

Perinatal Medicine 2019

9-11 May 2019, Hilton Hotel • İzmir, Turkey



Abnormal placentation



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Placenta

- Placenta is the connection between mother and fetus.
- Ensures implantation and development of the growing fetus
- Produces hormones(progesterone, estrogen, hCG, HPL, GnRH...)



The Trophotropic Theory

«According to the trophotropic theory, the placenta migrates to better vascularized areas. Normally, the placenta grows towards the fundus, which can provide more blood.

Defective vascularization of the endometrium due to **scarring** or atrophy caused by previous operations or **infections** may result in **reduced differential growth of the lower uterine segment and less of an upward shift in placental location»**

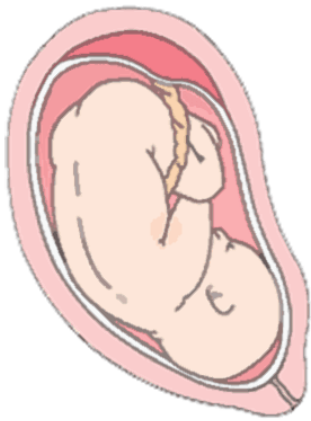
Dashe, J. S., McIntire, D. D., Ramus, R. M., Santos-Ramos, R., & Twickler, D. M. (2002). Persistence of placenta previa according to gestational age at ultrasound detection. *Obstetrics & Gynecology*, 99(5), 692-697.

Abnormal Placentation

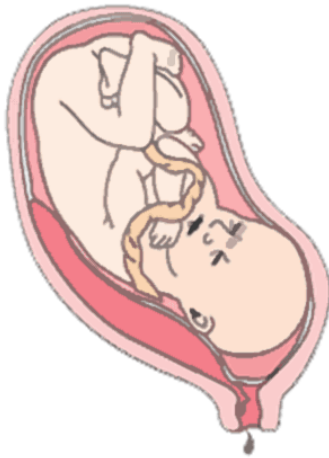
- **Position (placenta previa)**
- **Invasion (accreta spectrum disorders)**

