Morbid Placenta

Finding it
Treating it
Being ready for it

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CONFLICT OF INTEREST
DISCLOSURE STATEMENT

I do not have financial interest or other relationships with the industry relative to the topics being discussed.

I am faculty at the SMFM critical care course, where best practice on accreta care is simulated & taught.
“…as we know, there are known knowns; there are ….known unknowns… but there are also unknown unknowns…”
OUTLINE

• What do when:
  • You know there is an accreta
  • There might be an accreta
  • An accreta shows up unexpectedly
    • At delivery
    • On placental pathology report
The unknown known

EVALUATING THE PATIENT AT RISK FOR MORBID PLACENTA
Incidence of accreta

ICAN Accreta Awareness Month
October 2016

"The incidence of Placenta Accreta has increased and seems to parallel the increasing cesarean delivery rate."
-ACOG

#ICANsavelives
Cause?

- Deficient decidua
  - Scarring
  - Lower uterus

OR

- Overly invasive trophoblast
- Accreta without known prior scarring

http://embryology.med.unsw.edu.au/notes/placenta2.htm
Pre-delivery diagnosis

- Occurs in only 24-50% of cases
  - Accreta newly diagnosed in OR in 50-76%

- Goals of prenatal assessment:
  - Assess for risk factors
  - Assure appropriate screening
  - Arrange delivery at qualified center
Risk factors:

- Nordic Obstetric Surveillance Study (Denmark, Iceland, Finland, Norway, Sweden), prospective cohort, 2009-2012
  - N=205 abnormally invasive placenta (AIP)
  - Low rate overall (~1/2900); strict definition/low-risk
- Cesarean rate 14-21% in 2010
- Relatively lower BMI
- No antenatal diagnosis in 71%

Thurn et al., BJOG 2016
Risk factors:

- No antenatal diagnosis in 71%

- Implications: targeted ultrasound should be performed in women with risk factors

- Prior PPH should be considered a risk factor

Thurn et al., BJOG 2016
Risk factors: your best clue

**MAJORITY** of patients have at least 1 risk factor!
Cesarean – Previa connection

<table>
<thead>
<tr>
<th>TABLE 1</th>
<th>Incidence of placental accreta as related to the number of prior cesareans</th>
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</thead>
<tbody>
<tr>
<td>WITHOUT CURRENT PREVIA</td>
<td></td>
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<tr>
<td>Prior c/s</td>
<td>OR 1.5-15</td>
</tr>
<tr>
<td>WITH CURRENT PREVIA</td>
<td></td>
</tr>
<tr>
<td>Prior c/s w previa</td>
<td>OR 51.4</td>
</tr>
</tbody>
</table>

Source: Silver et al, 2006

- Myomectomy/Fibroids
- Ablation/UA/Asherman’s
- Prior accreta; Prior PPH
- IVF
- Prior suction D&C $\text{OR} 1.3$
- Advanced age $>35$ $\text{OR} 4.7$
- Advanced age $>40$ $\text{OR} 9$
- Multiparity $\text{OR} 1.1-1.7$
- Non-white (all) $\text{OR} 0.3$
- Tobacco use $\text{OR} 1.4-3x$

Wu S et al. AJOG 2005;192(5):1458-61
Serum analytes

- Increased analytes associated w/ accreta
- msAFP
  - >2.5 MoM -- Kupferminc MJ et al. Obstet Gynecol 1993
- hCG >2.5 MoM
- PAPP-A >95th%ile (2.63 MoM)
  - Not highly sensitive or specific
How worried should these make you?

Odds ratios:

- MS-AFP >2.5 MoM OR 8.3-9.7
- hCG >2.5 MoM OR 3.9-8
- BOTH MS-AFP & hCG >2.5 MoM OR 32
- PAPP-A ≥95th%ile (2.63 MoM) aOR 8.7

Hung et al, Obstet Gynecol, 1999
Desai N, 2014
Dreux S et al. Prenat Diagn 2012
Buke B, 2017
I know she is at risk...now what?

