PLACENTA ACCRETA SPECTRUM
OB ULTRASOUND PROTOCOL

BILLING CODES:

UOBC – if performing anatomy study at the same time
UOBF - if we have seen them for an anatomy and this is a return visit
UOBL- if no anatomy study in our system
UOBTV -to be added for transvaginal imaging when performed

PATIENT PREP: Bladder should be partially full

Protocol to be used when requested or suspected for evaluation of placental invasion in patients with the following risk factors:

- Anterior placenta covering the lower uterine segment in patients with a history of prior c-section.
- History of prior uterine rupture or perforation
- History of myomectomy or other uterine procedures that may compromise myometrium of uterus.

****Full protocol be completed on initial presentation and repeated with a general standard of every 6 weeks. This may vary based on level of concern. Always read the prior report for this information and when in doubt, ask whoever is reading if they want the PAS evaluation repeated.**

****If a patient has had an anatomy elsewhere, and is referred for just a PAS evaluation, obtain all images that would be needed for a follow up study with biometry, but a full anatomy study is not needed. It should be stated in the report that we are doing a limited evaluation, and the anatomy study was done at an OSH. Charge an UOBL.**

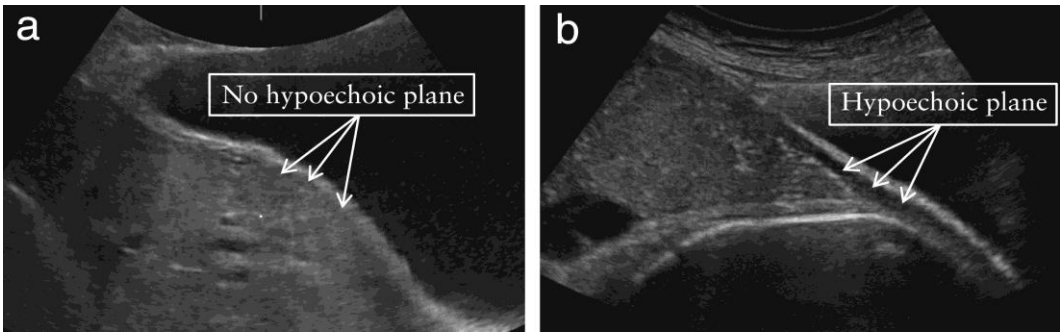
IMAGES TO OBTAIN

All images should be taken with light pressure to avoid compressing anterior structures and vessels.

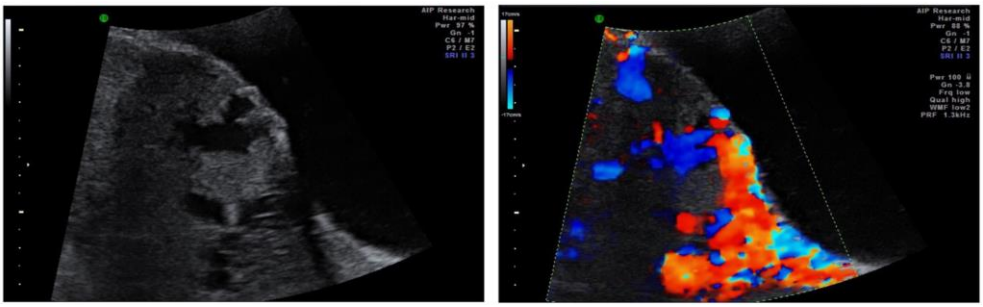
1. 2D cine clips sweeping through the whole placenta in transverse and sagittal. Do not zoom to anterior uterus only – include whole depth of uterus.
2. Color Doppler cine clips of whole placenta in transverse and sagittal. Do not zoom to anterior uterus only – include whole depth of uterus.
3. 2D cine clip in sagittal of the LUS interface with bladder.
4. Color cine clip in sagittal of the LUS interface with bladder.
5. If a suspicious area is seen:
    a. 2D cine clip zoomed to focus on any suspicious area.
    b. Color Doppler cine clip zoomed to focus on any suspicious area.
6. Uterine wall thickness to be measured at any areas of suspected thinning.
7. Length and width measurement of entire area of thinning for assessment of extent.
8. Transvaginal images of the LUS and CVX should also be obtained if accreta is suspected or the LUS is not well seen.