Placenta previa

Types of Placenta Previa



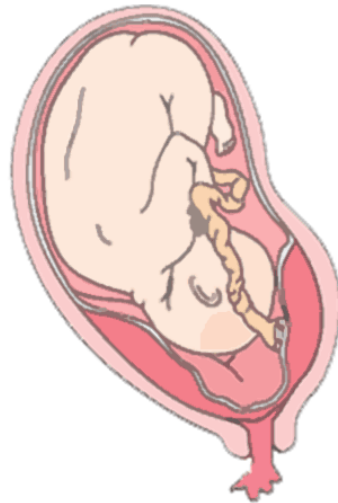
NORMAL
PLACENTA



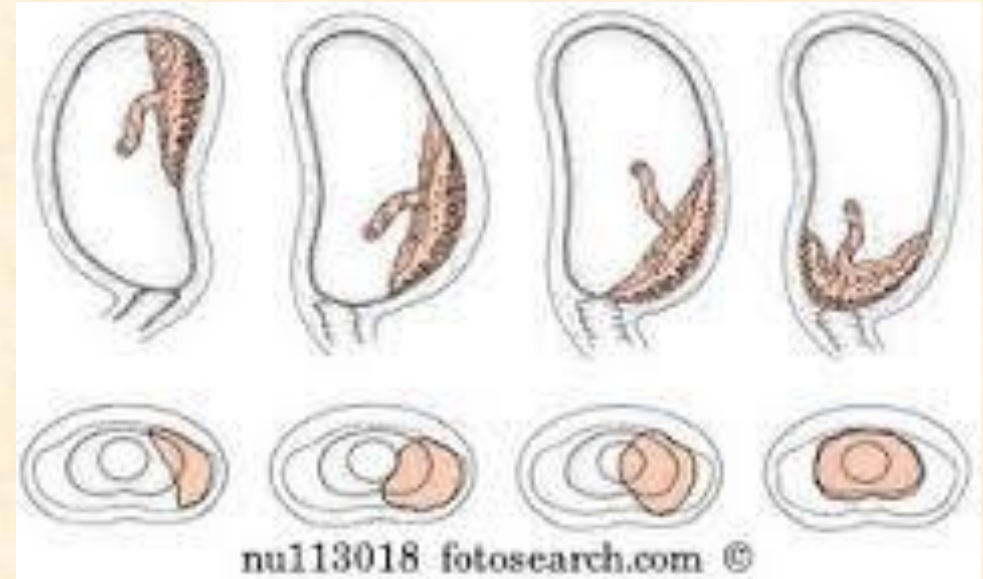
LOW
IMPLANTATION



PARTIAL
PLACENTA PREVIA



TOTAL
PLACENTA PREVIA

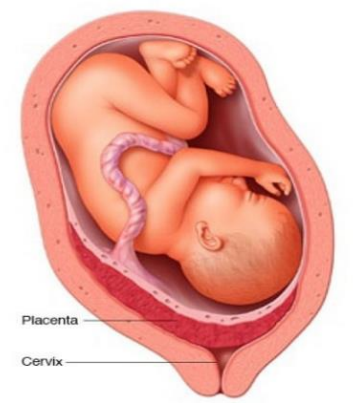


Placenta previa

- 0.3-0.5% of pregnancies



Placenta previa

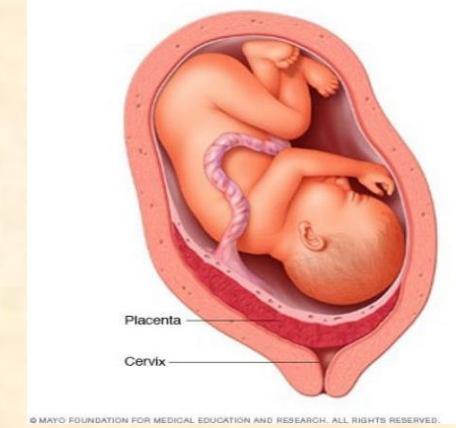


1.Multiparity (80%)	7.Cocaine
2.Age >40 (0,25% vs 0,03% age <29)	8.IVF
3.Smoking	9.Recurrent miscarriages
4.Male fetus	10.History of placenta previa
5. PCS or uterus scars	11.D&C
6.multiples	12. Living in high altitude

- 1.Karami, M., Jenabi, E., & Fereidooni, B. (2018). The association of placenta previa and assisted reproductive techniques: a meta-analysis. *The Journal of Maternal-Fetal & Neonatal Medicine*, 31(14), 1940-1947.
2. Jing L, Wei G, Mengfan S, Yanyan H. Effect of site of placentation on pregnancy outcomes in patients with placenta previa. *PLoS One* 2018; 13:e0200252.
3. Matalliotakis, M., Velegarakis, A., Goulielmos, G. N., Niraki, E., Patelarou, A. E., & Matalliotakis, I. (2017). Association of placenta previa with a history of previous Cesarean deliveries and indications for a possible role of a genetic component. *Balkan Journal of Medical Genetics*, 20(2), 5-9.
- 4.Simmons, R. (2018). Abnormalities of fetal growth. In *Avery's Diseases of the Newborn (Tenth Edition)* (pp. 61-69).

