Impact of Maternal Vulnerability on Hemorrhage Severity in Placenta Accreta Spectrum

Background & Hypothesis

- PAS is a leading cause of severe obstetric hemorrhage and morbidity
- Current risk stratification relies heavily on placental invasion depth alone
- Limited data on predictors of hemorrhage severity after PAS diagnosis

Hypothesis: Hemorrhage severity is influenced by:

- **Maternal comorbidities** (hypertension/obesity), **pregnancy factors** (gestational age), and **disease severity** (percreta/placental pathology)

Study Design & Methods

- Retrospective cohort (2015–2025) at UC Davis Medical Center
- N = 87 (pathology-confirmed PAS)

Primary Outcome

- Hemorrhage severity:
  - Continuous: estimated blood loss (EBL)
  - Binary: massive hemorrhage threshold of ≥2.5 L EBL

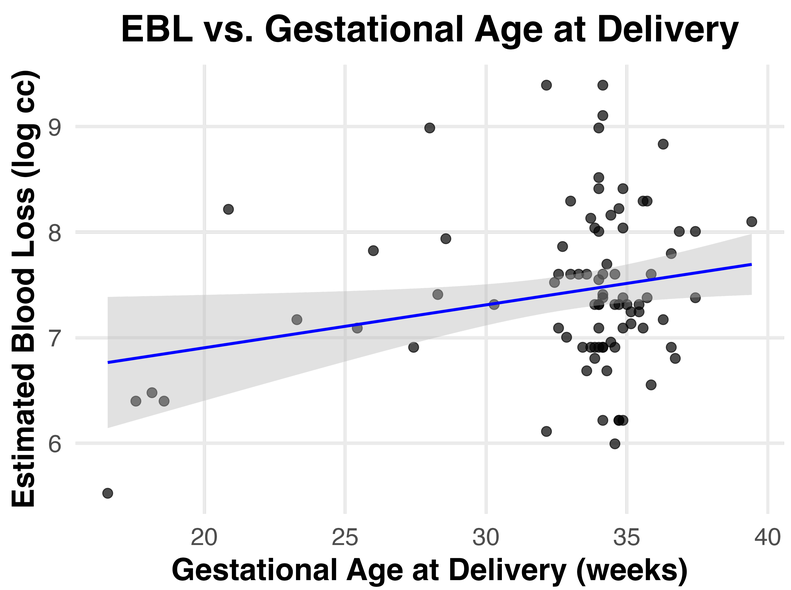
Predictors

- **Maternal**: age, obesity (BMI ≥ 35) , hypertension (HTN), diabetes
- **Obstetric Hx**: gestational age, vaginal bleeding after 1st trimester (VB), gravidity/parity
- **Disease**: PAS severity (accreta/increta/percreta)

Maternal Demographics	
Age (years), mean ± SD	33.1 ± 4.6
BMI (kg/m²), mean ± SD	33.1 ± 9.8
Medical History	
Hypertension, n (%)	10 (11.5%)
Preeclampsia, n (%)	4 (4.6%)
Diabetes, n (%)	20 (23.0%)
Obstetric History	
Gravidity, mean ± SD	5.4 ± 2.3
Parity, mean ± SD	3.2 ± 1.7
Index Pregnancy & Disease Severity	
Gestational age at delivery (weeks), mean ± SD	32.9 ± 4.4
Placenta percreta, n (%)	27 (31.0%)

Results

Estimated Blood Loss	
Mean ± SD (mL)	2,522 ± 2,945
Median (IQR) (mL)	1,500 (1,000–3,000)
Range (mL)	250–20,000
EBL ≥1,000 mL, n (%)	72 (82.8%)
EBL ≥2,500 mL (massive hemorrhage), n (%)	25 (28.7%)
Blood Transfusion	
Any blood product transfusion, n (%)	51 (58.6%)
Packed red blood cells (units), median (IQR)	1 (0–4)

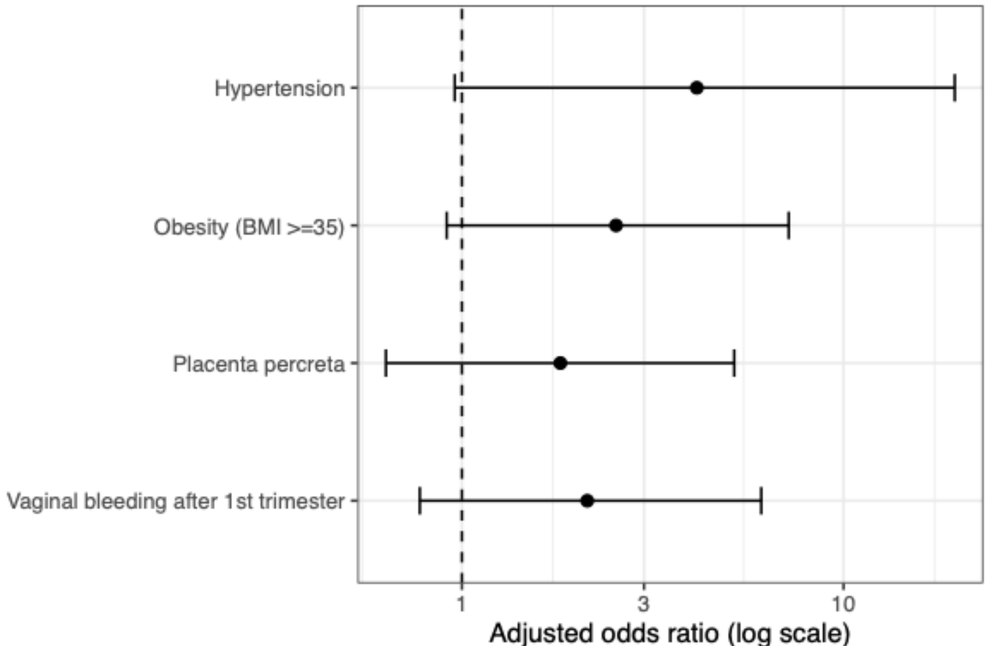


Continuous EBL Outcome:

- **HTN, BMI ≥ 35, placenta percreta**
- **Gestational Age at Delivery**

Massive hemorrhage (≥2.5 L EBL) :

- 25 out of 87 patients (28.7%)
- **Maternal HTN** (aOR 4.1; 95% CI 0.96–19.6)
- **BMI ≥ 35** (aOR 2.5; 95% CI 0.91–7.2)
- **Placenta percreta** (aOR 1.8; 95% CI 0.63-5.2)
- **VB after 1st trimester** (aOR 2.1; 95% CI 0.78-6.1)



Conclusion & Discussion

Hemorrhage severity in PAS is:

- Highly heterogeneous
- Not explained by anatomy alone

Maternal vulnerability matters - hypertension and obesity (BMI ≥ 35) shown to be strongest predictors of extreme hemorrhage

Gestational age + percreta also drive incremental blood loss and transfusion needs

Implications for OB Anesthesia

- Preoperative planning should incorporate maternal comorbidities in addition to PAS disease severity/placental pathology