

# AMSER Case of the Month

## December 2022

35-year-old G4P2012 female with first  
trimester bleeding

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# Patient Presentation

- **HPI:** 35 year old G4P2012 female at 7w6d presented for evaluation of first trimester bleeding.
- **PMHx:** Gestational HTN (previous pregnancy)
- **SHx:** 2 Low-transverse C-sections
- **Meds:** Prenatal vitamin
- **ROS:** Bloody vaginal discharge overnight, no cramping
- **Physical Exam:** Soft, non-distended abdomen without tenderness to palpation, scant blood draining from closed cervix.

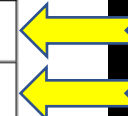
What Imaging Should We Order?

# Select the applicable ACR Appropriateness Criteria

**Variant 1:** First trimester vaginal bleeding. Positive urine or serum pregnancy test.

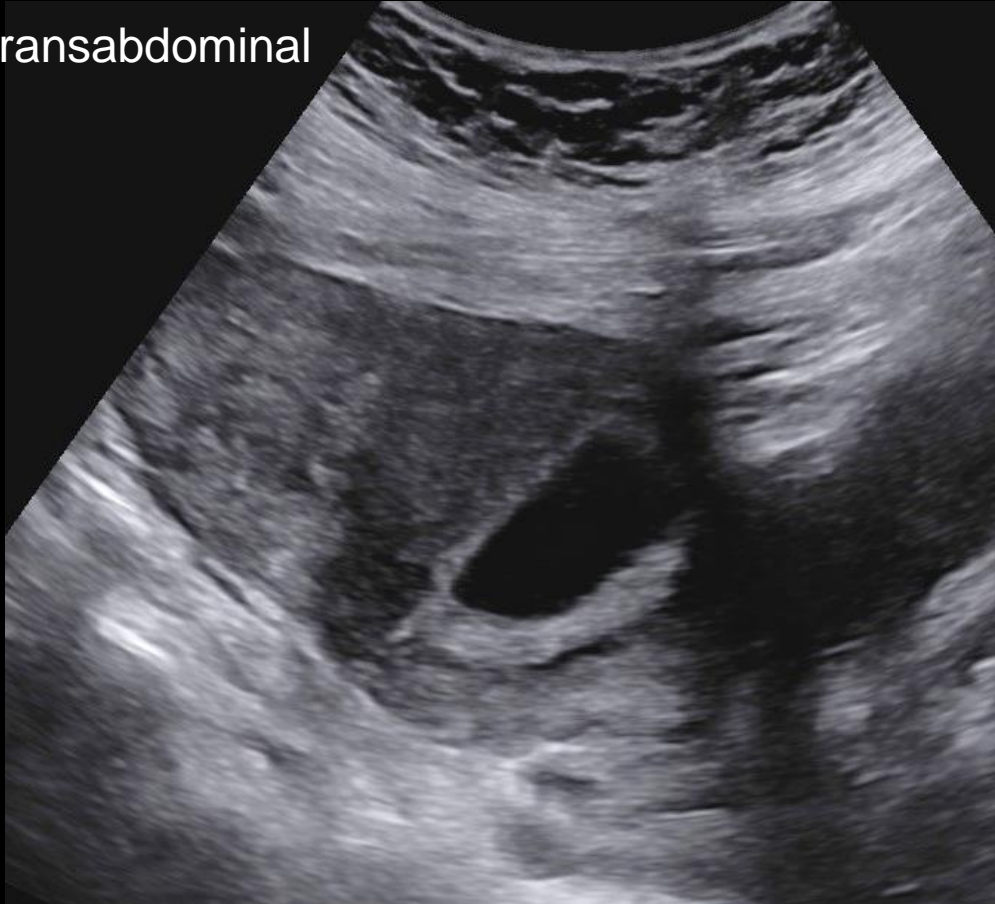
Procedure	Appropriateness Category	Relative Radiation Level
US pelvis transvaginal	Usually Appropriate	0
US pelvis transabdominal	Usually Appropriate	0
US duplex Doppler uterus	May Be Appropriate	0
MRI pelvis without IV contrast	May Be Appropriate	0
MRI pelvis without and with IV contrast	Usually Not Appropriate	0
CT pelvis without IV contrast	Usually Not Appropriate	☼☼☼
CT pelvis with IV contrast	Usually Not Appropriate	☼☼☼
CT pelvis without and with IV contrast	Usually Not Appropriate	☼☼☼☼

