

IMAGING OF PLACENTA ACCRETA



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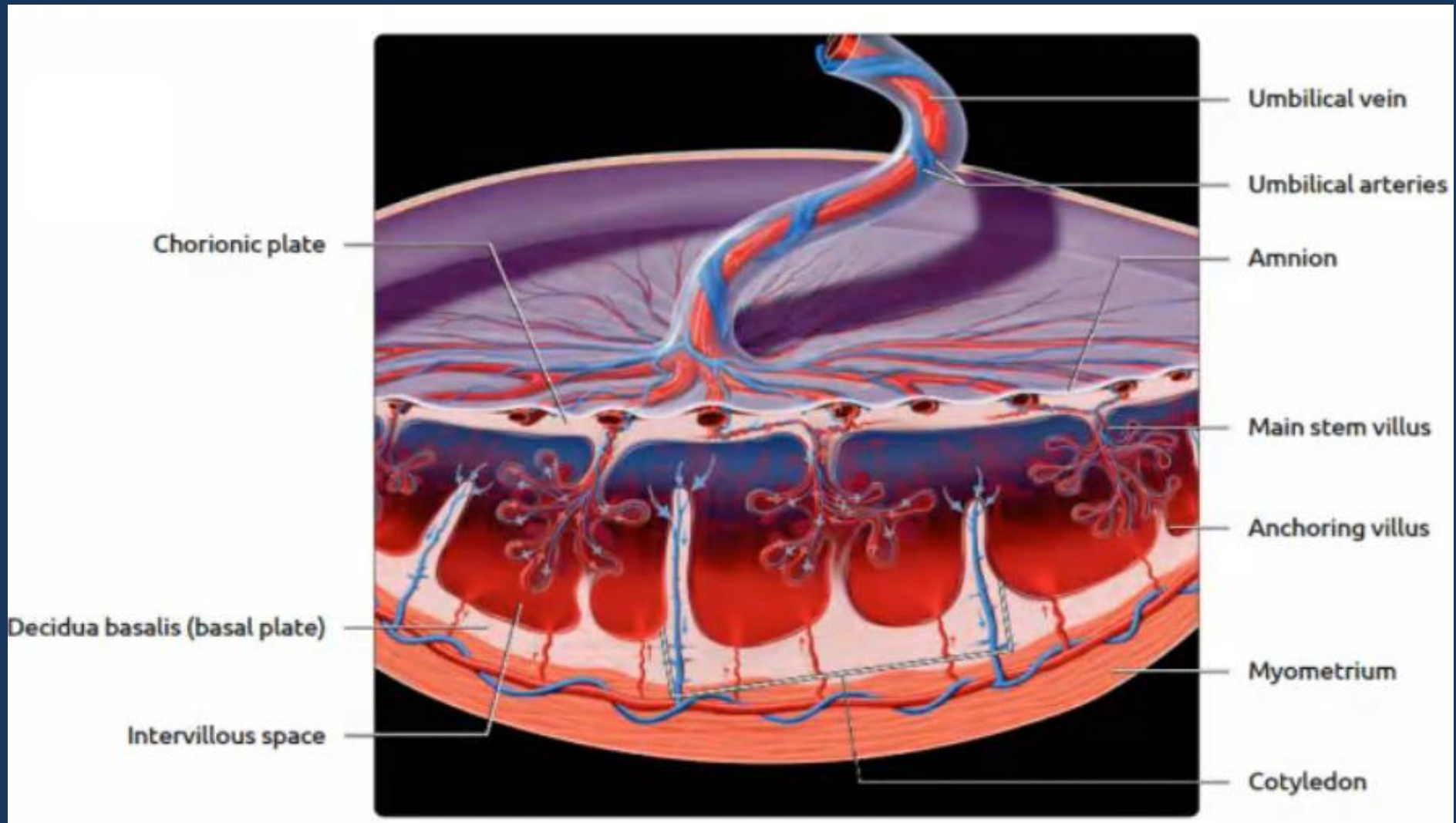
Educational Objectives:

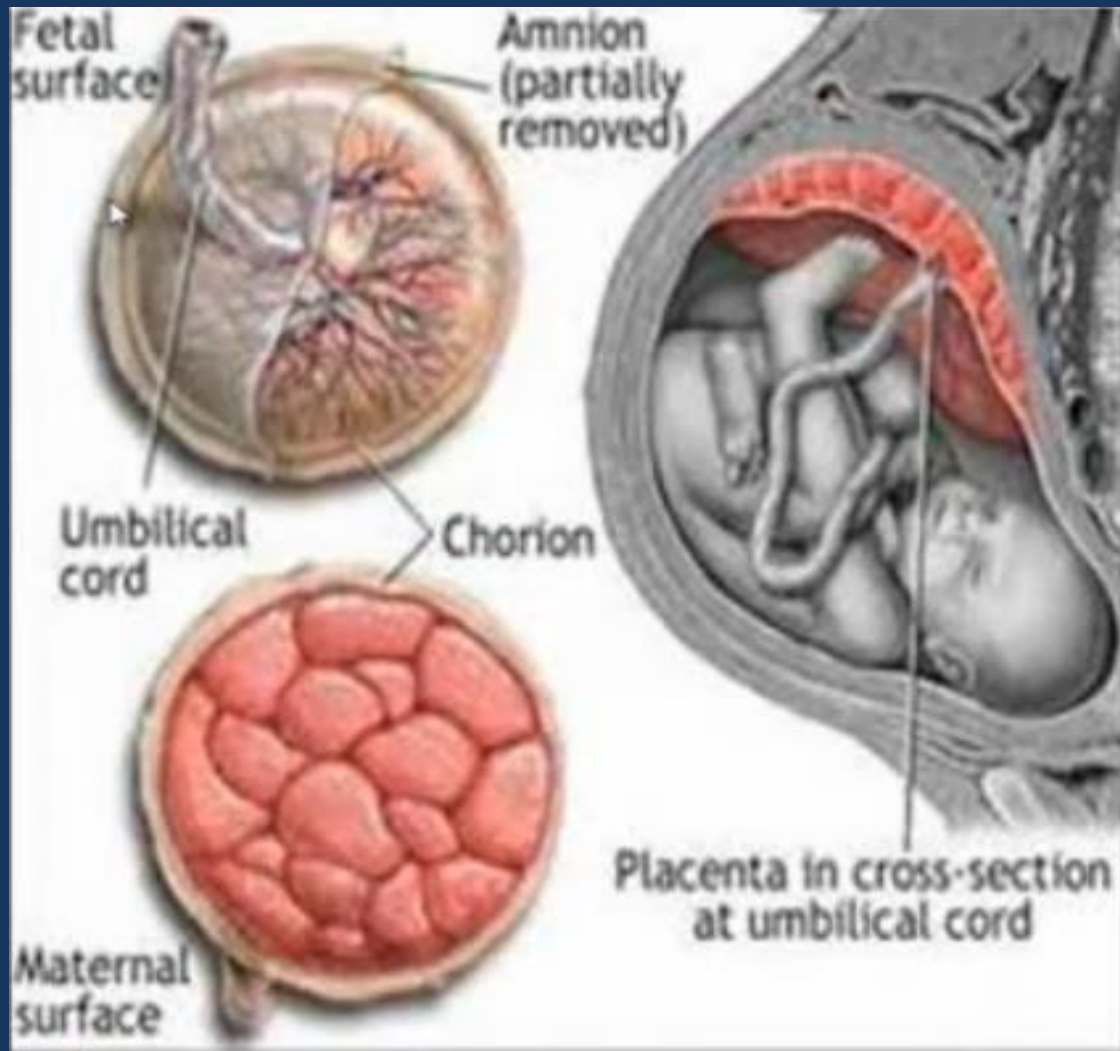
- Review classic imaging findings
- Illustrate ultrasound imaging methods and pitfalls in interpretation
- Show some MRI images for correlation
- How to diagnose secarian scar pregnancy