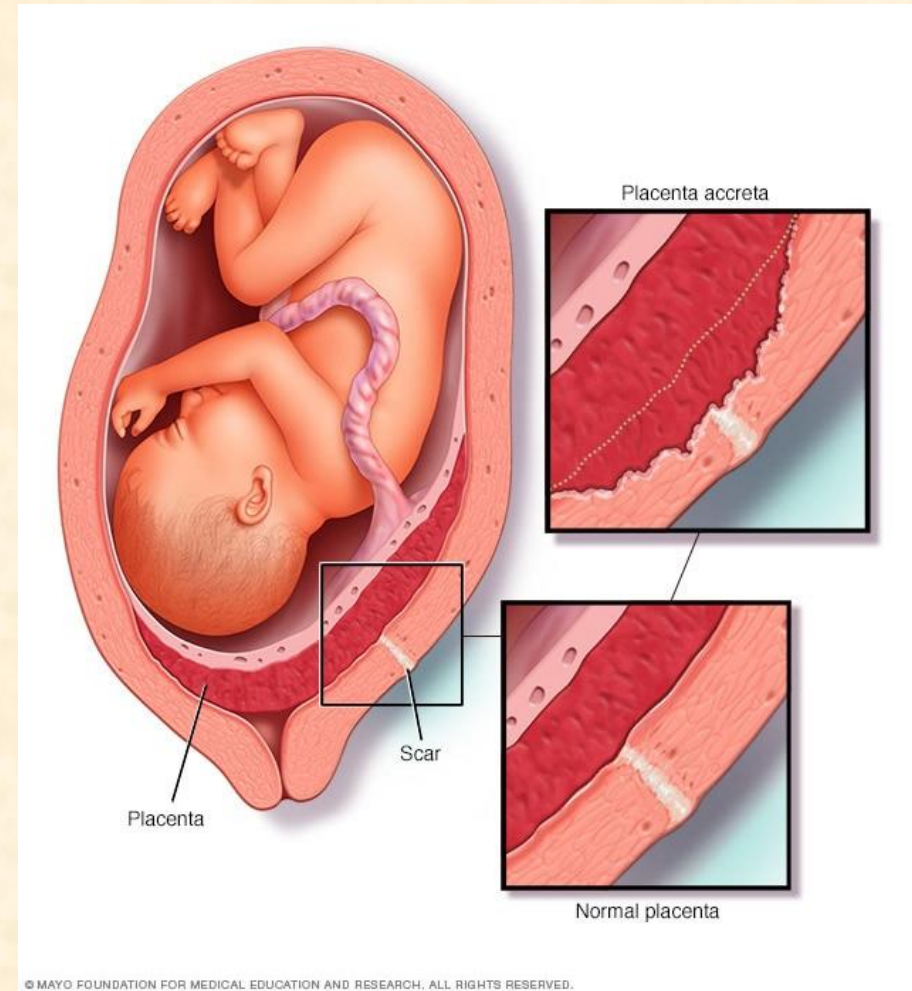
Placenta previa

Cesarean Delivery	Placenta Previa
First	3.3%
Second	11%
Third	40%
Fourth	61%
≥Fifth	67%



- 1.Karami, M., Jenabi, E., & Fereidooni, B. (2018). The association of placenta previa and assisted reproductive techniques: a meta-analysis. *The Journal of Maternal-Fetal & Neonatal Medicine*, 31(14), 1940-1947.
2. Jing L, Wei G, Mengfan S, Yanyan H. Effect of site of placentation on pregnancy outcomes in patients with placenta previa. *PLoS One* 2018; 13:e0200252.
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- 4.Simmons, R. (2018). Abnormalities of fetal growth. In *Avery's Diseases of the Newborn (Tenth Edition)* (pp. 61-69).

Accreta spectrum disorder



Historical.....

First report from pathologist Dr D.S. Forster in Montreal General Hospital Canada.

Obstetrical hysterectomy 1 : 8000 deliveries

Forster DS. A case of placenta accreta. *Can Med Assoc J.* 1927;17:204-207.
Irving C, Hertig AT. A study of placenta accreta. *Surgery, Gynecol Obstet.* 1937;64:178-200.

Accreta spectrum disorder

Year	Incidence
1950	1:30,000 deliveries
1960	1:19,000 deliveries
1980	1: 7,000 deliveries
1990	1:2,500 deliveries
2002	1:533 deliveries
2012	As high as 1: 333 deliveries

Belfort, M. A., Publications Committee, & Society for Maternal-Fetal Medicine. (2010). Placenta accreta. *American journal of obstetrics and gynecology*, 203(5), 430-439.

Accreta spectrum disorder

Changes in cesarean delivery rate and placenta accreta spectrum (PAS) disorder prevalence over time.

Author	Type of study	Country of origin	Cesarean delivery rate period A (years)	Cesarean delivery rate period B (years)	PAS disorders period A (years)	PAS disorders period B (years)
Wu et al. ¹⁵ (2005) ^a	Matched case-control study	USA	12.5% (1982)	23.5% (2002)	0.38 per 1000 births (1982)	1.88 per 1000 births (2002)
Higgins et al. ²⁰ (2013) ^b	Cohort study	Ireland	4.1% (1975)	20.7% (2010)	1.65 per 1000 births after prior cesarean (2003)	2.37 per 1000 births after prior cesarean (2010)
Morlando et al. ¹⁸ (2013) ^c	Cohort study	Italy	17% (1970s)	64% (2000s)	1.20 per 1000 births after prior cesarean (1976-1978)	3.11 per 1000 births after prior cesarean (2000s)
Cheng and Lee ²⁴ (2015) ^d	Cohort study	Hong Kong	19.5% (1999-2003)	27.1% (2009-2013)	0.17 per 1000 births after prior cesarean (1999-2003)	0.79 per 1000 births after prior cesarean (2009-2013)

^aTotal prevalence 0.19% (121 cases of PAS disorders out of 64 359 deliveries during the study period).