- Start with US screening
  - At least 20 week, repeat 3\textsuperscript{rd} trimester
- Communicate your fear
  - Sonographer and reading physician
  - Should know RF/concerns
- Utilize a level II AIUM MFM staffed US unit
  - Experienced OB sonographers
  - Standardized placental evaluation protocol
  - Standardized machine settings/approach
  - ongoing QA
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>

Prenatal diagnosis occurs in ONLY 24-50% of cases
MRI

• MRI may be helpful for depth and location of invasion

• May be helpful if ultrasound is inconclusive

• SMFM: “Ob us is the primary tool for diagnosis….MRI can be helpful if US is inconclusive or if ...percreta is suspected”
Concerning findings

Ultrasound
- Myometrial border <1 mm
- Loss of hypoechoic border between bladder & placenta
- Lacunae within placenta (100% sensitivity)
- Increased vascularity

MRI
- Dark intra-placental bands
- Placental heterogeneity
- Uterine bulging
- Disruption of utero-placental zone
Concerning findings

- Loss of hypoechoic border
- Placental Lakes
- Hypervascularity
- Vascular projections into the bladder

Multiple Lacunae (lakes)

>6, irregular shape
Clear space, uterine-serosa bladder interface

NPV 92-100%

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

Normal

Abnormal
Clear space, uterine-serosa bladder interface

Percreta to bladder
Color Doppler

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

- Bridging vessels
Screening- who should be doing it?

- Significantly improved PPV and NPV after implementing:
  - training of all sonographers
  - standardized placental evaluation protocol
  - standardized machine settings/approach
  - ongoing QA
What if I do my own ultrasound?

- Using 5 criteria:
  - Clear space,
  - bladder line,
  - lacunae/flow,
  - 3-D irregular intraplacental vascularization,
  - 3-D hypervascular uterine serosa/bladder wall

- At least 2 criteria were present in all accreta/percreta cases
- All women without accreta/percreta had 0 or 1 criteria

Cali et al., Ultrasound Obstet Gynecol 2013
Understand Doppler Physics....

- Do not use Power Doppler
- Set Quality to High
- Set wall motion filter (WMF) to mid-2
- Set PRF to color scale of 15 cm/sec
  - or as close as possible (go over rather than under)
- Pulse Wave Doppler: angle correct if needed, not >60 degrees
Consider using “Stanford protocol”

- Lacunae: presence and number?
  - Peak systolic velocity within lacunae
- Retroplacental clear space: normal/absent
- Uterine-serosa bladder wall interface
  - Thickened? Irregular? Vascular?
- Irregular placental vessels crossing tissue planes?
- Placental location:
  - previa: lateral, posterior, anterior?

Result (includes assessment of RF)
- Low, moderate, or high suspicion or “no sonographic features”
THE KNOWN MORBID PLACENTA
The known known

Belfort et al, Am J Obstet Gynecol, Nov. 2010
Antepartum maternal morbidity

- Acute, life threatening hemorrhage
  - during pregnancy: 90% previa bleed by 37 weeks
  - at cesarean: during attempted placental removal
  - after cesarean

- No data suggesting increase risk preeclampsia/GHTN

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
THE KNOWN MORBID PLACENTA

The known known

Term-ish

Belfort et al, Am J Obstet Gynecol, Nov. 2010
Maternal morbidity

- Complications of hemorrhage:
  - renal, cardiac damage, VTE, TRALI, death
  - Average blood loss 3-5000 cc
    - 90% receive transfusion
    - 40% receive > 10 Units
- Surgical damage to surrounding organs
- Hysterectomy
- DVT/PE
- Infectious morbidity
- Amniotic fluid embolism
- Death: 6-7%

Maternal morbidity: hemorrhage

- 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

Do NOT be lulled by the “only” an accreta without evidence of bladder involvement...
Delivery: it takes a village

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

- DO NOT turn your back on it!
- Average blood loss 3-5000 cc
- 40% receive > 10 Units
Delivery at “Center of Excellence”

- Multidisciplinary team: ultrasound expert, experienced MFM/OB, pelvic surgeon, expert anesthesiologist, IR, neonatology
- ICU and facilities: IR, NICU
- Blood services
  - MTG, cell saver, Transfusion Medicine
Multidisciplinary team vs. standard team

- 5-fold reduced composite early maternal morbidity (OR 0.22 (95% CI, 0.07–0.70))
- Multidisciplinary care decreases blood loss (2 vs. 3 L)
- Less transfusion >4 units prbcs
  - 43% vs. 61%, $P=.031$
- Less reoperation w/in 7 days for bleeding
  - 3% vs. 36%, $P<.001$

Eller, Obstet Gynecol, Feb. 2011
General approach

- Scheduled c-hyst decreases mortality
- Planned hyst at 34-35 6/7 weeks
- Placenta left in place, proceed w/ hyst
- Early & aggressive 1:1:1:1 blood replacement
- Admit to ICU PP
- Arterial embolization if hemodynamically stable with intrapelvic bleeding
  - Transport from OR not suitable for unstable patient

Be Prepared!