These imaging modalities were ordered by the obstetrician



# Findings (unlabeled)

Transabdominal

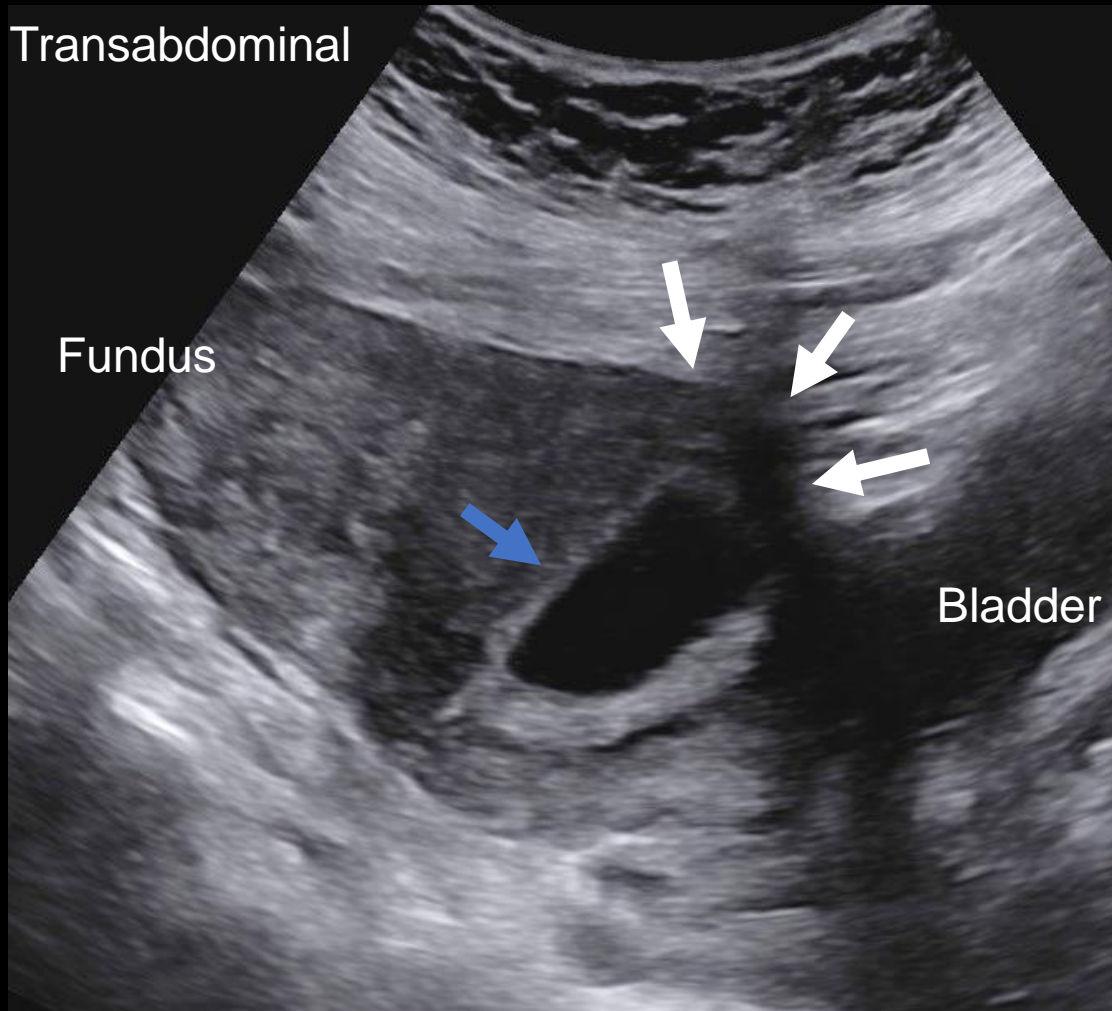


Transvaginal



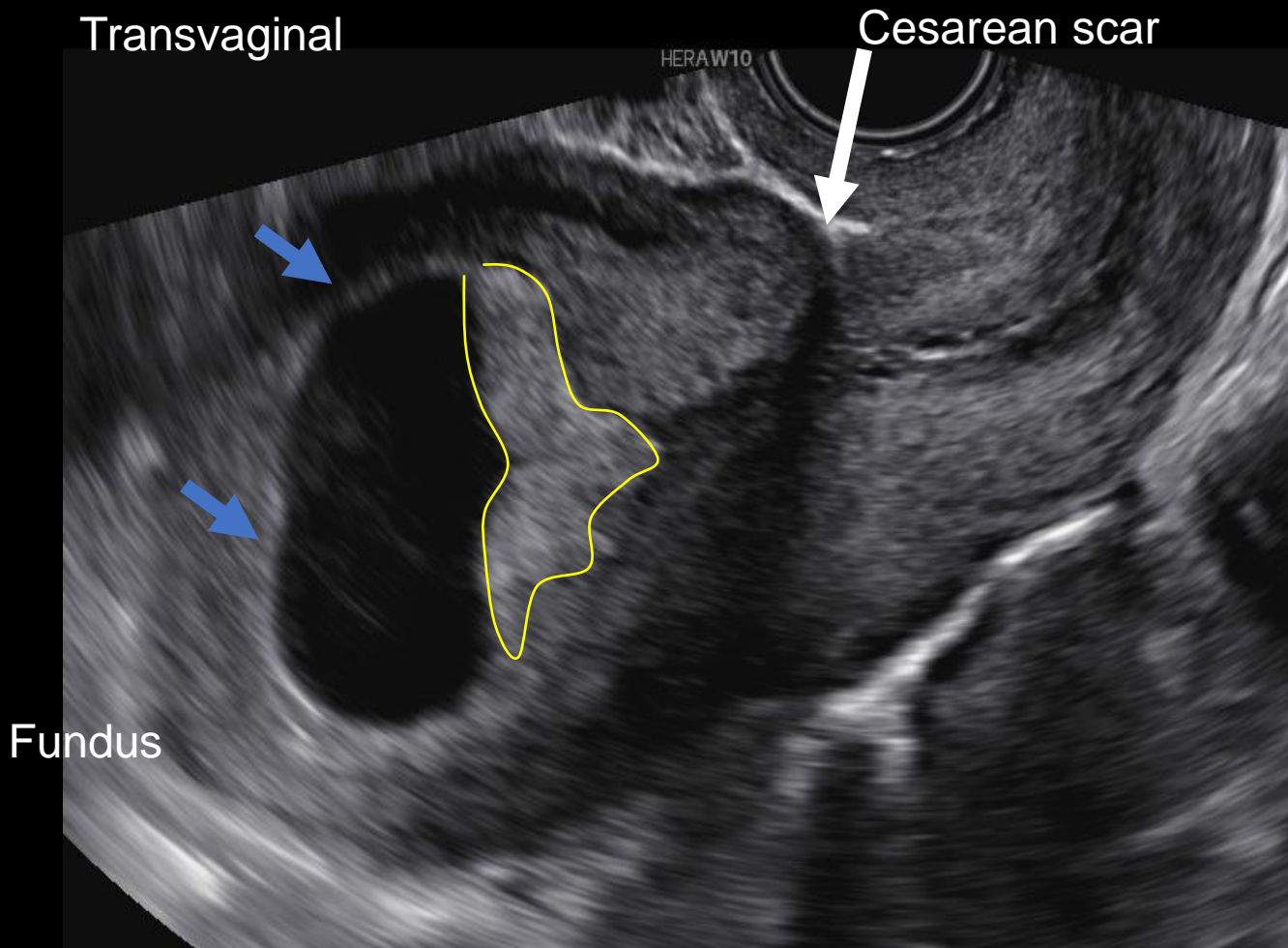
7wk 6 d

# Findings: (labeled)



TAUS showed a live embryo (not shown). However, the gestational sac (blue arrow) was situated low in the uterus with an apparent anterior myometrial bulge (white arrows). These findings were concerning for cesarean scar ectopic pregnancy.

# Findings: (labeled)



TVUS was performed for detailed imaging of the sac location and the relationship to the cesarean delivery scar. The sac is normally implanted and the myometrium at the level of the scar looks normal.

Of note, the chorion frondosum (outlined in yellow) is the placental precursor. Given this structure's inferior location in the gestational sac, the study was read as normal implantation but increased risk for placenta previa in the setting of prior cesarean delivery.

The risk of placenta accreta spectrum (PAS) with placenta previa and 2 prior cesarean deliveries is ~40%. Further evaluation is necessary.