^bTotal prevalence 0.01% (36 cases of PAS disorders out of 275 121 deliveries during the study period).

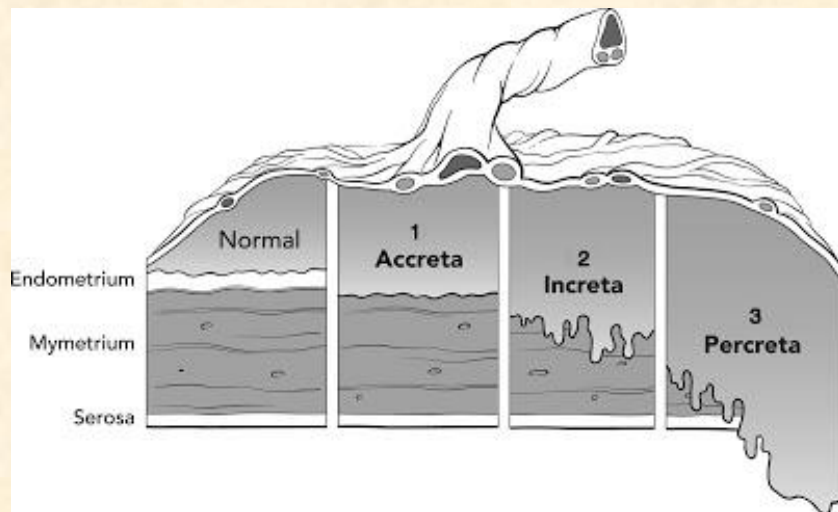
^cTotal prevalence 0.16% (50 cases of PAS disorders out of 30 491 deliveries during the study period).

^dTotal prevalence 0.05% (39 cases of PAS disorders out of 81 497 deliveries during the study period).

Accreta spectrum disorder

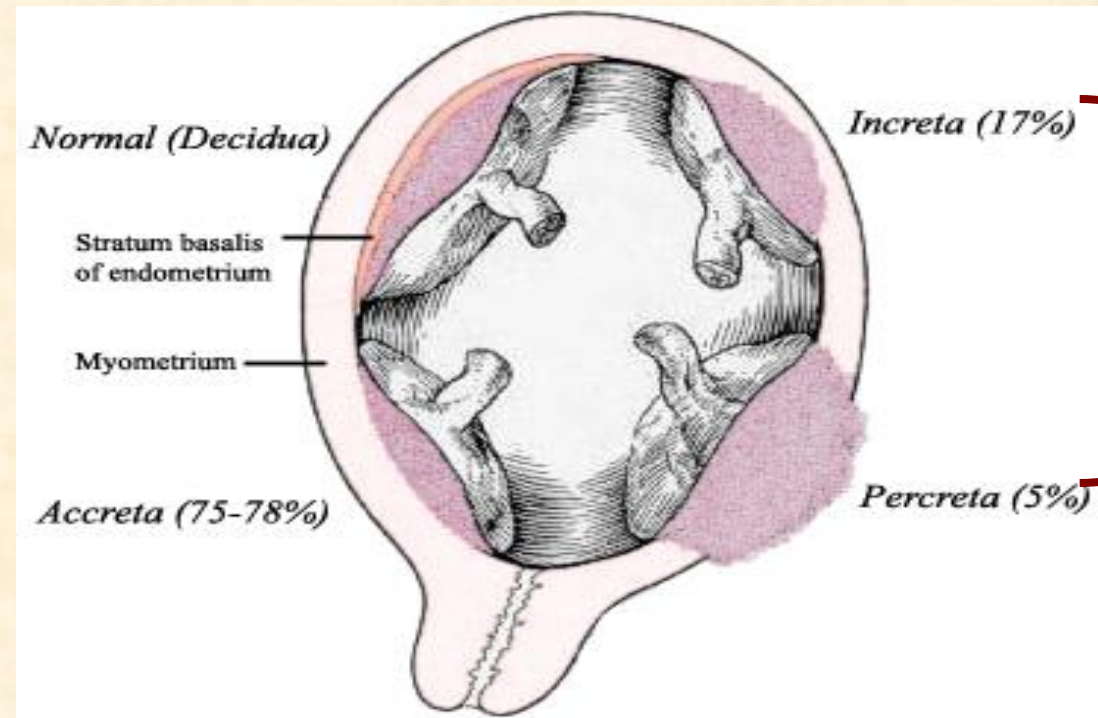
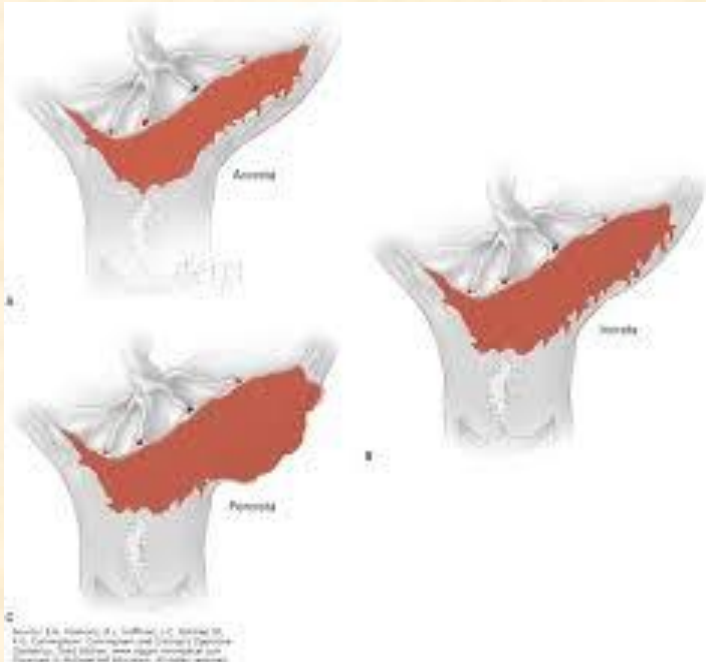
When placenta develops in an area where decidua is partially or complete absent, trophoblastic villi invades the myometrium