Glossary

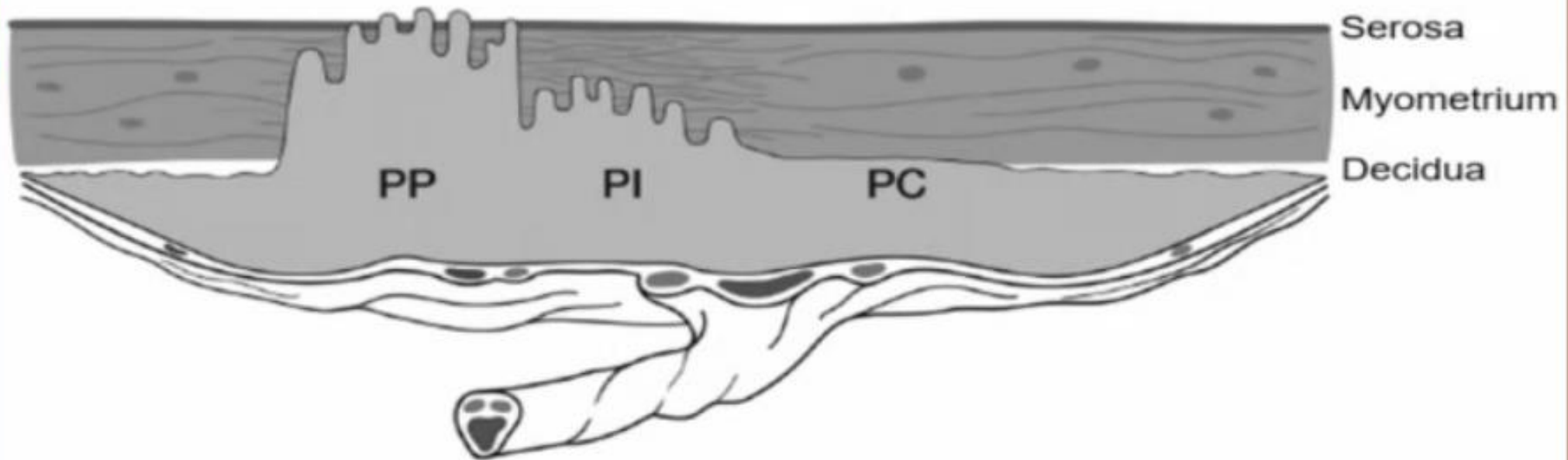
- **AIP:** Abnormal Implantation of Placenta (Europe)
- **MAP:** Morbidly Adherent Placenta (USA- Canada)
- **PAD:** Placenta Adherence Disorders (also used)
- **PAS: Placenta Accreta Spectrum (FIGO 2018)**

- **CSP:** Cesarean Scar Pregnancy





Types of Placenta Accreta Spectrum Disorders (PAS)



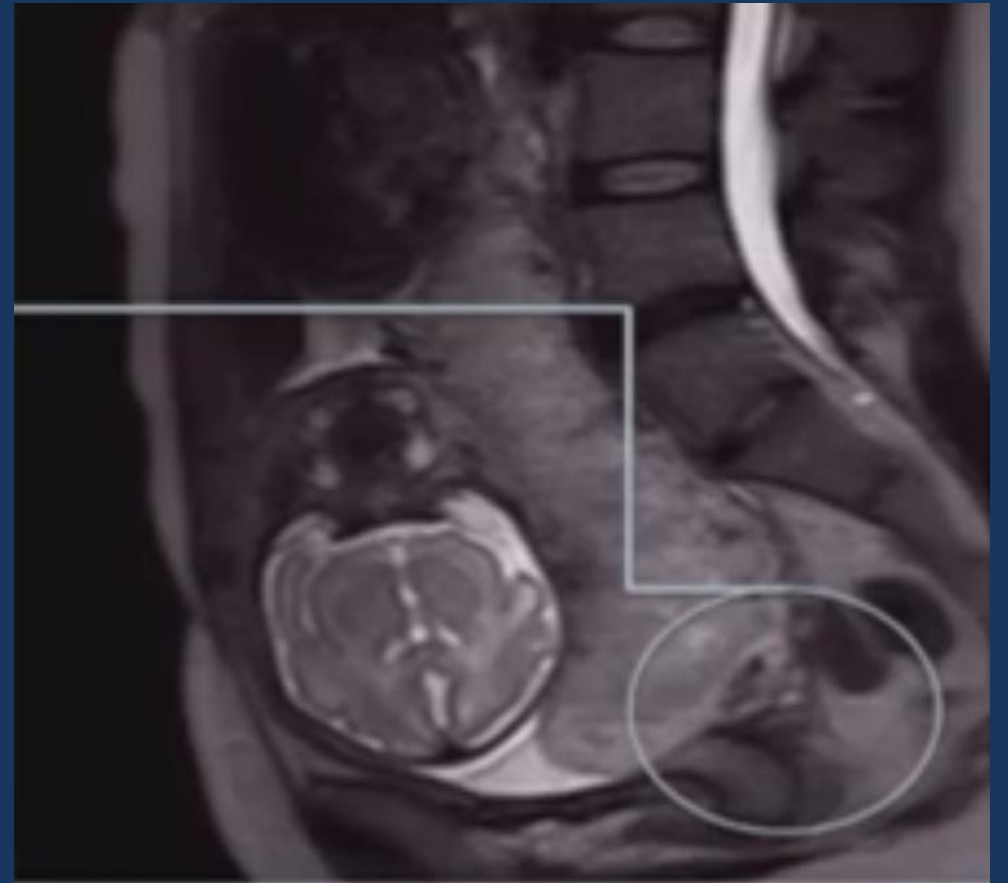
- Accreta 75%
 - Villi adhere to myometrium
- Increta 18%
 - Villi invade myometrium
- Percreta 7%
 - Villi through myometrium into or beyond serosa

Epidemiology & Risk Factors

- Increasing in parallel with the rise in cesarean delivery
- 1/500- 1/900 of CS
- Two major & required risk factors:
 - **PP: 5% association with PAS**
 - **Prior CS:** -after first: **3%**
 - second: **11%**
 - third: **40%**
 - subsequent: **60-70%**

Other Risk Factors:

- Maternal age: **>35 y**
- Previous uteral surgery
- Prior accrete
- Smoking
- Endometritis
- Uterine artery embolization
- ...



The Issues

- **Morbidity & mortality**
 - Preterm birth
 - Hemorrhage/ DIC/ shock/ maternal death
- **Gold standard for dx?**
 - Expert placental pathologist
 - Focal invasion maybe missed
- **Management**
 - Elective sectarian hysterectomy?

