Placenta Accreta Diagnosis and Management

Deirdre J. Lyell, MD
Professor, Maternal-Fetal Medicine
Lucile Packard Children’s Hospital at Stanford
UCSF AIM Conference, June 2017

Objectives

- Identify women at high risk for accreta in need of a targeted ultrasound
- Understand the clinical severity and safe management of accreta in order to use resources effectively

Conflict of interest disclosure

- Consultant for Bloom Technologies
- Investor in ZenFlow
Both unrelated to the content of this talk

Objectives

- Identify women at high risk for accreta in need of a targeted ultrasound

Why does this matter?
“Center of Excellence”

Multidisciplinary team:
- expert sonographer, experienced MFM/OB, pelvic surgeon, expert anesthesiologist, IR, neonatology
- Appropriate facility:
  - ICU and NICU
  - Transfusion services
    - MTG, cell saver, Transfusion Medicine

- Silver et al, AJOG, May 2015

Multidisciplinary team vs. standard team

- 5-times less composite early maternal morbidity
  - OR 0.22 (95% CI, 0.07–0.70)
- Fewer women needed transfusion of >4 units RBCs
  - 43% vs. 61%, P=.031
- Fewer reoperations w/in 7 days for bleeding
  - 3% vs. 36%, P<.001
  - Eller, Obstet Gynecol, Feb. 2011

Pre-delivery diagnosis

- Occurs in only 24-50% of accretas
  - Population-wide studies: discovered at delivery in 50-76%

- Critical for optimal delivery location (“Center of Excellence”), timing
Cause?

- Deficient decidua
  - Scarring
  - Lower uterus

- Overly invasive trophoblast
  - Accreta without known prior scarring

Risk factors: your best clue

Who has the highest risk for accreta?

A. 45 yo G1P0 with previa
B. 38 yo G4P3 with 3 prior cesareans
C. 22 yo G2P1 with previa and one prior cesarean
D. 20 yo G1P0 with a PAPP-A of 3.1 MoM
Accreta risk factors

- Myometrial damage/scarring
- Prior surgery: cesarean, myomectomy, D&C, thermal ablation
- Uterine artery embolization, radiation
- Asherman’s Syndrome
- Placenta previa
- Submucous fibroids
- Multiparity
- Advanced maternal age
- IVF

Cesarean and previa: patient history is the best clue

- Accreta risk with history of:
  - One cesarean, 0.3%
    - With previa: 11%-25%
  - Two cesareans, 0.6%
    - With previa: up to 40%
  - Three cesareans, 2.4%
    - With previa: up to 61%

- Accreta incidence is increasing with cesarean and previa

Accreta: increasing with cesarean

![Graph showing increasing risk of accreta with cesarean and vaginal birth rates.]

Accreta: increasing with previa

<table>
<thead>
<tr>
<th>Risk Factor for Previa</th>
<th>Increased Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prior placenta previa</td>
<td>8x</td>
</tr>
<tr>
<td>Prior cesarean delivery</td>
<td>1.5-15x</td>
</tr>
<tr>
<td>Prior suction curettage</td>
<td>1.3x</td>
</tr>
<tr>
<td>Age &gt; 35 years</td>
<td>4.7x</td>
</tr>
<tr>
<td>Age &gt; 40 years</td>
<td>9x</td>
</tr>
<tr>
<td>Multiparity</td>
<td>1.1-1.7x</td>
</tr>
<tr>
<td>Non-white (all)</td>
<td>0.3x</td>
</tr>
<tr>
<td>Asian</td>
<td>1.9x</td>
</tr>
<tr>
<td>Cigarette smoking</td>
<td>1.4-3x</td>
</tr>
</tbody>
</table>
Other clues: serum analytes

- Increased MS-AFP with accreta
  - >2.5 MoM Kupferminc MJ et al. Obstet Gynecol 1993
- AFP and hCG odds ratios:
  - MS-AFP >2.5 MoM, OR 8.3-9.7
  - hCG >2.5 MoM, OR 3.9-8
    - Hung et al, Obstet Gynecol, 1999
    - Dreux S et al. Prenat Diagn 2012
  - Both MS-AFP and hCG >2.5 MoM, OR 32
    - Dreux S et al. Prenat Diagn 2012

First trimester analytes

- Increased PAPP-A with previa/accreta
  - Median 1.20-1.68 MoM vs. .98-.85 for previa alone
  - No differences in f-BhCG
- Women with previa and PAPP-A >95thile (>2.63 MoM) had 8.7x increased risk of morbidly adherent placenta
  - No differences in f-BhCG

Second trimester analytes

Radiologic clues
Multiple Lacunae (lakes)

Clear space, uterine-bladder interface

NPV 92-100%

Absence PPV 15-50%: often due to technical error

Percreta to bladder

Color doppler

- High flow lacunae (≥15 cm/sec)
- PPV 60%; NPV 90%
- Bridging vessels

Stanford accreta evaluation protocol

1. Lacunae: presence and number
   - Peak systolic velocity within lacunae
2. Retro-placental clear space: normal/absent
3. Uterine-serosa bladder wall interface
   - Thickened, irregular, vascular?
4. Bridging vessels?
Ultrasound vs. MRI?