- Minimize risk of blood transfusion
  - Maximize predelivery HCT (iron, transfusion)
  - Consider dilutional anemia prior to incision
  - Early aggressive replacement

- Delivery with planned hyst at an appropriate institution
  - appropriate surgical & transfusion capabilities

- Avoid unscheduled and emergent delivery
  - Delivery 34-35 6/7 weeks
  - Team strategy and preparedness

Shamshirsaz AA et al AJOG 2015;212:218.e1-9
Before beginning surgery

- Large bore I.V. access
- High-flow infusion device
- 1-2 massive transfusion/equivalents in the room
- DVT prophylaxis
- Antibiotics one hour prior to delivery
- I.R. aware of patient
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
  - Avoid hypothermia
- Repeat antibiotic administration
  - Every 1500cc EBL
  - Every 3 hours of surgery
Keep the uterus? Conservative Therapy

- Retrospective study 50 patients (50%/50%)
  - 92% required additional treatments (med, surg, UAE)
  - 20% failed conservative therapy
  - High risk complications (DIC, fever)

- 167 women with conservative therapy (France)
  - 78% success rate
    - 75% spontaneous resorption (mean 13.5 wks (4-60 wk)
    - 25% hysteroscopic resection or curettage
  - Among failures: 50% primary hyst, 50% delayed hyst
  - 6% severe morbidity (sepsis, peritonitis, vesicouterine fistua, uterine necrosis)

Adjuncts & other approaches

- Majority MFM - HYST is primary approach
  - 32% had tried conservative therapy
- Had “tried” other “help” for delivery
  - 35% femoral balloons
  - 36% ureteral stents
  - Significant regional variation

Kept the uterus? Now what?

- Significant risk next pregnancy
  - Only small series, limited data (as best)
- Does not seem to affect fertility
- High risk pregnancy
  - accreta again (at least 15%-30%)
  - Hyst (3% (without accreta)
  - PPH/Blood transfusion (20%)
  - Uterine rupture (3-5%)
Best Practice

- Delivery at experienced center with large blood bank
- Scheduled c-hyst at 34-35 6/7 week
- Placenta left in place while completing hysterectomy
- Early & aggressive 1:1:1 blood replacement
Prevention:
Avoid 1st cesarean when possible
The unknown unknown

WHAT THE WHAT?
THE ACCRETA FOUND AT DELIVERY
Always expect an accreta

- Prenatal dx occurs in ONLY 24-50% of cases
- EVEN WITH SCREENING
  - Newly diagnosed in OR in 50-76%

If you do not expect the unexpected, you will not recognize it when it arrives.

~ Heraclitus
Regardless of how well we screen—we are all going to have “that” moment
Know your resources & guidelines

- Safe motherhood PPH prevention

Now in an app!
Know your resources & guidelines

- Safe motherhood PPH prevention

- Make sure your hospital has:
  - PPH education and team training
  - protocol & drills & cart
  - MTP – and everyone knows how to initiate it
Know your resources & guidelines

- 10 clinical diamonds article!
- Ob/gyn’s Greatest Hits

Thanks for slightly reducing your alcohol consumption while I was living inside your uterus.

your e cards
someecards.com
10 Diamonds

- Angiographic Embolization Is Not Meant to Be Used for Acute, Massive Postpartum Hemorrhage
- Never Treat “Postpartum Hemorrhage” Without Simultaneously Pursuing an Actual Clinical Diagnosis
- If More Than A Single Dose of Medication Is Necessary to Treat Uterine Atony, Go to the Patient’s Bedside Until…Has Resolved
- In the Postpartum Patient Who Is Bleeding ….and Oliguric, Furosamide Is Not the Answer
- Any Woman With Placental Previa and One or More Cesarean Deliveries Should Be Evaluated and Delivered in a Tertiary Care Medical Center
- If Your Labor and Delivery Unit Does Not Have a Recently Updated Massive Transfusion Protocol … Get One
Do SOMETHING!

