PLACENTA ACCRETA SPECTRUM (PAS)

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DISCLOSURES

- none

LEARNING OBJECTIVES

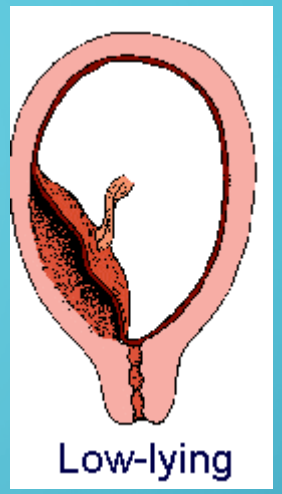
- Definitions
- Incidence
- Risk factors
- Pathophysiology
- Ultrasound markers
  - 1st trimester
  - 2nd trimester
- Other imaging modalities

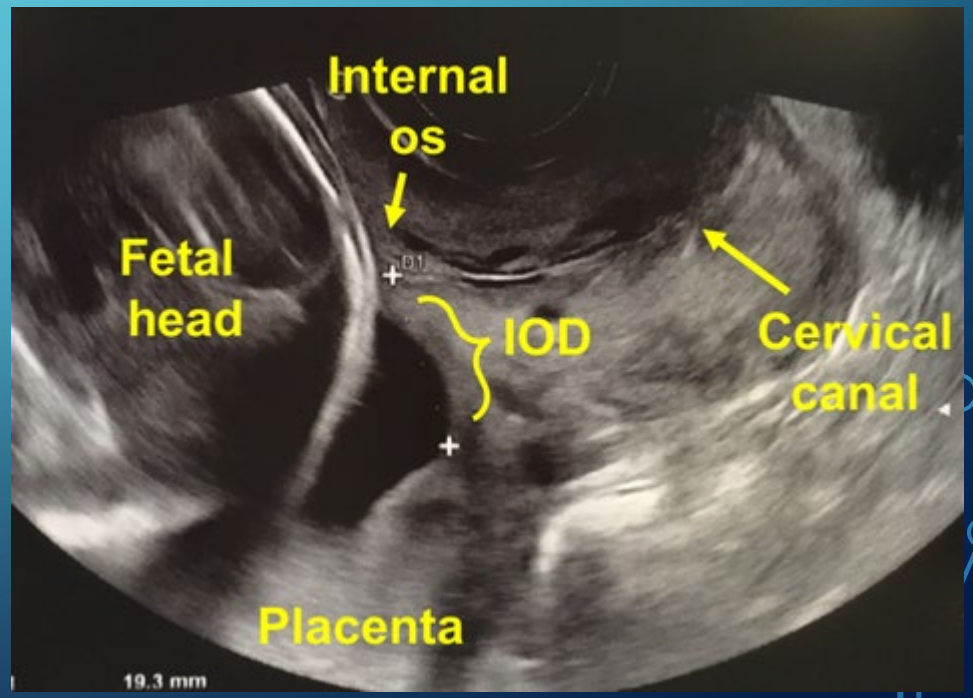
TERMS USED IN PAST

- Previa:
  - Complete, incomplete, partial, marginal
- Abnormal placentation
  - Accreta, increta, percreta
  - Morbidly adherent placenta (MAP)

DEFINITIONS (CURRENT)

- Location
  - Normal
    - At least 2 cm from the internal cervical os
  - Low lying
    - Placenta within 2 cm of the cervical os
  - Previa
    - Placenta that covers the cervical os





IOD: internal os distance

DEFINITIONS (CURRENT)

- Abnormal adherence
  - PAS (placenta accreta spectrum)
    - Abnormally deep placental anchoring

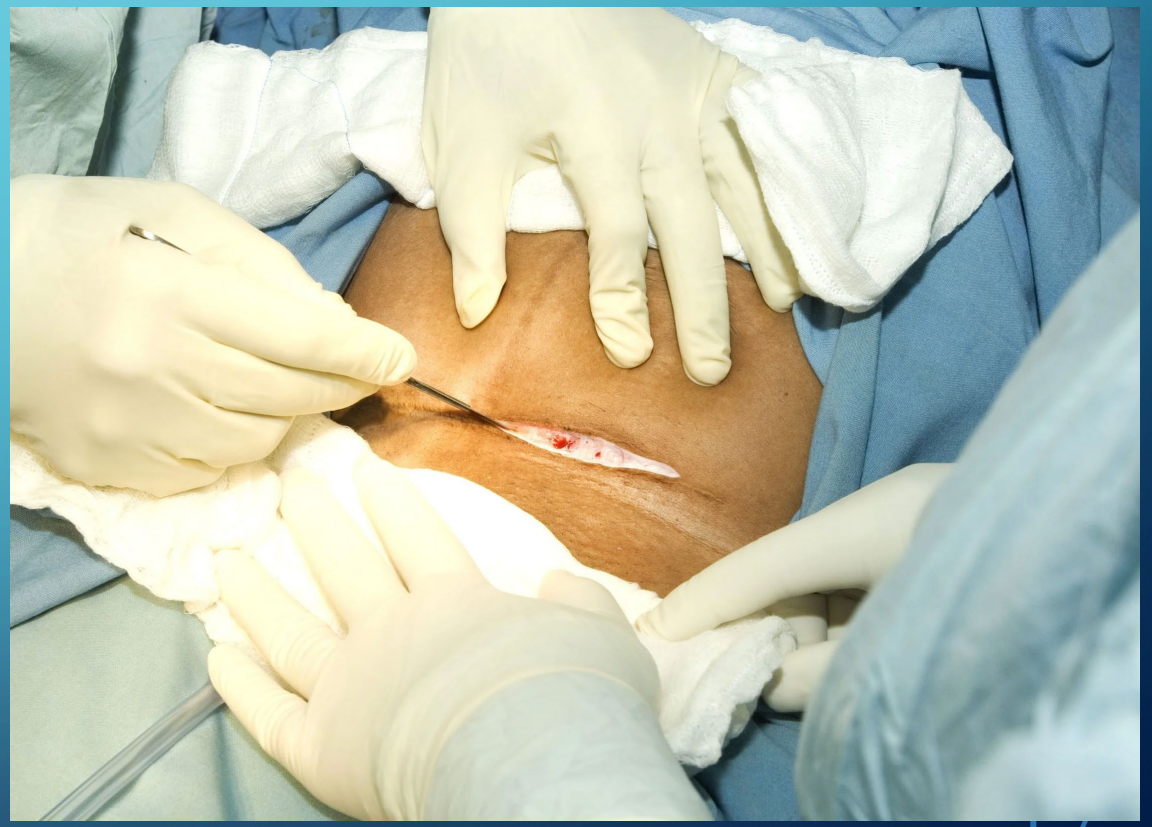
INCIDENCE OF PAS

• 1950	1:30,000
• 1960	1:10,000
• 1970-1980	1:2520 to 1: 4017
• 2002	1:533
• 2010	1:333
• 2016	1: 272

1. National accreta foundation: https://www.preventaccreta.org/
2. Placenta accreta spectrum. Obstetrical Care Consensus No. 7. American College of Obstetricians and Gynecologists. Obstet Gynecol 2018;132:e259-75.

WHY??