REPORT ON THE PRESENCE OR ABSENCE OF THE FOLLOWING

1. **LOSS OF CLEAR ZONE** – Loss or irregularity of the hypoechoic plane in the myometrium underneath the placental bed - aka the "clear zone"



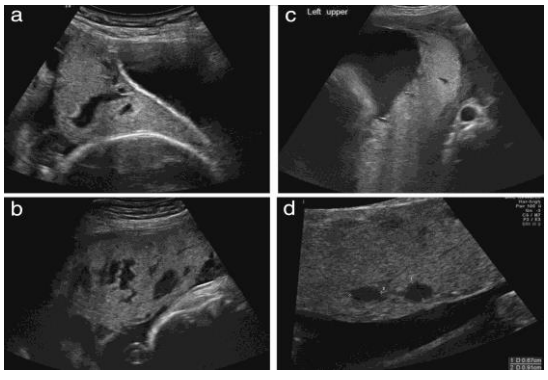
2. **ABNORMAL PLACENTAL LACUNAE** – Presence of numerous lacunae including some that are large and irregular, often containing turbulent flow visible on 2D grayscale imaging.



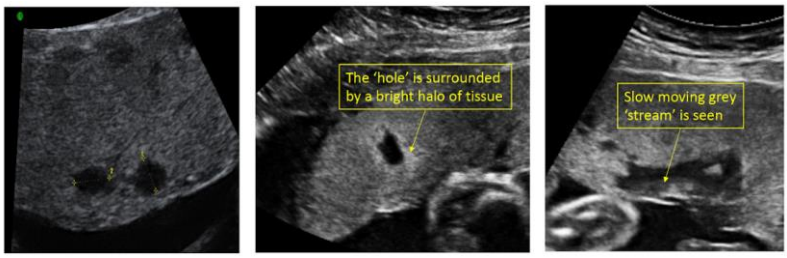
Lacunae with high velocity blood flow

VENOUS LAKE	vs	LACUNAE
Slow flow		High velocity flow (>10 cm/s)
Often compressible or dynamic		Not compressible
Fewer in number and widely distributed		Numerous in region of abnormal placentation
More uniformly shaped		Irregular in shape
Usually found on fetal side of placenta		Extend from placental bed / maternal side of placenta

NOTE: PAC lacunae and venous lakes can both be present in the same patient.



Figures a and b showing abnormal lacunae. Figures c and d showing normal venous lakes.



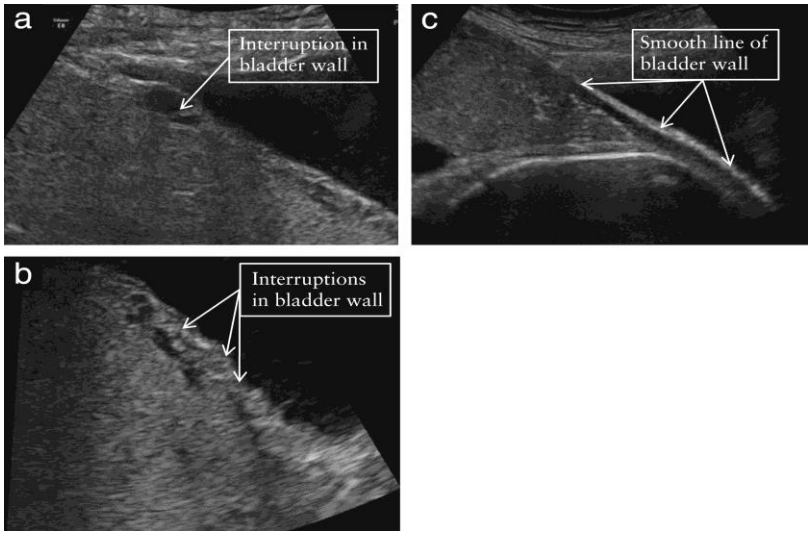
A) Simple placental lakes – note there is no increased brightness in the surrounding tissue