<table>
<thead>
<tr>
<th></th>
<th>Ultrasound (n=922)</th>
<th>MRI (n=71)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitivity %</td>
<td>86</td>
<td>84</td>
</tr>
<tr>
<td>Specificity %</td>
<td>94</td>
<td>80</td>
</tr>
<tr>
<td>PPV %</td>
<td>74</td>
<td>86</td>
</tr>
<tr>
<td>NPV %</td>
<td>97</td>
<td>78</td>
</tr>
</tbody>
</table>

Berkley and Abuhamad, J Ultrasound Med 2013

- MRI may be helpful for depth and location of invasion
- May be helpful if ultrasound is inconclusive

Prospective cohort, Nordic countries, 2009-2012
No antenatal diagnosis in 71%
Thurn et al., BJOG 2016

Retrospective cohort study
No antenatal diagnosis of MAP among 76%
Miller ES et al., BJOG 2016

Maternal morbidity: hemorrhage

- Acute, life threatening hemorrhage
  - during pregnancy: 90% previa bleed by 37 weeks
  - at cesarean: during attempted placental removal
  - after cesarean
- 66 cases of cesarean with accreta+
  - 95% received RBCs (0 to 46 units (mean 10±9))
  - 39% >10 units
  - 11% >20 units
  - No differences among accreta subtypes
    - Stottler B. et al, Transfusion, 2011
Maternal morbidity of accreta

- Complications of hemorrhage:
  - renal, cardiac damage, VTE, TRALI, death
  - Surgical damage to surrounding organs
  - Hysterectomy
  - DVT/PE
- Infectious morbidity
- Amniotic fluid embolism
- Death: 6-7%
  - Washecka et al, Hawaii Med J 2002,

Fetal/neonatal outcomes

- No reported increase in fetal anomalies, IUGR
- Perinatal mortality from maternal hemorrhage (previa):
  - 1% (2010 estimate)
- Neonatal sequelae of late preterm birth
  - 34-35 weeks, recommended delivery timing
    - NIH: Timing of Indicated Late-Preterm and Early-Term Birth, Spong et al. Obstet Gynecol, 2011 August

Delivery timing

- 34+0-35+6 weeks
  - Spong et al. Timing of Indicated Late-Preterm and Early-Term Birth. Obstet Gynecol, Aug 2011

Best management practices
Delivery: it takes a village

Maternal-Fetal Medicine
Obstetric Anesthesia
Gynecologic Oncology
Neonatal Intensive Care
Transfusion Services
Perinatal Nursing
Pathology
Interventional Radiology
Adult Critical Care
Trauma Surgery
Vascular Surgery
Pediatric Radiology

Before beginning surgery

- Large bore I.V. access
- High-flow infusion device
- 1-2 MTG equivalents in the room
- DVT prophylaxis
- Antibiotics one hour prior to delivery
- I.R.?

Intra-operative management

- Create fundal hysterotomy, deliver
- If future childbearing is planned and feasible:
  - Can await spontaneous placental separation
    (DO NOT attempt manual separation)
- If proceeding with hysterectomy
  - Close hysterotomy, placenta in situ

Intra-operative management

- Avoid hypothermia
- Repeat antibiotic administration
  - Every 1500cc EBL
  - Every 3 hours of surgery
If bleeding will not stop

- Diffuse, non-arterial bleeding
  - Pelvic pressure packing with laparotomy sponges
- Infrarenal aortic compression
- Balloon occlusion or clamping of aorta in extreme cases
  - Risks: distal thrombosis and ischemia
- Know when to walk away: interval surgery

Interval staged surgery

August, 2012, Stanford

Accreta postoperative risks

- Determined by surgical events
- Prolonged surgery, massive transfusion, hypotension
  - Renal, cardiac and other organ dysfunction
- Sheehan syndrome
  - Hyponatremia is an early sign
- Pulmonary edema, TRALI
- DVT/PE
- Infection

Postoperative care

- Frequently ICU admission, observation
- Correction of coagulopathy, anemia
- Ongoing evaluation for bleeding, renal tract injury
- Low threshold for re-exploration if concerns
- Lactation consult
Prevention

Avoid first cesarean when possible