta previa and previous cesarean section are the greatest risk factors for placenta accreta spectrum. Risk of placenta accreta is 3%, 11%, 40%, 61%, and 67%, for the first, second, third, fourth, and fifth or more cesarean, respectively.[1]

The rate of placenta accreta spectrum with the need for hysterectomy is 0.7%, 0.4%, 0.9%, 2.4%, 3.5% and 9.0% for the 1st, 2nd, 3rd, 4th, 5th, and 6th or more cesarean sections. [1]

Additional risk factors include prior uterine surgeries or curettage, Asherman's syndrome, advanced maternal age, multiparity, and In Vitro Fertilization (IVF).[2][3]

Diagnosis

Placenta previa is the most important ultrasound abnormality associated with placenta accreta, present in 80%.[2]

Other abnormalities include multiple placental vascular lacunae, loss of the normal hypoechoic zone, decreased retroplacental myometrial thickness, uterine serosa-bladder interface abnormalities, and extension of the placenta into myometrium, serosa, or bladder. Color doppler may facilitate diagnosis evaluating for turbulent lacunar flow, subplacental vascularity gaps, gaps in myometrial blood flow, and vessels bridging the placenta to the uterine margin.[2][4]

In a systematic review and meta-analysis of 23 studies mainly evaluating patients with anterior placenta and history of prior uterine surgery, the sensitivity was 90.72% and specificity was 96.74%.[4]

In a retrospective study in which observers were blinded to the clinical history the sensitivity was 53.5% and the specificity was 88.0%.[5]

Although ultrasound examination is important, the absence of ultrasound findings does not preclude PAS and clinical risk factors are equally important.[2]

Treatment

Generally, the most accepted approach to PAS is cesarean hysterectomy with the placenta left *in situ* after delivery of the fetus as attempts at placental removal are usually associated with significant hemorrhage.

Uterine artery embolization may be utilized to decrease bleeding especially when continued fertility is highly desired or to help minimize bleeding with placenta percreta cases.

Resuscitative Endovascular Balloon Occlusion of the Aorta (REBOA) has also been utilized to reduce massive hemorrhage which can occur with PAS.[2][6]

When possible, antenatal diagnosis of PAS is highly desirable with delivery at a Level III or IV maternal care facility at 34-36 weeks gestation before the onset of labor or bleeding.[2]

References

- 1.Silver RM, et al. Maternal Morbidity Associated with Multiple Repeat Cesarean Deliveries. Obstet Gynecol 2006; 107:1226-32
- 2.Obstetric Care Consensus No. 7: Placenta Accreta Spectrum, Obstetrics & Gynecology: Dec 2018. Vol 132. Issue 6 p e259-e275
- 3.Salmanian B, et al. In Vitro Fertilization as an Independent Risk Factor for Placenta Accreta Spectrum. American journal of Obstetrics and Gynecology Oct 2020 p568.e1-5.
- 4.D'Antonio F, et al. Prenatal identification of invasive placentation using ultrasound: systematic review and meta-analysis. Ultrasound Obstet Gynecol 2013; 42: 509-517.
- 5.Bowman ZS, et al. Interobserver variability of sonography for prediction of placenta accreta. J Ultrasound Med 2014;33:2153-8
- 6.Ioffe YJM, et al. When the balloon goes up, blood transfusion goes down: a pilot study of REBOA in placenta accreta spectrum disorders. Trauma Surg Acute Care Open 2021;6 e000750.