B) Echogenic cystic lesion (resulting from a placental infarct)

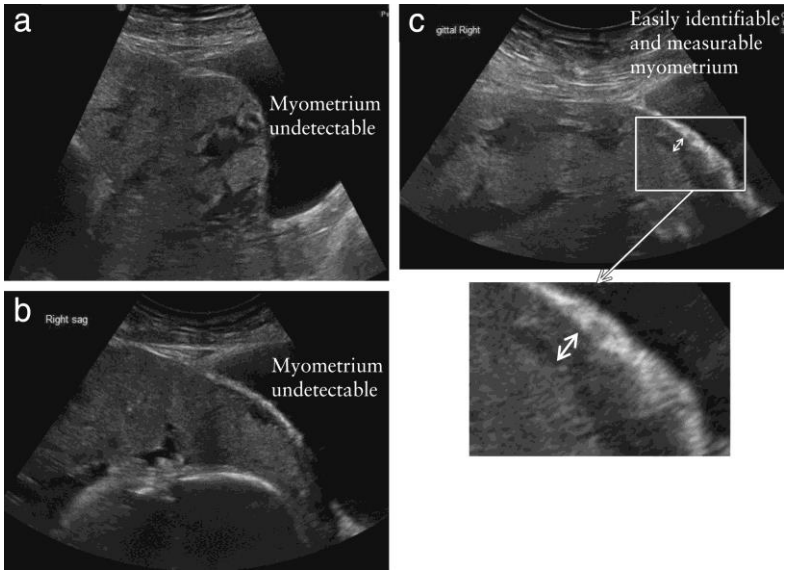
C) Placental lake with slow flow visible in greyscale – note the position away from the placental basal plate

Placental infarcts can be differentiated from lakes and lacunae by their hyperechoic rim

3. **BLADDER WALL INTERUPTION** - Loss or interruption of bright bladder wall, hyperechoic band or 'line' between uterine serosa and bladder lumen.

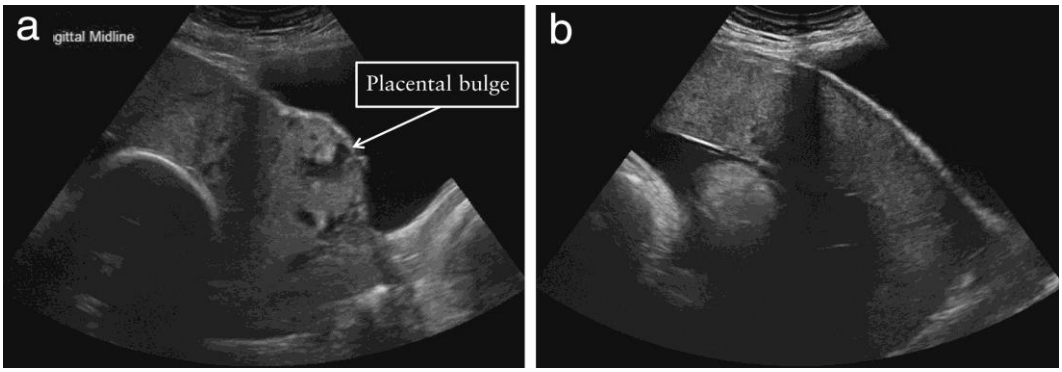


4. **MYOMETRIAL THINNING** - Thinning of myometrium overlying placenta to < 1 mm or undetectable.