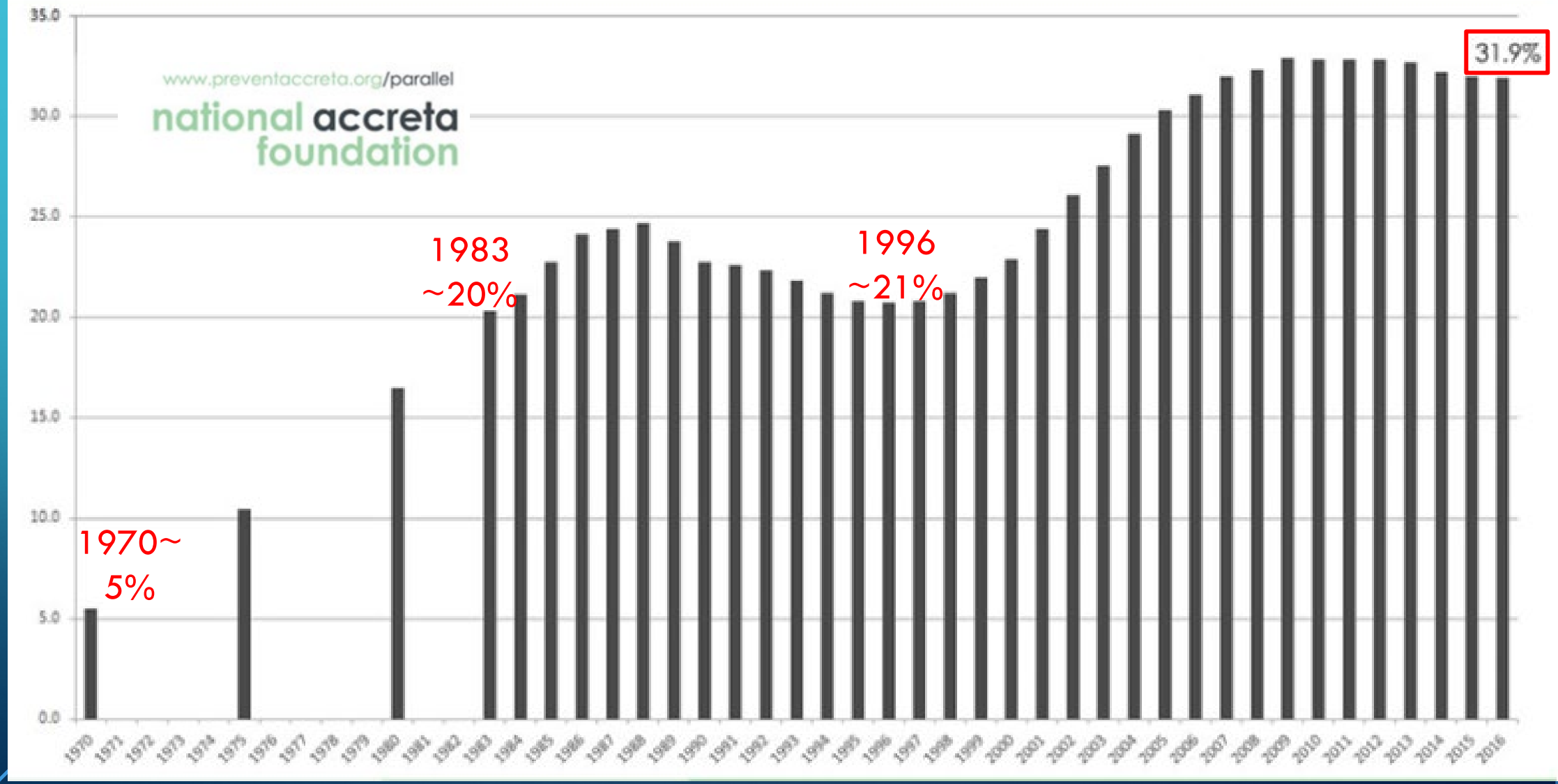
- CESAREAN RATE



CESAREAN RATES

- 1910 (Babe Ruth was 15)
  - 0.6%
- 1929
  - 3%

U.S. Cesarean Rate, 1970 - 2016



CESAREAN RATES WORLDWIDE

2018

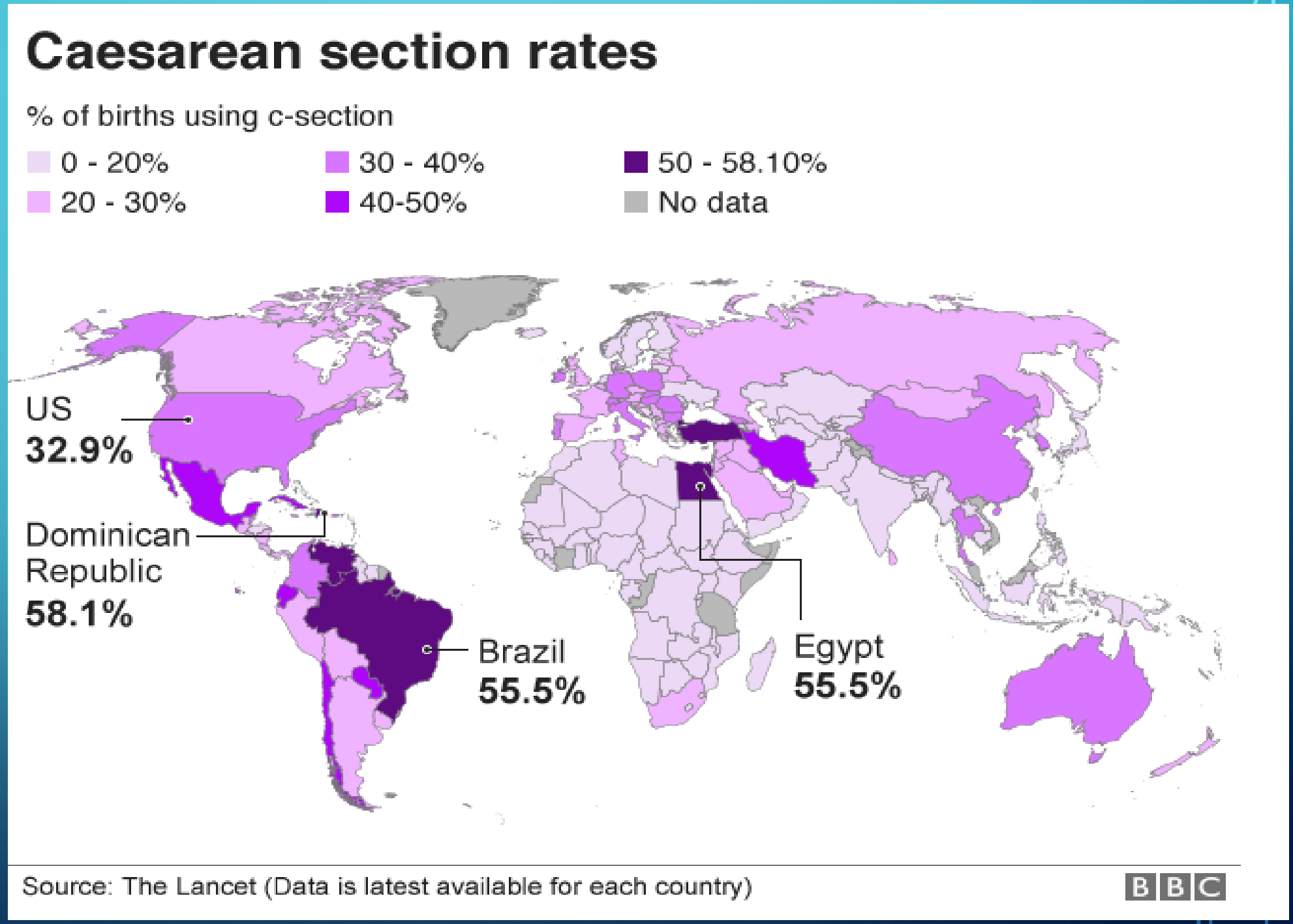
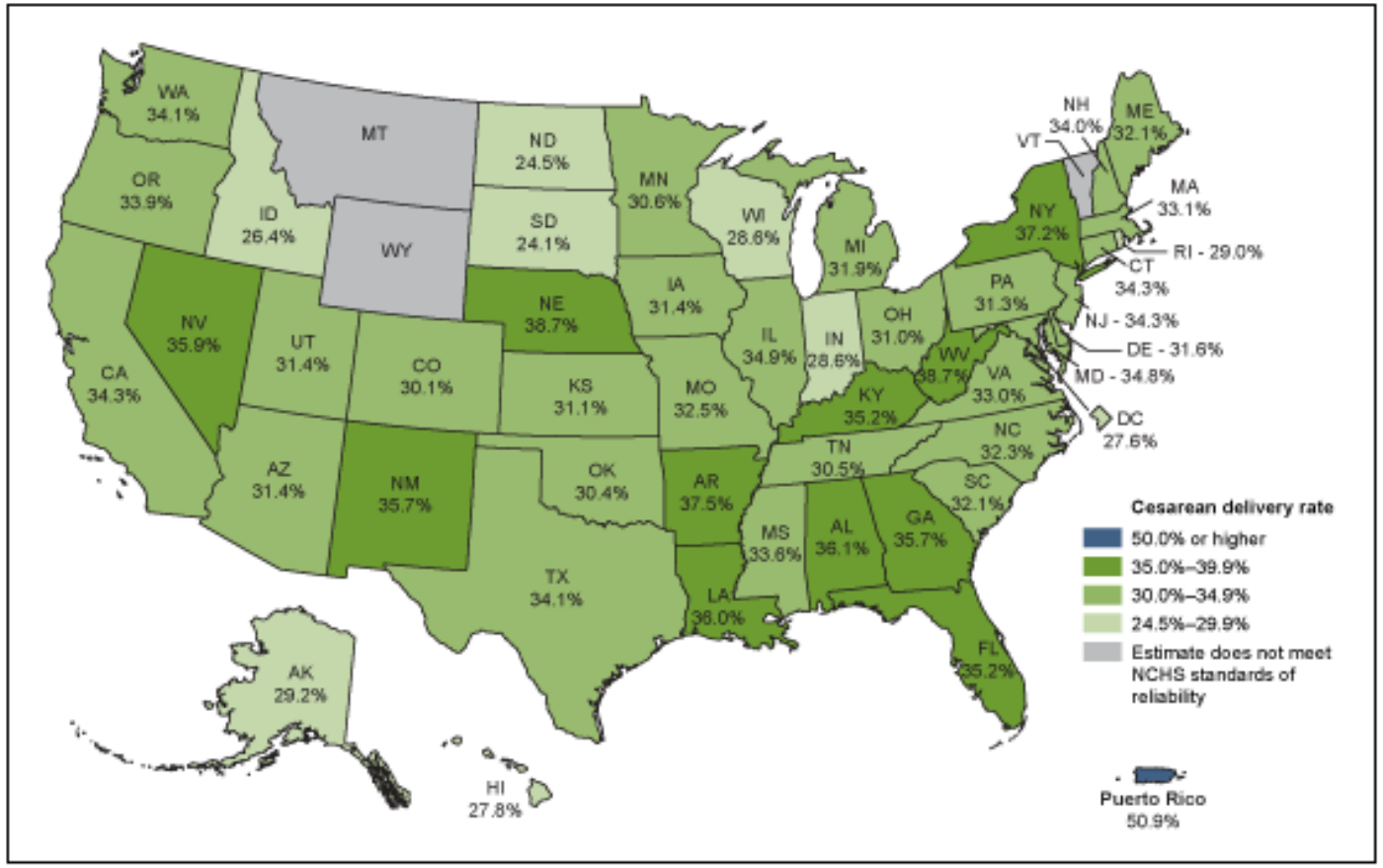


Figure 4. Cesarean delivery rate for Puerto Rican mothers in U.S. mainland, by state of occurrence, and Puerto Rico, 2023

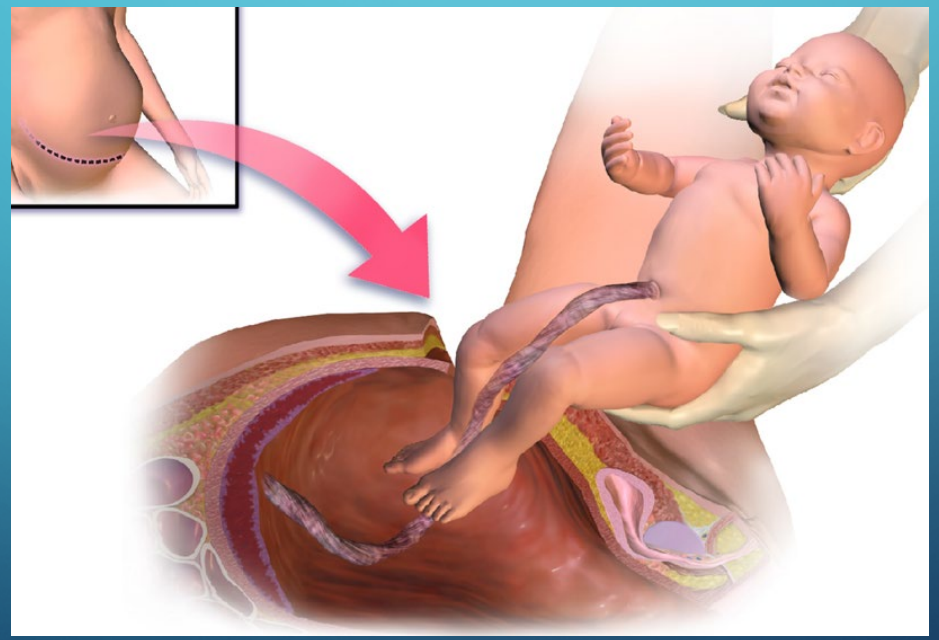


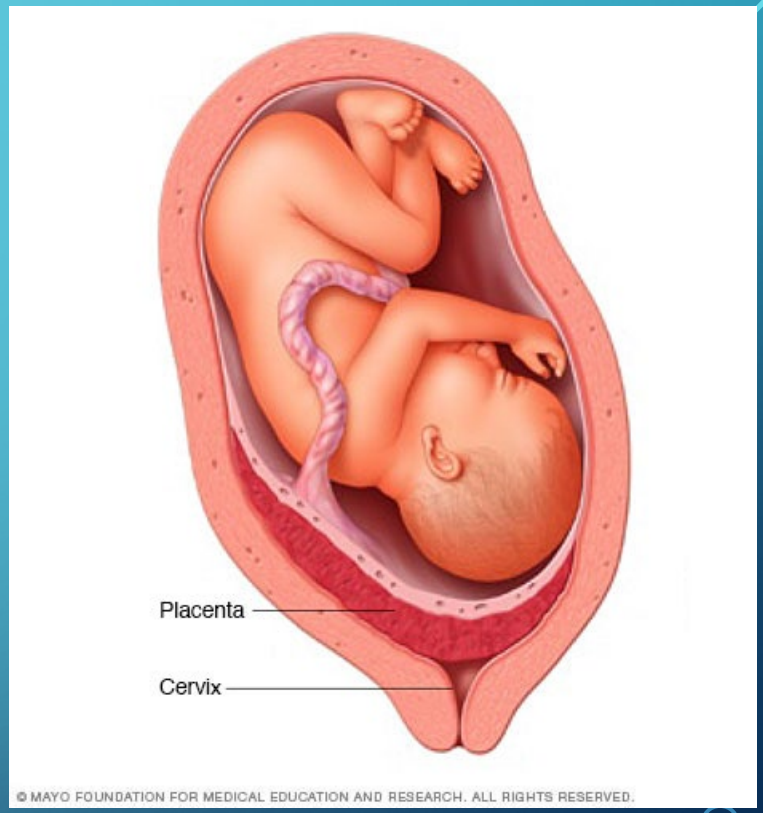
NOTES: All differences between each state or the District of Columbia and Puerto Rico are statistically significant at $p < 0.05$. NCHS is National Center for Health Statistics. No states had cesarean delivery rates at 40.0%-49.9%.

SOURCE: National Center for Health Statistics, National Vital Statistics System, natality data file.

RISK FACTORS FOR PAS

- Cesarean
  - Uterine niche
- Previa
  - 80% of PAS have previa





DANGEROUS COMBO

Cesarean Delivery	Previa*:Accreta† [n (%)]	No Previa‡:Accreta† [n (%)]
First§	13 (3.3)	2 (0.03)
Second	23 (11)	26 (0.2)
Third	29 (40)	7 (0.1)
Fourth	20 (61)	11 (0.8)
Fifth	4 (67)	2 (0.8)
≥ 6	2 (67)	4 (4.7)

* Percentage of accreta in women with placenta previa.
† Increased risk with increasing number of cesarean deliveries; $P < .001$.
‡ Percentage of accreta in women without placenta previa.
§ Primary cesarean.

- Silver, Robert, Landon, Mark, Rouse, Dwight, et al. Maternal Morbidity Associated With Multiple Repeat Cesarean Deliveries. Obstet Gynecol. 2006;107(6):1226-1232. doi:10.1097/01.AOG.0000219750.79480.84.

