เสวนาปัญหา

PAS ที่ยังไม่ PASS

Q1 ความกังวลในการดูแลเคส PAS

Q2 ปัญหาในการวินิจฉัย PAS ในแต่ละจังหวัด

Q3 กรณีสงสัย PAS อายุครรภ์ที่เหมาะสมที่ควรส่งตัวมาพบ MFM

Q4 ความเป็นไปได้ในการค้นหาเคสเชิงรุก เพื่อลดการวินิจฉัยล่าช้า

No.	HN	ชื่อ	วินิจฉัยโรค	MRI placenta	Refer	Outcome
1	884496	[redacted]	P.C/S no previa R/O PAS US: no obvious sign of PAS	ไม่ได้ส่ง		ไม่ได้คลอดรพ.ร้อยเอ็ด
2	1177506	[redacted]	Placenta low-lying c P.CS	No evidence of PAS		คลอด รพ.ร้อยเอ็ด
3	561455	[redacted]	FU placenta previa R/O PAS	ส่ง	รพ.ศรีนครินทร์	
4	273904	[redacted]	Previa R/O PAS	ส่ง		LT C/S c TR 3/1/68 (GA 38+ wk) รพ.ร้อยเอ็ด
5	1031605	[redacted]	Placenta previa cover os, P.C/S	ไม่ได้ส่ง		
6	1328926	[redacted]	R/O PAS	ไม่ได้ส่ง		
7	951507	[redacted]	P. C/S c placental lacunae	ไม่ได้ส่ง		LT C/S c TR 28/5/67 (GA 37+ wk) รพ.ร้อยเอ็ด
8	990773	[redacted]	R/O PAS	Suspicious PAS	รพ.ศูนย์ขอนแก่น	
9	1360990	[redacted]	Previous C/Sx2 c pelvic adhesion, TPL	ไม่ได้ส่ง		LT C/S c TR 4/2/68 (GA 37+ wk) รพ.ร้อยเอ็ด
10	1340378	[redacted]	Primigravida c placenta previa totalis R/O PAS US: no obvious sign of PAS	ไม่ได้ส่ง		
11	893349	[redacted]	P.C/S c placenta low-lying c Placenta accreta	Suggestive placenta accreta	รพ.ศูนย์ขอนแก่น	
12	852249	[redacted]	P. C/S c placenta previa totalis	ส่ง MRI placenta 10/01/68		LT C/S c TR 25/3/68 (GA 37+ wk) รพ.ร้อยเอ็ด
13	847162	[redacted]	PPAT (no PAS) c TPL			LT C/S c TR 10/3/67 (GA 37+ wk) รพ.ร้อยเอ็ด
14	51523	[redacted]	Previous C/S c R/O PAS, GDMA1	ไม่ได้ส่ง		
15	430203	[redacted]	previous c/s+placenta previa	ส่ง MRI ได้ทำ 2/8/67		
16	713072	[redacted]	P.C/S x3 , R/O PAS	Suspected PAS	รพ.ศูนย์ขอนแก่น	LT C/S c TR 9/6/68 ไม่เป็น PAS, severd adhesion EBL 400 ml.
17	882828	[redacted]	Previous CS c PPAT c R/O PAS US: มี obvious sign of PAS	No evidence of PAS		C-hyst รพ.ร้อยเอ็ด, EBL 3,000 ml **Patho** Uterus with both fallopian tube,resection:- – Presence of chorionic villi attaching direcly to mucular layer with multiple organized clotted blood within vascular channels along endometrial and endocervical cavity, from fundus to endocervix; consistent with clinical history of placenta acreta. – Adenomyosis with decidualized change.
18	37223	[redacted]	P.C/S , R/ O PAS AFI 24.6 cm c Fetal LGA, placental lacunae US: no obvious sign of PAS ?	ไม่ได้ส่ง		ไม่ได้คลอด รพ.ร้อยเอ็ด
19	174496	[redacted]	Primigravida, Placeta previa anterior totalis US: no obvious sign of PAS	ไม่ได้ส่ง		ตาม outcome
20	314549	[redacted]	No ANC, P.C/S with placenta increta(at least)	ไม่ได้ส่ง	รพ.ศรีนครินทร์	Placenta percreta , EBL 3000 ml
21	220027	[redacted]	Resolved Mild bilat ventriculomegaly (46XY, CMA normal, TORCH neg) Borderline FGR c multiple placental lacuna c P.C/S R/O PAS	Suspicious PAS	รพ.ศูนย์ขอนแก่น	KKH ส่งกลับมาให้คลอดที่ร้อยเอ็ด Set C/S 2 ก.ย.68
21	1006043	[redacted]	Placenta previa R/O PAS c renal pyelect	Suggestive PAS	รพ.ศรีนครินทร์	Maternal death

		Prenatal Dx	Operation	date	EBL
Accreta					
1350618	[redacted]L	PL with placenta previa totalis with PPH with re-explor for Subtotal hysterectomy	- LT C/S - Subtotal hysterectomy	7 Oct 24	2000 400
773527	[redacted]	Placenta previa totalis	- C-hyst with BS	3 Aug 20	3600
Increta					
903595	[redacted]	Placenta previa totalis with previous C/S	- Subtotal hysterectomy	12 Apr 24	1400
1103317	[redacted]	Placenta previa totalis with previous C/S	- LT C/S with B-lynch - Subtotal hysterectomy	14 Feb 23	2000 600
Percreta					
1006043	[redacted]	Placenta percreta with intraabdominal bleeding with previous C/S with cardiac arrest	- Subtotal hysterectomy	14 Jul 24	6000
767910	[redacted]	Incomplete abortion with placenta percreta	- TAH with BSO	18 May 22	1000
981144	[redacted]	Placenta percreta with ruptured uterus with previous C/S oligohydramnios	- Subtotal hysterectomy with Lt SO	22 Sep 20	2500

R/O PAS but no PAS	
516702	[redacted]
1026747	[redacted]

Q5 ข้อผิดพลาดในการอ่าน MRI

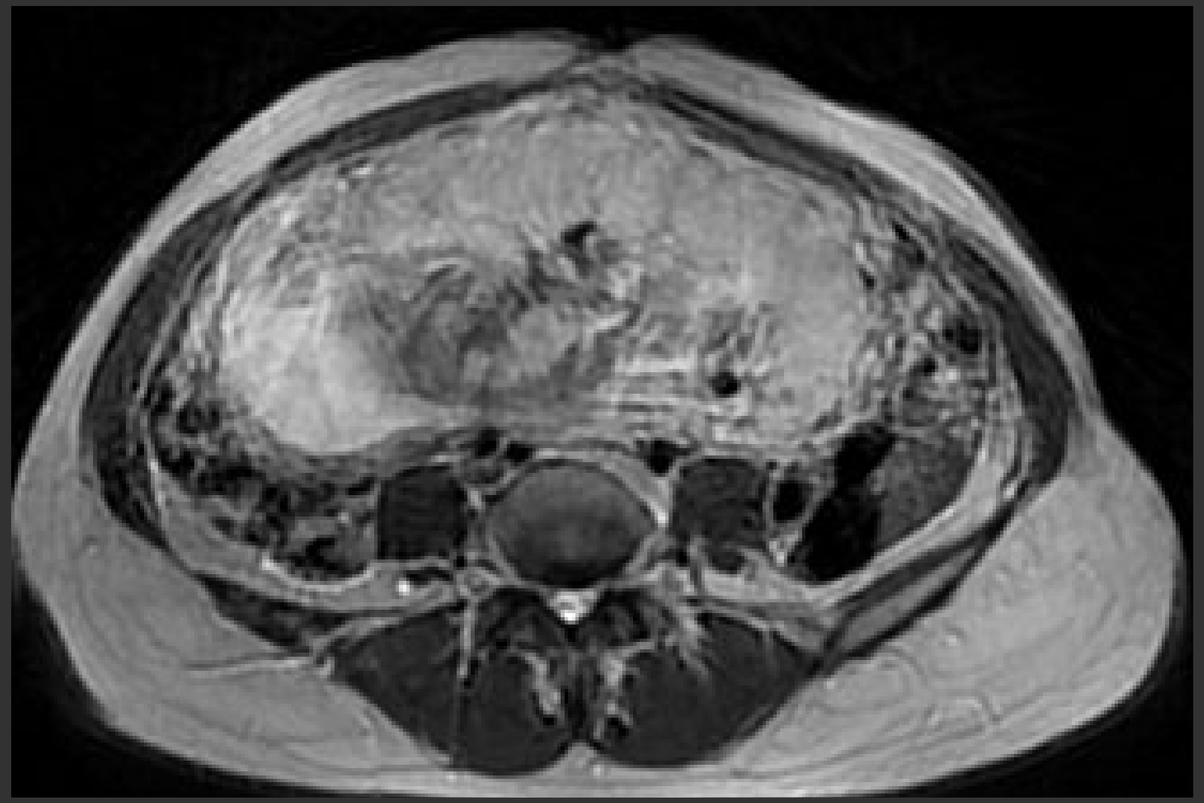
Case 1

A 35 y/o pregnant woman G5P3013 GA 28+ weeks with previous CS *3 times

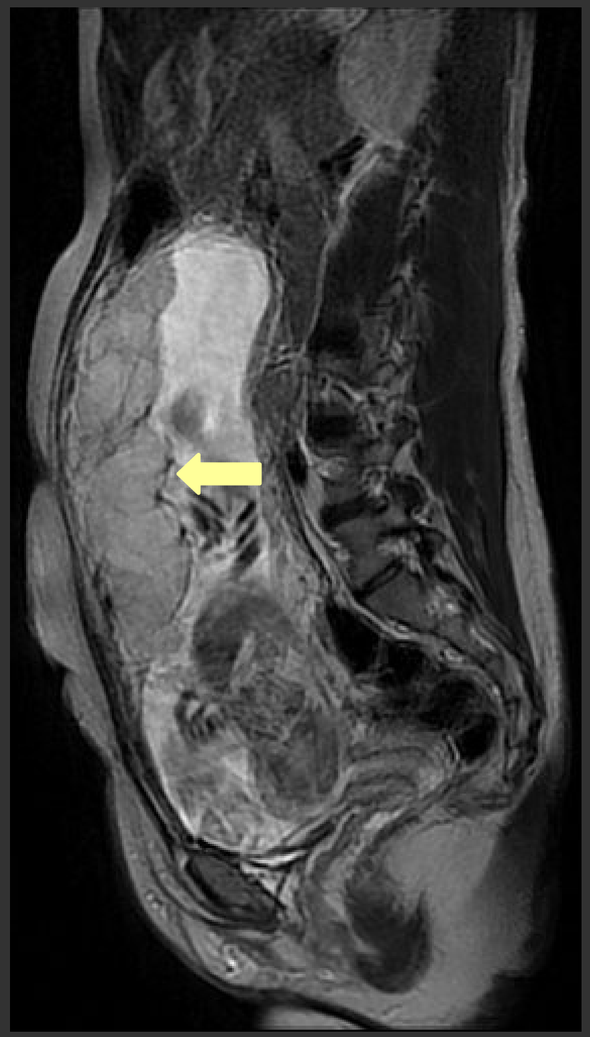
TAS: Placenta anterior upper fundus, anechogenic lesion in placenta