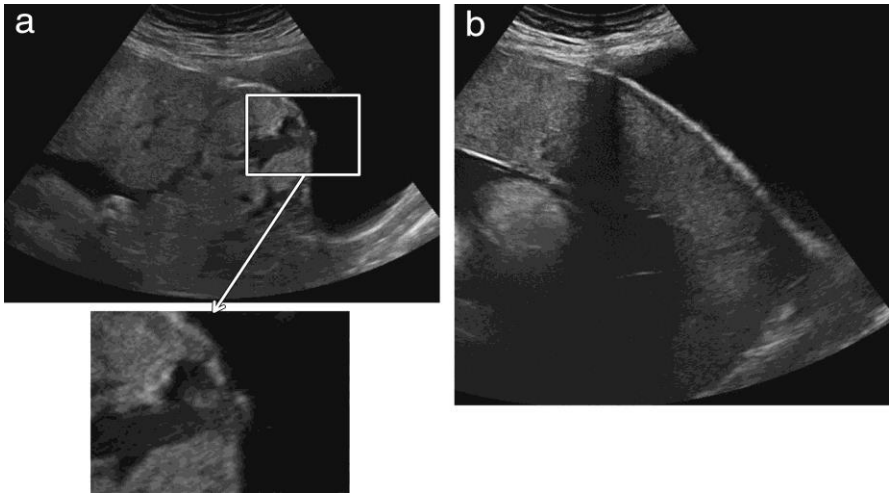


5. **PLACENTAL BULDGE** - Deviation of uterine serosa away from expected plane, caused by abnormal bulge of placental tissue into neighboring organ, typically bladder; uterine serosa appears intact but outline shape is distorted.

   Can have a similar ultrasound appearance to a uterine window or dehiscence. In the case of uterine window or dehisence, there will be no other signs of PAC and the bulge will lack hypervascularity.



6. **FOCAL EXOPHYTIC MASS** - Placental tissue seen breaking through uterine serosa and extending beyond it; most often seen inside filled urinary bladder.



7. **UTEROVESICAL HYPERVASCULARITY -** Striking amount of color Doppler signal seen between myometrium and posterior wall of bladder; this sign probably indicates numerous, closely packed, tortuous vessels in that region (demonstrating multidirectional flow and aliasing artifact)

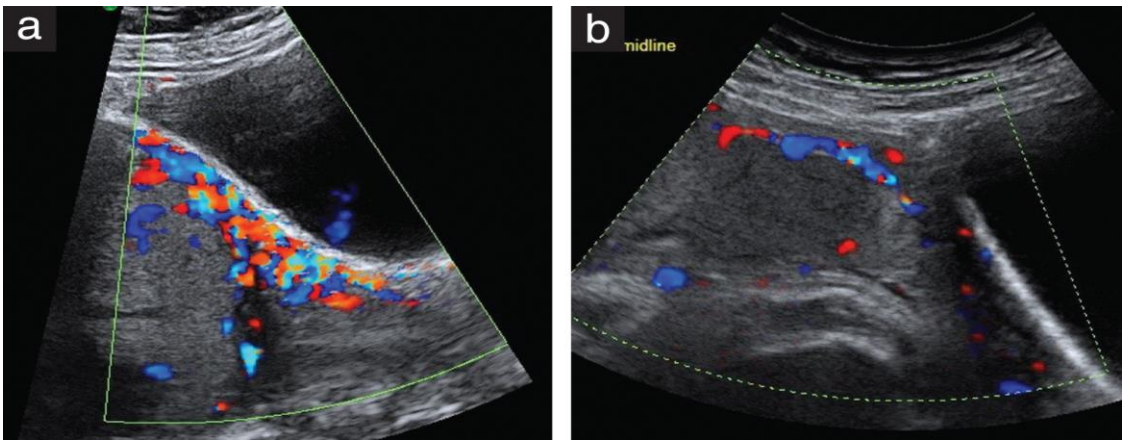
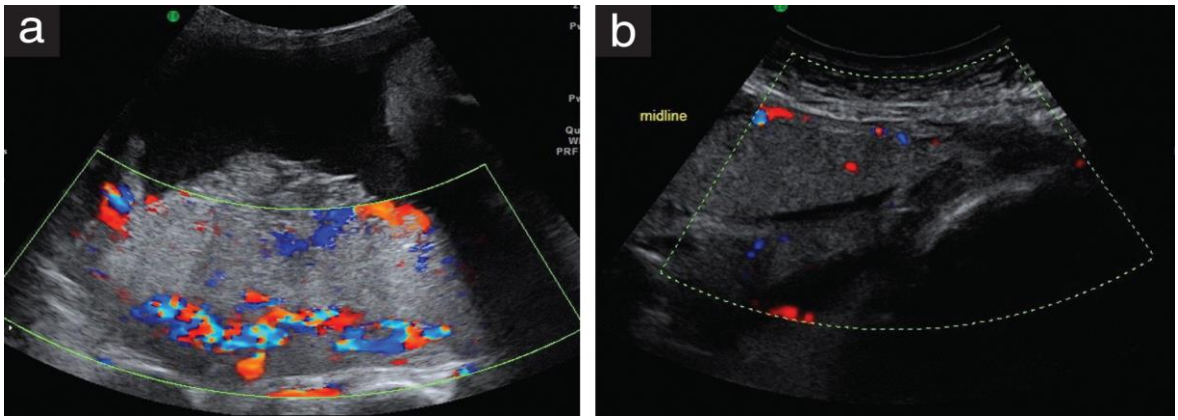


