Safety Action Series

Placenta Accreta Spectrum: Utilizing the Obstetric Hemorrhage Bundle to Improve Outcomes

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Speakers

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Disclosures

- Daniela Anne Carusi, MD, MSc has no real or perceived conflicts of interest.
- Nora Scharf, MSN, RN has no real or perceived conflicts of interest.
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Objectives

- Review elements of the Obstetric Hemorrhage Bundle under the lens of the Placenta Accreta Spectrum
- Examine the importance of a multidisciplinary care team to improve outcomes
- Discuss strategies to address mental health in the presence of PAS during the pregnancy, delivery, and postpartum stages
Definition

• Placenta Accreta Spectrum (PAS)
  – Clinical
    • Lack of separation plane between placenta and uterus
    • Excessive bleeding from placental bed
    • Surgical measures to control bleeding
    • Gross evidence of invasion at laparotomy
  – Pathologic
    • Lack of normal decidual (endometrial) layer between placenta & uterus
    • Accreta: placenta implanted on myometrium
    • Increta/ Percreta: placenta invading myometrium
Background

- Placenta Accreta Spectrum (PAS)
  - ~ 1/1000 deliveries
  - Highly Morbid
    - Transfusion: 50-70%
    - Hysterectomy: 90-100%
    - ICU Admission: 20-30%
    - Urinary tract injury, fistula: 3-7%
    - Death: 0.1-1%

Accreta and Severe Maternal Morbidity (SMM)

Components of SMM Outcome:
- Unanticipated surgery
- Intubation > 12 hrs
- Transfused > 3 units
- ICU admission
- Organ failure

• > 1/2 of SMM cases were due to hemorrhage

• Risk Score: Based on strength of association with SMM

<table>
<thead>
<tr>
<th>Patient Characteristic</th>
<th>Adjusted OR (95% CI)</th>
<th>Risk Score Points</th>
</tr>
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<tbody>
<tr>
<td>Age 35 y or older</td>
<td>1.70 (1.31–2.21)</td>
<td>2</td>
</tr>
<tr>
<td>Cigarette use during pregnancy</td>
<td>1.44 (1.06–1.96)</td>
<td>1</td>
</tr>
<tr>
<td>Government-assisted insurance</td>
<td>1.56 (1.23–1.98)</td>
<td>1</td>
</tr>
<tr>
<td>Obstetric history (referent: prior vaginal delivery only)</td>
<td>1.38 (1.04–1.83)</td>
<td>1</td>
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<tr>
<td>Nulliparous</td>
<td>1.99 (1.35–2.95)</td>
<td>2</td>
</tr>
<tr>
<td>Prior cesarean delivery only</td>
<td>2.12 (1.52–2.95)</td>
<td>2</td>
</tr>
<tr>
<td>Any hypertension</td>
<td>3.36 (2.61–4.32)</td>
<td>4</td>
</tr>
<tr>
<td>Diabetes mellitus (referent: no diabetes mellitus)</td>
<td>2.07 (1.49–2.88)</td>
<td>2</td>
</tr>
<tr>
<td>Gestational</td>
<td>2.13 (1.00–2.64)</td>
<td>2</td>
</tr>
<tr>
<td>Antepartum anticoagulant use</td>
<td>5.21 (2.07–12.32)</td>
<td>5</td>
</tr>
<tr>
<td>Placenta accreta</td>
<td>58.11 (36.84–91.64)</td>
<td>13</td>
</tr>
<tr>
<td>Placental abruption</td>
<td>1.92 (1.14–3.24)</td>
<td>2</td>
</tr>
<tr>
<td>Gestational age at delivery (referent: 39 0/7–39 6/7 wk)</td>
<td>9.10 (5.52–15.02)</td>
<td>7</td>
</tr>
<tr>
<td>23 0/7–27 6/7</td>
<td>4.66 (3.08–7.06)</td>
<td>5</td>
</tr>
<tr>
<td>28 0/7–33 6/7</td>
<td>3.15 (2.17–4.58)</td>
<td>4</td>
</tr>
<tr>
<td>34 0/7–36 6/7</td>
<td>1.52 (0.97–2.36)</td>
<td>1</td>
</tr>
<tr>
<td>37 0/7–37 6/7</td>
<td>0.97 (0.62–1.51)</td>
<td>0</td>
</tr>
<tr>
<td>38 0/7–38 6/7</td>
<td>1.09 (0.69–1.72)</td>
<td>0</td>
</tr>
<tr>
<td>40 0/7–40 6/7</td>
<td>1.60 (0.90–2.82)</td>
<td>1</td>
</tr>
<tr>
<td>41 0/7–41 6/7</td>
<td>1.41 (0.19–10.21)</td>
<td>1</td>
</tr>
</tbody>
</table>