OTHER RISK FACTORS FOR PREVIA

- Uterine surgery
- Endometrial curettage
- Myomectomy
- Ashermans syndrome
- AMA
- Multiparity
- IVF
- Unexplained increased AFP (poor predictor)
- Fibroids
- Previous placenta previa
- Tobacco abuse
- Manual removal of placenta
- African American or Asian ethnicity
- Mullerian anomalies

PATHOPHYSIOLOGY

Multiple hypotheses

- Defect in endometrial-myometrial interface > failure of normal decidualization in the area of the scar
  - Absent decidua means the normal plane of separation is lacking > adherent placenta > abnormal deep anchoring villi and trophoblastic infiltration
  - Doesn't account for G1 with no prior instrumentation whom has PAS

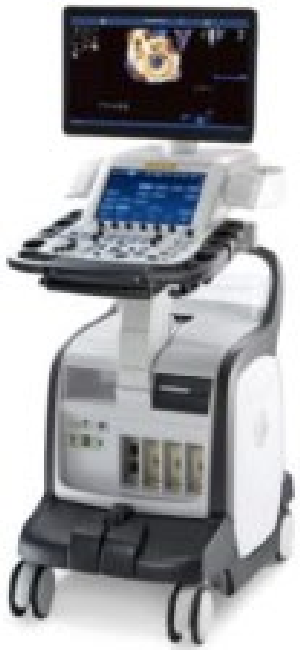
HOW DO WE IDENTIFY PAS

- Ultrasound
- MRI
- Pathology

* important to find AP to decrease morbidity & mortality

IMAGING MODALITIES

- Ultrasound: GOLD standard
  - Operator dependent
    - Substantial variability in image quality
  - Practice, practice, practice
    - (10,000 scans to be competent with Ob sonography in general)



OTHER COMPLICATING FACTORS WITH ULTRASOUND

- BMI epidemic
- Posterior placentas
- Leiomyomata

- Debate on what gestational age timing is best to perform

FIRST TRIMESTER ULTRASOUND

- Implantation within the cesarean scar or in close proximity to the niche
  - Seen in 82% of patients with PAS
- Implantation in the lower uterine segment
  - "low implantation" associated with 28% chance of PAS

TABLE 2
Definitions of placenta accreta spectrum markers in the first trimester of pregnancy

Marker	Definition
Cesarean scar pregnancy	Gestational sac implantation in part or totally within the cesarean scar.
	Gestational sac may have a teardrop or triangular shape.
Low implantation pregnancy	Gestational sac located close to the internal cervical os (up to 8 6/7 weeks of gestation) and/or placental implantation located posterior to a partially filled maternal bladder (up to 13 6/7 weeks of gestation).

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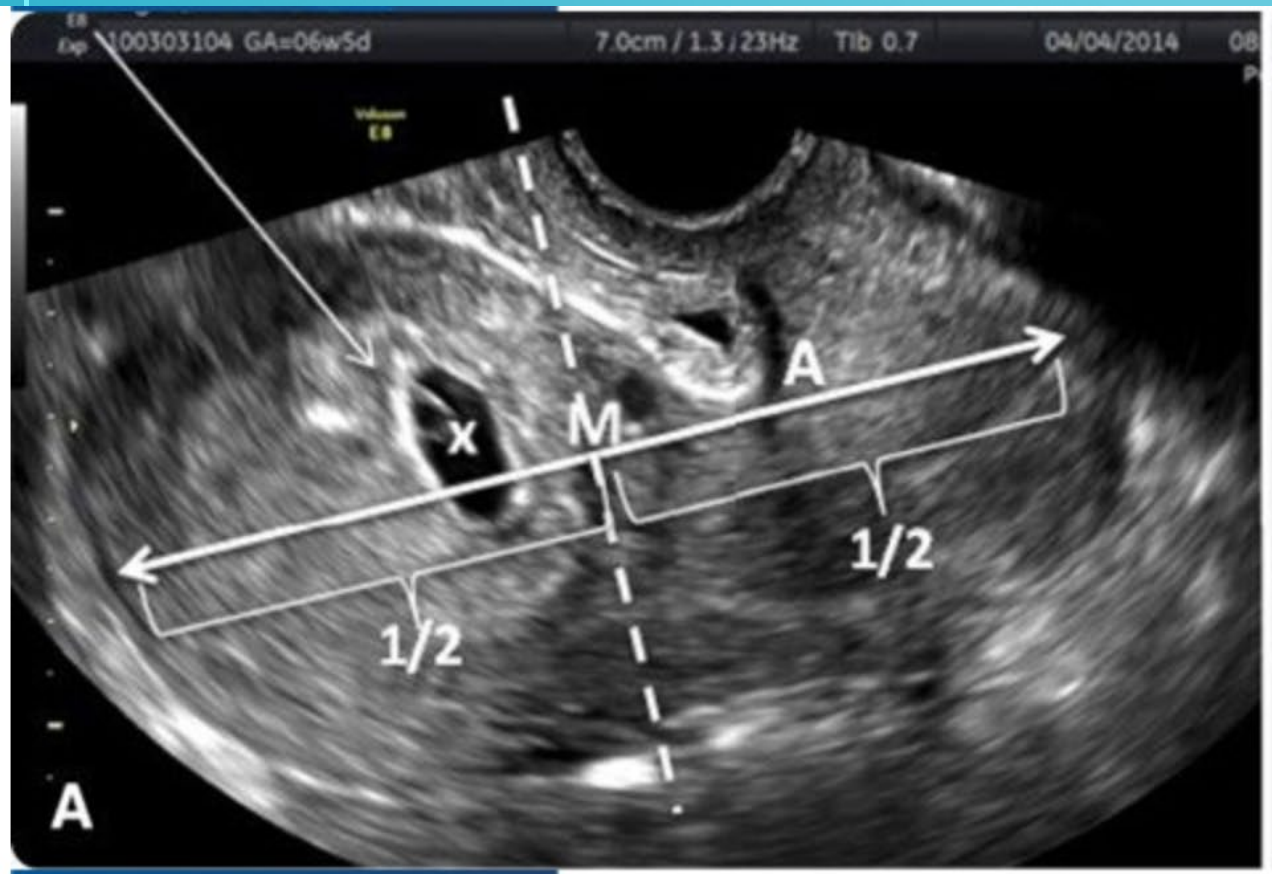
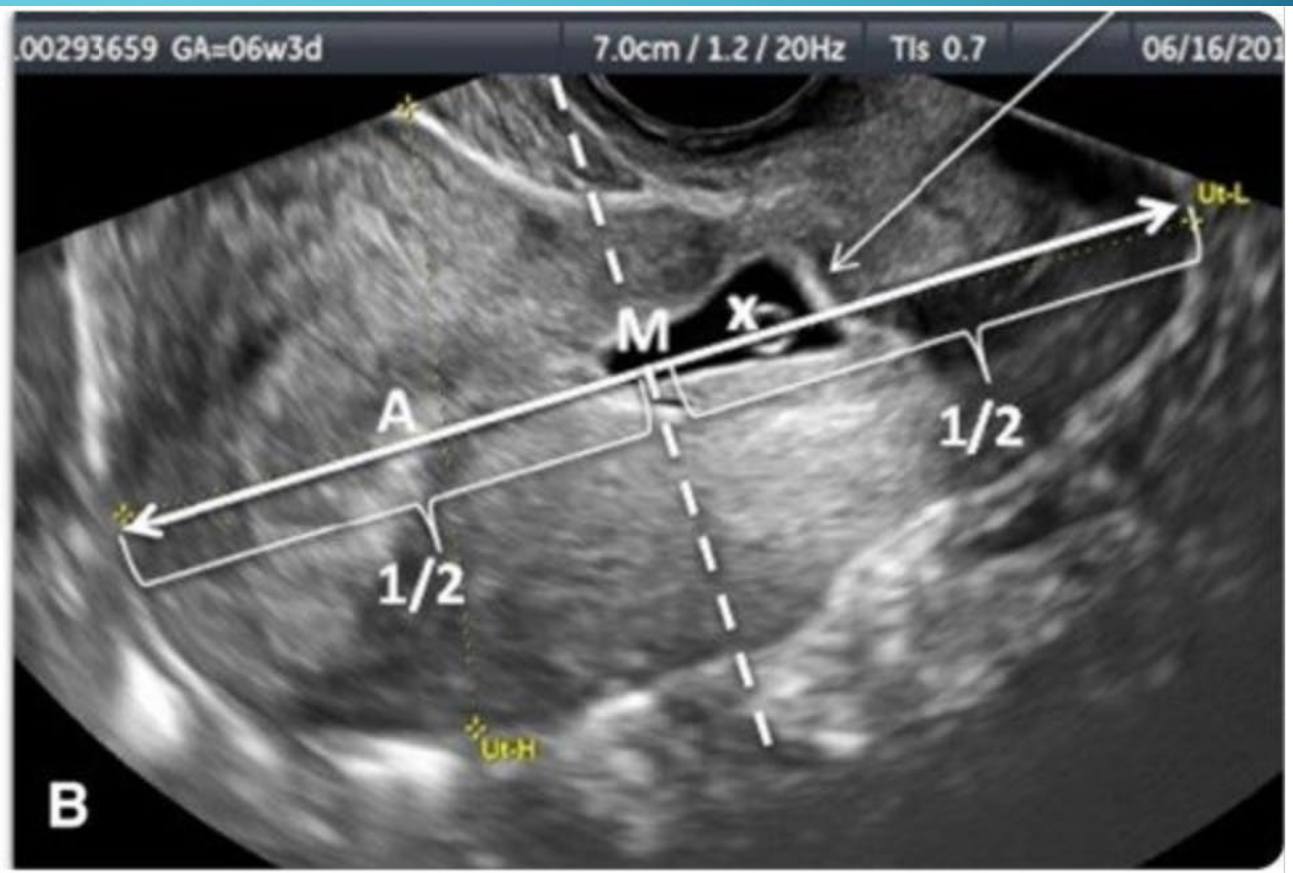
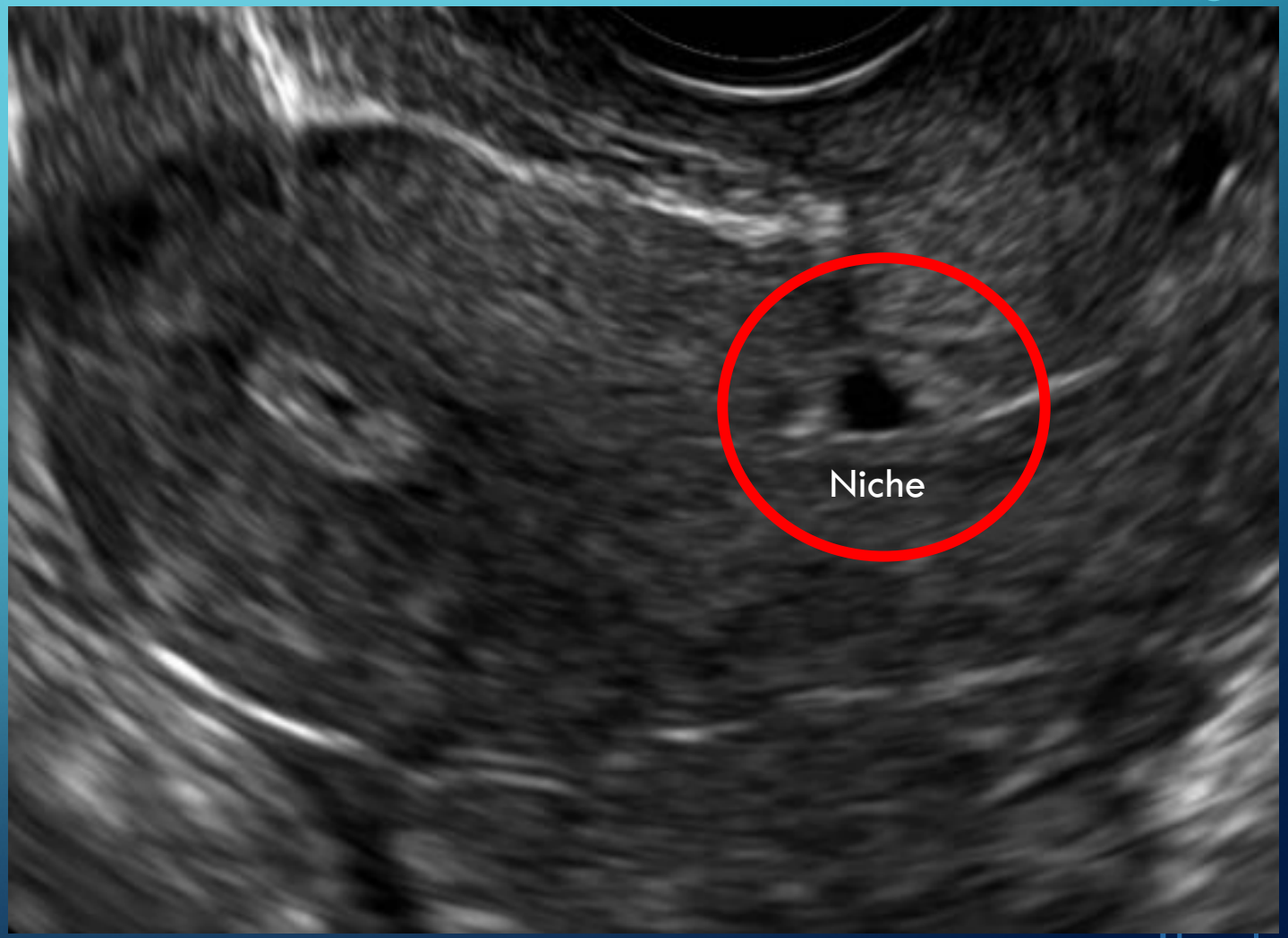
TIMOR-TRITSCH METHOD





CESAREAN SCAR NICHE

- Blastocyte implantation within microscopic dehiscence tract in the scar from previous cesarean.
  - Can lead to CSP



VARIOUS CSEP CLASSIFICATIONS

Common Classification Systems

1. Type I vs. Type II (Growth Direction)

- **Type I (Endogenic/Inward):** Sac implants in the scar and grows towards the uterine cavity; potentially less risky but can still cause issues.
- **Type II (Exogenic/Outward):** Sac implants deep in the scar, growing outwards towards the bladder/abdominal cavity; higher risk of rupture.
    - a thin layer of myometrium, often<5 mm, may initially be seen between the gestational sac and the bladder

2. Detailed "Ban 5" System (Myometrial Thickness & Sac Size)

- **Type I:** Muscle > 3mm thick (less invasive, often stable).
- **Type IIa:** Muscle 1-3mm thick, sac ≤ 30mm (intermediate).
- **Type IIb:** Muscle 1-3mm thick, sac > 30mm (intermediate).
- **Type IIIa:** Muscle < 1mm thick, sac ≤ 50mm (high risk).
- **Type IIIb:** Muscle < 1mm thick, sac > 50mm (highest risk, bulges outward).