Given low implantation and history of caesarean section, there was concern for development of placenta accreta spectrum. Patient was scheduled for follow up imaging at 19 weeks.



# Select the applicable ACR Appropriateness Criteria

**Variant 3:** Follow-up of placenta accreta spectrum disorder.

Procedure	Appropriateness Category	Relative Radiation Level
US duplex Doppler pregnant uterus	Usually Appropriate	0
US pregnant uterus transabdominal	Usually Appropriate	0
US pregnant uterus transvaginal	Usually Appropriate	0
MRI abdomen and pelvis without IV contrast	May Be Appropriate	0
MRI abdomen and pelvis without and with IV contrast	Usually Not Appropriate	0

These imaging modalities were ordered by the obstetrician

# Findings (unlabeled)

19 weeks

Transabdominal

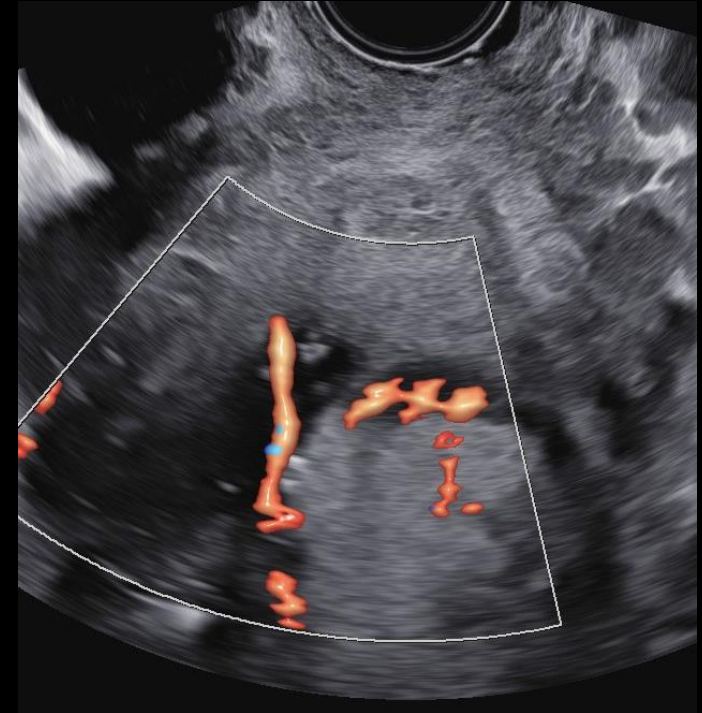
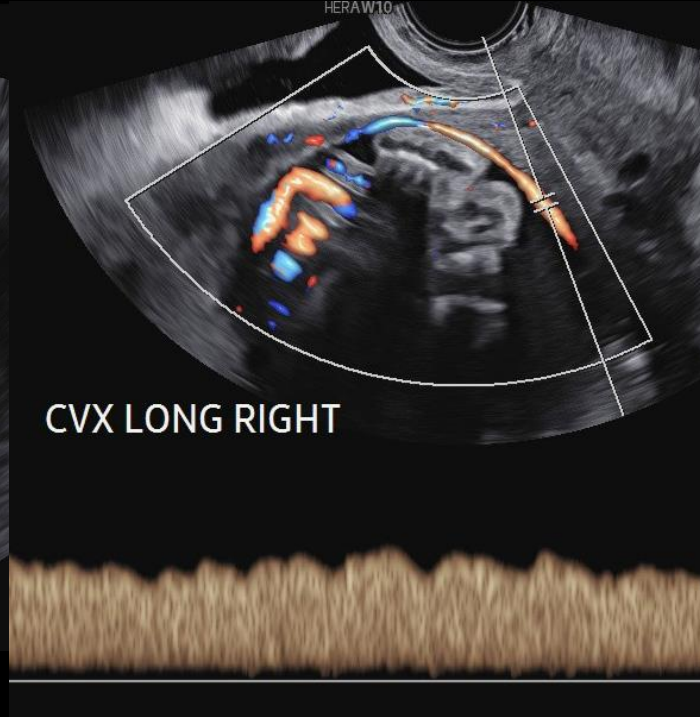