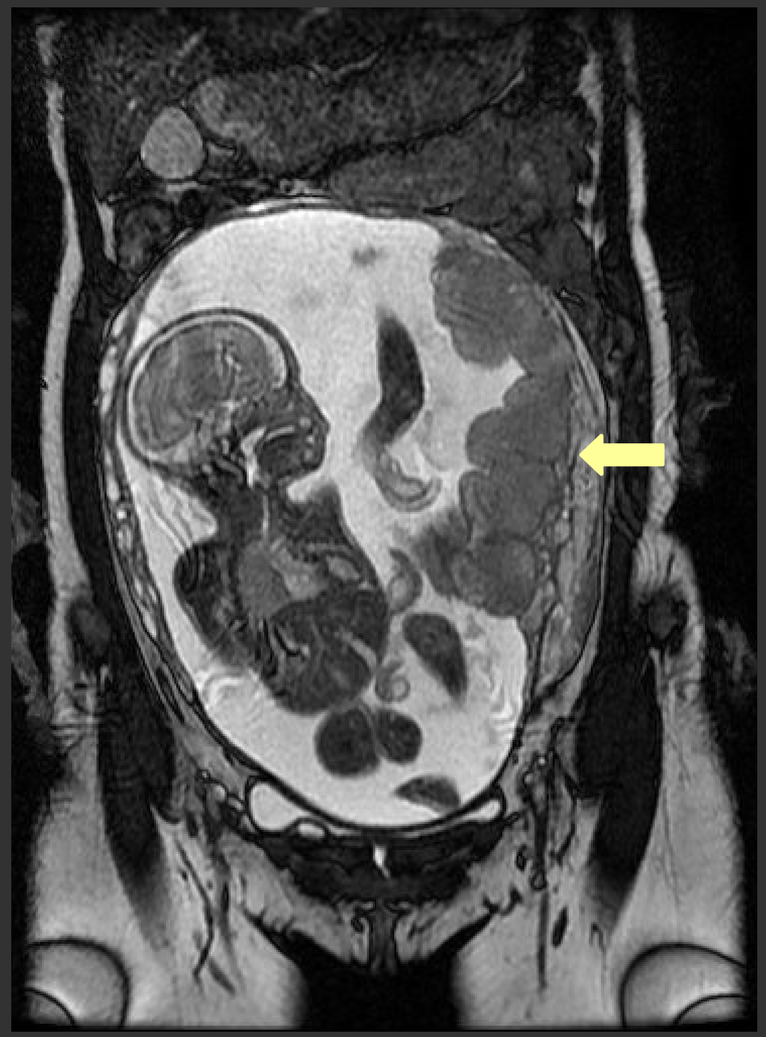
Case 1

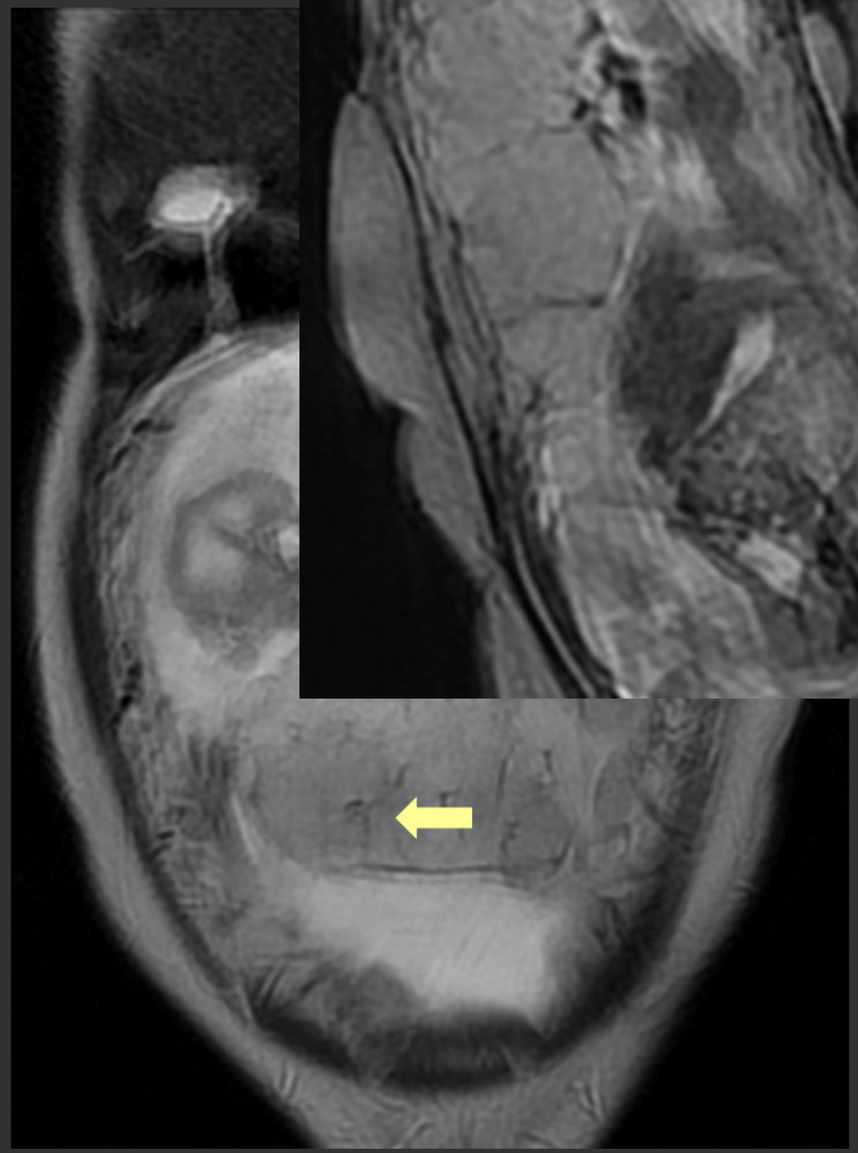
Motion artifact

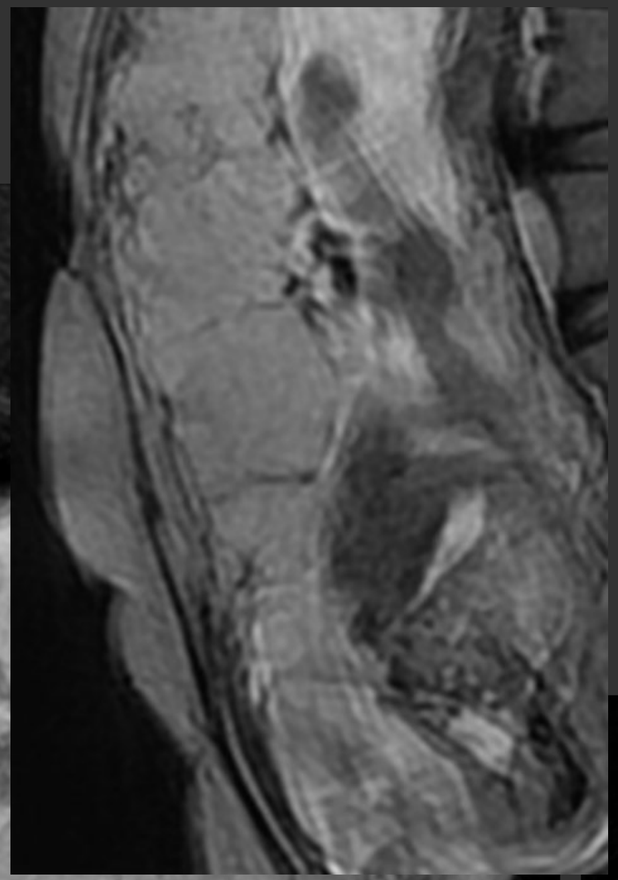


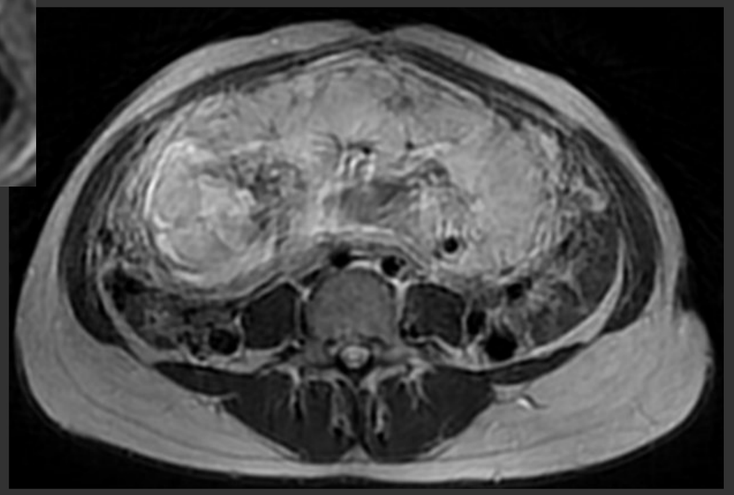
Anterior placenta
No placenta previa







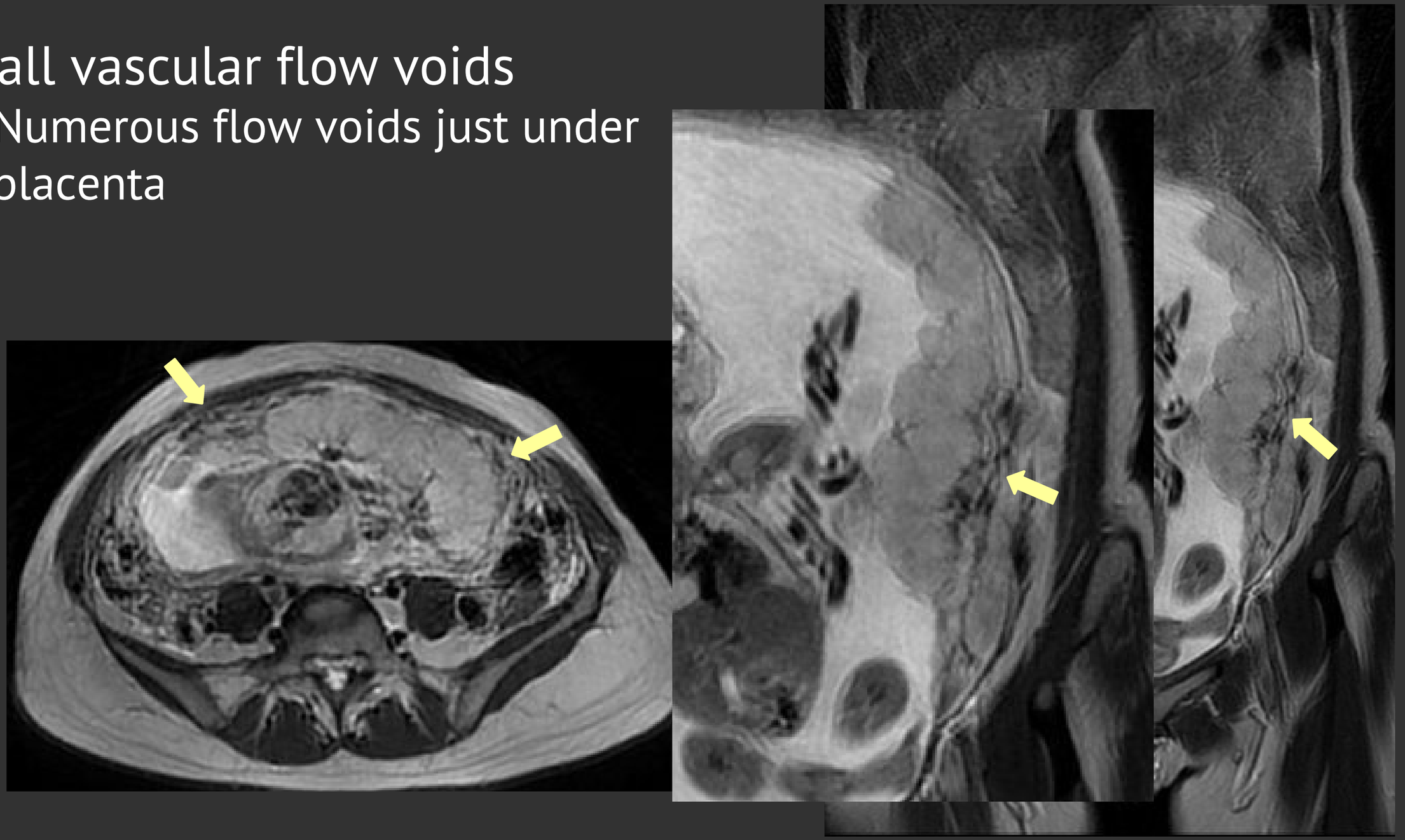


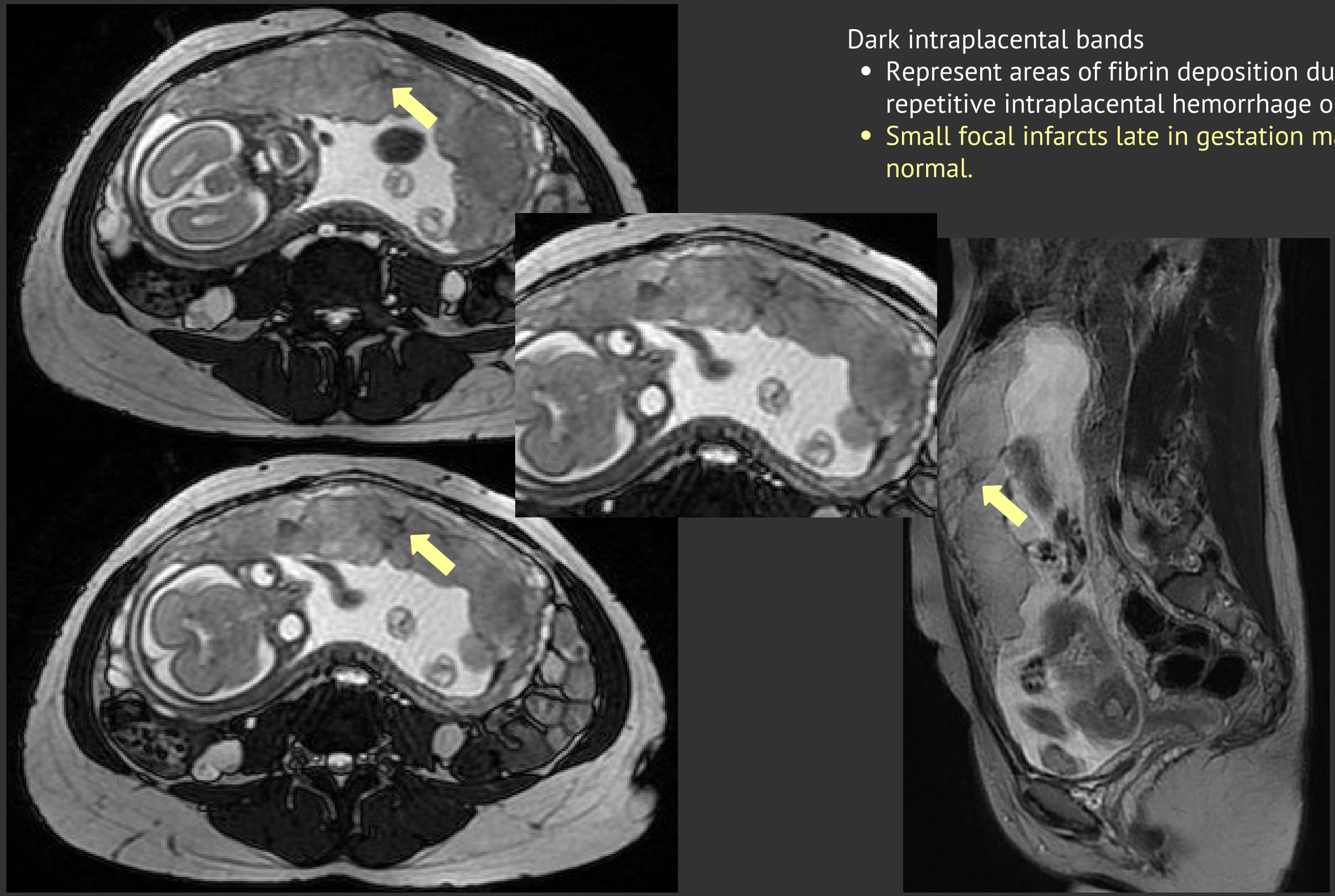


- Discoid shape, smooth tapered margins
- High T2 SI
- Thin T2-hypointense septa

Small vascular flow voids

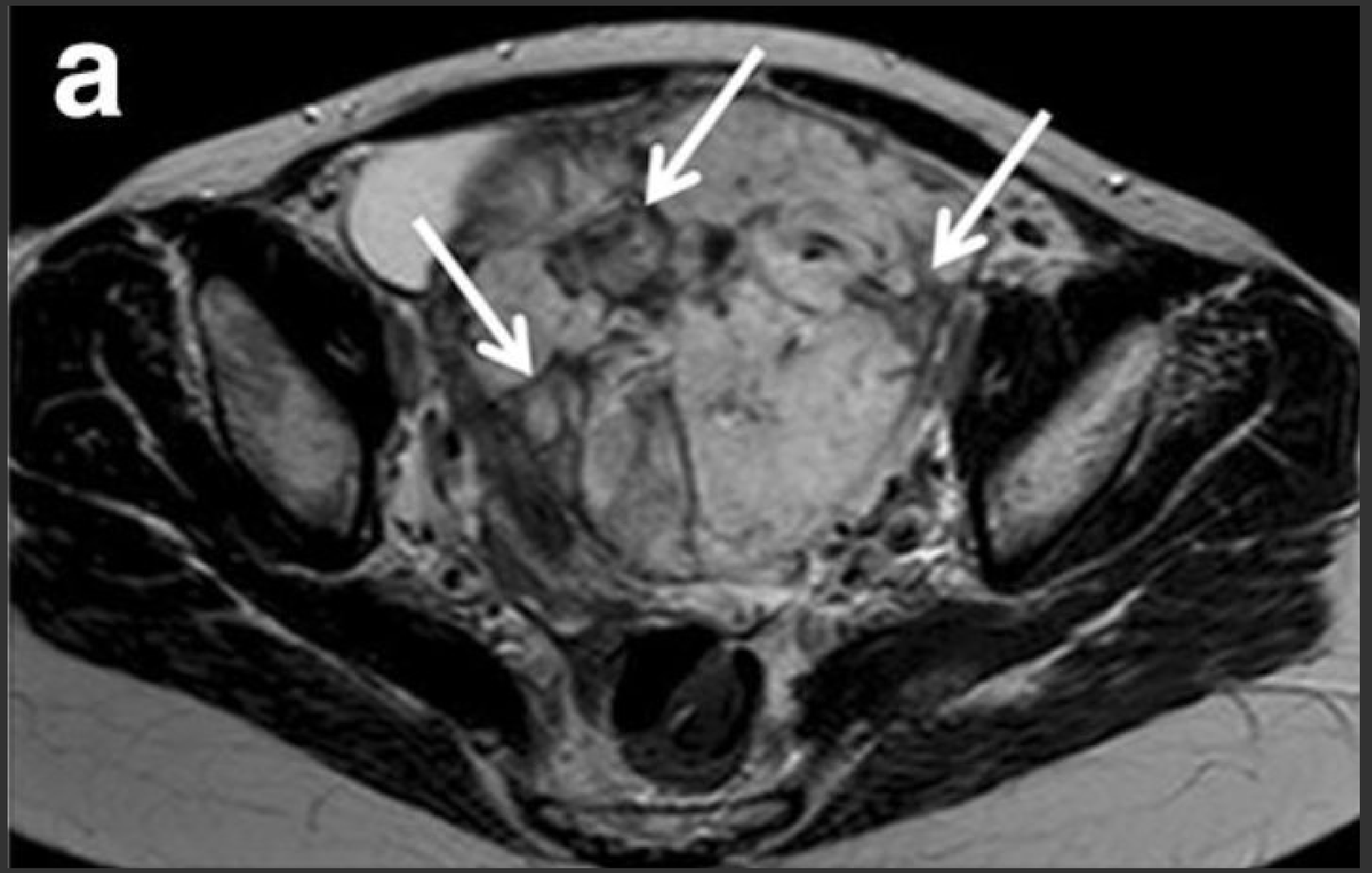
- Numerous flow voids just under placenta