- 1) Accreta placenta, endometrial invasion (78%)
- 2) Increta placenta, myometrial invasion (17%)
- 3) Percreta placenta, invasion of other organs (5W%)



Irving, F. C. (1937). A study of placenta accreta. *Surg Gynecol Obstet*, 64, 178-200.
Luke, R. K., Sharpe, J. W., & Greene, R. R. (1966). Placenta accreta: The adherent or invasive placenta. *American Journal of Obstetrics & Gynecology*, 95(5), 660-668.

Accreta spectrum disorder



Abnormal
Place

Accreta spectrum disorder

A clinical grading system to assess and categorize placental adherence or invasion at delivery.^a

Grade	Definition
1	<i>At cesarean or vaginal delivery:</i> Complete placental separation at third stage. Normal adherence of placenta
2	(A) <i>Cesarean/laparotomy:</i> No placental tissue seen invading through the surface of the uterus. Incomplete separation with uterotonics and gentle cord traction, and manual removal of placenta required for remaining tissue and parts of placenta thought to be abnormally adherent (B) <i>Vaginal delivery:</i> Manual removal of placenta required and parts of placenta thought to be abnormally adherent
3	(A) <i>Cesarean/laparotomy:</i> No placental tissue seen invading through the surface of the uterus. No separation with uterotonics and gentle cord traction with manual removal of placenta required and the whole placental bed thought to be abnormally adherent (B) <i>Vaginal delivery:</i> Manual removal of placenta required and the whole placental bed thought to be abnormally adherent
4	<i>Cesarean/laparotomy:</i> Placental tissue seen to have invaded through the serosa of the uterus but a clear surgical plane can be identified between the bladder and uterus to allow nontraumatic reflection of the urinary bladder at surgery
5	<i>Cesarean/laparotomy:</i> Placental tissue seen to have invaded through the serosa of the uterus and a clear surgical plane cannot be identified between the bladder and uterus to allow nontraumatic reflection of the urinary bladder at surgery
6	<i>Cesarean/laparotomy:</i> Placental tissue seen to have invaded through the serosa of the uterus and infiltrating the parametrium or any organ other than the urinary bladder