Diagnosis:

- **Defenite dx** can only be made **after delivery**, by histopatho dx
- Difference between placenta accreta & increta **can only** be made by histological finding.
- Prenatal US dx is based on a number of different signs by:
European Working Group on Abnormaly Invasive Placenta in 2015

Unified descriptors for US findings in AIP

by: **European Working Group on AIP**

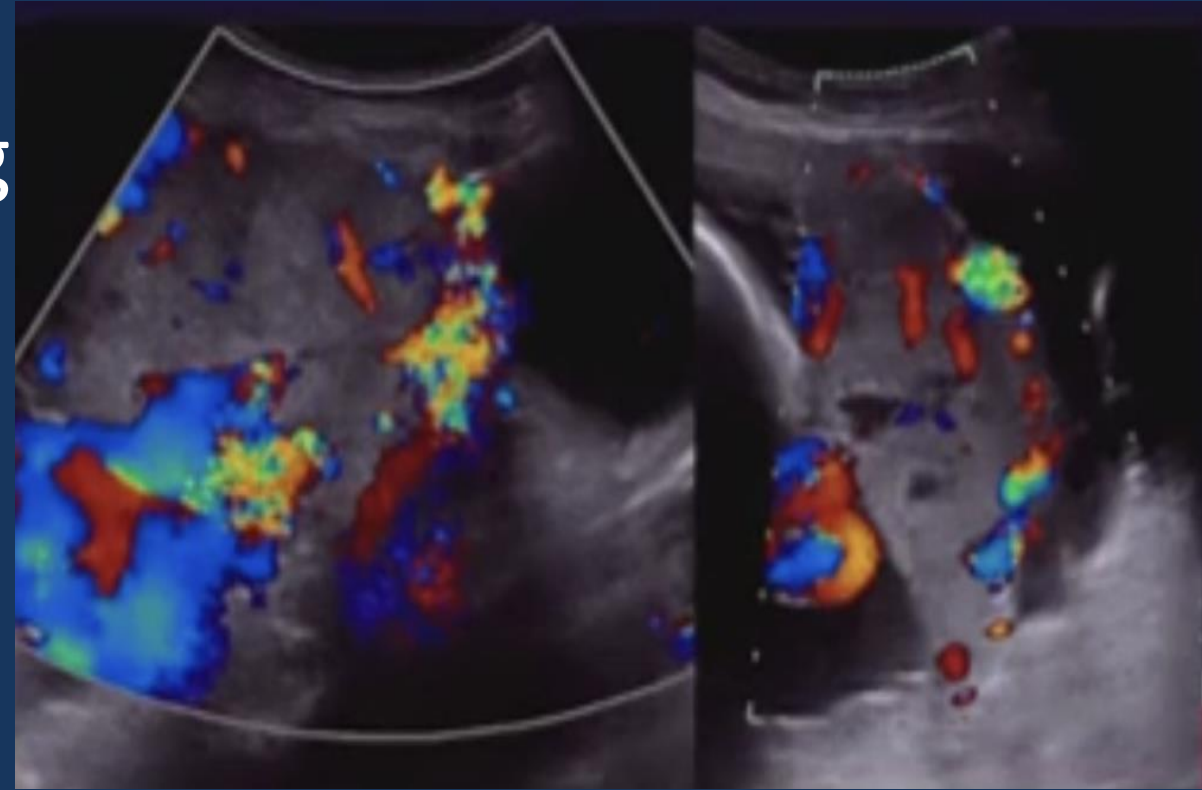
- Loss of clear zone
- Abnormal placenta lacunae
- Bladder wall interruption
- Myometrial thinning --> **less than 1 mm**
- Placental bulge --> uterine **serosa is intact** but **outline shape is distorted**
- Focal exophytic mass --> breaking uterine serosa, **often inside bladder**

2D Color Doppler according to **EW- AIP**

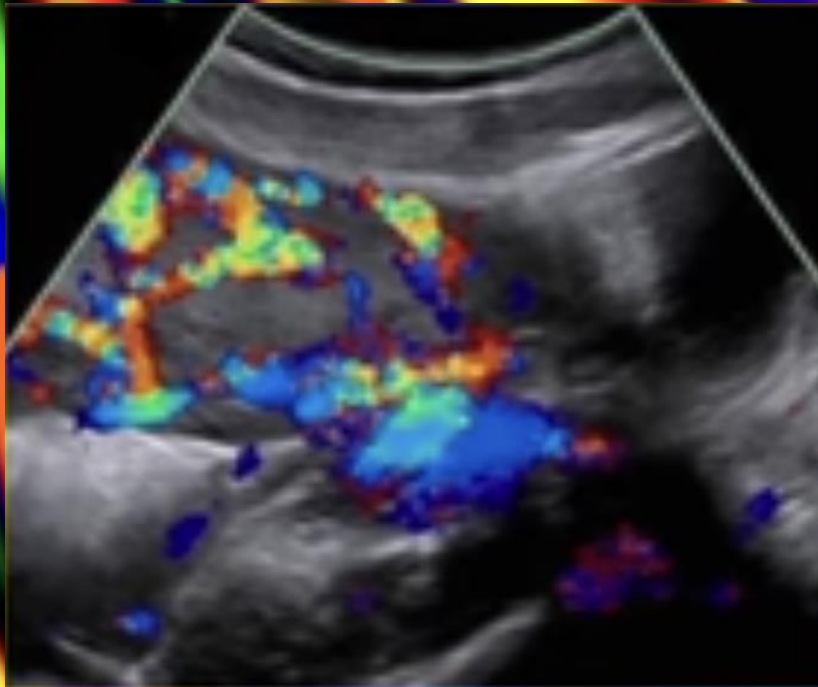
- **Uterovesical hypervascularity** --> multidirectional flow with aliasing
- **Subplacental hypervascularity** --> ~ ~ ~ in placental bed
- **Bridging vessels** --> across the myometrium
- **Placenta lacunae feeder vessels** --> high velocity flow from myometrial spiral artery toward lacunae

Setting of Color/Power Doppler

- **PRF:** should be set as **0.9**
 - Less than 0.9 → makes aliasing
- **Gain:** should be set as sub noise