OR, odds ratio; CI, confidence interval.
* Severe maternal morbidity defined as a score of at least 8 based on the system of Geller et al.4
1 Based on dividing each β by 0.322, the smallest significant β (corresponds to nulliparous) and rounding to the nearest integer.

Diagnosis

• Antepartum: Suspicion
  – Risk Factors
  – Ultrasound
    • Sensitivity: 54-91%
    • Specificity: 88-97%
  – MRI: Investigational
  – Diagnosis confirmed at delivery

Risk Factors
• Placenta Previa
• Prior Cesarean Delivery
  • In vitro fertilization
  • Other uterine surgeries
    • Endometrial damage
  • Intrauterine adhesions
  • Advanced maternal age
  • History of PAS

PAS and Hemorrhage Bundle Implementation

- Readiness
- Recognition & Prevention
- Response
- Reporting and System Learning

READINESS
Readiness: Case

- 34 weeks pregnant
- 2 prior cesarean deliveries + placenta previa
- Admitted at 32 weeks with vaginal bleeding
- Ultrasound: highly vascular placenta accreta spectrum
Readiness

• Major Elements
  – Hemorrhage cart/ supplies
  – Immediate access to medications
  – Response team
  – Massive & Emergency-release transfusion protocols

Readiness: Delivery Planning

• Centers of Excellence & Regionalization of Care
  • Major components¹
    – Level III or Level IV Center for maternal care²
    – Advanced surgical support
    – Dedicated multidisciplinary team planning
    – On-site OB Anesthesia
    – 24-hour ICU availability
  • Data
    – Better outcomes in higher-volume hospitals³
    – Better outcomes with a dedicated PAS team⁴

Readiness: Response Teams

**Primary Team**
- OB/ MFM
- Anesthesia
- Nursing
  - Critical Care
  - PDM
- Surgical Technologists
- Urology
- Gyn Oncology/ Pelvic Surgery
- Perfusionist/ Blood Bank
- Mental Health

**Backup Teams**
- Surgical Assistance
  - Trauma
  - Advanced pelvic surgeons
- Intensivists
- Interventional radiology
### Delivery Planning

#### PAS Center

- **Patient details**
  - Expected surgical difficulty
  - Hemoglobin, transfusion issues
  - Proximity to hospital – admit?
- **Logistics**
  - Delivery location & timing
  - Surgical team
  - Equipment
- **Communication**
  - Details available to all L&D Staff

#### Other Settings

- **Need for consultation**
- **Need for patient transfer**
  - When?
- **Local plan if patient arrives emergently**
- **Consider referring any previa + prior cesarean delivery**
  - Local resources
  - 24/7 coverage
Readiness: Case

- Antepartum Planning
  - Inpatient until 34 week delivery: NICU aware
  - Early OB Anesthesia consult with detailed plan
  - Urology: cystoscopy and ureteral stenting preop
  - Experienced surgical team on-call
  - Hemorrhage preparations
    - Cooler of blood products *at the bedside*, blood bank stays ahead
    - Perfusionist, cell salvage
    - Belmont infuser set up in the room
    - Critical Care OB nurse
Readiness: Level I and Level II Centers

• Preparation for emergent arrivals
  – Massive transfusion protocol
    • Simulate with staff and blood bank
  – Maternal stability
    • IV access, monitoring, frequent labs
    • Trauma surgeons, intensivists as needed
  – Immediate transfer preparations
    • Established relationship with Level III or Level IV Center
    • Avoid delivery
      – Avoid placental disruption if delivery deemed necessary
    • Don’t assume stability until patient is at the appropriate level center
RECOGNITION & PREVENTION
Recognition: Case

- Gravida 1 with IVF twins, laboring at 36 weeks
- Placenta does not deliver
  - Difficult to find separation plane
  - +/- postpartum hemorrhage
Recognition: Major Elements