Dark intraplacental bands

- Represent areas of fibrin deposition due to repetitive intraplacental hemorrhage or infarcts
- Small focal infarcts late in gestation may be normal.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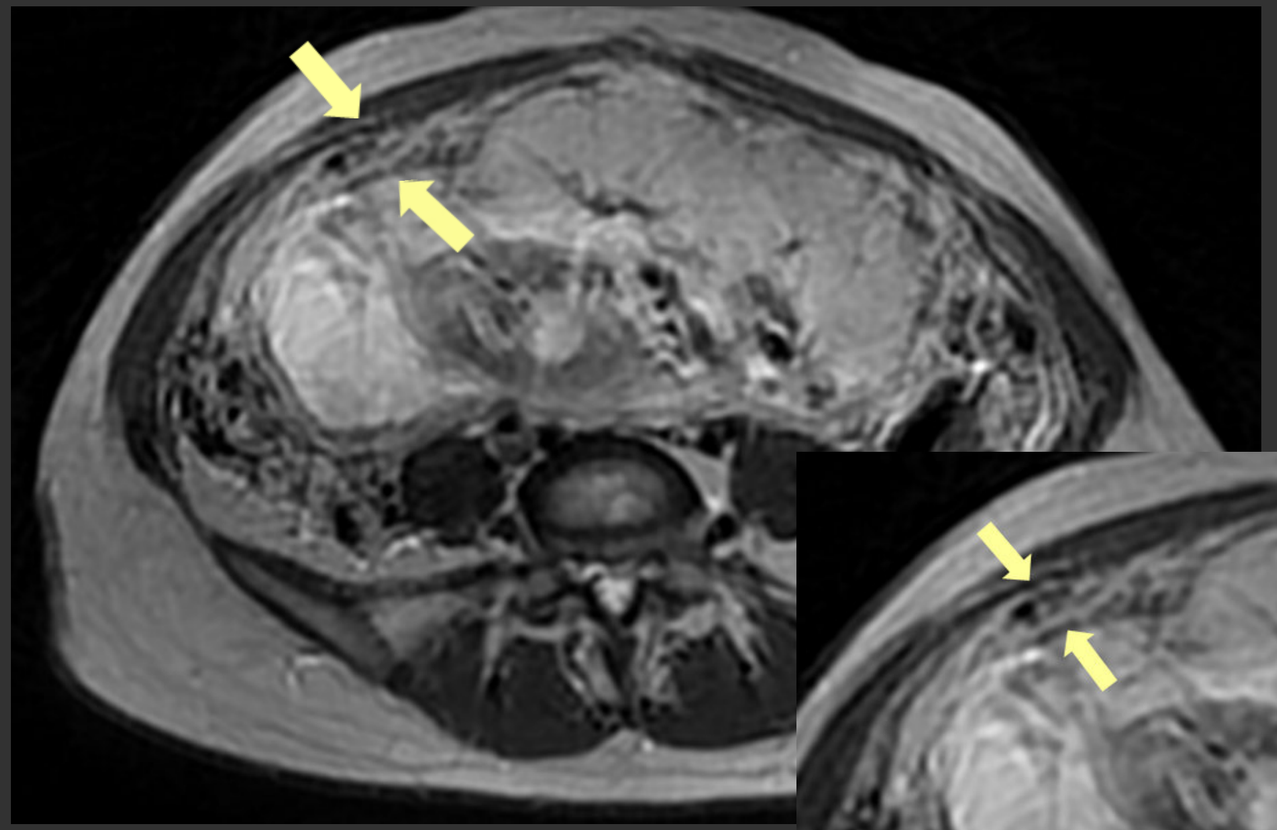
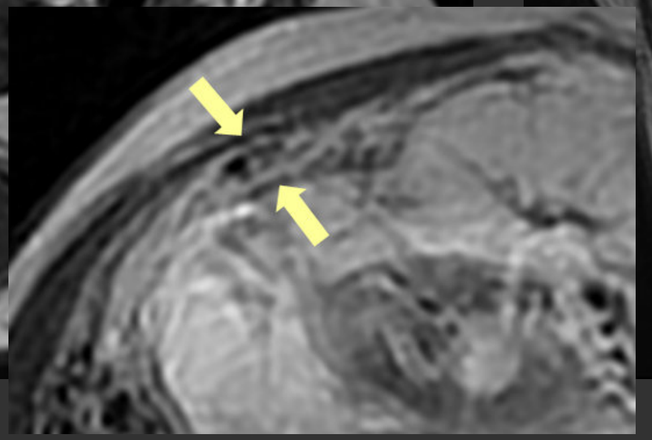
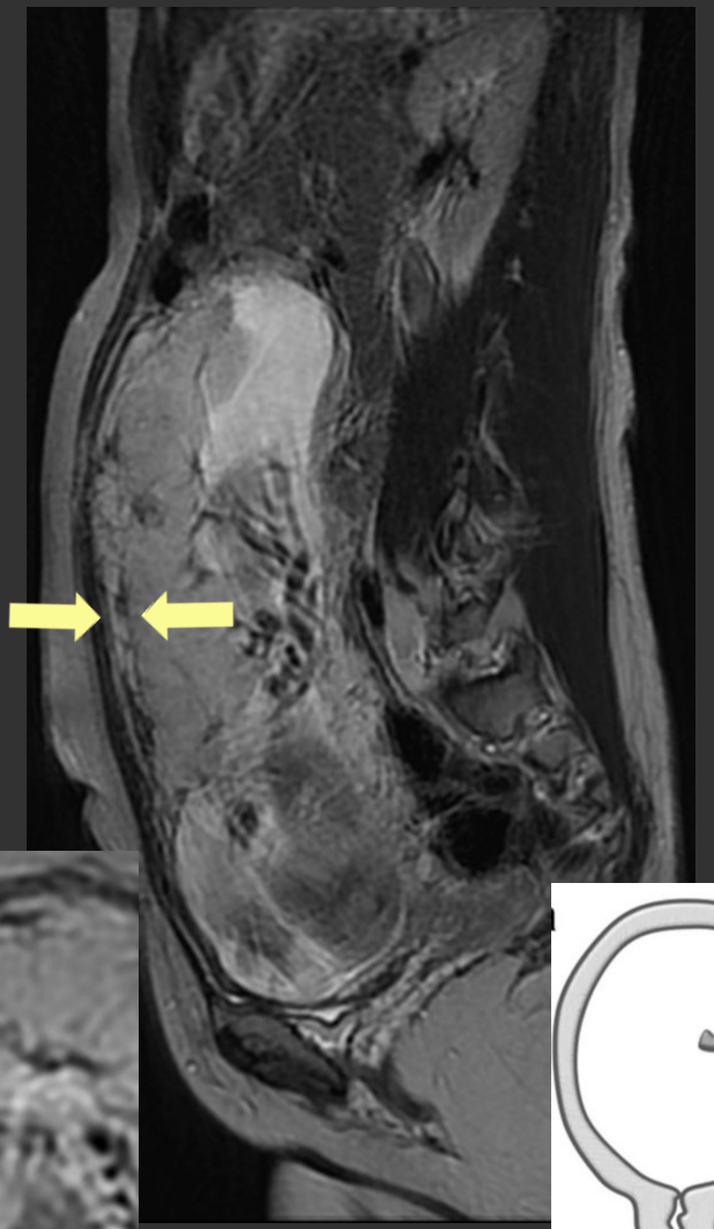
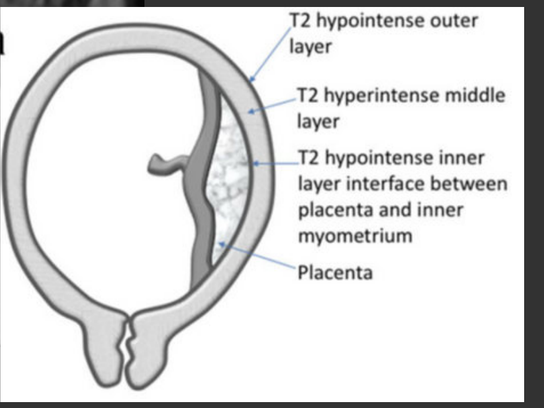
Triple-layered sandwich appearance of normal myometrium