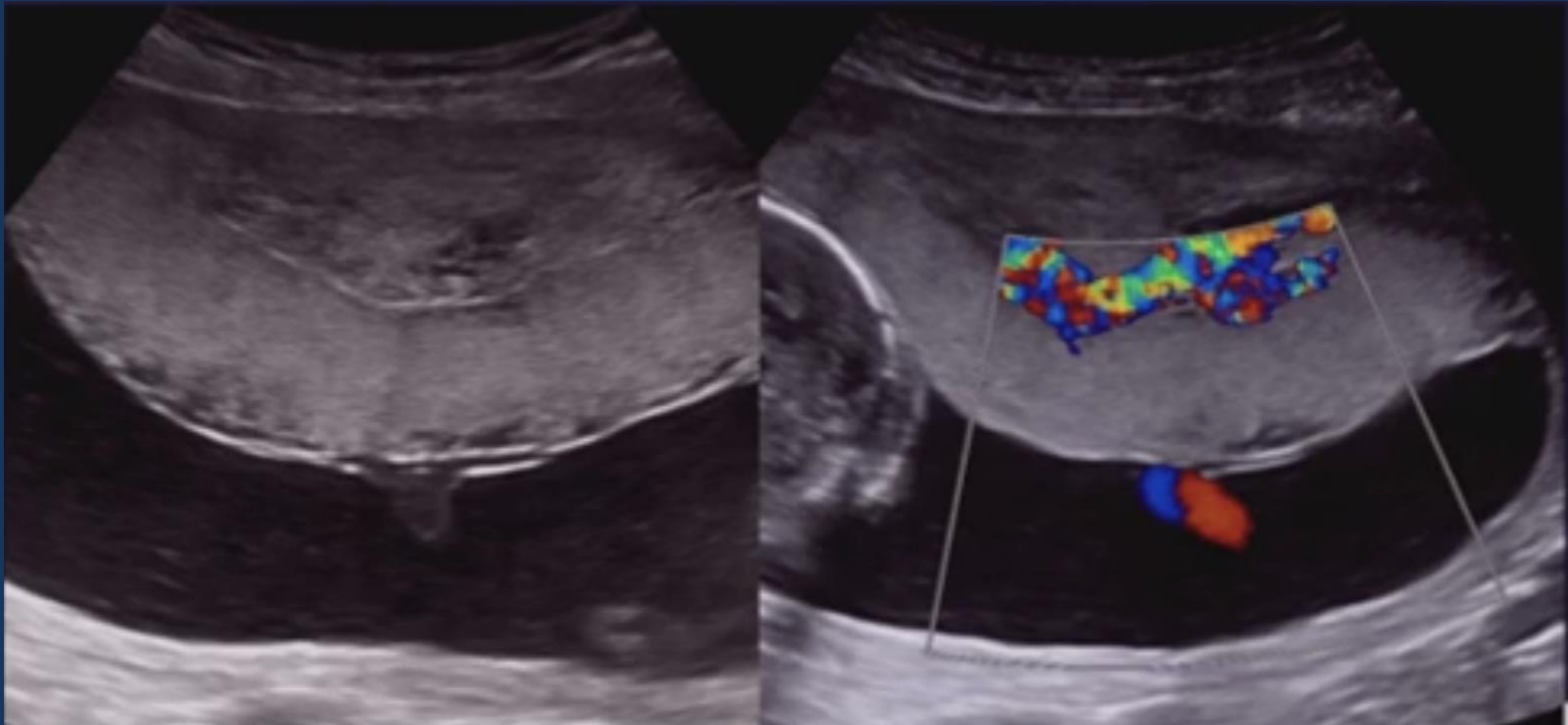
Don't Go Crazy with Color



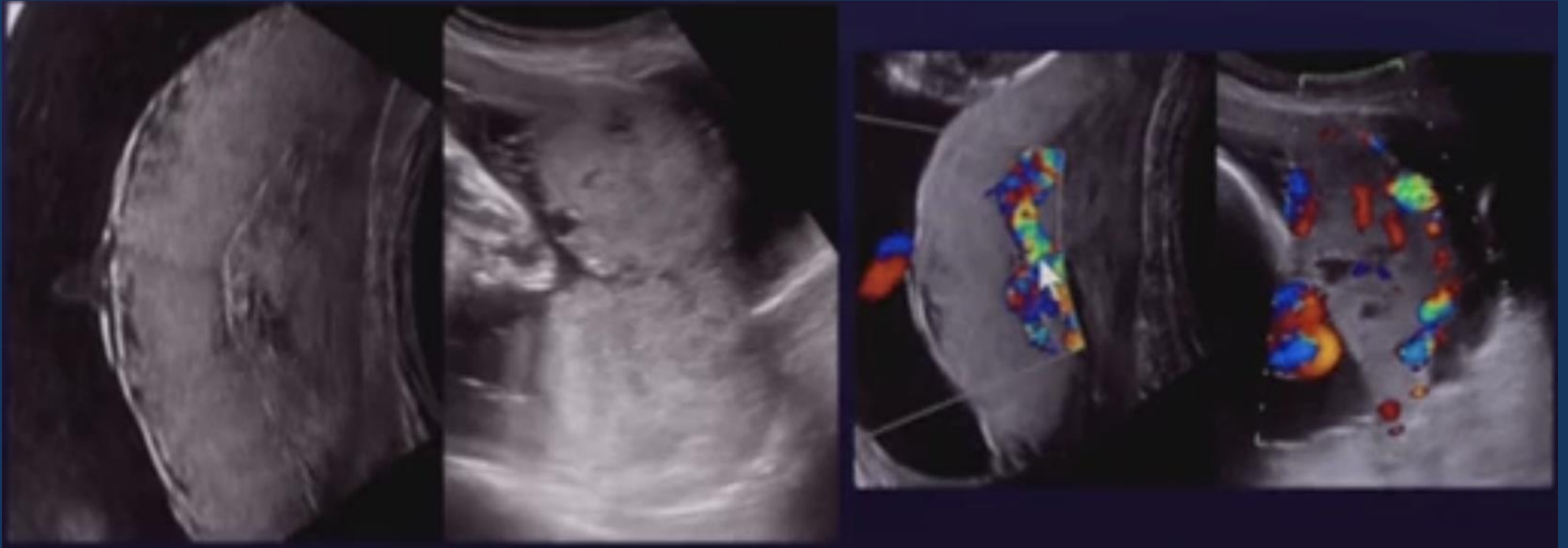
Proceed with caution!

**Increased vascularity
described- **very subjective****

US Normal Anterior Placenta

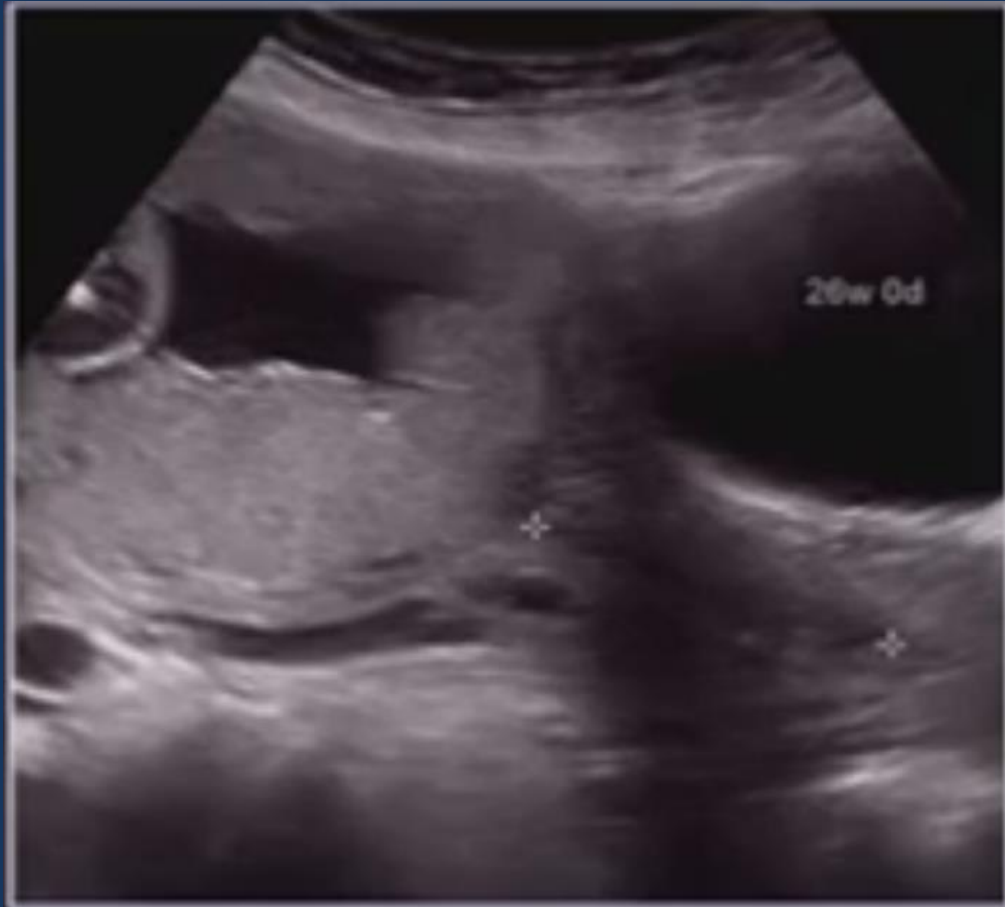


Normal vs Abnormal



Normal vs Abnormal

3 Prior c/s

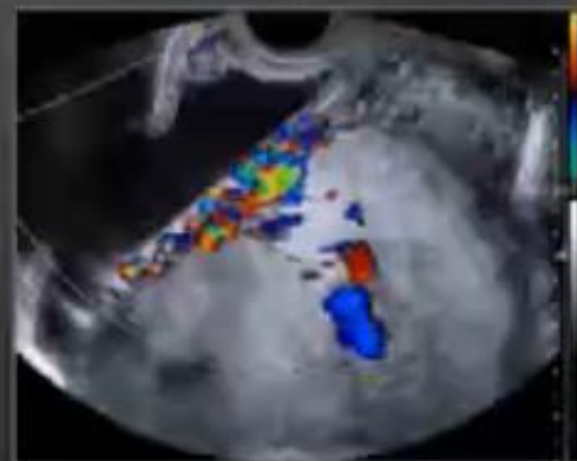
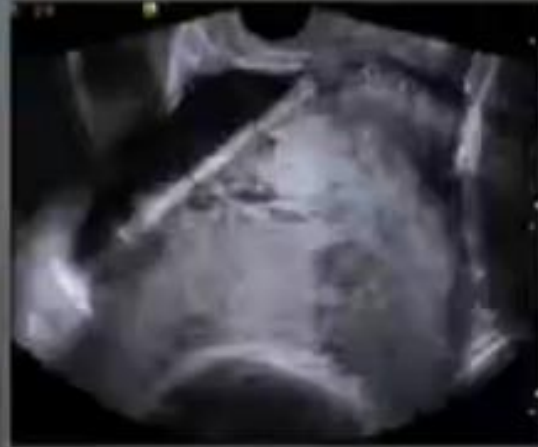