3. Partial vs Complete (Invasion Depth)

- **Partial:** Sac invades the myometrium but partly in the cavity.
- **Complete:** Sac entirely embedded within the scar (rarer).

CESAREAN SCAR GRADING

Table 3. New Clinical Classification of Cesarean Scar Ectopic Pregnancy and Recommended Individual Surgical Treatment Strategy

Practical Clinical Classification	Anterior Myometrium Thickness (mm)	Average Diameter of the Gestational Sac or Mass (mm)	Surgical Treatment Strategy Recommended
Type I	Greater than 3		Suction curettage with or without hysteroscopy* under ultrasound guidance
Type II	1–3	IIa: 30 mm or less	Suction curettage with hysteroscopy* under ultrasound guidance
		IIb: greater than 30 mm	Hysteroscopy with laparoscopic monitoring or excision† or transvaginal excision
Type III	1 or less	IIIa: 50 mm or less	Laparoscopic excision or transvaginal excision
		IIIb: greater than 50 mm or with UAVF	Laparoscopic excision after UAE or laparotomy

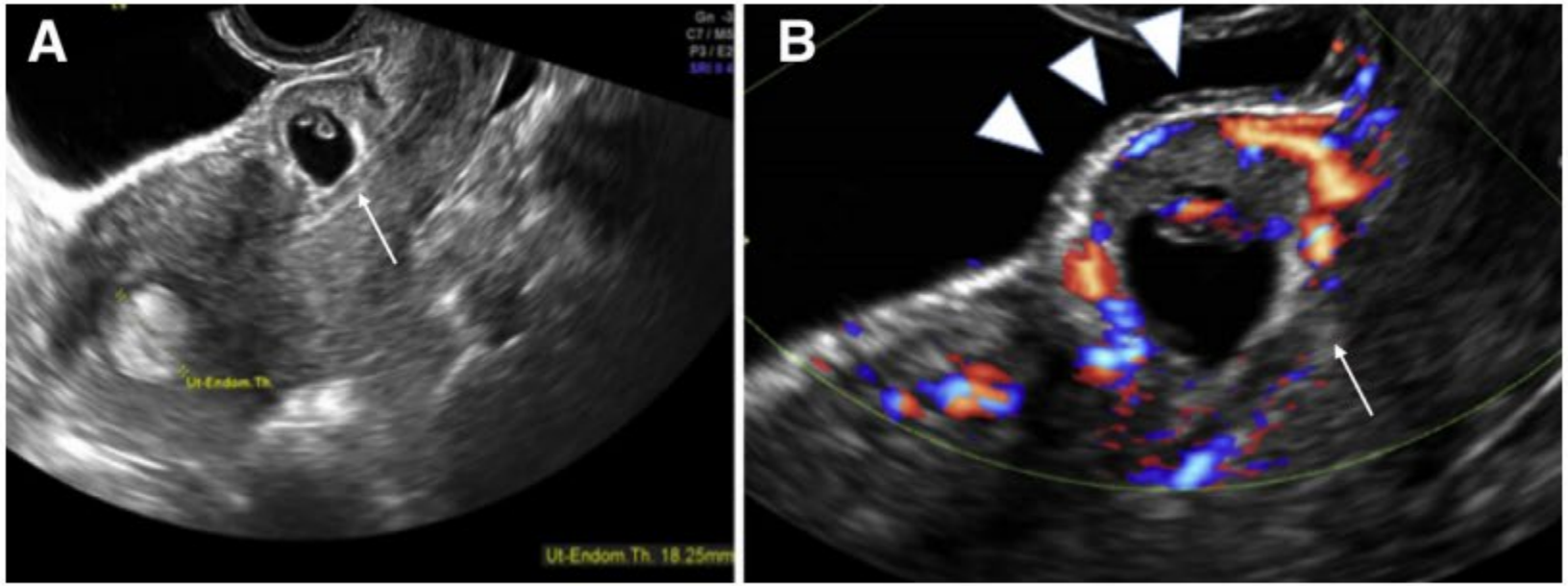
UAVF, uterine arteriovenous fistula; UAE, uterine artery embolization.

* Hysteroscopy is used to evaluate whether products of conception have been removed completely, with hysteroscopic resection of residual products when indicated.

† During laparoscopy, if the products of conception could not be removed completely by hysteroscopy, hemorrhage occurred, or myometrial layer bulge or thin-appearing myometrium was found, laparoscopic excision with scar defect repair was performed.

FIGURE 8

Ultrasound markers commonly seen in cesarean scar pregnancy



Transvaginal ultrasound in grayscale imaging (**A**) and color Doppler imaging (**B**) of a cesarean scar implantation (*arrow*) and bulging of the bladder line (*arrowheads*).

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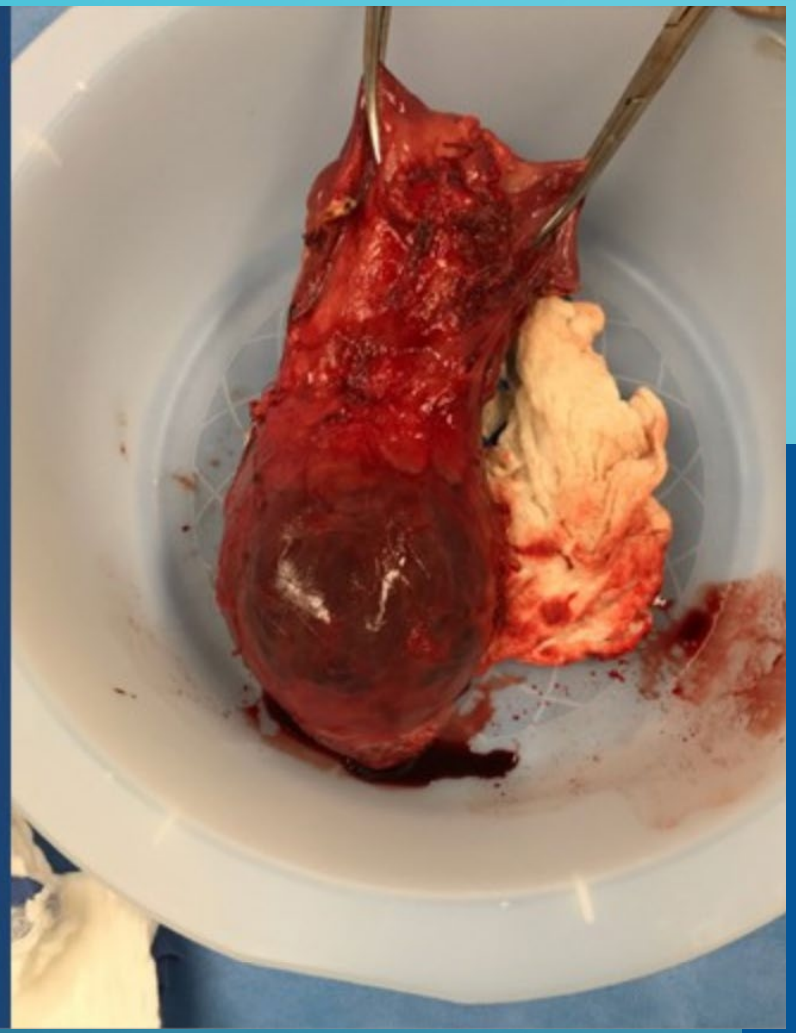
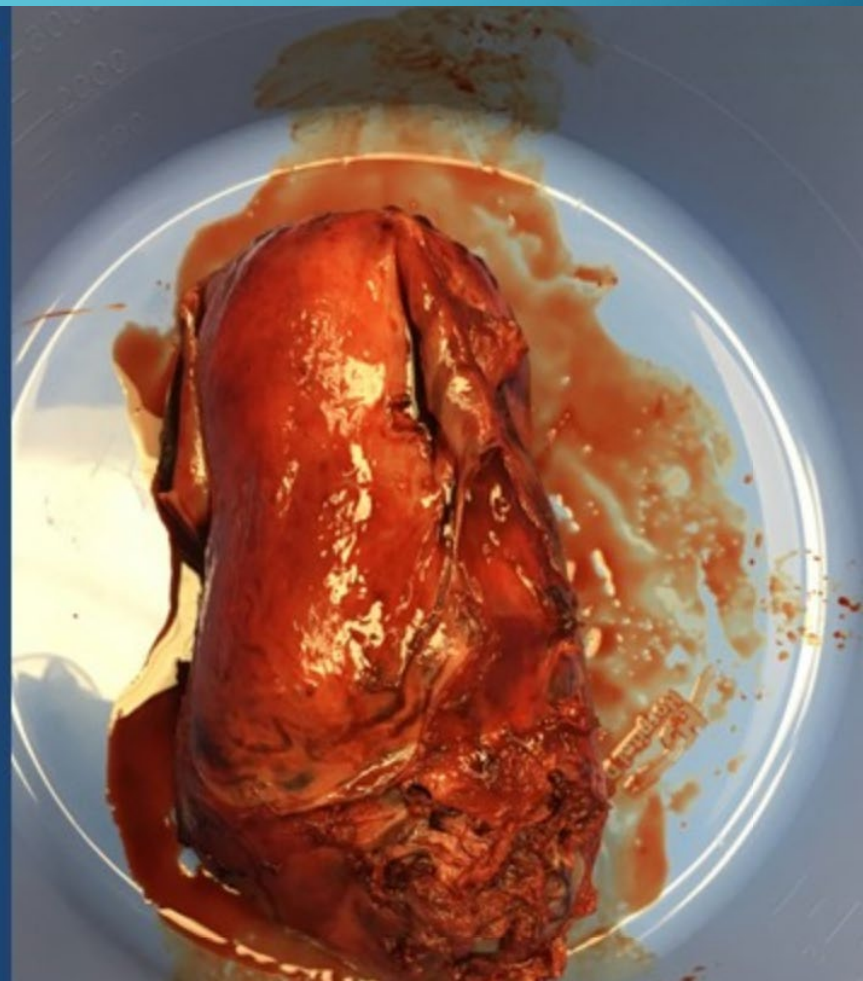
- Del 29 wks for PreE w/ SF & VB
- C-Hyst