- Tell everyone what is going on
  - Remove baby and partner from the room
- Make sure anesthesia is starting their part
  - Early & aggressive 1:1:1 blood replacement
    - Large bore I.V. access
    - INTRODUCER (not central line) access if needed
  - General anesthesia
- Avoid hypothermia
- Repeat antibiotic administration
  - Every 1500cc EBL; 3 hrs
- Just keep operating
If bleeding will not stop

- Blood products and more blood products
  - Consider a TEG
- 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
- Don’t be a hero:
  - Call EVERYONE
Interval staged surgery
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

- ICU admission, observation
  - Correction of coagulopathy, anemia
  - Ongoing evaluation for bleeding, renal tract injury
  - Low threshold for re-exploration if concerns
- Lactation consult
WHAT DOES THAT EVEN MEAN?

The OTHER unknown unknown

THE ACCRETA ON PATHOLOGY REPORT AFTER A NORMAL DELIVERY
Myometrial fibers on placental pathology

- 25 women with morbidly adherent placenta (MAP) vs. 100 controls
- Pathologist conducted blinded review of prior placental pathology slides
- Basal plate myometrial fibers were seen in 19(76%) cases vs. 41(41%) controls
  - 4.8-fold more common among women with future MAP compared to normal controls

Miller ES et al., BJOG 2016
Predictor of the future?

- Modeled risk using RF
  - age, prior CDs, previa, prior multiples, prior curettage, and ultrasonographic suspicion

- Adding Basal plate myometrium
  - improved sensitivity MAP suspicion (61% vs. 39%, P < 0.001)
  - No change in specificity (97% versus 97%, P = 1.00)

- No antenatal diagnosis of MAP among 76%

Miller ES et al., BJOG 2016
More common in complicated deliveries

- 491 women with focal accreta
  - more like to have RF!
    - Prior cesarean
    - Prior Uterine surgery
    - IVF
  - more likely to have adverse outcomes
    - PPH, transfusion, peripartum hyst
Next pregnancy RF?

- 339 women with pathology accreta
  - 39 with subsequent pregnancy
- Index pregnancy higher risk for:
  - Bleeding/placenta indication for pathology (100%)
  - Retained POCs (80%)
  - Manual placenta removal (40%)
- Divided complications non/minor/major in index compared to subsequent
More common in complicated deliveries

- 491 women with focal accreta
  - 130 follow up pregnancies
- more like to have
  - Recurrent accreta (30%)
  - Adherent placenta/manual extraction (43%)
    - PPH, transfusion, peripartum hyst
Next pregnancy RF?

- Subsequent pregnancy
  - No accretas (pathology or clinical) in incidental grp
  - 25% accreta risk if severe morbidity index grp
    - only 2/5 found by ultrasound!

- Accreta prior pregnancy RF for PPH (2 vs 0.6%)
  - EVEN IN INCIDENTAL group without any placenta adherence in index pregnancy
Best practice?

- **Current delivery:**
  - Consider slightly higher risk for retained products

- **Subsequent delivery:**
  - Consider higher risk for accreta
  - Consider higher risk for PPH even if US is low risk

- Not enough risk to recommend avoiding pregnancy
Summary

- Screen for accreta based on risk factors
  - Make sure MFM/Sonographer is aware of risk factors
  - Use the “5” criteria
  - Remember the previa-accreta connection

- Have patients at HR evaluated at a tertiary center by an MFM US physician
  - Prior c/s with previa
  - 2+ risk factors
  - Make sure risk factors are known to the consulting physician!
Summary

- Don’t always believe the US- be prepared
Summary

- If you know ahead of time:
  - Arrange delivery at experienced center w large blood bank
  - Scheduled c-hyst at 34-35 6/7 week
  - Placenta left in place while completing hysterectomy
- Early & aggressive 1:1:1 blood replacement
- Optimize maternal condition, minimize morbidity
- DON’T try to save the uterus
ONE DOES NOT SIMPLY SAVE LIVES...

ANY WOMAN WITH PLACENTAL PREVIA AND ONE OR MORE CESAREAN DELIVERIES SHOULD BE EVALUATED AND DELIVERED IN A TERTIARY CARE MEDICAL CENTER
Watch for risk factors!
(especially the more unusual ones)

They can save a life!

THANK YOU!
Each month has an average of 30-31 days… except the last month of pregnancy, which has 1453 days.

Give blood for those who give life.