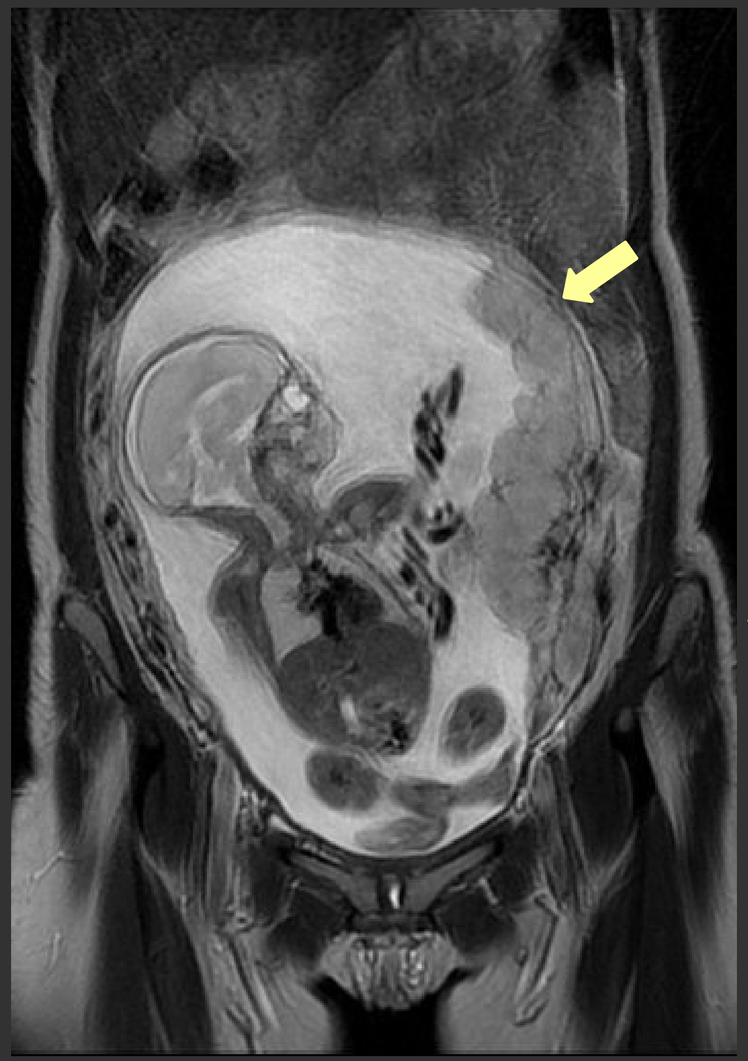


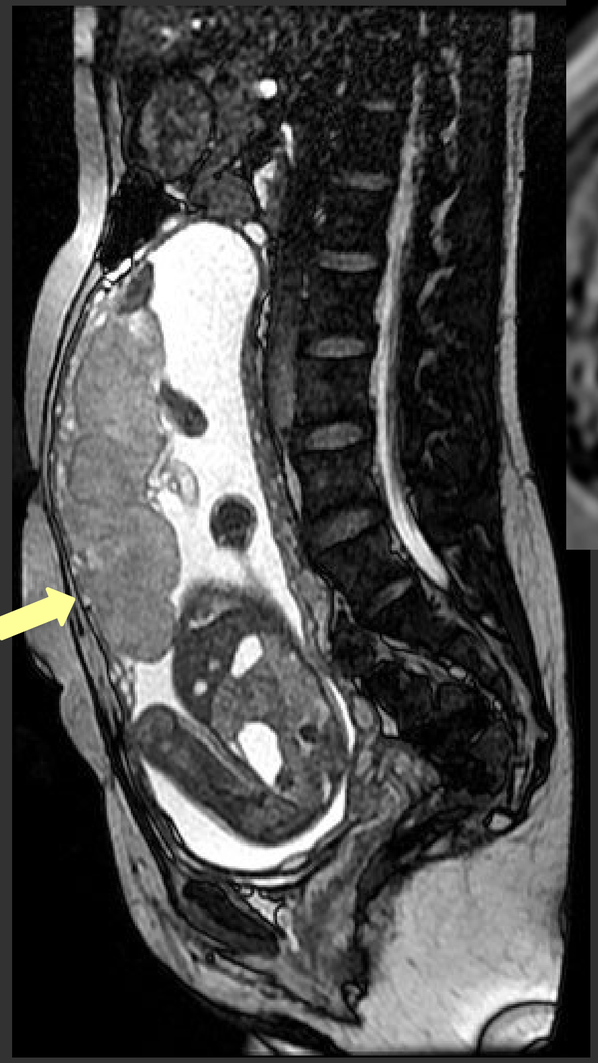


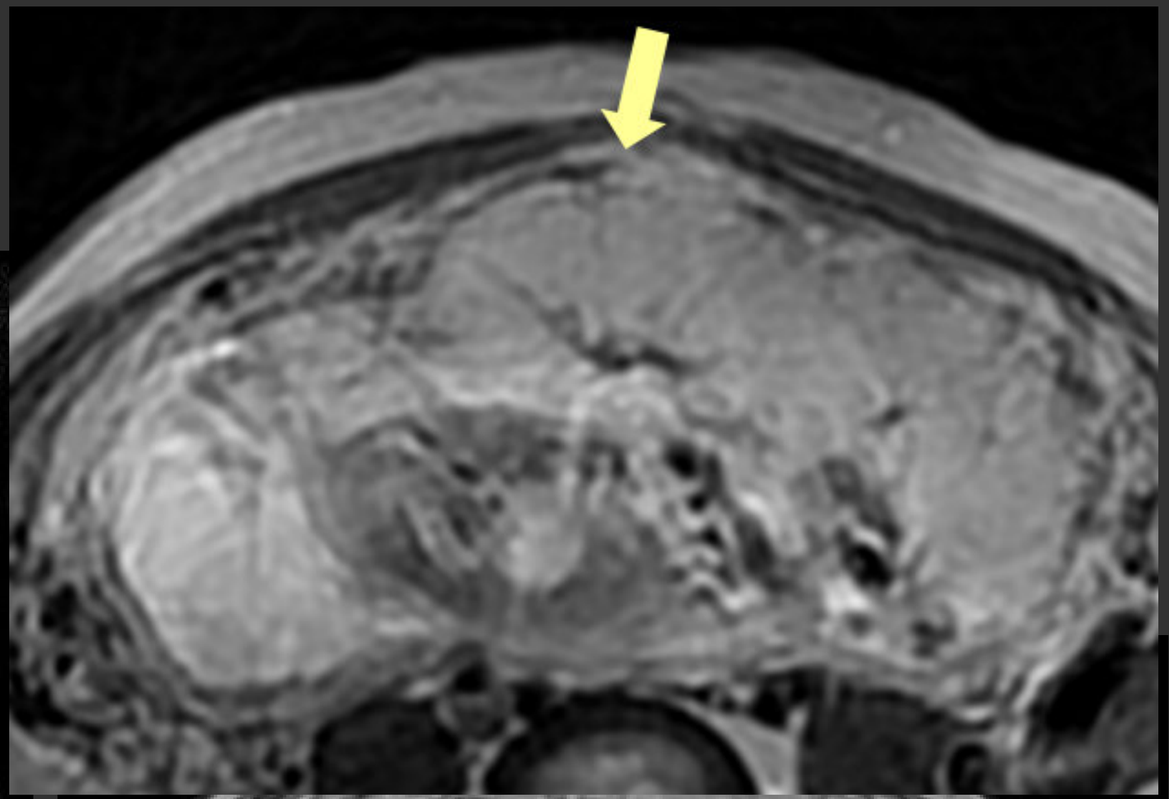


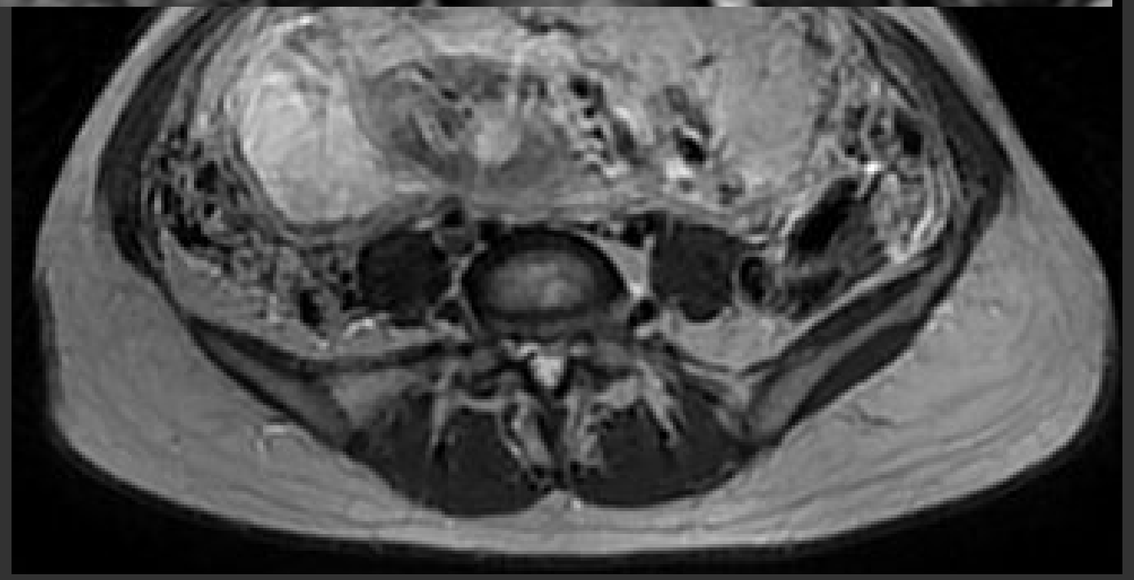


Myometrial thinning

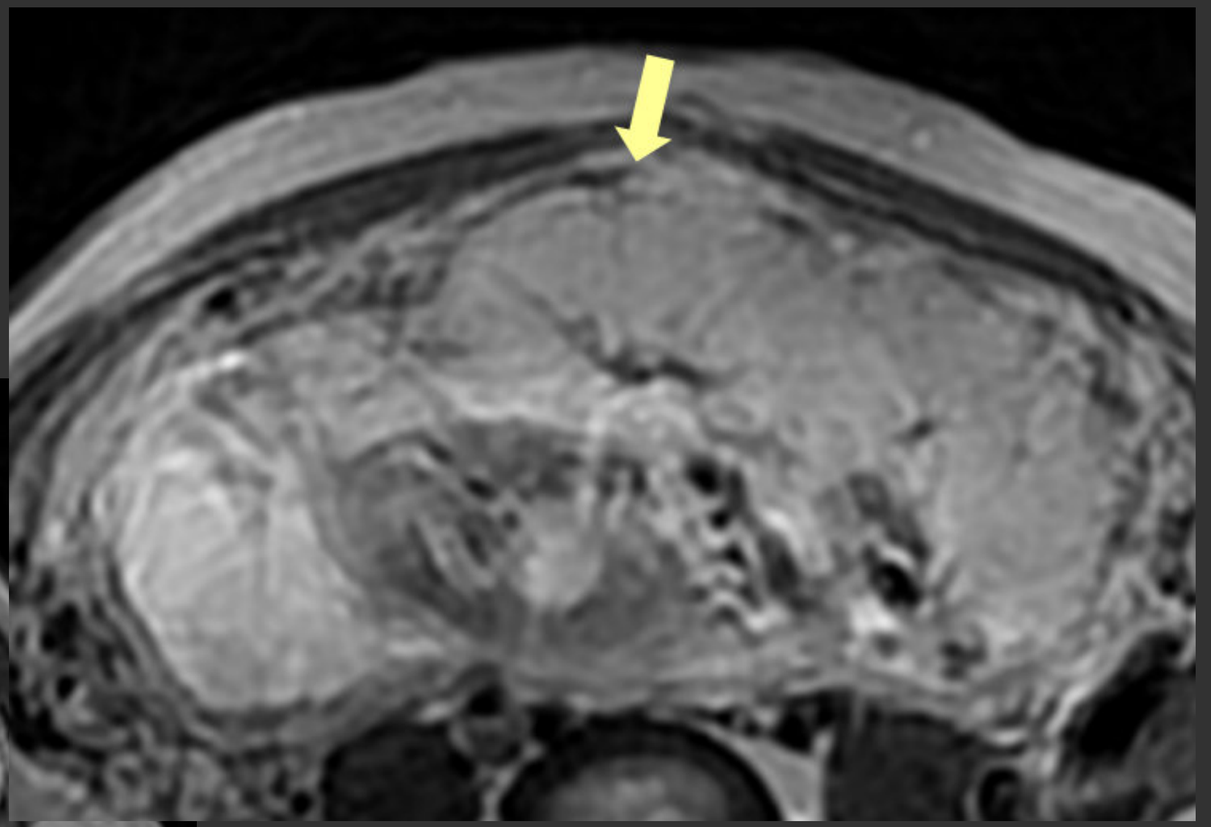


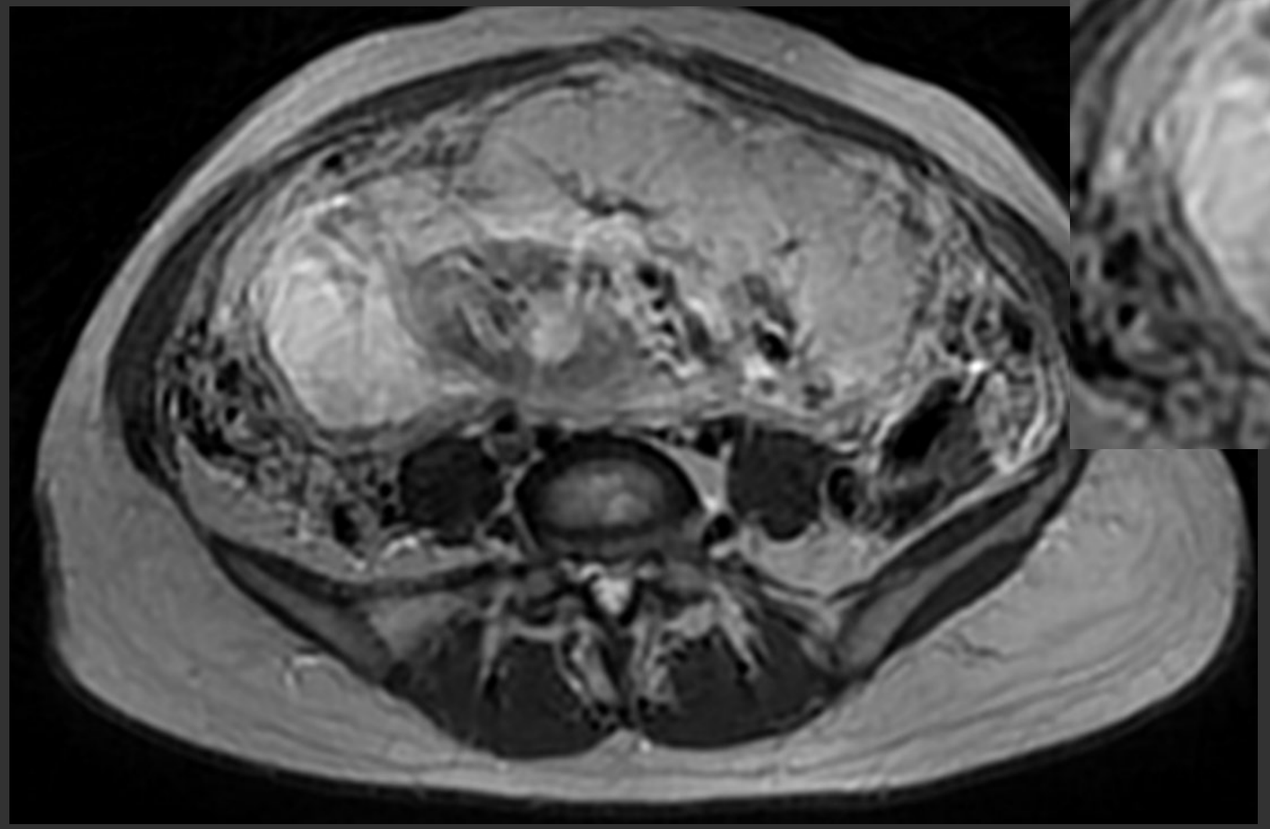






+/- Uterine bulging





No other signs of PAS disorders

- Focal exophytic mass
- Abnormal vascularization of placental bed
- Bladder wall interruption

Table 1 Results of imaging experts survey and literature review summary

Magnetic resonance imaging finding	Definition	Accuracy based on expert opinion
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Abnormal vascularization of the placental bed	Prominent vessels in the placental bed with disruption of the uteroplacental interface. They may extend to the underlying myometrium to a variable degree, reaching up to the uterine serosa; and may be accompanied by extensive neovascularization around the bladder, uterus, and vagina	100% (95% CI 96–100%)
Placental heterogeneity	Heterogeneous signal within the placenta, which can be seen on both T1- and T2-weighted sequences	70% (95% CI 58–81%)
Asymmetric thickening/shape of the placenta	Part of the placenta, the portion involved with PAS and usually the part overlying the internal os (in cases of placenta previa) are asymmetrically thickened, compared to the rest of the placental tissue	50% (95% CI 39–61%)
Placental ischemic infarction	In the acute phase, areas of T2W hyperintensity and T1W hypointensity are present. Areas of asymmetric placental thinning are noted with chronic infarction	60% (95% CI 49–70%)
Abnormal intraplacental vascularity	Abnormal vessels, tortuous enlarged flow voids on T2-weighted images deep within the placenta	70% (95% CI 65–79%)

Case 2

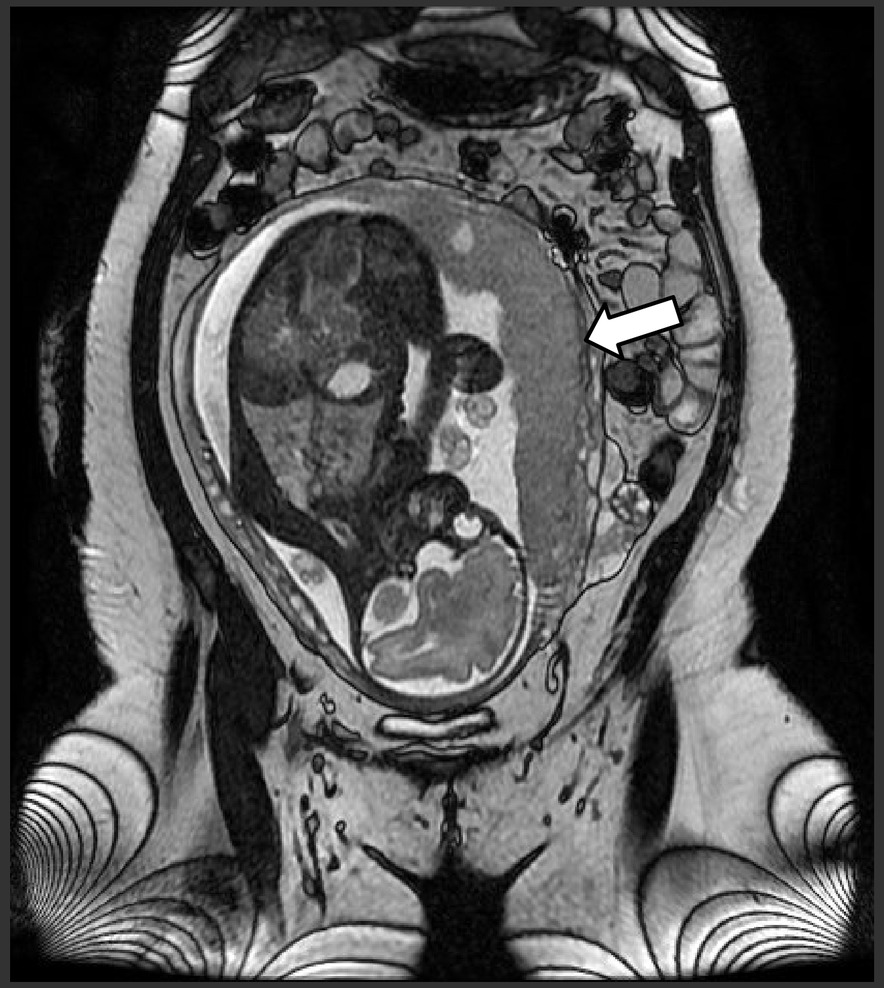
G4P2012 GA 31+ weeks with previous CS * 2, History of D&C *1