^aModified from Collins et al.⁷¹

Accreta spectrum disorder

IATROGENIC DISORDER

Figo Consensus 2018

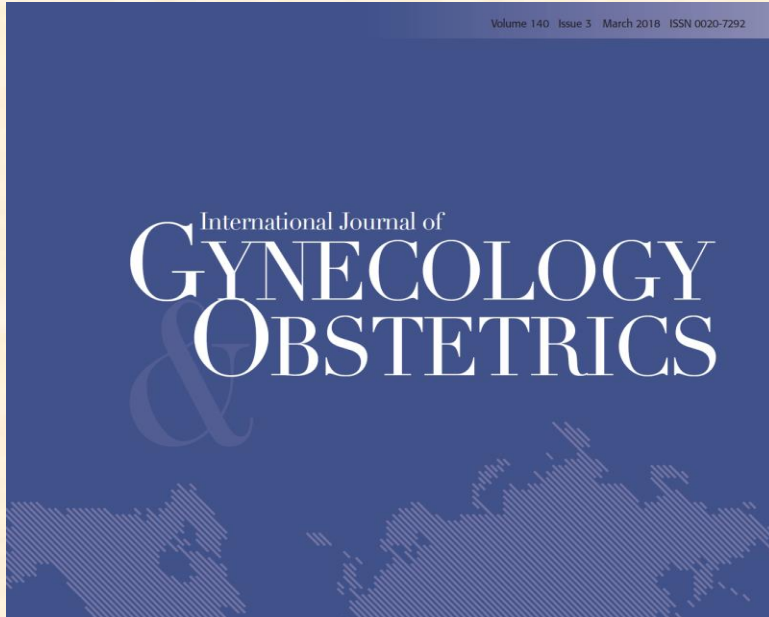


TABLE 3 Primary and secondary uterine pathologies reported to be associated with placenta accreta spectrum (PAS) disorders.^a

Classification	Type of uterine pathologies
Direct surgical scar	Cesarean delivery Surgical termination of pregnancy Dilatation and curettage Myomectomy Endometrial resection Asherman's syndrome
Nonsurgical scar	IVF procedures Uterine artery embolization Chemotherapy and radiation Endometritis Intra-uterine device Manual removal of placenta Previous accreta
Uterine anomalies	Bicornuate uterus Adenomyosis Submucous fibroids Myotonic dystrophy

^aSource: Irving and Hertig,¹ Jauniaux and Jurkovic,² Jauniaux et al.,³ Parra-Herran and Djordjevic,⁴ Jauniaux E, et al.,¹⁴ Wu et al.¹⁵

Alexandra Hospital 2016-2018

52 PAS

40 cases obstetrical history of PCS

12 cases no CS

→ 3 myomectomy

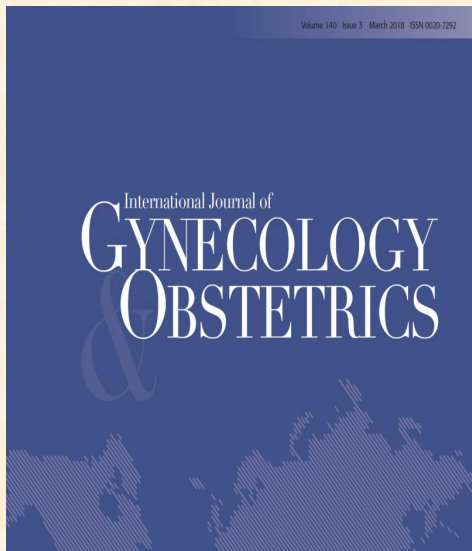
→ 5 history of D&Cs

→ NO history of surgical intervention

Accreta spectrum disorder epidemiology

TABLE 6 Recommendations for the evaluation of epidemiological data on placenta accreta spectrum (PAS) disorders.