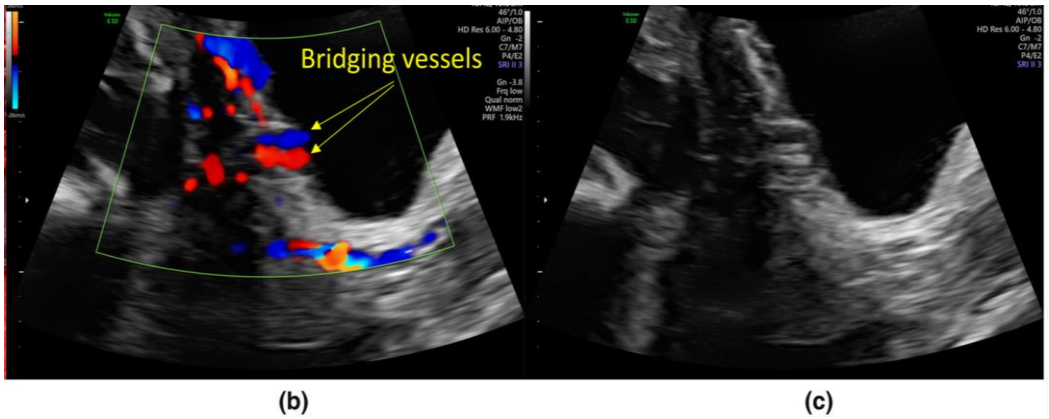
Figure a - abnormal *Figure b - normal*

8. **SUBPLACENTAL HYPERVASCULARITY** - Striking amount of color Doppler signal seen in placental bed; this sign probably indicates numerous, closely packed, tortuous vessels in that region (demonstrating multidirectional flow and aliasing artifact)