1 Prior c/s



Nine-Point scale for probability of PAS

| PAI Parameter Values | |
|-------------------------------|------|
| ≥2 cesarean deliveries | 3.0 |
| Lacunae | |
| Grade 3 | 3.5 |
| Grade 2 | 1.0 |
| Smallest myometrial thickness | |
| ≤ 1 mm | 1.0 |
| > 1 but ≤ 3 mm | 0.5 |
| > 3 but ≤ 5 mm | 0.25 |
| Anterior placenta previa | 1.0 |
| Bridging vessels | 0.5 |



Practical Points:

- Avoid bladder over filling;
 - Bladder volume **about 300** cc is enough
- Use **trans abdominal and TVS** together
- Use **gray scale and color Doppler** together
- **Do TVS with partially filled bladder**

- **Notice:** In woman with prior CS & PP:
 - Any individual sonographic findings should prompt investigation of other PAS signs.

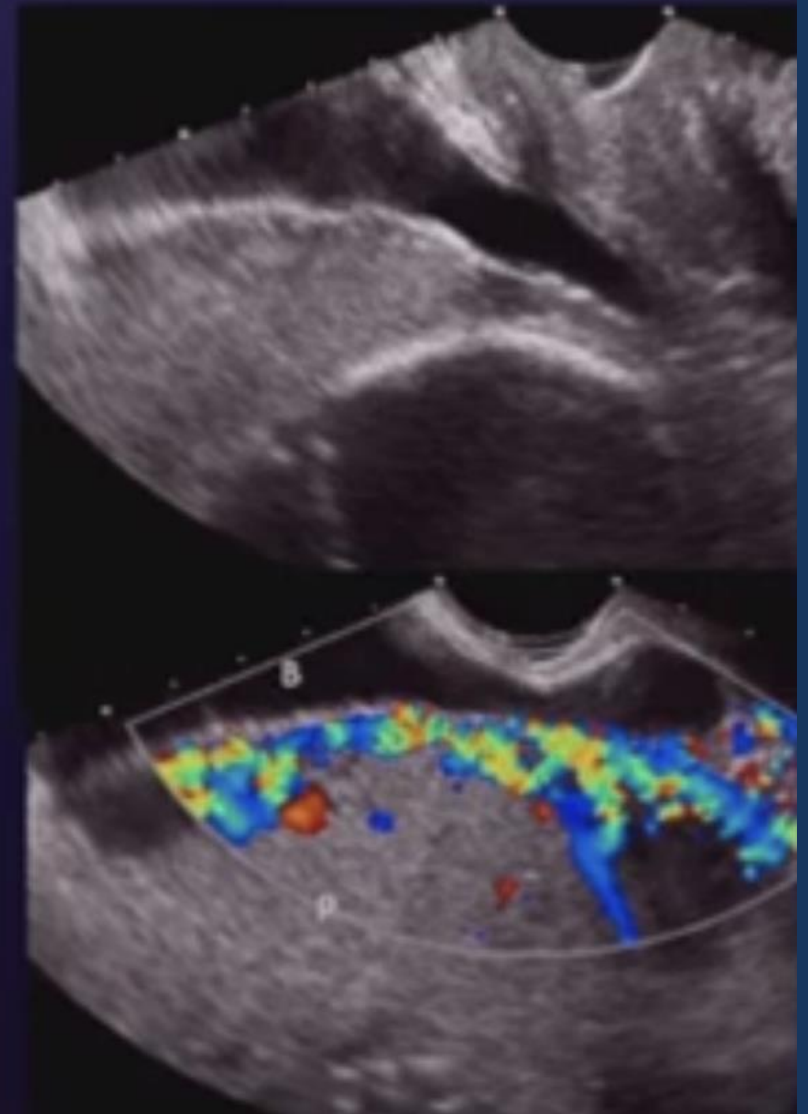
Potential pitfalls:

- Transducer selection
- Transducer pressure
- Normal structures
- Pregnancy related physiologic changes
- Scan plane
- Gain settings
- Observer bias

1- Transducer Selection



Transvaginal



2- Excessive Transducer Pressure

Without pressure



With pressure

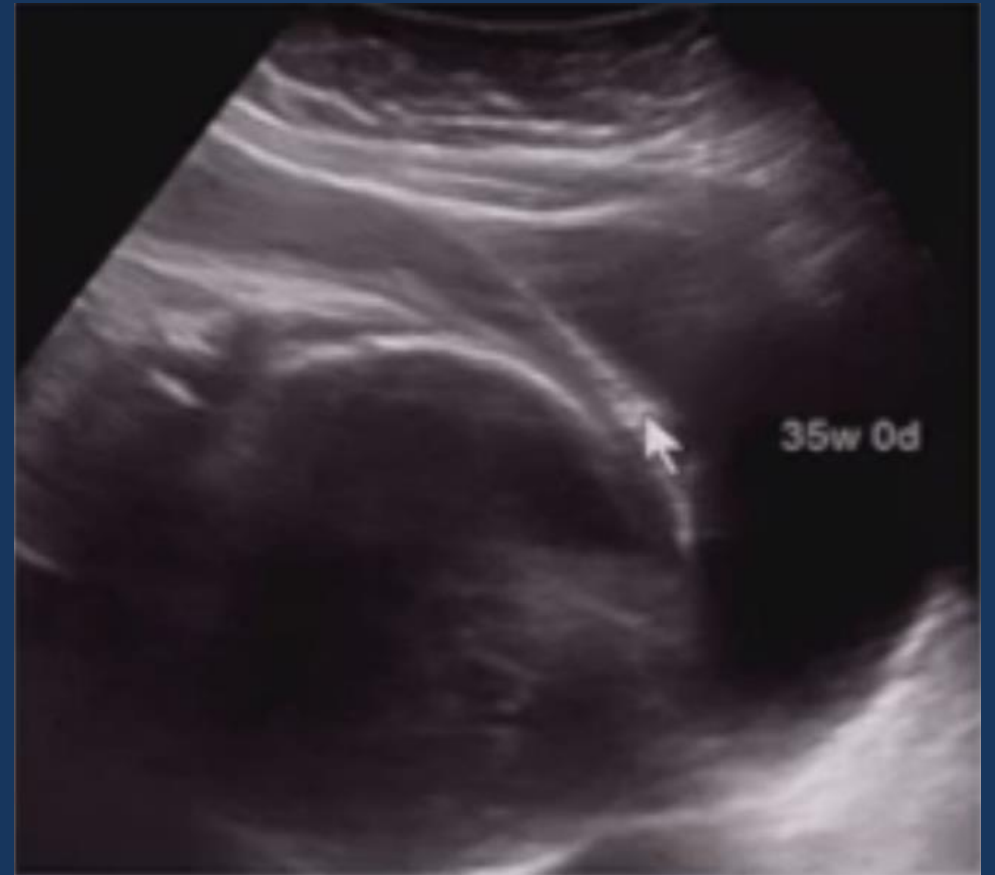


3- Normal Structures:

Myometrial vessels



Thin lower uterine segments



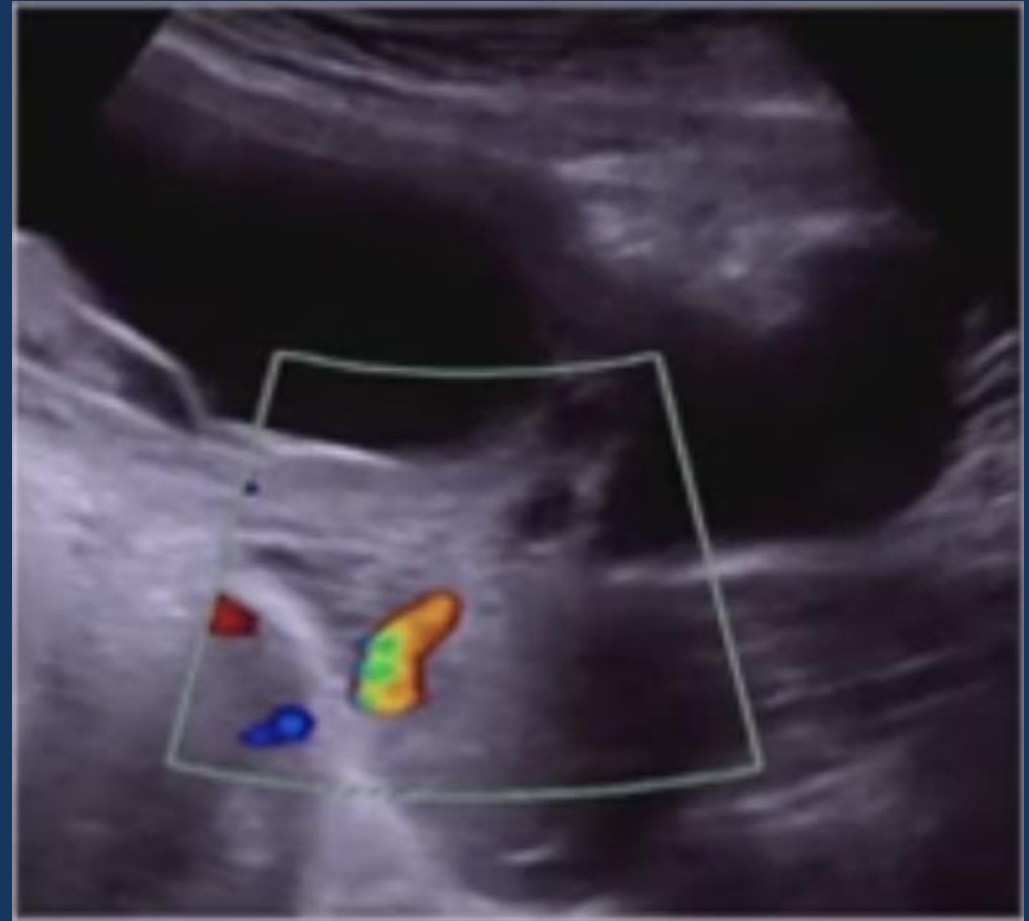
Myometrial vessels:



Myometrial vessels

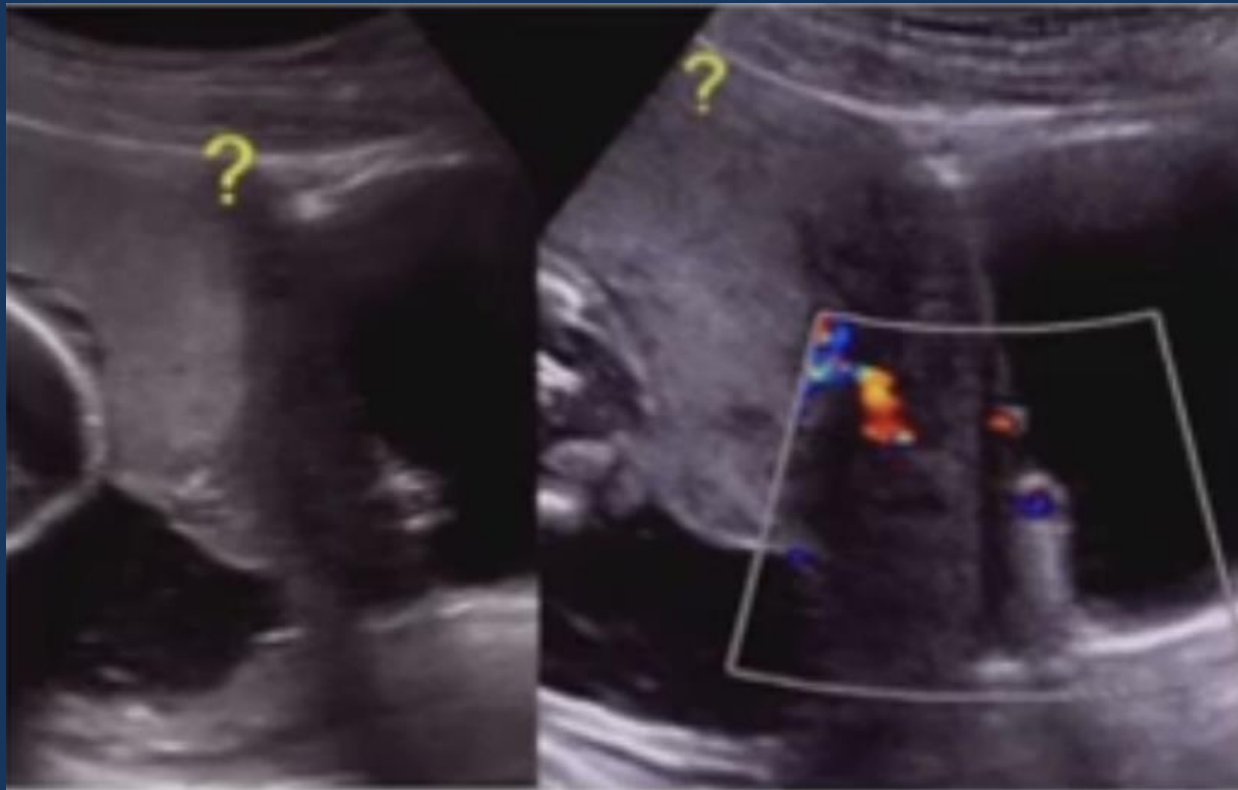


Uterine artery



4- pregnancy related physiologic changes:

Bladder varices



Where is the retroplacental clear space?