- Suspected CSP
- Del 18 wks for PPROM & VB
- Fetus in situ
- Path: percreta

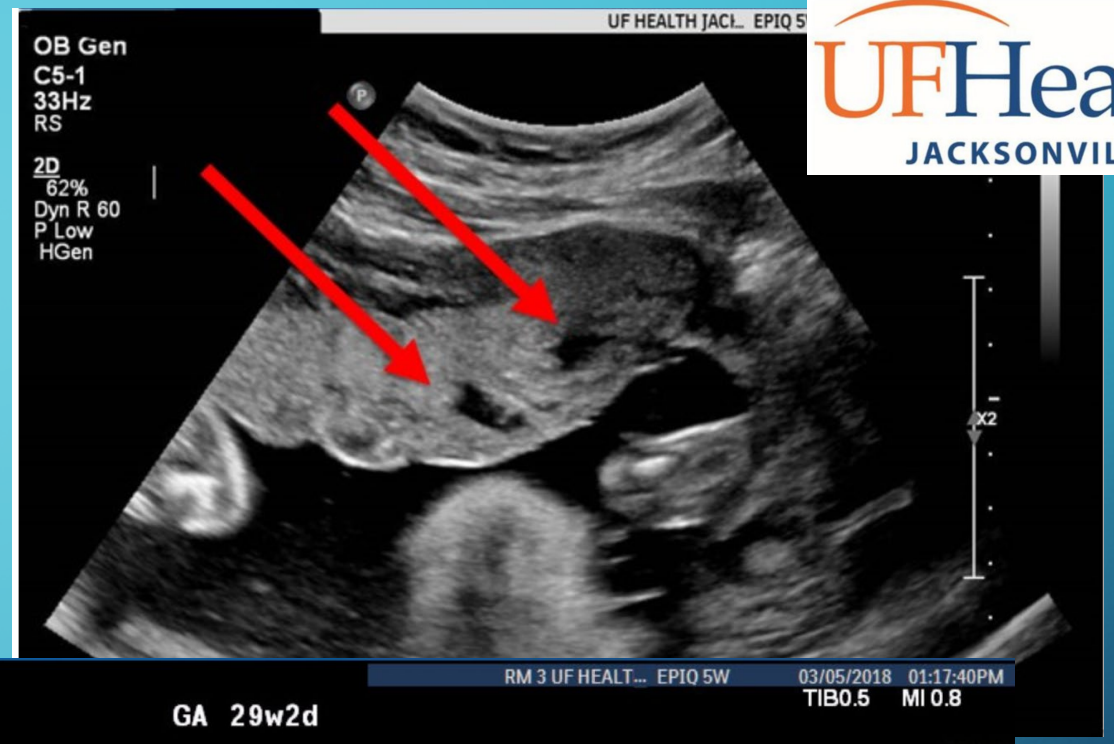


SECOND TRIMESTER ULTRASOUND

- Placental lacunae
  - Sensitivity 80-90%
- Abnormal uteroplacental interface
  - Loss of retroplacental clear zone (83% sensitivity)
    - Diagnostic Odds ratio: 23.8%
  - Thinning of the retroplacental myometrium
- Uterovesicular interface
  - hypervascularity
  - bulging or exophytic mass
    - Sensitivity 80-90%

PLACENTAL LACUNAE

- Numerous, large and irregular echolucencies within the parenchyma of the placenta
- NO consensus regarding specifics (SMFM Jan 2021)
- High risk for PAS:
  - Multiple (>/= 3)
  - “Large”
  - Irregular borders
  - High velocity &/or turbulent flow



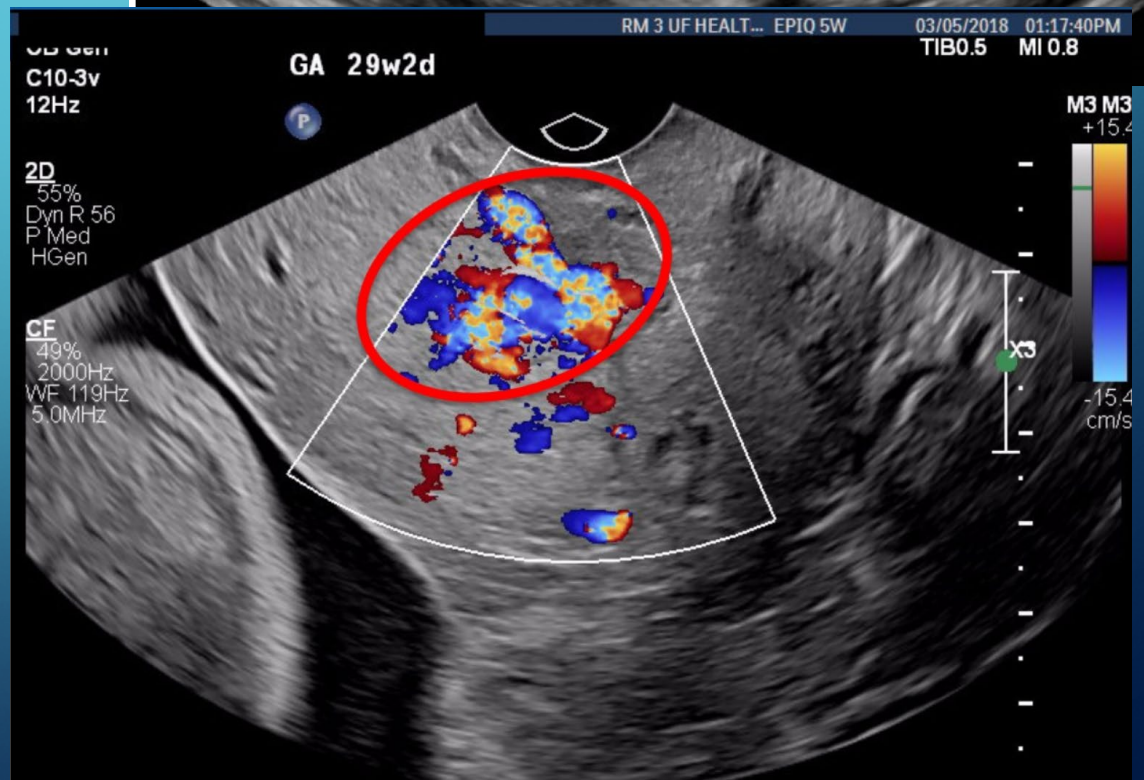
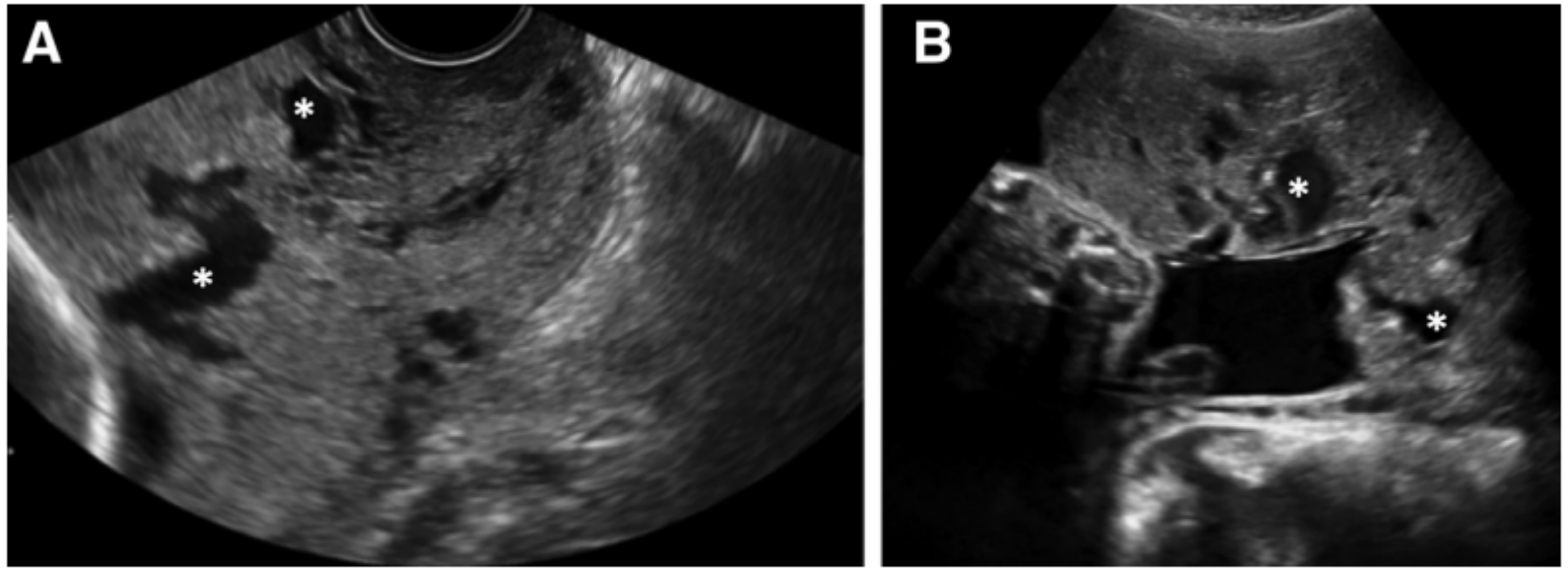


FIGURE 1
Placenta lacunae



Grayscale imaging of placenta lacunae (*asterisk*) in the setting of placenta previa with placenta accreta spectrum. **A,** Transvaginal midline sagittal image. **B,** Transabdominal midline sagittal image.

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- Lacunae congregate near invasion
- Need for hysterectomy & overall complications is correlated with number of lacunae

PLACENTA LACUNAE GRADING

- Grade 0: no lacunae (NPV: 88-100%)
- Grade 1: containing 1-3 small lacunae
- Grade 2: containing 4-6 larger and irregular lacunae
- Grade 3: many large and “bizarre appearing” lacunae throughout

ABNORMAL UTEROPLACENTAL INTERFACE

- Loss of the retroplacental hypoechoic zone, myometrial thinning (<1mm), increased vascularity on color Doppler
  - Substantial variation
  - Seen more often at advanced gestational age
  - Can be falsely produced or exaggerate with transducer pressure

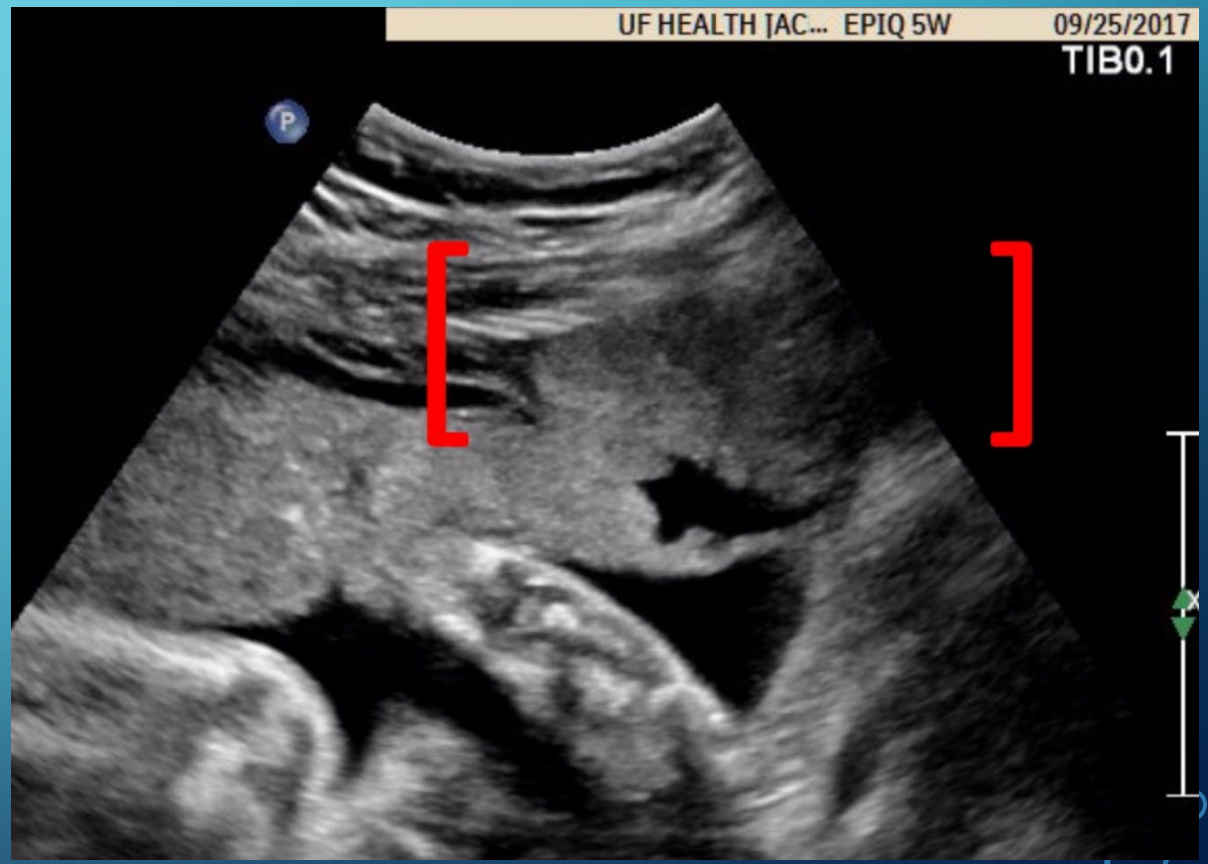
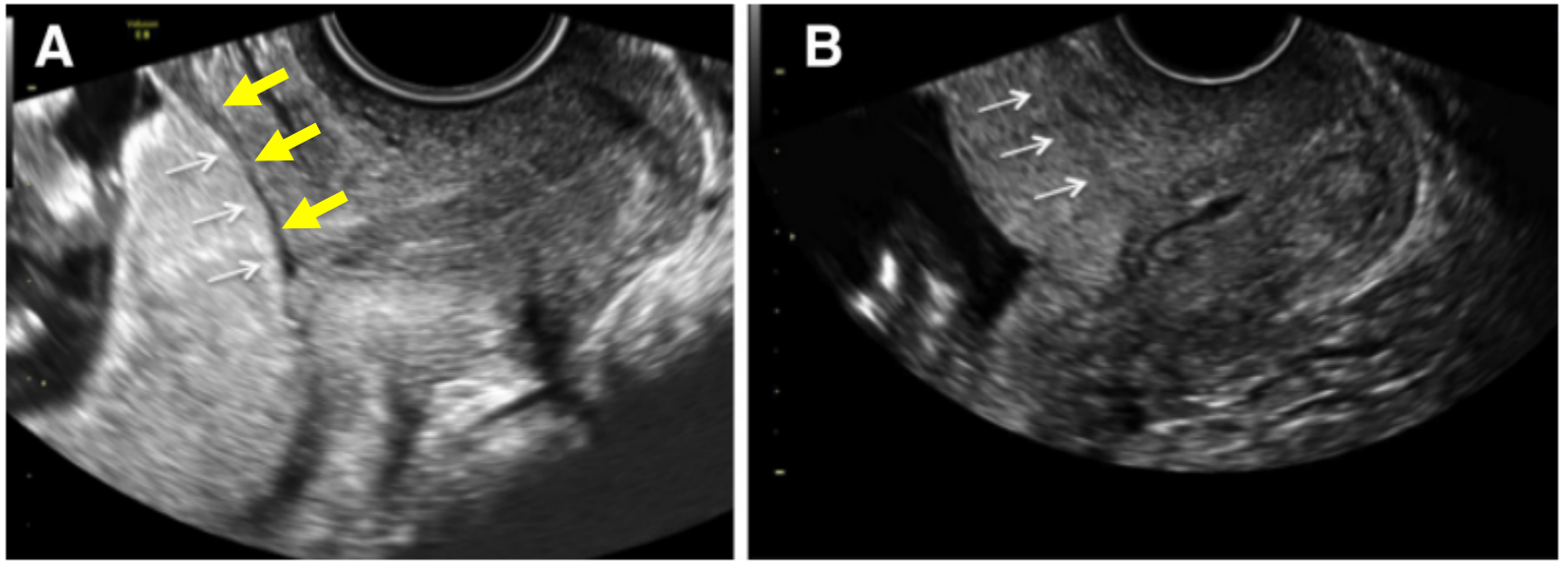