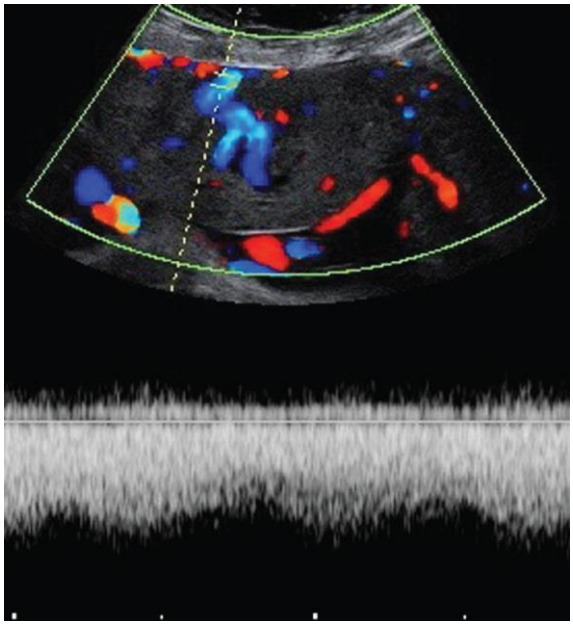


9. **BRIDGING VESSELS -** Vessels appearing to extend from placenta, across myometrium and beyond serosa into bladder or other organs; often running perpendicular to myometrium. It may appear as a pair, or pairs, of echogenic lines running parallel to the uterine serosa and posterior bladder wall. This is also referred to as the "= sign"

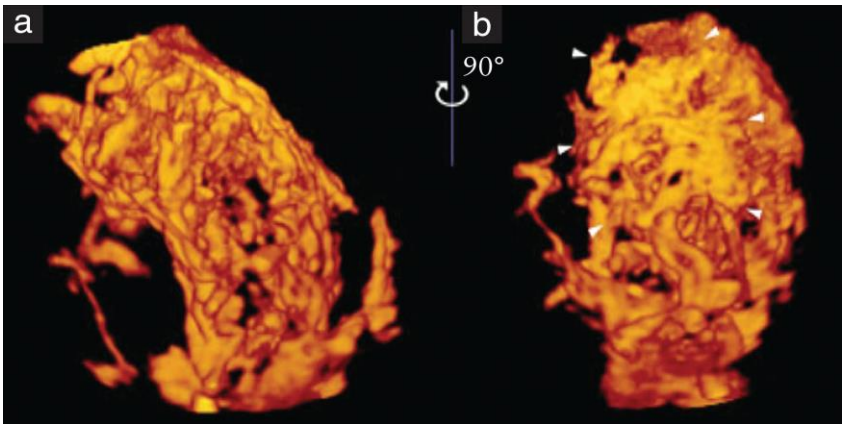
Example of "= Sign"



10. **PLACENTAL LACUNAE FEEDER VESSELS** - Vessels with high-velocity blood flow leading from myometrium into placental lacunae, causing turbulence upon entry



11. **INTRAPLACENTAL HYPERVASCULARITY**
Complex, irregular arrangement of numerous placental vessels, exhibiting tortuous courses and varying calibers



Source: Shis et al. (2009) UOG;33; 193-203

Table 1 Unified descriptors, as suggested by the European Working Group on Abnormally Invasive Placenta (EW-AIP), for ultrasound (US) findings in AIP

US finding	*EW-AIP suggested standardized definition*
2D grayscale	
Loss of 'clear zone' (Figure 1)	Loss, or irregularity, of hypoechoic plane in myometrium underneath placental bed ('clear zone')
Abnormal placental lacunae (Figure 2)	Presence of numerous lacunae including some that are large and irregular (Finberg Grade 3), often containing turbulent flow visible on grayscale imaging
Bladder wall interruption (Figure 3)	Loss or interruption of bright bladder wall (hyperechoic band or 'line' between uterine serosa and bladder lumen)
Myometrial thinning (Figure 4)	Thinning of myometrium overlying placenta to < 1 mm or undetectable
Placental bulge (Figure 5)	Deviation of uterine serosa away from expected plane, caused by abnormal bulge of placental tissue into neighboring organ, typically bladder; uterine serosa appears intact but outline shape is distorted
Focal exophytic mass (Figure 6)	Placental tissue seen breaking through uterine serosa and extending beyond it; most often seen inside filled urinary bladder
2D color Doppler	
Uterovesical hypervascularity (Figure 7)	Striking amount of color Doppler signal seen between myometrium and posterior wall of bladder; this sign probably indicates numerous, closely packed, tortuous vessels in that region (demonstrating multidirectional flow and aliasing artifact)
Subplacental hypervascularity (Figure 8)	Striking amount of color Doppler signal seen in placental bed; this sign probably indicates numerous, closely packed, tortuous vessels in that region (demonstrating multidirectional flow and aliasing artifact)
Bridging vessels (Figure 9)	Vessels appearing to extend from placenta, across myometrium and beyond serosa into bladder or other organs; often running perpendicular to myometrium
Placental lacunae feeder vessels (Figure 10)	Vessels with high-velocity blood flow leading from myometrium into placental lacunae, causing turbulence upon entry
3D ultrasound ± power Doppler	
Intraplacental hypervascularity (Figure 11)	Complex, irregular arrangement of numerous placental vessels, exhibiting tortuous courses and varying calibers
Placental bulge	(as in 2D)
Focal exophytic mass	(as in 2D)
Uterovesical hypervascularity	(as in 2D)
Bridging vessels	(as in 2D)