Scar dehiscence : **Not** abnormal placentation

5- Scar Plane

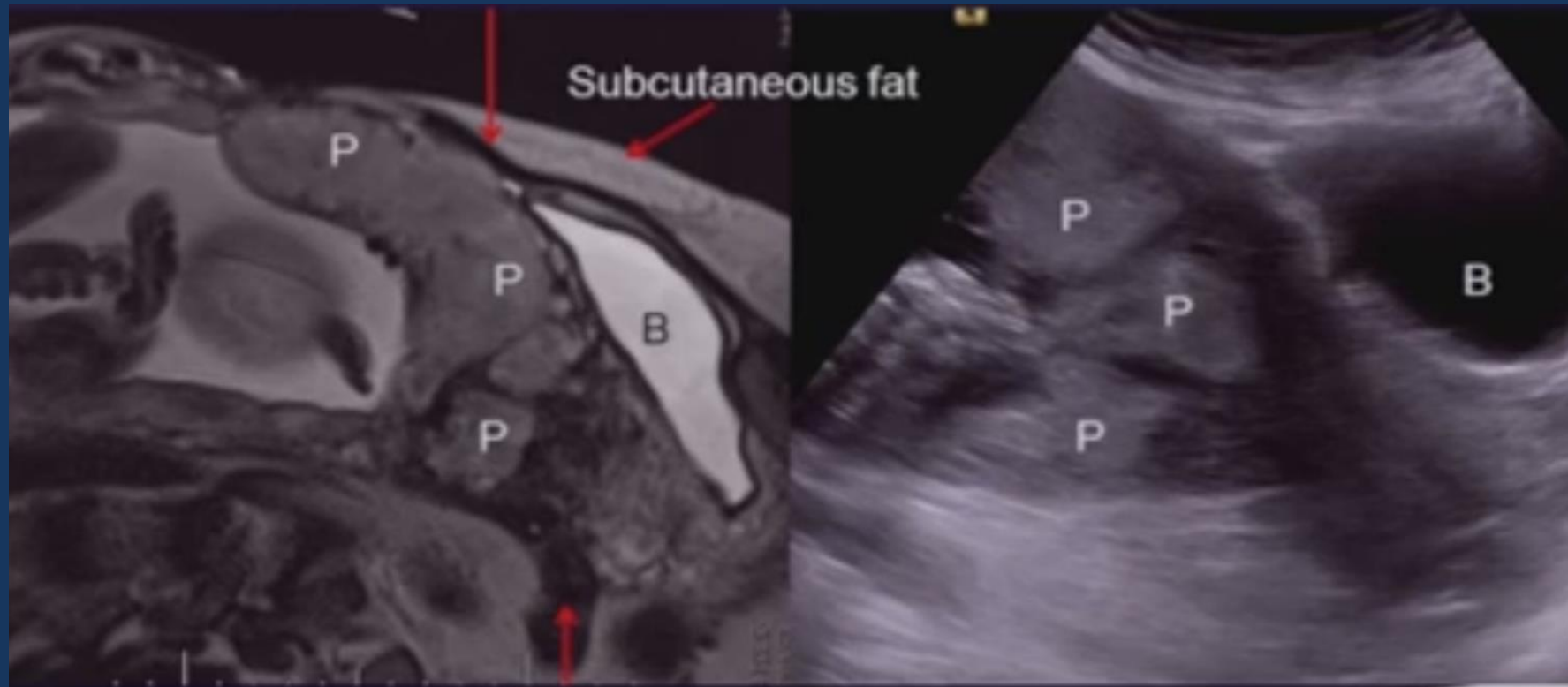
- “**Walk**” the placental insertion site
- **Real time** is the key
- **Saggital views** are far less confusing than axial

Is MRI necessary ?