Transvaginal



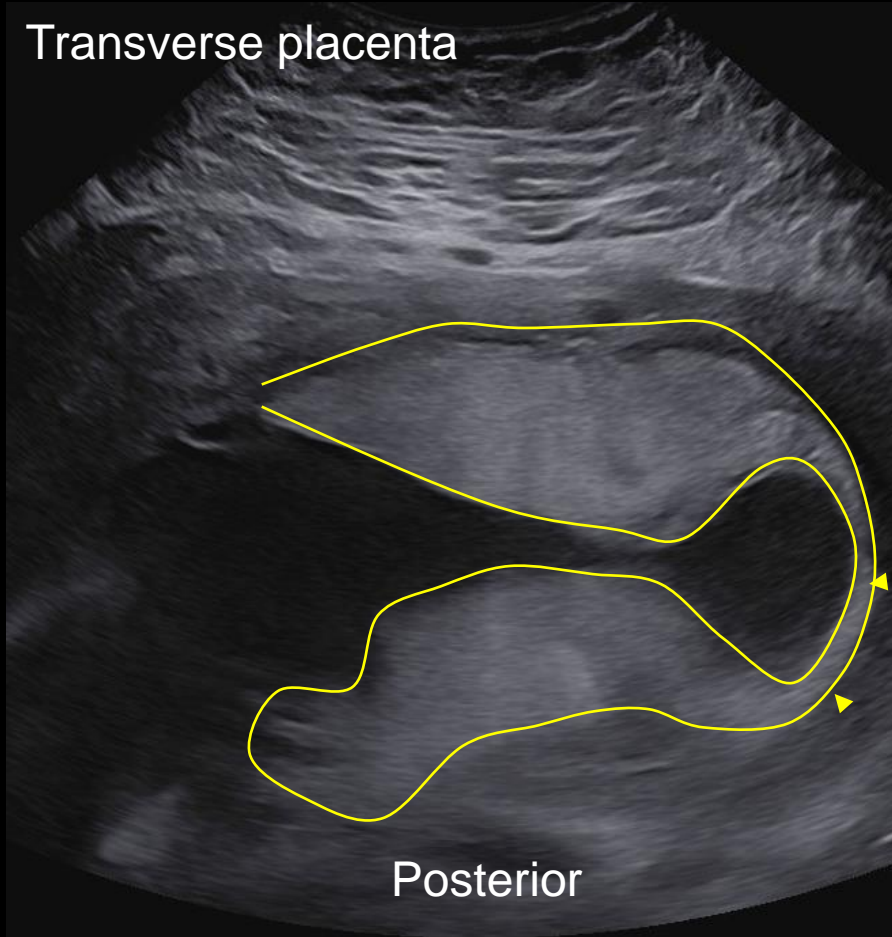
# Findings (unlabeled)

24 weeks  
Transvaginal



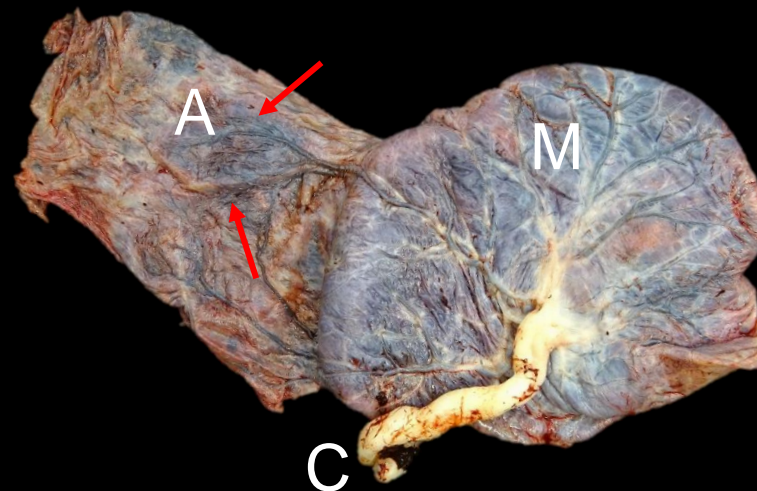
# Findings: (labeled)

Transverse placenta



The placenta (outlined in yellow) wraps anteriorly and posteriorly on the left with a thinner area in the most lateral aspect (yellow arrowheads). This can be seen with developing bilobed placenta or succenturiate lobe.

In either situation vessels run between the placental masses. Below is an example of a succenturiate lobe with vessels (red arrows) between the main placental mass (M) and the accessory lobe (A). These vessels are unsupported by Wharton jelly as they travel in the membranes and are not encased within the umbilical cord (C).