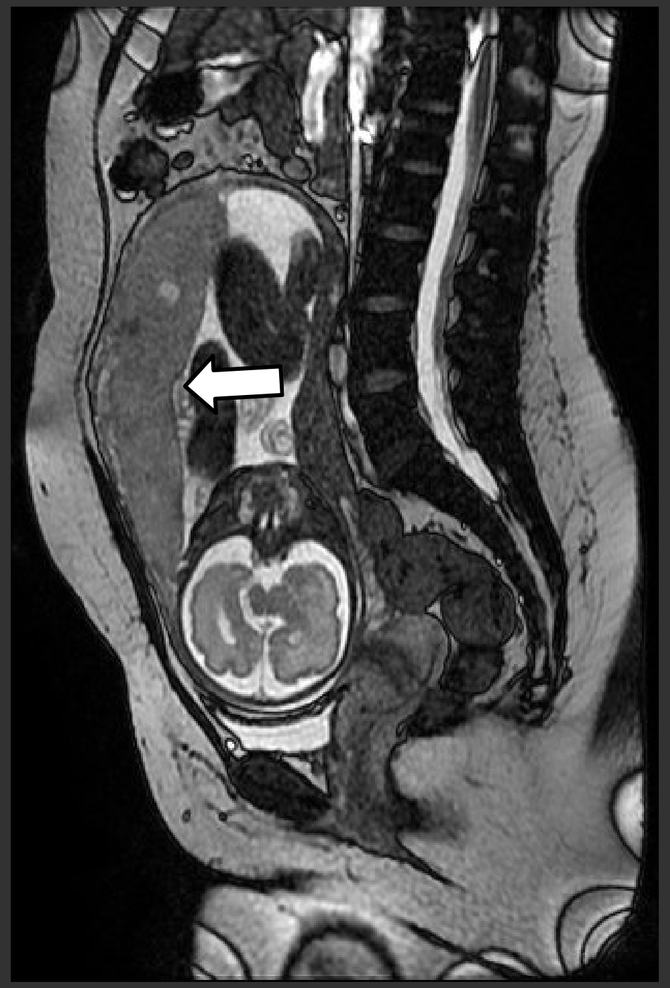
TAS: Placenta location anterior upper middle, grade 2, no placenta previa, no placenta bulging

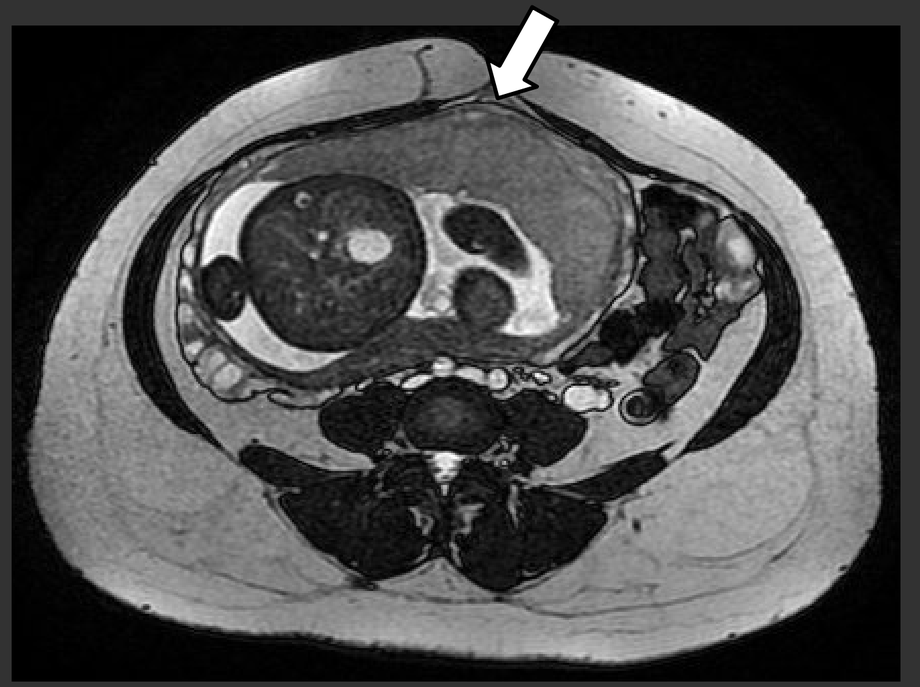
Case 2

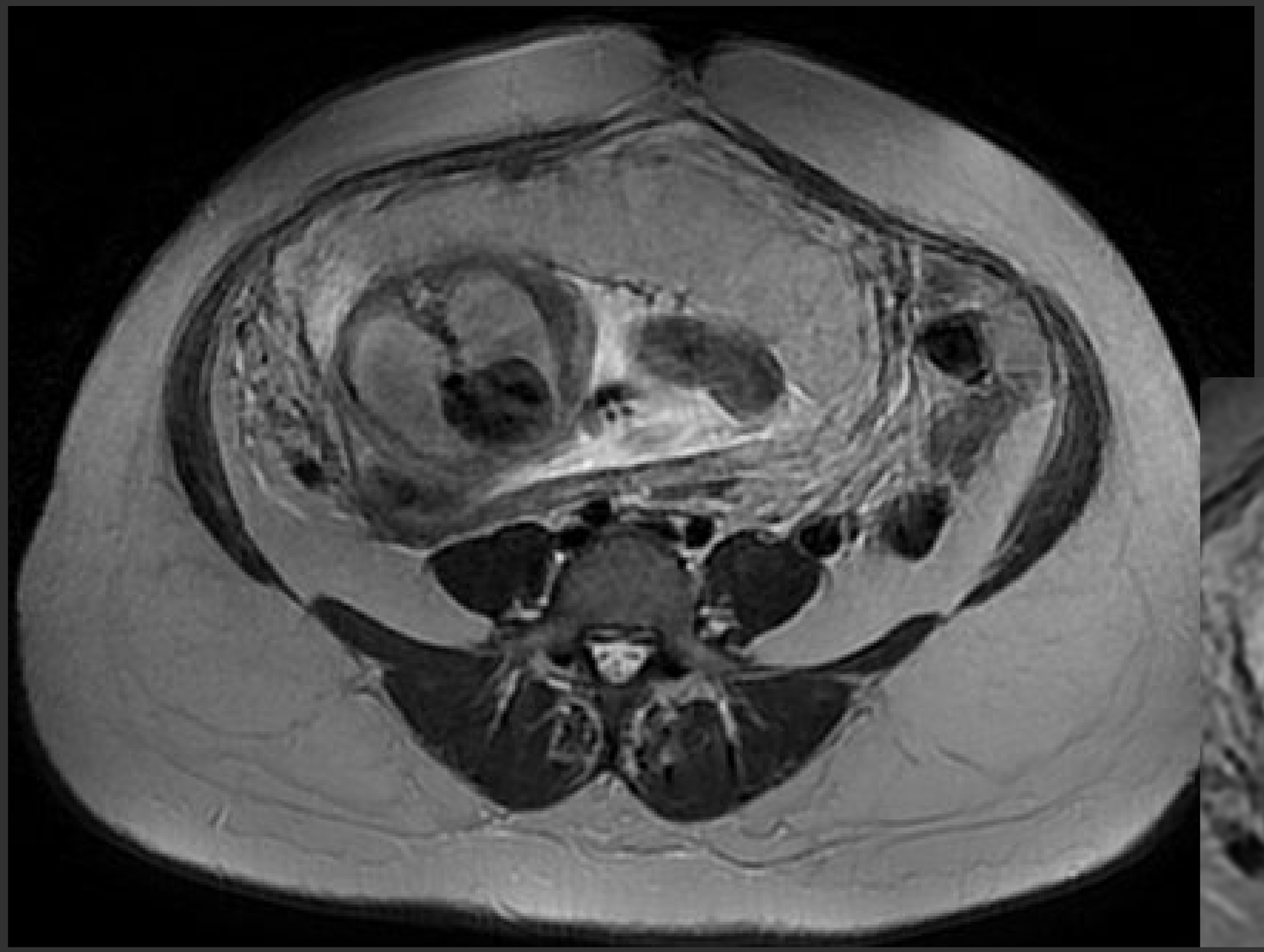
Motion artifact

Anterior placenta
No placenta previa









- Discoid shape, smooth tapered margins
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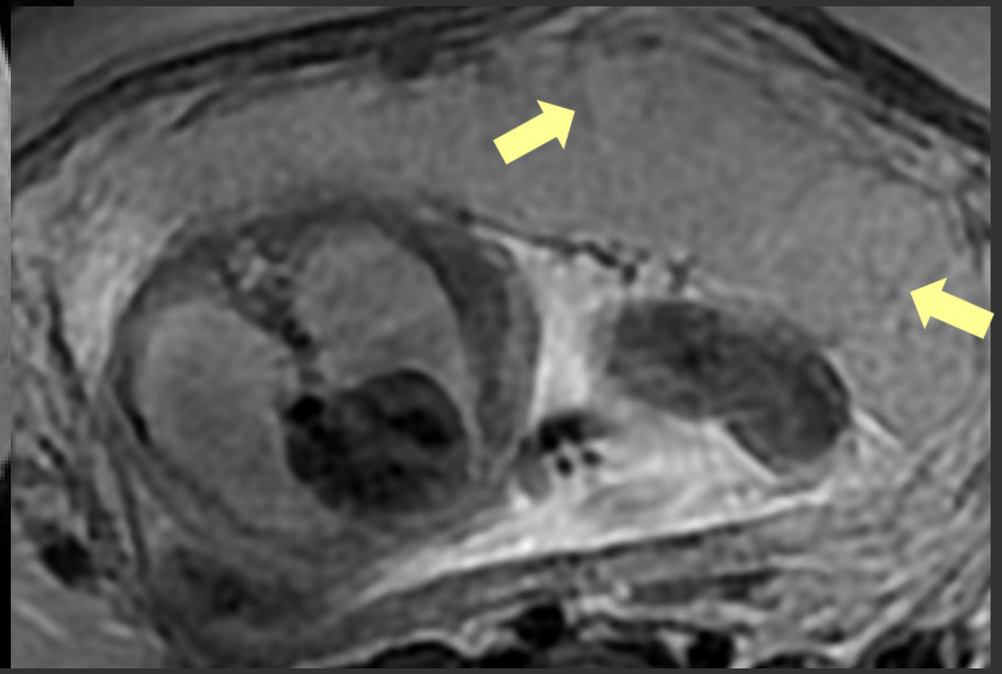

Small vascular flow voids

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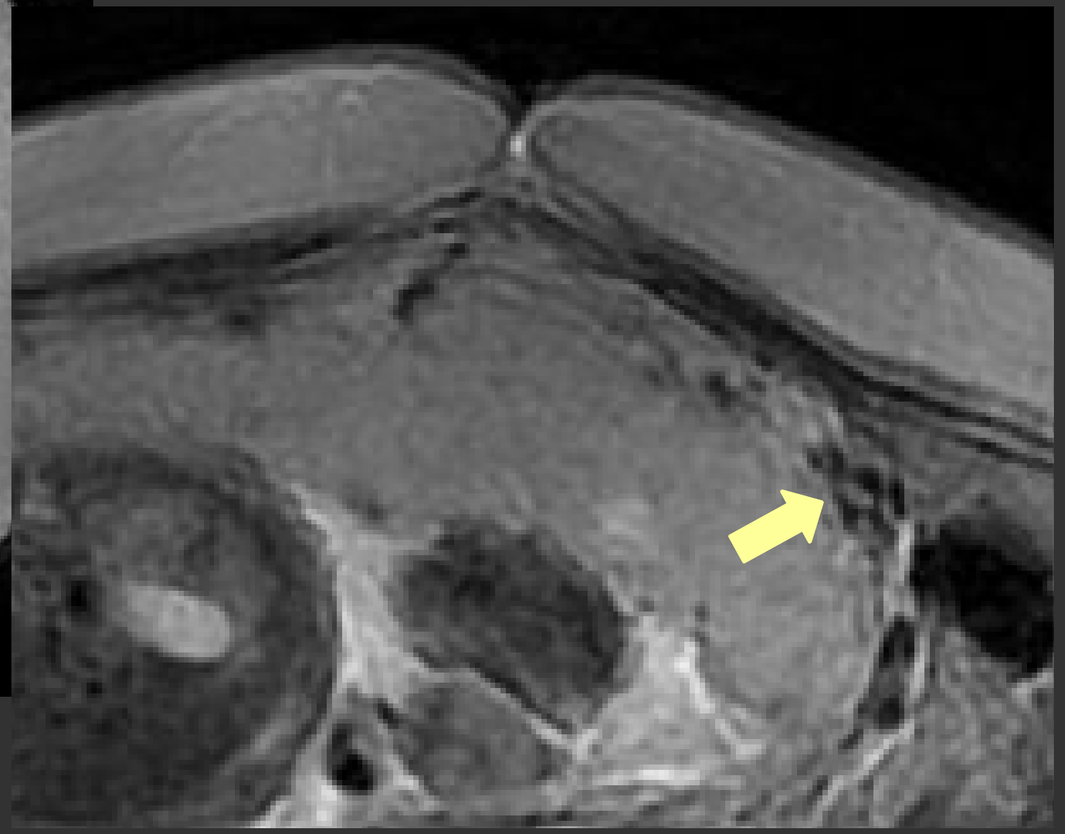