Is extremely hard to interpret

But occasionally have a role played

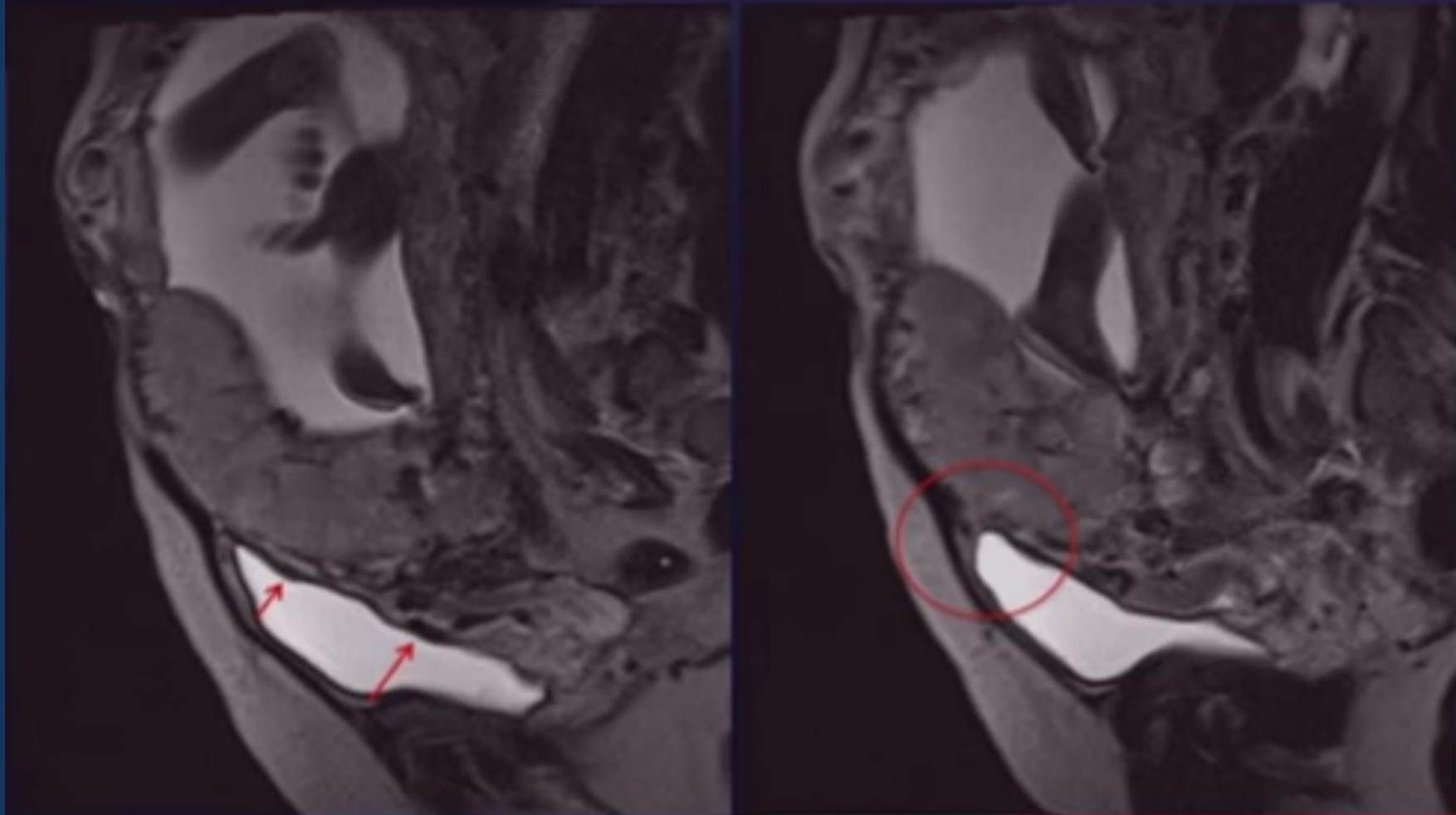
Anterior abdominal muscle

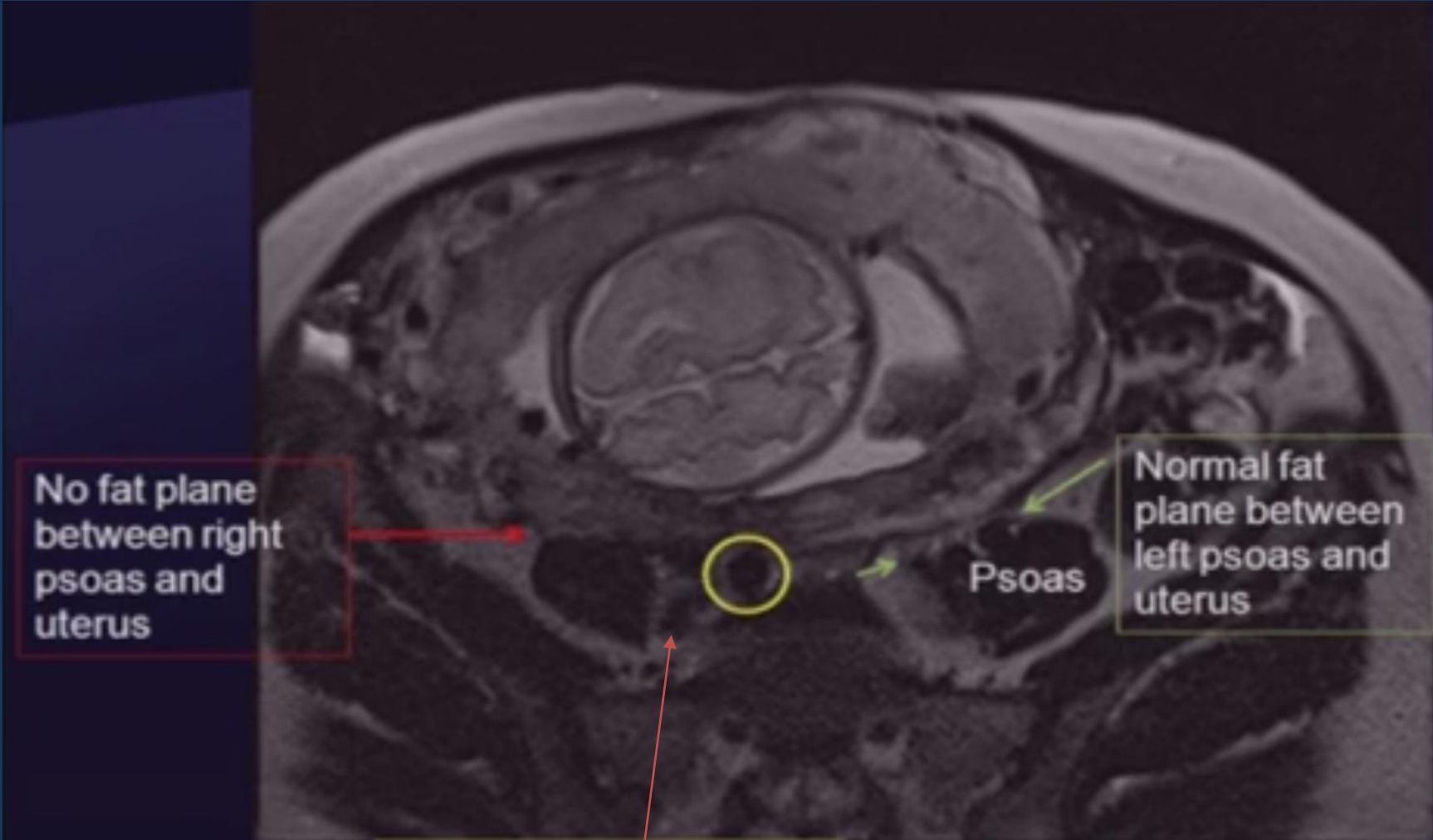


Colon

SO: it is better that do US first, & use MRI as a problem solving tool

Vessels in bladder wall Percreta at bladder dome





RT Common ilic artery

First-trimester PAS and Cesarean scar pregnancy



Cesarean scar pregnancy

- Implantation in lower uterine segment in scar tissue
- May result in early uterine rupture
- Can be: - **in the scar**
- **on the scar**
- Before **8w** --> has **triangular** shape & fill the niche
- After that --> appear **more rounded**

Here are the sonographic markers of MAP in early pregnancy

1. Previous cesarean section (Not US but "sine qua non")
2. Low anterior gestational sac
3. Placenta previa or low anterior placenta
4. Placental lacunae
5. Thin/no myometrium between placenta & bladder
6. Irregular or disrupted bladder line
7. Increased vascularity at bladder/placenta interphase

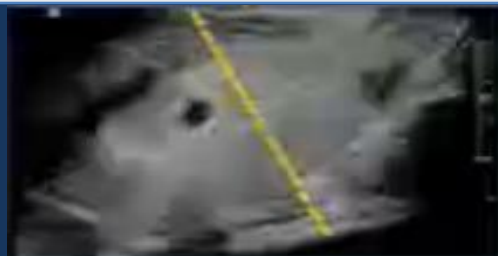
When Can You Make the Diagnosis?

The easiest and simplest way to the Dx

On a panoramic, longitudinal, sagittal scan: **Locate the GS**

Devide the **uterus in half** by imaginary line

If **GS is above** it: it's **nomal** implantation



Suspect **CSP**

If **GS is below** it:

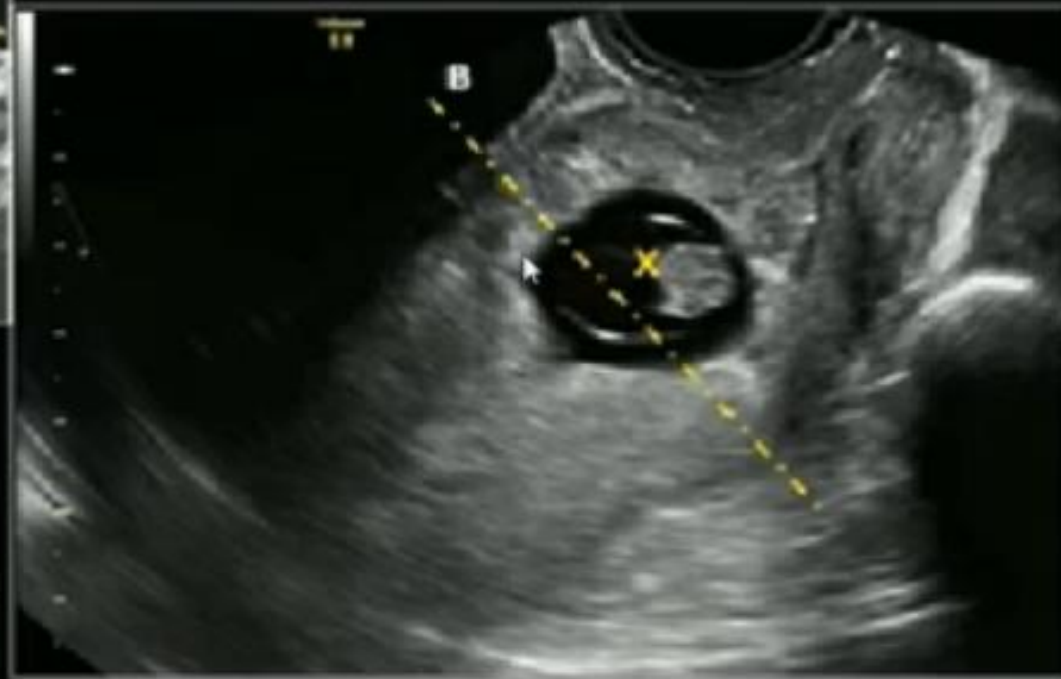
Or **Cervical pregnancy**

Sesitivity= 93.0%
Specificity= 98.9%
PPV= 96.4%
Npv= 97.9%

Low anterior GS

No fetal parts in the uterine cavity or cervix

Center of sac below the halfpoint of uterus



Warning:

- At times (mostly after 7 w) → the **location of sac** maybe **misleading**
 - Then color Doppler can be most helpful → GS elevates but placenta will be low like an anchor → see vascularity in CD in the scar
- Rely on : - The **patient HX**
 - The **location of sac**
 - The **vascular supply of sac**

Conclusion:

- The cases in literatures validate: CSP → Can be precursor of MAP
- But pregnancies with start as CSP → **Can achieve a live neonate**
- Then, Upon case series evidence: → You can **counsel the patient** with CSP to make an informed choice:
 - 1- **Terminate** of pregnancy
 - 2- **Continuation** of it with risks of **preterm delivery, loss of uterus, fertility**

Thanks for your attention