• Assessment of hemorrhage risk
  – Prenatal, admission and other appropriate times
• Measurement of cumulative blood loss
• Active management of 3rd stage of labor
QBL Background

- Delayed PPH interventions PPH are associated with mortality\(^1\)
- Visual EBL can underestimate blood loss by 33–50% \(^2\)
- AWHONN recommends formal, quantified blood loss after every birth \(^3\)
- QBL methods:
  - Low fidelity: manual calculation by staff
  - AI based technology

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\(^3\) Quantification of Blood Loss: AWHONN Practice Brief Number 1, JOGNN, 00, 1–3; 2014. DOI: 10.1111/1552-6909.12519
QBL Pearls

• Timed checks during a hemorrhage event
• Include vaginal blood loss calculation during laparotomy
• Automatic alerts to designated staff at critical QBL thresholds
• Helping staff adjust to new total values for blood loss
• Cultural change
Data: Operating room

- Prospective study of 242 scheduled cesareans
  - QBL: Gauss colorimetric system
  - Blinded surgeons gave EBL
- QBL estimates were significantly lower than EBL

EBL
Mean: 800 cc

QBL
Mean: 415 cc

Data: Operating room

- Prospective study of 242 scheduled cesareans
- QBL was significantly better at predicting hemoglobin drop in the upper quartile.

Recognition

• **PAS**
  – Presence of risk factors
  – Delayed placental delivery
  – Lack of normal separation plane

• **Hemorrhage**
  – Frequent QBL checks
  – Maternal vital signs, clinical symptoms

95% of normal placental deliveries occur within 18 minutes*

Prevention of Hemorrhage

• Active 3rd Stage Management
  – Uterotonics, massage +/- cord traction
  – Hemorrhage risk increases with time

• Avoid aggressive placental removal*
  – Make early hemorrhage preparations while placenta is in

• Intervene early
  – Embolization/ ligations, tamponade, hysterectomy

RESPONSE
Hemorrhage Response with PAS

• Usual guidelines
  – PPH Escalation
  – Massive Transfusion Protocol

• Unique Considerations
  – Blood loss may be especially **massive** and **rapid**
    • Especially if the placenta is forcibly removed
Hemorrhage Response

• Steps should be taken early
  – Communication of PAS
  – Adequate IV access
  – Invasive hemodynamic monitoring
  – Acquire blood products
  – Adequate anesthesia – prepare for General
  – Necessary help
    • Surgical: hysterectomy, urology, trauma or general surgery
    • Interventional radiology
    • Critical care nursing

Time = Blood
Hemorrhage Response

• Communication
  – Anesthesia team
  – Nursing
  – Surgical help
  – Patient

• Assignment of Roles
  – Event manager
  – Blood bank liaison
  – QBL manager
    • Consider vaginal bleeding during laparotomy
  – Family liaison
REPORTING & SYSTEM LEARNING
Reporting

• Regular review of hemorrhage cases
• PAS team reviews outcomes
• Review areas for improvement
  – All stages of care
  – Delivery planning
  – Hemorrhage response
System Learning

- Education
- Protocol sharing
- Simulation
  - Uncommon, high acuity event
  - Involve all teams
PATIENT SUPPORT
Mental Health Needs

- PPH
  - 3% PTSD at 3-6 months postpartum
- Hysterectomy/ Loss of fertility
- Anticipation
  - Unique patient group: Anticipated peripartum morbidity

Mental Health Support

• Routine screening: Antepartum and Postpartum
  – Depression
  – Anxiety, PTSD
  – Negative childbirth memories
• Involvement of perinatal psychiatry or social worker
  – Higher acceptance if presented as routine
• Patient involvement in decision making
  – Planning, hysterectomy
• Attention to partner/ family needs
Summary

• Anticipation, planning and team-based care are essential for PAS management

• Core hemorrhage bundle implementation is unchanged
  – Define response team
  – Early implementation is key

• If not a “PAS Center of Excellence,” drill scenarios for unanticipated PAS and have a referral plan

• Remember immediate and ongoing needs for patient and family
Q&A Session

To ask a question, please follow the instructions below:

• Submit your question by typing it into the box at the bottom of the control panel. Your question will be read aloud by the facilitator.
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