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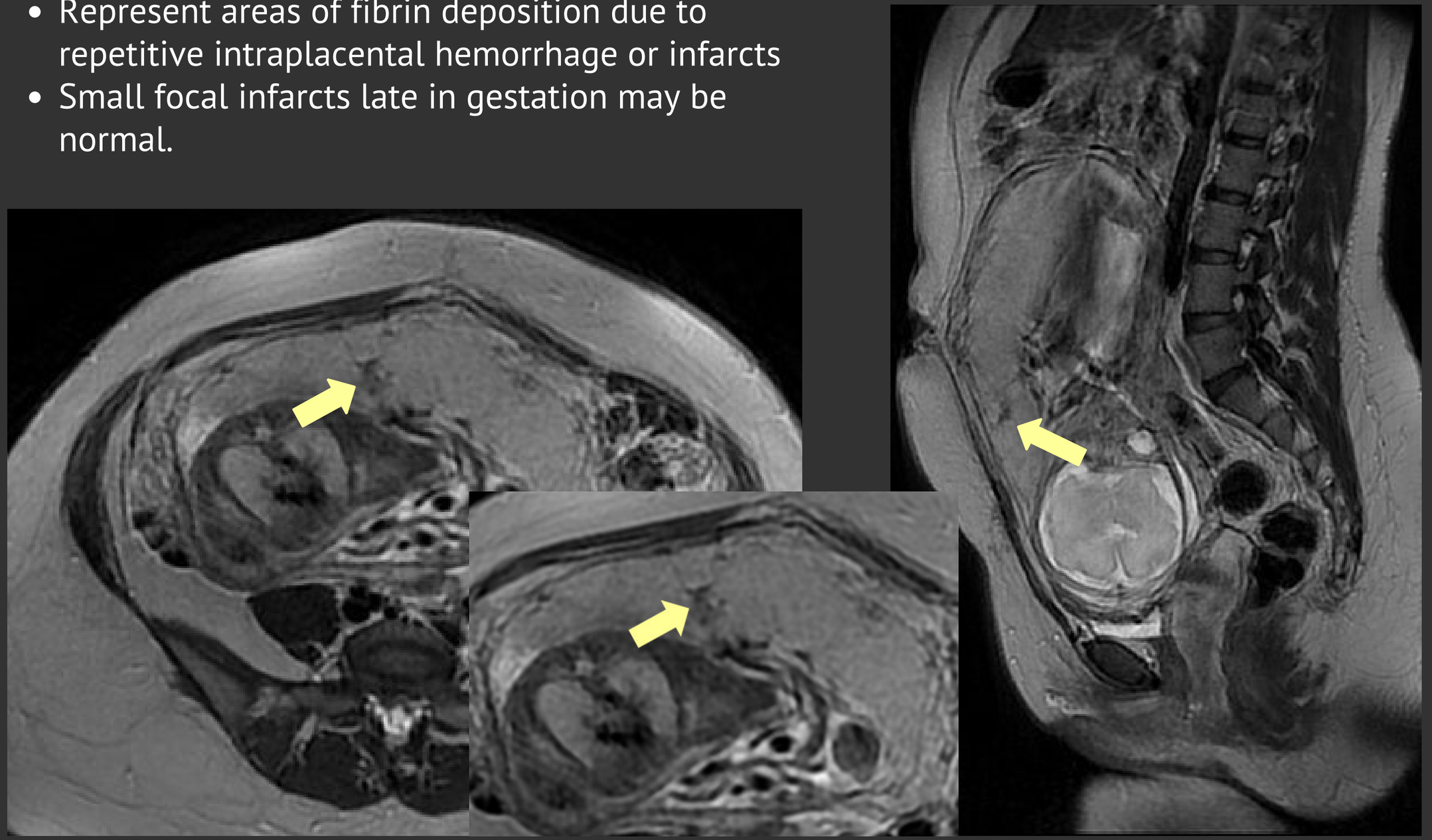
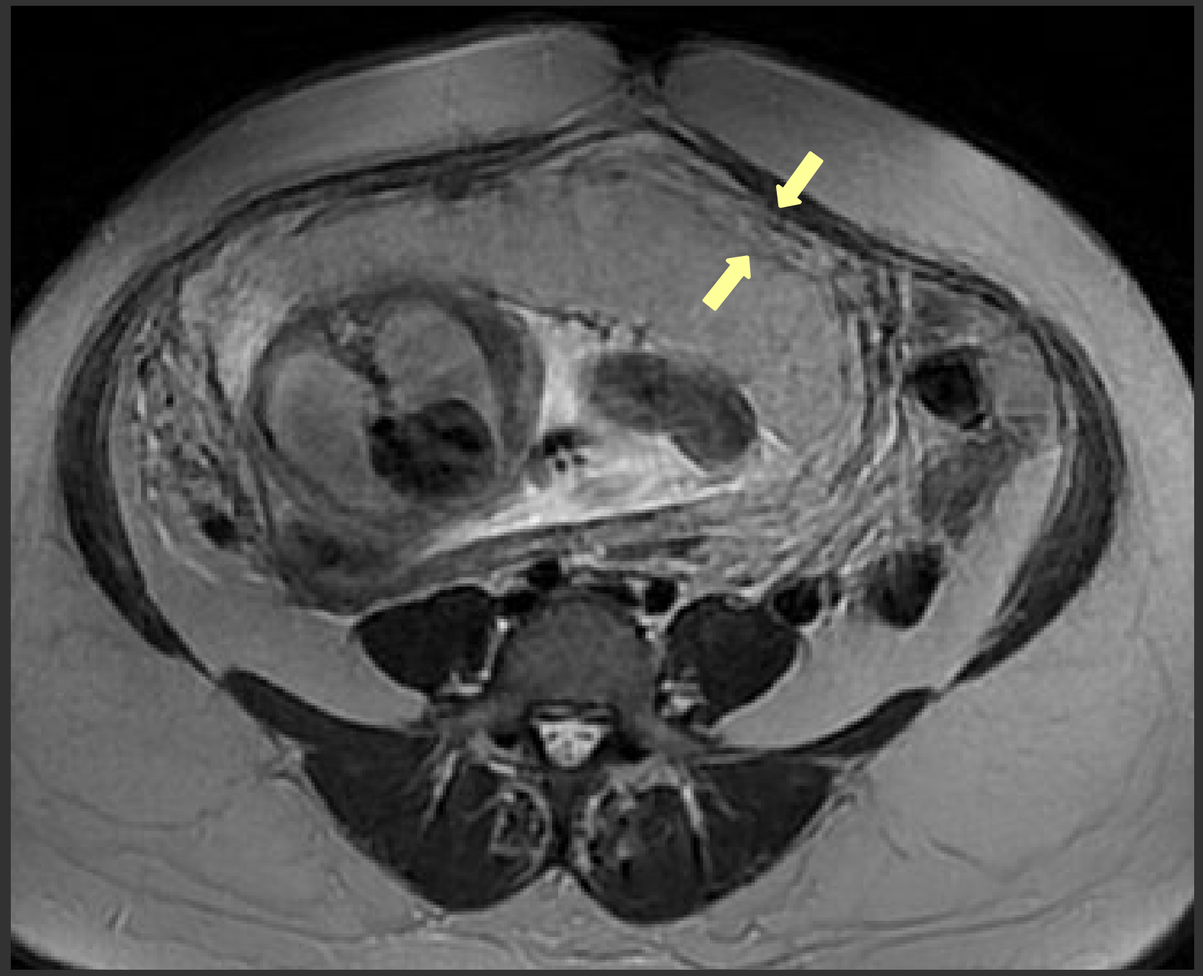
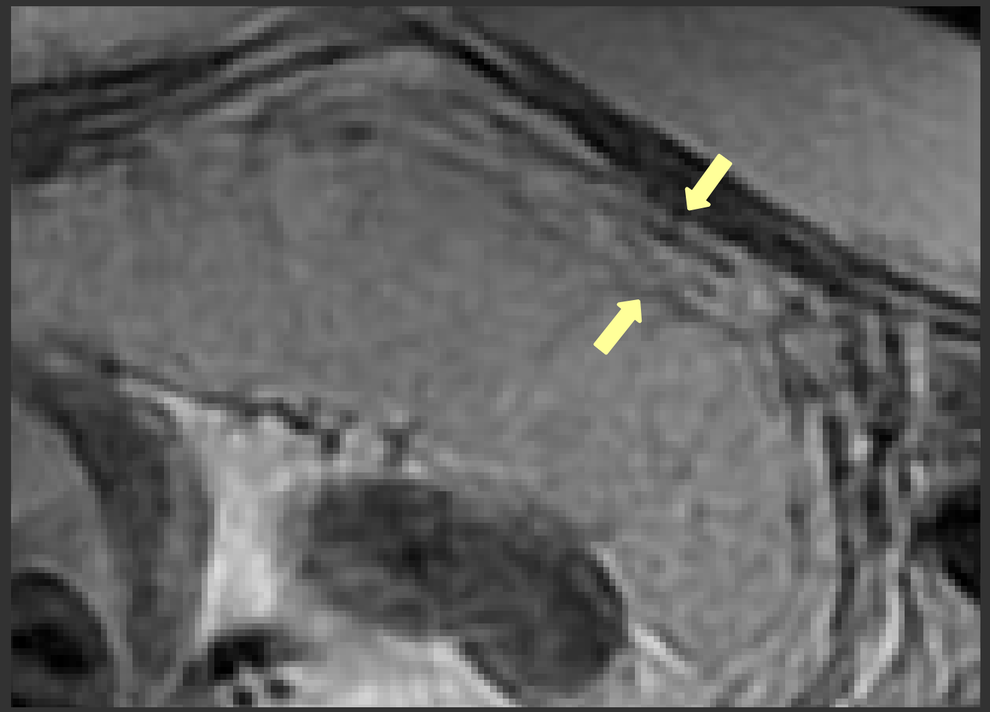
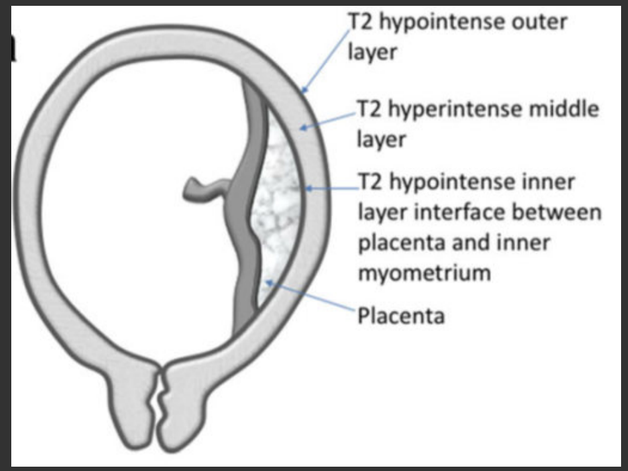


Triple-layered sandwich appearance of normal myometrium







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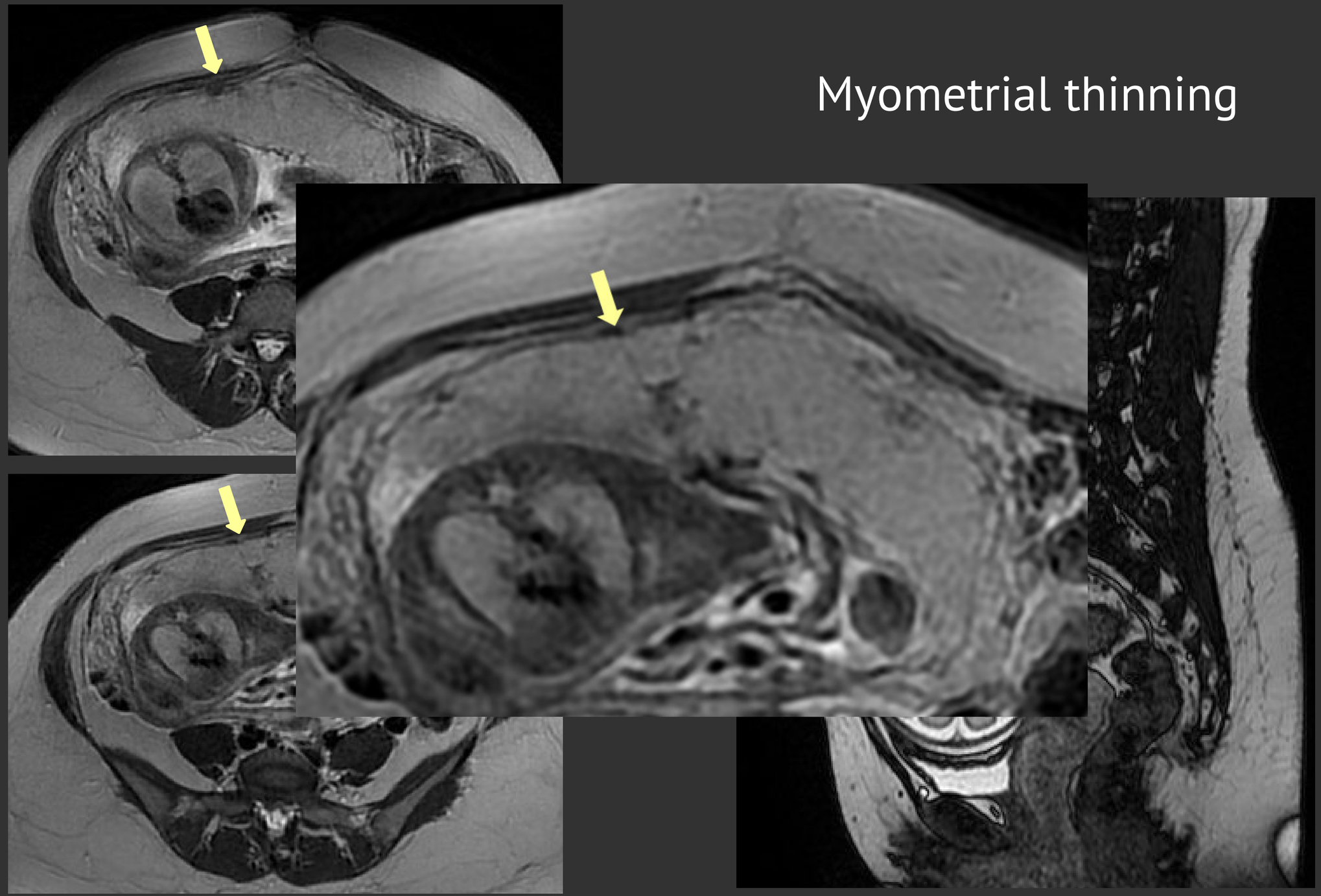

No other sign of PAS disorders

- Placental/uterine bulge
- Bladder wall interruption
- Focal exophytic mass
- Abnormal vascularization of placental bed

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Q6 ความจำเป็นในการส่ง MRI ในฐานะแพทย์รังสีวินิจฉัย

Role of MRI in Diagnosis of PAS Disorders

Chawiporn Muktabhant, MD
Department of Radiology, Faculty of Medicine, KKU

MRI OF PAS disorders

- Identification of the depth of invasion
- Excellent soft tissue resolution
- Multiplanar availability
- High image quality independent of the fetal and placental position

Diagnostic Accuracy of MRI

Systematic Review and Meta-analysis (AbdelAziz et al., 2023)

- 40 studies (3,664 women; 1,894 confirmed PAS)
- Sensitivity 0.867 (95% CI: 0.807–0.910)
- Specificity 0.860 (95% CI:0.799–0.905) >> False positive rate ~ 14%

Diagnostic Accuracy of MRI

- US and MRI have similar diagnostic accuracy for PAS disorders.
  - Hong et al., *Insights Imaging*, 2022
    - US: sens 90%, spec 83%
    - MRI: sens 89%, spec 87%

- MRI is reliable for diagnosing PAS, but less accurate in distinguishing accreta from increta. Percreta can be accurately identified by invasion into surrounding organs.
- MRI may be considered in cases with a posterior placenta and suspicion of percreta.

Jauniaux et al., 2018
Patel-Lippmann et al., 2023
Khalaf et al., 2019

FIGO consensus guidelines

TABLE 3 Recommendations for prenatal diagnosis and screening of placenta accreta spectrum (PAS) disorders.