19 weeks transabdominal

# Findings: (labeled)

Sagittal cervix, posterior wall of bladder

HERAW10

Bladder

PLACENTA



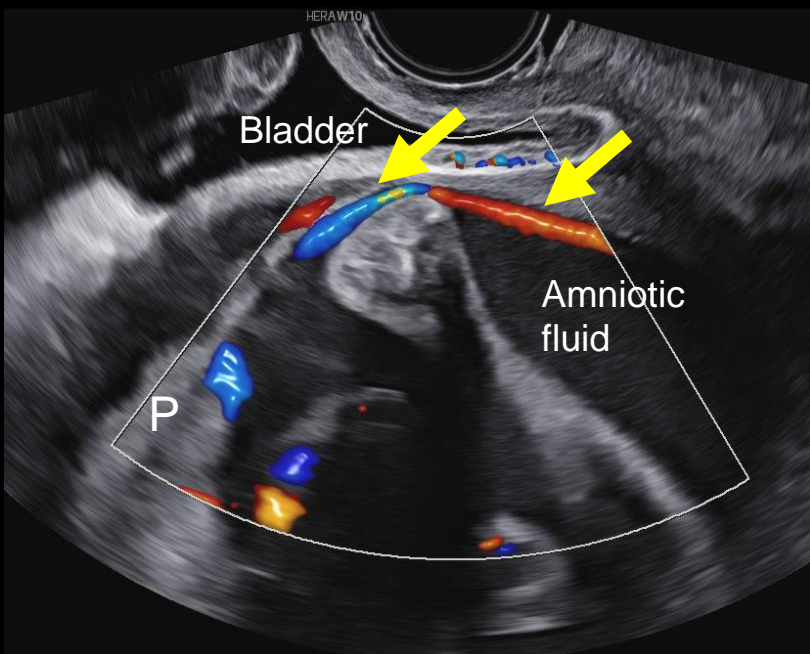
PLACENTA

TVUS was performed to assess for both placenta previa and PAS. The posterior aspect of the placenta terminates within millimeters of the internal os (\*), consistent with a low-lying placenta.

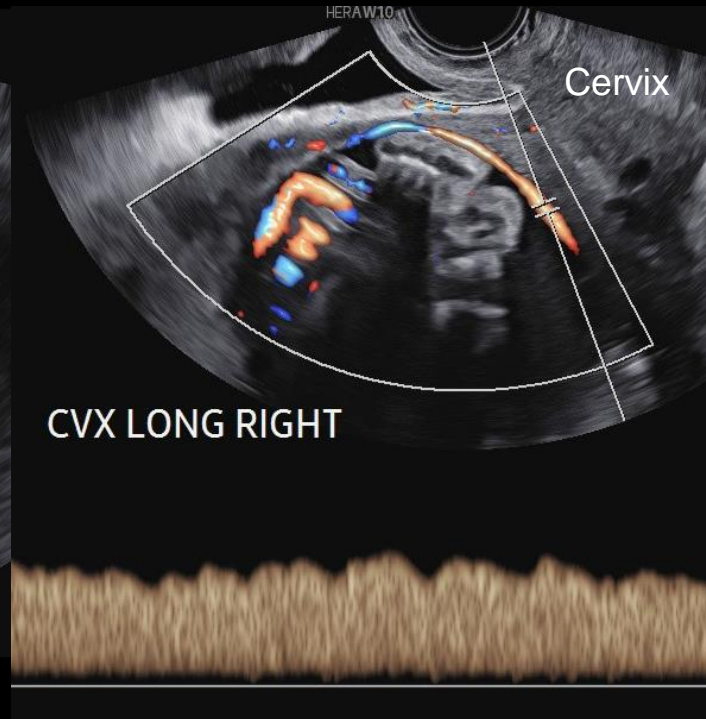
The anterior portion of the placenta was clear of the internal os and the posterior bladder wall. Therefore, the final interpretation was low-lying placenta with low suspicion for PAS.