FIGURE 2

Retroplacental hypoechoic zone



Transvaginal midline sagittal grayscale imaging of placenta previa. **A,** Normal-appearing retroplacental hypoechoic zone (*arrows*). **B,** Abnormal or loss of the retroplacental hypoechoic zone (*arrows*) in placenta accreta spectrum.

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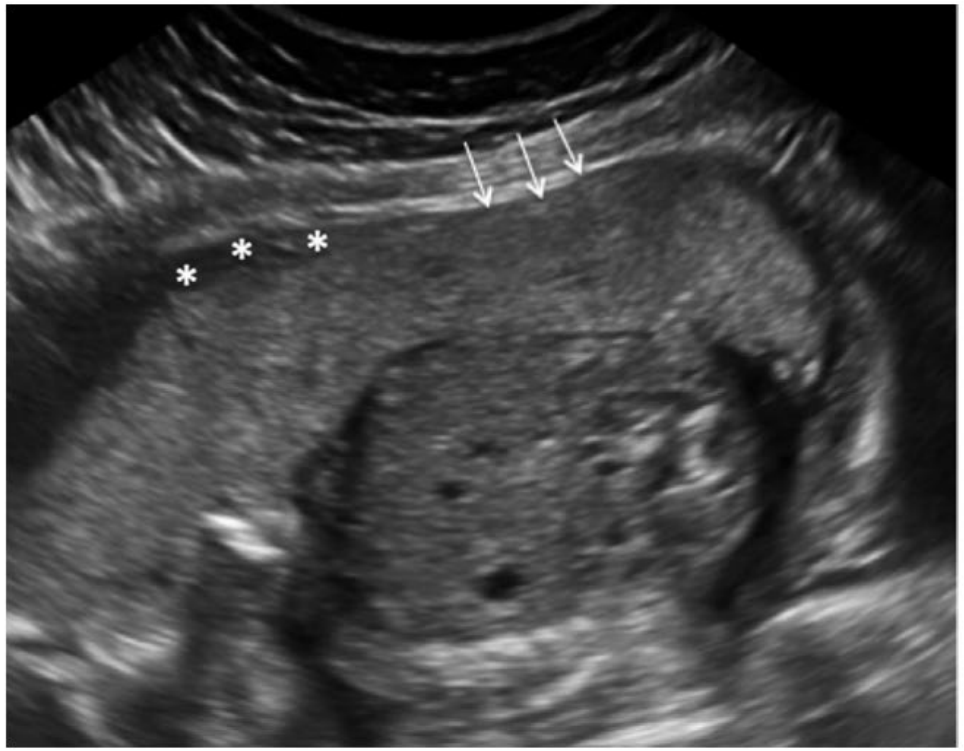
- More pronounced in advancing gestational age
- More common with prior cesarean

FIGURE 3
Myometrial thinning



Transabdominal midline sagittal grayscale imaging from a patient with focal placenta accreta spectrum. The area with normal myometrial thickness (*asterisks*) is compared to areas with myometrial thinning (*arrows*).

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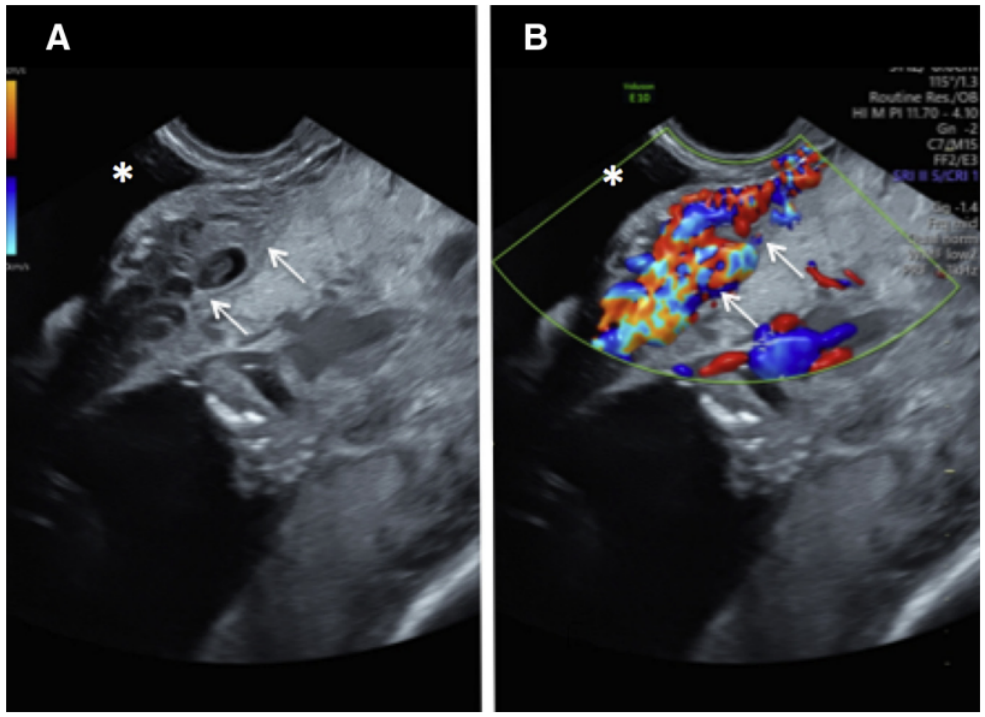
UTEROVESICAL INTERFACE

- Look for:
  - Bridging vessels
  - Increased vascularity between bladder and uterus
  - Interruption of bladder wall
  - Subplacental vascularity

*Turbulent blood flow is the most common finding on doppler in PAS cases

FIGURE 5
Uteroplacental interface



Transvaginal midline sagittal imaging of placenta previa with placenta accreta spectrum. **A,** Grayscale imaging demonstrating irregularities along the uteroplacental interface (*arrows*) and bulging of the lower uterine segment into the bladder (*asterisk*). **B,** Color Doppler imaging highlighting hypervascularity within the uteroplacental interface.