Recommendations	Resource settings	Quality of evidence and strength of recommendation
Ultrasonography is a relatively inexpensive and widely available imaging modality and therefore	All	High and Strong
At the mid-trimester examination for fetal anomaly, all women should be asked if they have had a previous cesarean delivery. If so, this should prompt careful assessment of the placental implantation site especially if it is anterior, low lying, or previa	All	Medium and Strong
The ultrasound signs observed for the diagnosis of PAS disorders should be described using standardized protocols	All	Medium and Strong
The recorded presence or absence of each ultrasound sign will be influenced by the operator's interpretation of what constitutes that marker	All	High and Strong
MRI is not essential for making a prenatal diagnosis of suspected PAS disorders but may be useful in evaluating the pelvic extension of a placenta percreta or areas difficult to evaluate on ultrasound	High-income	Medium and Weak

MRI is not essential for making a prenatal diagnosis of suspected PAS disorders but may be useful in evaluating the pelvic extension of a placenta percreta or areas difficult to evaluate on ultrasound

Jauniaux et al., 2018

Role of MRI in Diagnosis of PAS Disorders

1. Adjunct to Ultrasound

- MRI is used when US findings are inconclusive, especially:
  - Posterior or lateral placenta
  - Maternal obesity, difficult acoustic window
  - Uterine scarring
  - Suspected deep invasion

2. Better Assessment of Placental Invasion Depth

- The location of the placenta relative to adjacent structures
- Depth and extent of placental invasion
- Extra-uterine invasion, especially bladder involvement

Role of MRI in Diagnosis of PAS Disorders

3. Surgical planning
    - Helps map the extent of invasion and vascular involvement
    - Helps anticipate complications and guide management

WHEN TO PERFORM MRI

The optimal time for MRI: GA 28–32 wks

< 28 wks: Placenta not fully mature ⟶ difficult to assess invasion

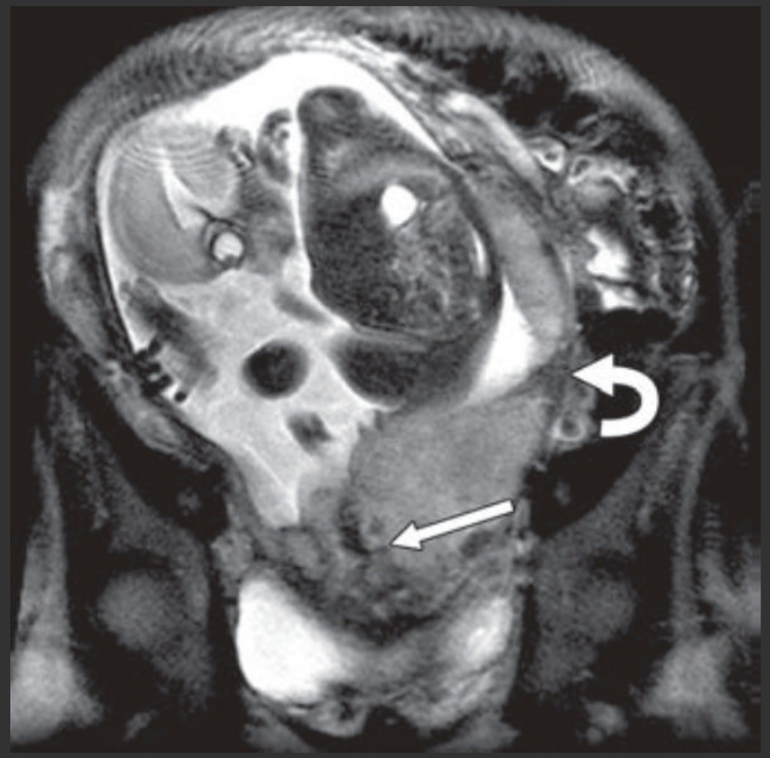
> 32 wks: Natural myometrial thinning, more heterogeneous ⟶ may mimic PAS (overlapping features of normal late gestation and PAS)

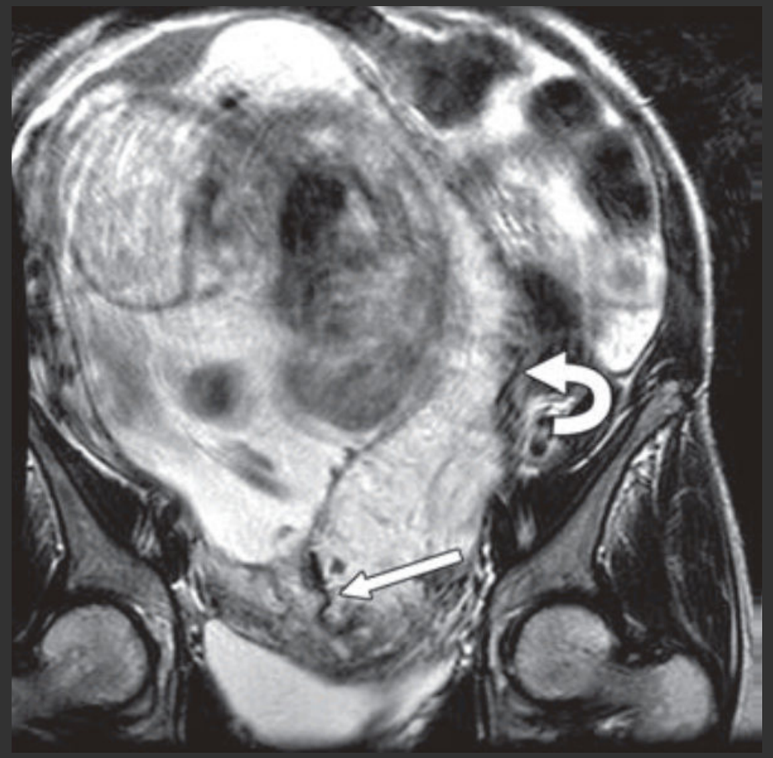
- Clinical Context Still Critical
  - MRI should be done when clinically indicated, regardless of gestational age

Patel-Lippmann et al., 2023

Common pitfalls in diagnosis of PAS

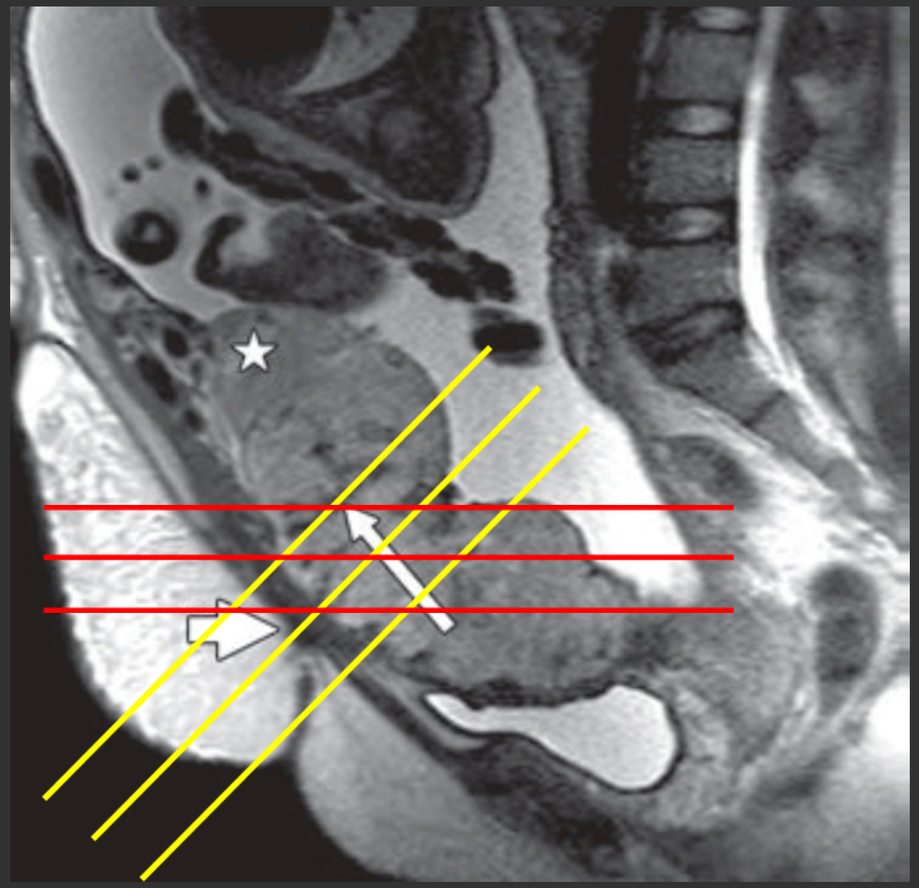
- Fetal or maternal motion artifact





Common pitfalls in diagnosis of PAS

- Imaging technique
  - Urinary bladder should be moderately distended.
  - Axial oblique T2W sequence should be prescribed perpendicular to the placenta–myometrium interface
  - Localization of abnormality in at least two orthogonal planes
  - Imaging in oblique planes >> pseudo impressions
  - Slice thickness ≤ 4 mm



Common pitfalls in diagnosis of PAS

Some normal pregnancy variations can mimic signs of PAS.

- Normal in late pregnancy
  - Dark intraplacental bands
  - Myometrial thinning
  - Placental heterogeneity
  - Abnormal intraplacental vascularity

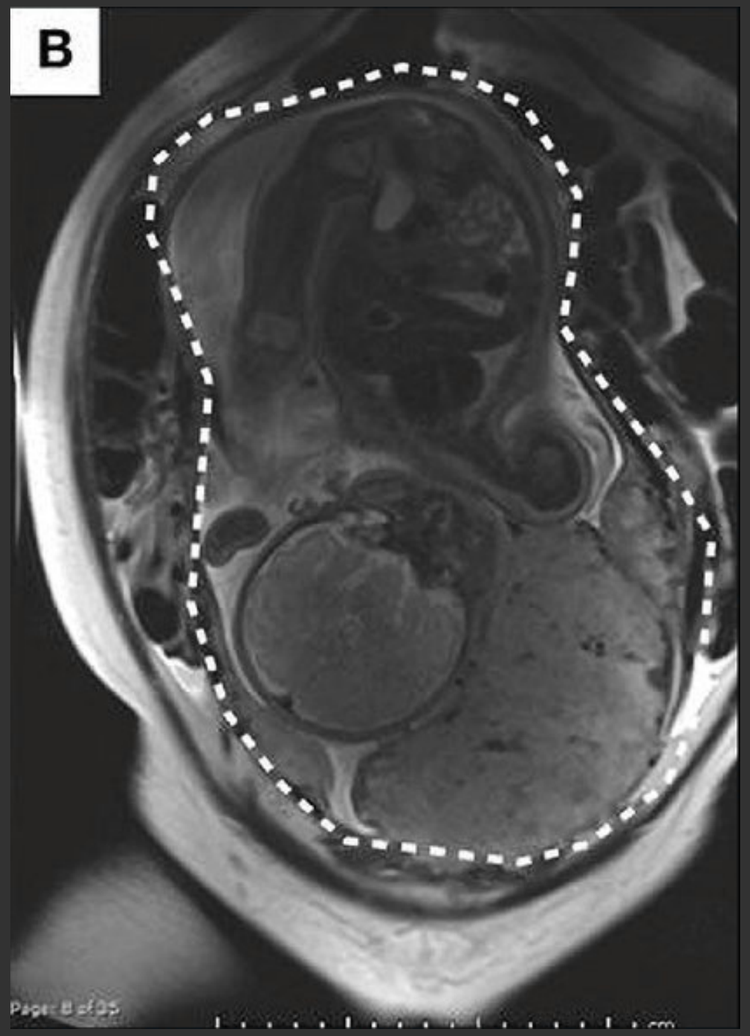
- Normal variations
  - Hourglass shape to uterus

Dark intraplacental bands

Myometrial thinning

Placental heterogeneity

Normal



Hourglass configuration

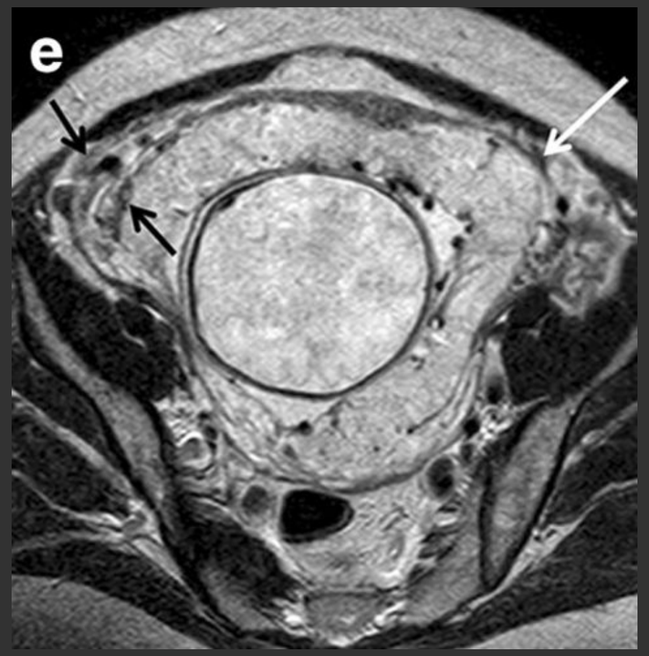
Table 1 Results of imaging experts survey and literature review summary

Magnetic resonance imaging finding	Definition	Accuracy based on expert opinion
T2-dark bands	One or more areas of hypointensity on T2-weighted images, which are usually linear in configuration and often contact the maternal surface of the placenta	90% (95% CI 65–93%)
Placental bulge	Deviation of the uterine serosa from the expected plane caused by abnormal bulge of placental tissue toward adjacent organs, typically toward the bladder and parametrium. The uterine serosa may be intact, but the outline shape is distorted	100% (95% CI 92–100%)
Loss of T2 hypointense interface	Loss of a thin dark line behind the placental bed, as seen on T2-weighted images	90% (95% CI 84–96%)
Myometrial thinning	Thinning of the myometrium over the placenta to less than 1 mm or even invisible	90% (95% CI 87–95%)
Bladder wall interruption	Irregularity or disruption of the normal hypointense bladder wall, which can be accompanied by blood products in the bladder lumen	100% (95% CI 97–100%)
Focal exophytic mass	Placental tissue seen protruding through the uterine wall and extending beyond it Most commonly seen inside at least partially filled urinary bladder and laterally into the parametrium	95% (95% CI 95–100%)
Abnormal vascularization of the placental bed	Prominent vessels in the placental bed with disruption of the uteroplacental interface. They may extend to the underlying myometrium to a variable degree, reaching up to the uterine serosa; and may be accompanied by extensive neovascularization around the bladder, uterus, and vagina	100% (95% CI 96–100%)
Placental heterogeneity	Heterogeneous signal within the placenta, which can be seen on both T1- and T2-weighted sequences	70% (95% CI 58–81%)
Asymmetric thickening/shape of the placenta	Part of the placenta, the portion involved with PAS and usually the part overlying the internal os (in cases of placenta previa) are asymmetrically thickened, compared to the rest of the placental tissue	50% (95% CI 39–61%)
Placental ischemic infarction	In the acute phase, areas of T2W hyperintensity and T1W hypointensity are present. Areas of asymmetric placental thinning are noted with chronic infarction	60% (95% CI 49–70%)
Abnormal intraplacental vascularity	Abnormal vessels, tortuous enlarged flow voids on T2-weighted images deep within the placenta	70% (95% CI 65–79%)