2D, two-dimensional; 3D, three-dimensional.

REFERENCES:

1- Collins SL, Ashcroft A, Braun T, Calda P, Langhoff-Roos J, Morel O, et al. Proposal for standardized ultrasound descriptors of abnormally invasive placenta (AIP). Ultrasound Obstet Gynecol. **2016;47(3):271-5.**

2- A simple guide to ultrasound screening for placenta accreta spectrum for improving detection and optimizing management in resource limited settings. Adu-Bredu T. K. , Rijken M. J., Nieto-Calvache A.J., Stefanovic V., Aditya Aryananda R., Fox K.A. , Collins S. L. Int J Gynecol Obstet. 2022;00:1–10.

PLACENTA ACCRETA SPECTRUM IMAGE LIST

IMAGE	MODE
All images to be taken with light pressure	
Placenta Sagittal sweep *include whole depth of uterus*	Cine
Placenta Trans sweep *include whole depth of uterus*	Cine
Placenta Sagittal sweep w color *include whole depth of uterus*	Cine/color
Placenta Trans sweep w color *include whole depth of uterus*	Cine/color
Identify any bridging vessels	Color
Identify any feeder lacuna vessels *from myometrium to placenta*	Color
Interrogate bladder wall interface	2D
2D LUS/Bladder wall cine clip	Cine
Color LUS/Bladder wall cine clip	Cine/Color
2D Cine clip zoomed in on any area of interest	Cine
Color cine clip zoomed in on any area of interest	Cine/color
Measure any myometrial thickness if thin	2D+
Measure entire area of thinning if present Lx H	2D+
TV of LUS if any question of accreta	TV

PLACENTA ACCRETA SPECTRUM OB PROTOCOL HISTORY

	Date	Changes made	By whom
Created	11/15/2022		Manjiri Dighe Renee Betit Fitzgerald
Added	4/16/2024	-Image List added	Renee Betit Fitzgerald
Reviewed	4/25/2024	-Removed definitions of accreta/increta/percreta to align with placenta accreta spectrum terminology -Removed MFI requirements -Removed spectral doppler requirements	Protocol Meeting Attendees: Dighe, Cheng, Ma, Simmons, Renee, Shaun, Becky
Added	8/6/2024	**Full protocol be completed on initial presentation and repeated with a general standard of every 6 weeks. This may vary based on level of concern. Always read the prior report for this information and when in doubt, ask whoever is reading if they want the PAS evaluation repeated. **If a patient has had an anatomy elsewhere, and is referred for just a PAS eval, obtain all images that would be needed for a follow up study with biometry, but a full anatomy study is not needed. It should be stated in the report that we are doing a limited evaluation, and the anatomy study was done at an OSH. Charge an UOBL.	Combined Protocol Meeting MFM/RAD Attendees: M. Dighe, E. Cheng, J. Hitti, M. Richley, S Bornemeier, B. Marion, R. Betit Fitzgerald