19 weeks transvaginal

# Findings: (labeled)

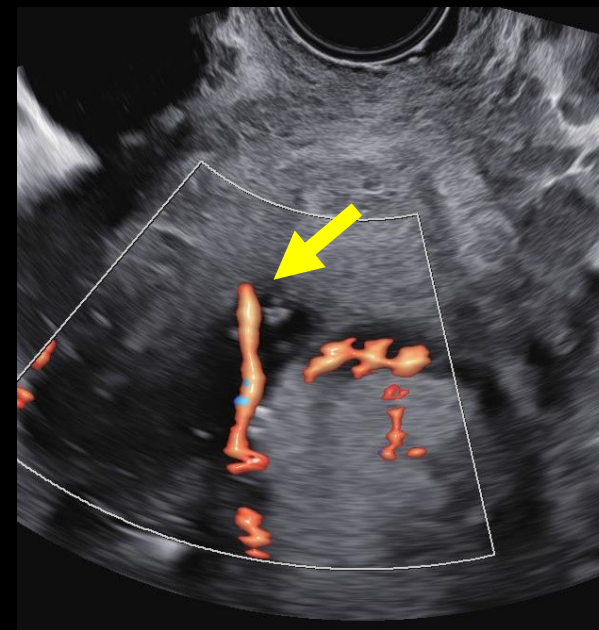


Follow up at 24 weeks showed intact myometrium and bladder wall without concern for PAS but color Doppler showed a vessel (arrows) running in the membranes between the anterior and posterior components of the placenta (P).



Spectral Doppler shows a venous waveform which did not change with maternal Valsalva maneuver indicating fetal origin. The vessel crosses the cervix, consistent with vasa previa. **Vasa previa is a critical diagnosis.**

Transverse oblique lower uterine segment



Transverse view of the same vessel shows it (arrow) and some shorter vessels running between the anterior and posterior placental masses.

Final Dx:

Vasa Previa

# Case Discussion

- **Epidemiology**

- 1:1275 – 2500 of pregnancies are affected
- Risk factors: Velamentous cord insertion, succenturiate and bilobed placenta, low-lying placenta, IVF, multiple gestations
- 44-50% fetal survival rate in prenatally *undiagnosed* cases
- 97-100% fetal survival rate in prenatally *diagnosed* cases

- **Etiology**

- Defined as fetal vessels covering or running  $<2-5^*$  cm from internal os (IO)
  - Vessels are submembranous and not protected normally as other vessels located in placenta or umbilical cord
- Two main types
  - Type 1: Velamentous cord insertion in lower uterine segment
  - Type 2: Vessels tranversing between two lobes of the placenta

\*Historically defined as  $<2$  cm though new data suggests cutoff of  $<5$  cm is safer



# Case Discussion

- **Clinical Presentation**

- Generally asymptomatic
- Often found incidentally while evaluating other conditions with ultrasound
- If ruptured, will present with vaginal bleeding and high risk for rapid fetal demise (obstetric emergency)

- **Imaging**

- Indications: Positive risk factor for vasa previa (as mentioned above)
- Imaging of Choice: Transvaginal ultrasound with Doppler
  - Findings: "Bubbles" and or "lines" in lower uterine segment on grayscale
  - Color Doppler showing arterial or venous waveform within vessels 2-5cm of IO
  - Alternatives: No other alternatives recommended

# Case Discussion

- **Treatment**

- Must be managed and monitored aggressively through pregnancy (20-40% of vasa previa diagnosed in 2<sup>nd</sup> trimester resolve by 3<sup>rd</sup> trimester)
- Prevent rupture of unprotected vessels
  - Elective admission to antepartum inpatient care at 32-34 weeks
  - Cesarean delivery at 35-36 weeks

- **Outcome of Case**

- Patient diagnosed in 2<sup>nd</sup> trimester and continuing to receive follow up with Maternal Fetal Medicine

# References:

- ACR Appropriateness Criteria <https://acsearch.acr.org/list>
- Ranzini AC, Oyelese Y: **How to screen for vasa previa.** *Ultrasound Obstet Gynecol* 2021, **57(5):720-725.**
- Rebarber A, Dolin C, Fox NS, Klauser CK, Saltzman DH, Roman AS: **Natural history of vasa previa across gestation using a screening protocol.** *J Ultrasound Med* 2014, **33(1):141-147.**
- Zhang W, Geris S, Al-Emara N, Ramadan G, Sotiriadis A, Akolekar R: **Perinatal outcome of pregnancies with prenatal diagnosis of vasa previa: systematic review and meta-analysis.** *Ultrasound Obstet Gynecol* 2021, **57(5):710-719.**