Jha et al., 2020

Common pitfalls in diagnosis of PAS

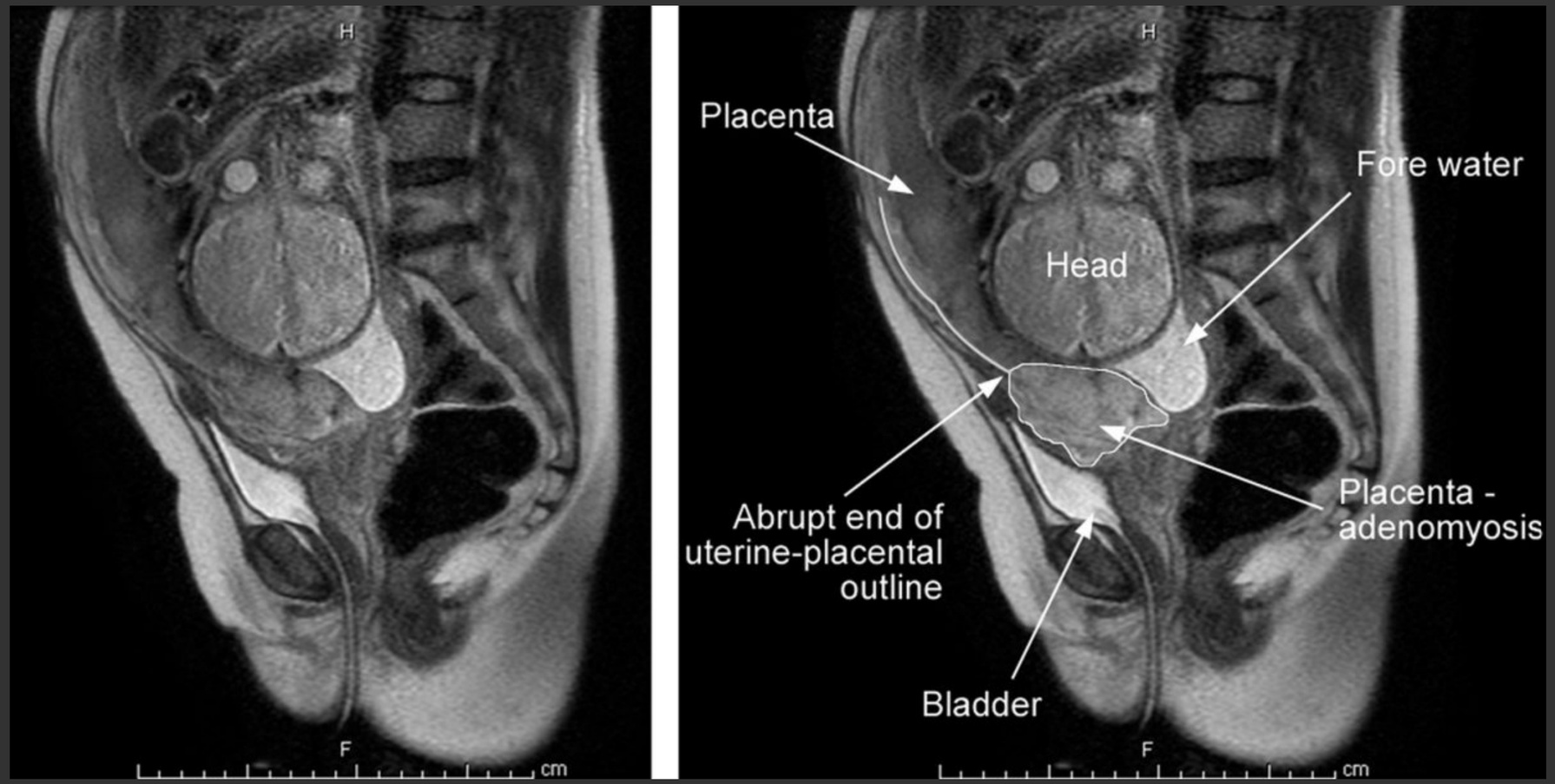
- Subjectivity of interpretation
  - Myometrial thinning
  - Placental heterogeneity



Common pitfalls in diagnosis of PAS

- Uterine abnormalities >> mimicking signs of invasion
  - Prior uterine surgery or C-section scar
    - Scars can distort the uterine contour or signal intensity
  - Adenomyosis, deep endometriosis
    - Thickening of the junction between the placenta and myometrium

Adenomyosis



Improving accuracy

- Appropriate MRI protocol
- Combining diagnostic signs
  - No single MRI feature is diagnostic of PAS.
  - Multiple imaging features + clinical risk factors
- Using structured MRI reports

Structured MRI reports

Table 5 Structured reporting for placenta accreta spectrum disorder

Clinical: key clinical information prior to MRI
– Patient age
– Gestational age
– Number of previous Cesarean sections
– Relevant ultrasound findings, if available
MRI
Presence of placenta previa
Location of the placenta
MRI: detect placental invasion It is recommended to include the presence or absence of the following imaging findings in the imaging report:
1. T2-dark intraplacental bands
2. Placental/uterine bulge
3. Loss of retroplacental T2-hypointense line
4. Myometrial thinning
5. Bladder wall interruption
6. Focal exophytic mass
7. Abnormal vascularization of placental bed
8. Placental heterogeneity
9. Asymmetric shape/thickening of the placenta
10. Placental ischemic infarction
11. Abnormal intraplacental vascularity
MRI: suspected depth of placental invasion
Accreta or increta
Placenta percreta
MRI: topography of the placenta invasion To determine the topography of the placenta invasion, a line is drawn perpendicularly to the middle of the posterior bladder wall, determining an upper area named S1, which mainly corresponds to the uterine body, and an area below this line, named S2, which involves the lower segment, cervix, and upper vagina
MRI evidence of extrauterine extension
Bladder invasion: location and structures involved
Parametrial invasion: location and structures involved

MRI appearances of PAS disorders

The goals of imaging

- Identify findings supportive of PAS disorders
- Identify the presence or absence of myoinvasion
- Outline the topography of myoinvasion, if present (location of myoinvasion, extrauterine spread, and adjacent organ invasion)

Q7 ความจำเป็นในการส่ง MRI ในฐานะสูติแพทย์

No.	HN	ชื่อ	วินิจฉัยโรค	MRI placenta	Refer	Outcome
1	314549	มุกดา สานัน	No ANC, Previous C/S x 1 US MFM: obvious sign of placenta increta(at least)	ไม่ได้ส่ง	รพ.ศรีนครินทร์	Placenta percreta , EBL 3000 ml
2	1006043	อนงค์ลักษณ์ อ่อนประทุม	Previous C/S x 1 Placenta previa anterior totalis GA 18 wk: QT: MS-AFP 8.29 MoM Placenta previa anterior totalis with multiple lacunae Fetal renal pyelectasis GA 25 wk: ส่งขอ MRI placenta R/O PAS GA 26 wk: MRI: Suggestive PAS --> refer รพ.ศรีนครินทร์ (Dx percreta)	Suggestive PAS	รพ.ศรีนครินทร์	Placenta percreta with intraabdominal bleeding with cardiac arrest with DIC รพ.ร้อยเอ็ด Subtotal hysterectomy (14/7/67) EBL 6000 ml. Maternal death
3	893249	รสสุคนธ์ แก่นการ	Previous C/S x 1 Placenta low-lying (ANC คลินิก)	Suggestive placenta accreta	รพ.ศูนย์ขอนแก่น	
4	990773	แพรวพิสุทธิ์ นรสิงห์	Previous C/S x 2 Placenta anterior middle	Suspicious PAS	รพ.ศูนย์ขอนแก่น	
5	561455	เบญจวรรณ รูปคม	Abortion x 1 Placenta previa	Abnormal placetal adhesion is considered	รพ.ศรีนครินทร์	
6	713072	สุดารัตน์ ทองยวง	Previous C/S x 3 Placenta anterior middle	Suspected PAS	รพ.ศูนย์ขอนแก่น	LT C/S c TR 9/6/68 ไม่เป็น PAS, severe adhesion EBL 400 ml.
7	220027	กิตติธิมาพร นิยมพงษ์	Previous C/S x 1 Placenta anterior middle Multiple placental lacunae	Suspicious PAS	รพ.ศูนย์ขอนแก่น (ประเมินแล้วให้กลับมา C/S ที่ รพ.ร้อยเอ็ดได้)	KKH ส่งกลับมาให้คลอดที่ร้อยเอ็ด Set C/S 2 ก.ย.68
8	847162	รุ่งฤดี ที่ยงธรรม	Previous C/S x 1 Placenta previa anterior totalis R/O focal adherence	ไม่ได้ส่ง (อายุครรภ์เยอะ GA 36+)	รพ.ศรีนครินทร์ (ประเมินแล้วให้กลับมา C/S ที่ รพ.ร้อยเอ็ดได้)	LT C/S c TR 10/3/67 (GA 37+ wk) รพ.ร้อยเอ็ด EBL 400 ml.
9	273904	ปิยนุช ภูมิทอง	Previous C/S x 1 Placenta posterior previa	Grade IV complete placenta previa with suggestive placenta accreta (FIGO grade 2)	consult PAS-NE ทางไลน์ อาจารย์ รพ.ศรีนครินทร์ช่วยดูคลิปวิดีโอ placenta แจ้งว่าไม่เหมือน PAS เนื่องจากเห็น myometrial lining ชัดเจน แต่บอก Focal adherence ยาก	LT C/S c TR 3/1/68 (GA 38+ wk) รพ.ร้อยเอ็ด

Q8 การเตรียมตัวผ่าตัด PAS

Q9 การรับมือการผ่าตัด undiagnosed PAS

Q10 แนวทางการดูแล PAS ในระดับจังหวัด

ความกังวลใจ	
ปัญหาการวินิจฉัย	
อายุครรภ์ในการส่งตัวมาวินิจฉัย	
การค้นหา PAS เชิงรุก	
ข้อผิดพลาการอ่านผล MRI	
ความจำเป็นการส่ง MRI	
การเตรียมตัวผ่าตัด PAS	
การรับมือผ่าตัด Undiagnosed PAS	
แนวทางการดูแล PAS ในระดับจังหวัด	

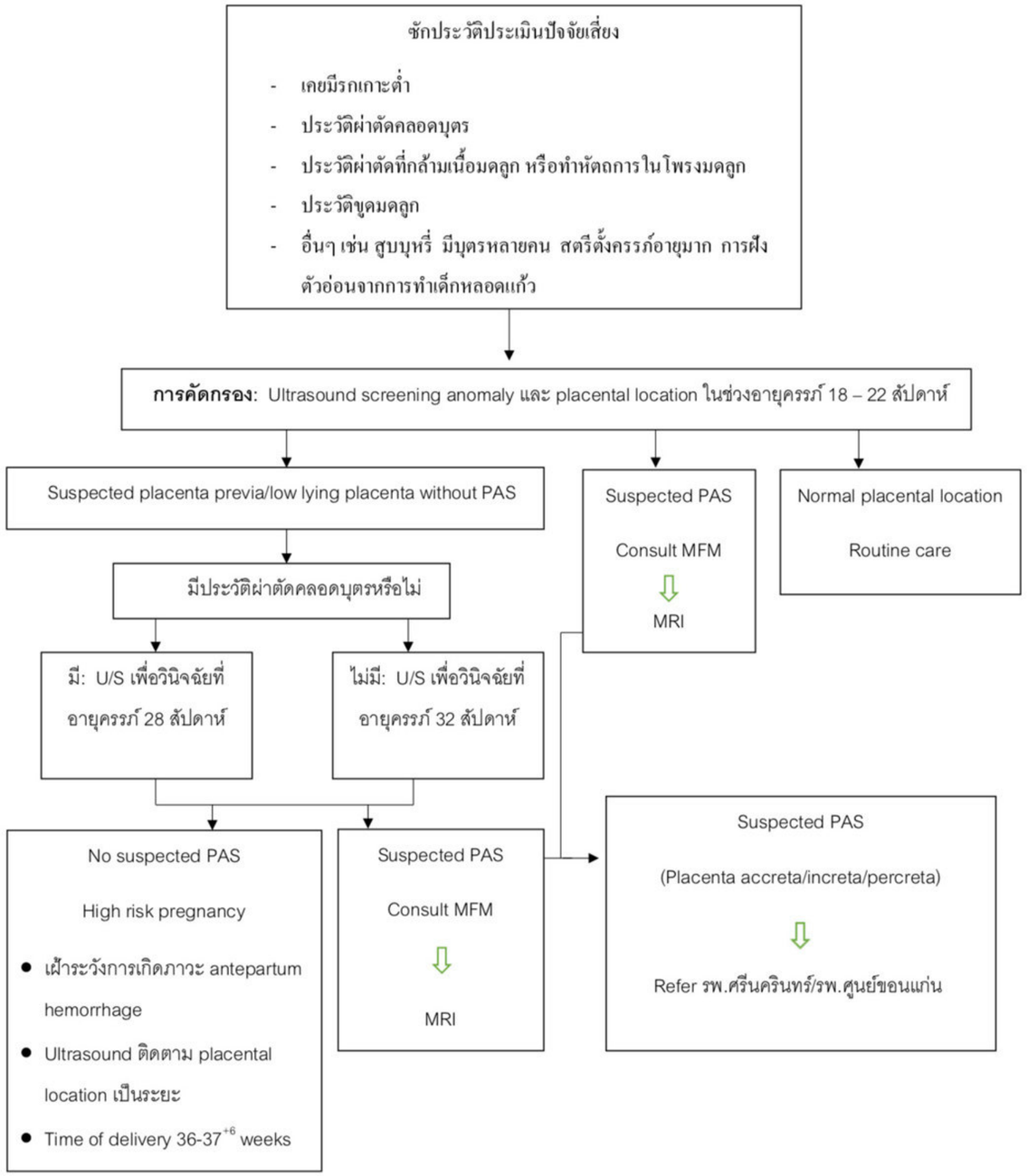
Placenta previa without PAS

ANC high risk pregnancy **รพ.มหาสารคาม**

การดูแลระยะก่อนคลอด

- เฝ้าระวังภาวะ antepartum hemorrhage
- Ultrasound ติดตาม placental location เป็นระยะๆ
- เฝ้าระวังภาวะเจ็บครรภ์คลอดก่อนกำหนด
- วางแผนการคลอด uncomplicated placenta previa โดย elective cesarean section เมื่ออายุครรภ์ 36-37^{+6} สัปดาห์ (Ref. ACOG 2021)
- เตรียมการจอง NICU
- เตรียมการจอง PICU
- เตรียม Blood component (G/M PRC, FFP)
- Counselling หญิงตั้งครรภ์และครอบครัว

แนวทางการวินิจฉัยและการรักษา Placenta previa/Placenta accreta spectrum (PAS)



Ref.: Williams 26th edition, RTCOG 2024, ACOG and SMFM 2021