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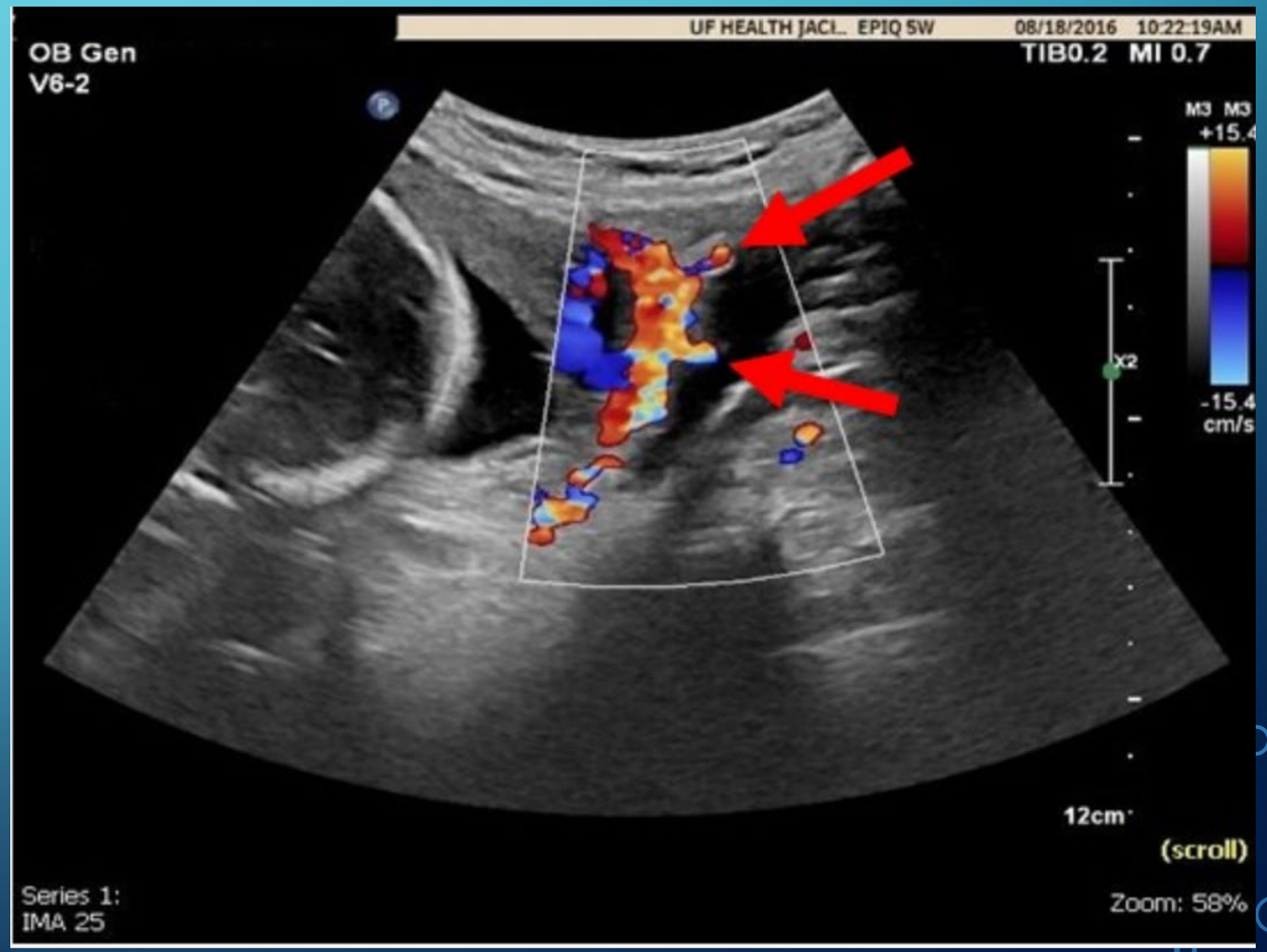
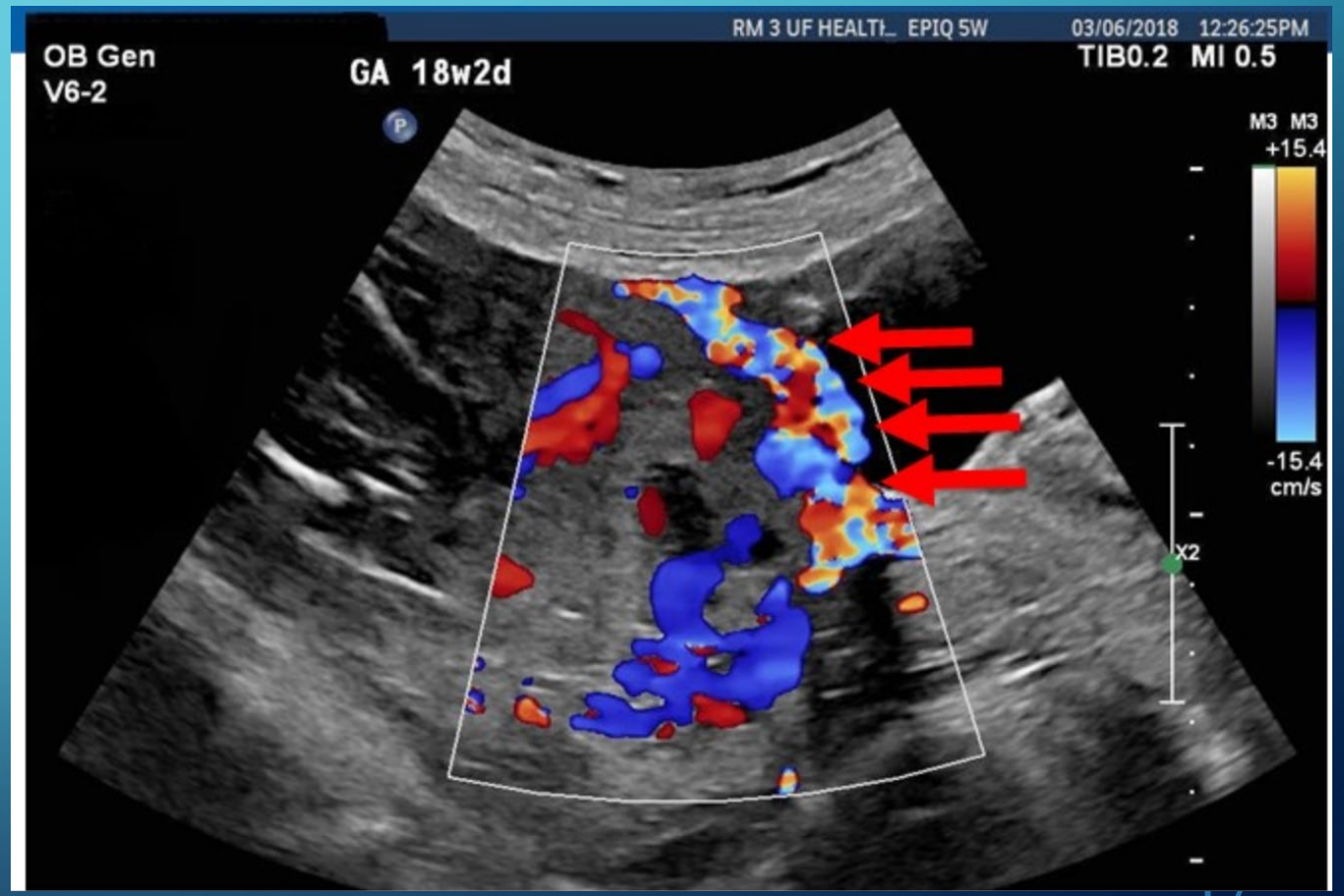
UTEROVESICAL INTERFACE

- Bridging vessels
  - Neovascularity atop uterine serosa
  - Engorged myometrial vessels in area of placentation
  - Extend from placenta across the myometrium and potentially beyond the serosa



UTEROVESICAL INTERFACE

- Increased vascularity between bladder and uterus
  - Dilation of uteroplacental vasculature
  - Chaotic vascular growth & flow
  - *Wide range of sensitivity & specificity



UTEROVESICAL INTERFACE

- Interruption of echogenic bladder wall
  - Placental "bulge"
    - Deviation of uterine serosa away from the expected planes
  - **Clear marker of PAS
    - Sensitivity 88%

- Beware:
  - Bladder varicosities are often seen in absence of PAS

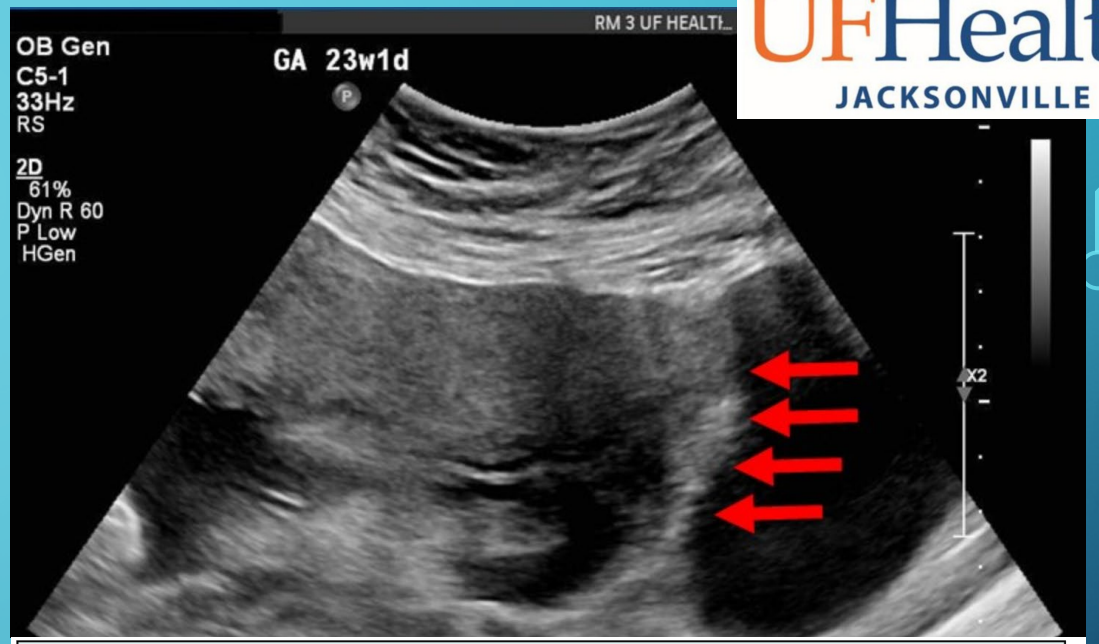
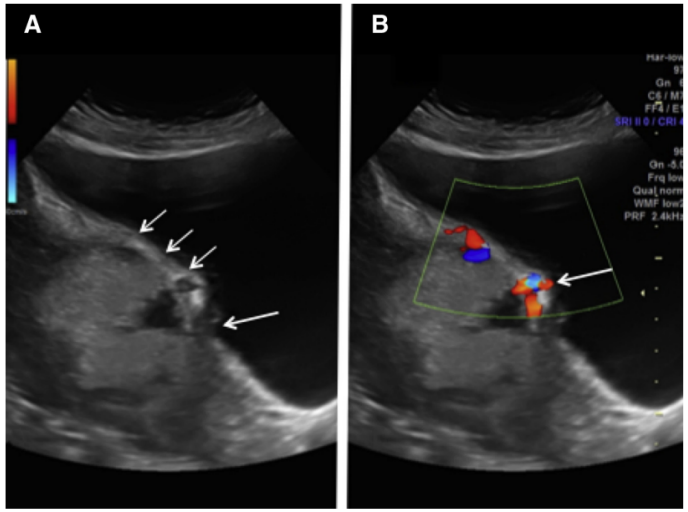


FIGURE 6
Abnormal uterine contour and bridging vessel



Transabdominal midline sagittal ultrasound image of placenta previa with placenta accreta spectrum. **A,** Grayscale imaging of an abnormal uterine contour with bulging of the lower uterine segment (*small arrows*) into the posterior bladder wall and interruption of the bladder wall (*large arrow*). **B,** Color Doppler imaging demonstrating bridging vessel at the site of the bladder wall interruption (*large arrow*).

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EXOPHYTIC MASS

- Protrusion of placental tissue outside the uterus
- Diagnostic of “percreta”
- Relatively rare in clinical practice

- *Also look for cervical vascular extension

WHICH MARKER IS BEST?

- International Federation of Gynecology & Obstectrics (FIGO)
  - Do NOT recommend using certain ones over others
  - NONE carry 100% sensitivity

COMBINING MARKERS

- More markers => higher risk
- Thinning of myometrium AND loss of retroplacental clear zone
  - Higher inter-observer agreements
- Although visualization of findings are useful in diagnosis, NONE of the features (or combinations of features) associated with PAS reliably predict depth of invasion.

HOW OFTEN SHOULD I ULTRASOUND MY PATIENT

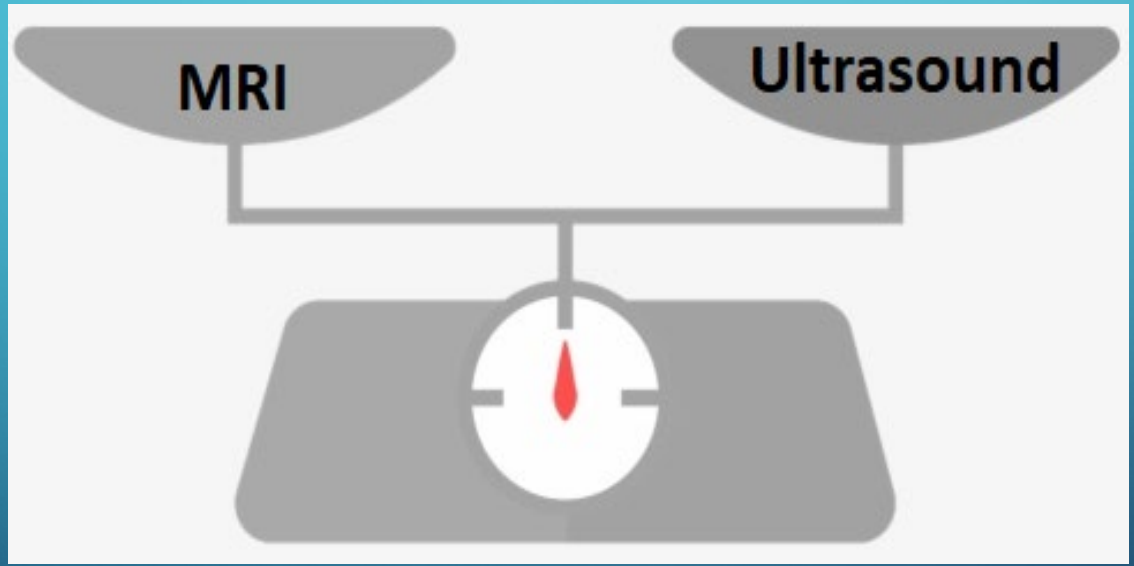
- No great consensus
- SMFM recs
  - 18-20 wks with anatomy: where many are diagnosed
  - 28-30 wks
  - 32-34 wks

  - These later scans allow for:
    - Assessment for Previa resolution (if it is going to happen)
    - Placenta location for delivery planning
    - Assessment for bladder invasion

IMAGING MODALITIES

MRI	Ultrasound
- Expensive - Less available - Limited by reading physician experience	- Operator dependent

- Useful for:
  - Increased BMI
  - Posterior placenta
	- Considered first line
	- Easily accessible



- MRI
  - Unclear if MRI truly improve diagnosis beyond ultrasound
    - Study of 78 cases: 38% of time MRI confirmed an INCORRECT PAS or incorrectly changed a diagnosis
  - unlikely to change management but may help with planning

BOX 2

PAS ultrasound marker research gaps

- What is the utility of transvaginal ultrasound screening in the first trimester of pregnancy in all women with previous cesarean delivery?
- What is the appropriate timing of screening in the first trimester of pregnancy in women with previous cesarean delivery?
- Does location, size, and number of lacunae predict extent of invasion?
- How to define "high" peak systolic velocity in lacunae?
- Are the vessels resulting in uterovesicular hypervascularity placental or maternal in origin?
- What is the significance of increased placental thickness?
- Does the role of vascular imaging change with newer techologies?
- What is the role of 3D ultrasound when assessing placental volume, exophytic masses, and bridging vessels?
- How to define and assess cervical hypervascularity?
- How do PAS ultrasound markers correlate with maternal biomarkers?
- How do placental ultrasound markers progress with advancing gestational age?
- What is the role of MRI in the evaluation of PAS?

3D, 3-dimensional; *MRI*, magnetic resonance imaging; *PAS*, placenta accreta spectrum.

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MANAGEMENT

2 main rules

- 1. Team approach
  - MFM, OB, Oncology, Urology or Urogynecology, Gen or Trauma Surgery team available, Interventional radiology, Anesthesia, Blood bank, Nursing, NICU, etc

- 2. Do NOT try to remove the placenta!!

UF HEALTH JAX PAS APPROACH

- PAS info sheet
- PAS meetings (formal or informal)
  - Plan date based on team availability
  - Steroid planning
- Massive transfusion protocol ready

In the setting of hemorrhage, data from other surgical disciplines support the use of a range of 1:1:1 to 1:2:4 strategy of packed red blood cells: fresh frozen plasma: platelets.

SMFM 2018

FIGURE 2
Sample antenatal planning worksheet for PAS

Antenatal Planning Worksheet: Interdisciplinary Team Plan (Part 1)

Date: _____

PATIENT INFORMATION
Name:
MRN/DOB:
EDD:
PAS Risk Factors:
Comorbidities:

Other:

TEAM AND PROVIDERS
Referring:
MFM/OB:
Anesthesiologist:
Consultants:
Urology Y/N GynOnc Y/N
Radiology Y/N Trauma Y/N
Other:
Healthcare Proxy:

1. Review of Imaging to Determine Surgical Approach
- ☐ Where is the placenta located?
  (e.g., anterior previa with extension toward bladder on left)
- ☐ What severity of disease is present or suspected?
  (e.g., suspect FIGO Grade 3a)
- ☐ What degree of hypervascularity is present?
  (e.g., significant uterovesical or cervical hypervascularity)
- ☐ Where does the team anticipate surgical difficulties?
  (e.g., suspected parametrial or bladder involvement)

2. Review of Histories to Prepare for Surgery
- ☐ Are there comorbidities that require preoperative consultation? Y/N
  (e.g., hematologic disorders, complex surgical history)
- ☐ Is the patient at risk of early delivery (<34 weeks)? Y/N
  (e.g., history of preterm birth, short cervix, antenatal bleeding)
- ☐ Are there significant anesthesia concerns? Y/N
  (e.g., difficult airway, contraindications to neuraxial)
- ☐ Does the patient have unique pain control needs? Y/N
  (e.g., opiate sensitivity or dependence)
- ☐ Are there unique blood bank considerations? Y/N
  (e.g., antibodies, refusal of blood products)
- ☐ Are there unique fertility preservation or sterilization requests? Y/N

3. Decide on Details for Surgery
- ☐ Surgery location, team, and backup plan:
  (e.g., main OR, GynOnc and MFM to start +/- trauma surgery backup)
- ☐ Surgical timing and plan:
  (e.g., vertical incision, planned cesarean hysterectomy at 35 weeks)
- ☐ Hemorrhage plan:
  (e.g., IR on standby, 6 PRBC / 6 FFP in OR)
- ☐ Anesthesia plan:
  (e.g., neuraxial convert to general, IV & arterial access)
- ☐ Urology plan:
  (e.g., stents, urology present)
- ☐ Special considerations:
  (e.g., avoid hysterectomy if possible, opiate-sparing protocol)

DOB, date of birth; *EDD*, estimated due date; *FFP*, fresh frozen plasma; *FIGO*, International Federation of Gynaecology and Obstetrics; *GynOnc*, gynecologic oncology; *IR*, interventional radiology; *IV*, intravenous; *MFM*, maternal-fetal medicine; *MRN*, medical record number; *NICU*, neonatal intensive care unit; *OB*, obstetrician; *OR*, operating room; *PACU*, postanesthesia care unit; *PAS*, placenta accreta spectrum; *PRBC*, packed red blood cells; *VTE*, venous thromboembolism.

FIGURE 2
Continued

Antenatal Planning Worksheet: Interdisciplinary Team Plan (Part 2)

Date of planned admission: _____ Date of planned surgery: _____

EMERGENCY CONTACT LIST

PAS Team Lead:	Gyn Onc / Gyn Surgery:
Anesthesiology:	Operating Room:
MFM:	Labor and Delivery:
Urology / Urogyn:	Neonatal / NICU:
Vascular Surgery:	Trauma Surgery:
Other:	

Antenatal Preparation
- ☐ PAS expert imaging complete
- ☐ Interdisciplinary team plan complete
- ☐ Advanced directive signed
- ☐ Blood type & antibody screen
- ☐ Confirm recent pap smear result
- ☐ Recent hemoglobin & platelets
- ☐ Hemoglobin optimization, if indicated
  (e.g., IV iron infusion)
- ☐ Other labs, if indicated
  (e.g., coagulation panel, creatinine)
- ☐ Psychological counseling arranged
- ☐ Preoperative consultations complete *(fill in):*
  - ☐
  - ☐
  - ☐
- ☐ Antenatal steroids indicated? *Y / N*
- ☐ Antenatal steroids administered? *Y / N / n/a*

PAS–Specific Operating Room Equipment
- ☐ Fetal monitor, if viable
- ☐ NICU resuscitation equipment
- ☐ Neuraxial anesthesia tray, if planned
- ☐ Video laryngoscope
- ☐ Blood bank cooler
- ☐ Blood & IV fluid rapid infuser
- ☐ Cell saver
- ☐ Arterial line and central line kits
- ☐ Cesarean tray, with cord blood tubes & clips
- ☐ Cystoscopy tray, stents, and tower
- ☐ Self-retaining or table-mounted retractors
- ☐ Hysterectomy tray, with surgeon preferences
- ☐ Hemorrhage control devices
  (e.g., surgical clips, bipolar device, linear stapler-cutter)
- ☐ Interv. Radiology equipment
  (e.g., C-arm, endovascular catheters)
- ☐ Table-mounted leg stirrups

Admission
- ☐ Antenatal steroids administered, if indicated
- ☐ Consent forms signed, in chart
- ☐ Preop labs complete, if indicated
- ☐ Active antibody screen
- ☐ Crossmatch of blood, per protocol
  (e.g., 6 units PRBC and FFP)
- ☐ All preoperative consultations complete
- ☐ Preop fetal monitoring completed
- ☐ Preop infection prevention
  (e.g., chlorhexidine wipe / bath)

Operating Room
Pre-operation
- ☐ Surgical consultants contacted
- ☐ NICU staff and equipment ready
- ☐ Surgical equipment ready *(see sample on right)*
- ☐ Pre-/Intra-operative fetal monitoring ready
- ☐ Umbilical cord clamping protocol reviewed
- ☐ Cell saver prepared, if indicated
- ☐ Blood cooler in room, verified and checked
- ☐ Interdisciplinary timeout performed

Post-operation
- ☐ Determine surgical grade *(eg, FIGO grade 1)*
- ☐ Quantify / estimate blood loss
- ☐ Decide on postoperative disposition
  (e.g., ICU, PACU, surgical or postpartum floor)
- ☐ Re-dose antibiotics, if indicated
- ☐ Urinary catheter & stent plan
- ☐ Endovascular intervention plan, if indicated
- ☐ Lab testing plan
- ☐ Specimen labeled and sent to pathology
- ☐ Pain management plan
- ☐ VTE prevention plan, first timed dose

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FIGURE 3
Bundle of activities to improve system and team preparedness for PAS

Activity Bundle: Optimizing Interdisciplinary Care for PAS (Part 1)

System and Team Preparedness

Suggested services and resources for hospital systems caring for patients with PAS

- ☐ Maternal Level of Care III (subspecialty) or higher care
- ☐ Blood bank services with unquestioned ability for massive transfusion
- ☐ On-site adult intensive care facilities that accept pregnant/postpartum patients
- ☐ Neonatal intensive care facilities
- ☐ Adequate experience in managing complex maternal and obstetric complications like PAS
- ☐ 24-hour prompt/emergent access to all of the following
  - PAS Imaging Expertise
  - Experienced obstetrician (may be maternal-fetal medicine)
  - Anesthesiologist with complex obstetric expertise (preferably OB Anesthesia)
  - Surgeon experienced in complex pelvic surgery (may be gynecologic oncology)
  - Urologist
  - Neonatologist
  - Interventional radiologist
  - Blood bank specialist
  - Vascular surgeon
  - Colorectal or acute care general surgeon
  - Intraoperative blood salvage services

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OB, obstetric; *PAS*, placenta accreta spectrum.

Society for Maternal-Fetal Medicine. Updated placenta accreta checklist. Am J Obstet Gynecol 2024.

FIGURE 3
Continued

Activity Bundle: Optimizing Interdisciplinary Care for PAS (Part 2)

☐ **Identify PAS program "champion(s)"**
- Member or members of the Department of OB/GYN committed to organizing, operationalizing PAS care
- Ideally, this person or people would have experience across the clinical spectrum of care in PAS diagnosis, delivery, pelvic surgery, and recovery.
- Willing Co-Champions from radiology, anesthesiology, gynecologic surgery, and pathology are beneficial

☐ **Build an interdisciplinary "PAS Team" with active membership from:**
- OB / MFM lead
- PAS imaging experts (radiology and/or MFM)
- OB Anesthesiology
- Pathologist with interest in PAS
- Pelvic surgical experts (eg, gynecologic oncologists)
- Interventional Radiology
- Social Support Staff (eg, social work)
- Psychological Support for perinatal grief, birth trauma, and PTSD
- Other surgical staff, depending on the site:
  (may include Trauma or General Surgery, Urogynecology, Urology, Vascular Surgery, General Obstetric, Minimally Invasive Gynecology)

☐ **Implement interdisciplinary PAS planning meetings in the form of either:**
(a) Scheduled in-person or virtual treatment planning conferences (preferred), or;
(b) Formalized, scheduled electronic communications.

Components of successful formalized PAS meetings:
- Pathology review, emphasis on correlating imaging and surgical findings with pathologic diagnosis
- Surgical debriefs
- Assessment of each case for quality and safety improvement

☐ **Organize and identify a PAS surgical team**
- Separate from OB team, if possible
- Including experts in antenatal care, cesarean delivery, and pelvic surgery

☐ **Develop a PAS care protocol**
This should be organized for the interdisciplinary meeting template in Figure 2, including consensus-derived *standardized* approaches to:
- Diagnosis, including standardized imaging protocols and reporting
- Preoperative consultations
- Antenatal management and delivery timing
- Anesthesia (eg, neuraxial versus general, vascular access, postop pain control, airway assessment)
- Delivery location (L&D, Main OR, Hybrid OR)
- Transfusion preparedness and administration (eg, number of units in the OR, use of thromboelastography, fibrinogen concentrate availability (Fibryga/RiaSTAP), cell saver, tranexamic acid use)
- Indications for endovascular intervention
- Operative management and techniques (eg, incision, ureteral stents, intra-operative ultrasound)

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Society for Maternal-Fetal Medicine. Updated placenta accreta checklist. Am J Obstet Gynecol 2024.

DELIVERY TIMING

Table 1. Recommendations for the Timing of Delivery When Conditions Complicate Pregnancy*

Condition	General Timing	Suggested Specific Timing
Placental/Uterine Conditions		
Placenta previa†	Late preterm/early term	36 0/7–37 6/7 weeks of gestation
Suspected accreta, increta, or percreta†	Late preterm	34 0/7–35 6/7 weeks of gestation
Vasa previa	Late preterm/early term	34 0/7–37 0/7 weeks of gestation
Prior classical cesarean	Late preterm/early term	36 0/7–37 0/7 weeks of gestation
Prior myomectomy requiring cesarean delivery‡	Early term (individualize)	37 0/7–38 6/7 weeks of gestation
Previous uterine rupture	Late preterm/early term	36 0/7–37 0/7 weeks gestation

- NOT recommended to go 36 wk +
  - ½ of these patients would experience emergent delivery for PPH

DIAGNOSIS & WORK UP CONCLUSION

- Scrutinize every placenta
- Prior cesarean PLUS Previa: HIGH risk for PAS
  - Scrutinize these even more
    - Look at the placenta…a bunch
  - Utilize most skilled sonographers and reading physicians
- PLAN, PLAN, PLAN
- As PAS incidence increases, the need for agreement on definitions of u/s markers and approach is crucial
- Increasing prenatal detection DECREASES morbidity

QUESTIONS
AT THE END