Recommendations	Resource settings	Quality of evidence and strength of recommendation
The recent increase in the incidence and prevalence of PAS disorders is a consequence of the rise in cesarean deliveries over the last two decades	All	High and Strong
A cesarean delivery scar increases the risk of placenta previa in subsequent pregnancies	All	High and Strong
A myomectomy scar increases the risk of PAS disorders in subsequent pregnancies	High	Low and Weak
Minor surgical procedures such as uterine curettage can lead to PAS disorders in subsequent pregnancies	All	Low and Weak
Women with a previous history of cesarean delivery presenting with a low-lying placenta or placenta previa in the second trimester of pregnancy have become the largest group of women with the highest risk of PAS disorders	All	High and Strong
Women should be informed that their risk of PAS disorders increases with each cesarean delivery	All	High and Strong
Women who request a pre-labor elective cesarean delivery should be informed that their risk of developing PAS disorders is higher than after emergency/emergent cesarean delivery	High	Low and Weak
Women presenting with cesarean scar pregnancy in the first trimester of pregnancy should be informed of the high risk of invasive placentation and/or major placenta previa later in pregnancy and should be offered the option of terminating the pregnancy	High	Moderate and Strong
The use of standardized protocol and terminology for both the clinical diagnosis and histopathological confirmation of PAS disorders is essential to obtaining new and more accurate epidemiological data	All	High and Strong



Accreta spectrum disorder

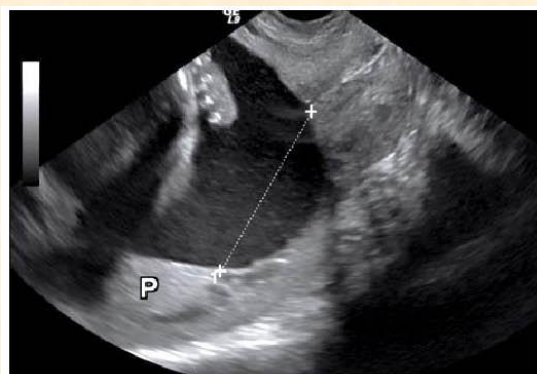
«The rates of placenta praevia and accreta have increased and will continue to do so as a result of rising rates of caesarean deliveries, increased maternal age and use of assisted reproductive technology (ART), placing greater demands on maternity-related resources»

Jauniaux, E., Alfirevic, Z., Bhide, A. G., Belfort, M. A., Burton, G. J., Collins, S. L., ... & Silver, R. (2018). Placenta Praevia and Placenta Accreta: Diagnosis and Management: Green-top Guideline No. 27a. *BJOG: an international journal of obstetrics and gynaecology*.

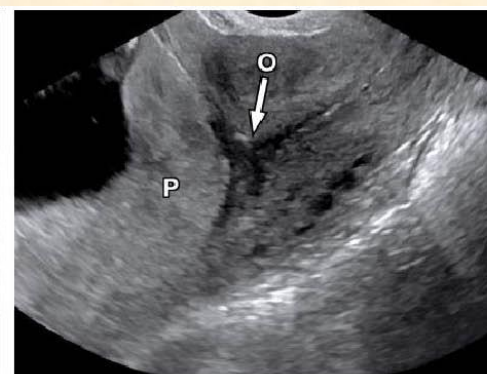
Ultrasonographic diagnosis of AIP

PLACENTA PREVIA





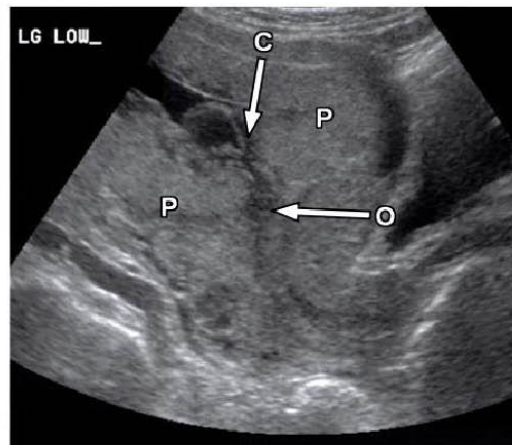
a.



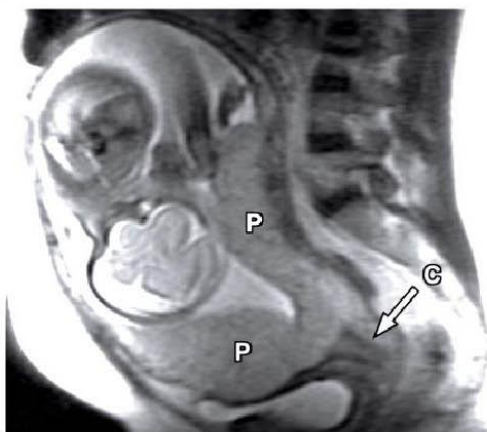
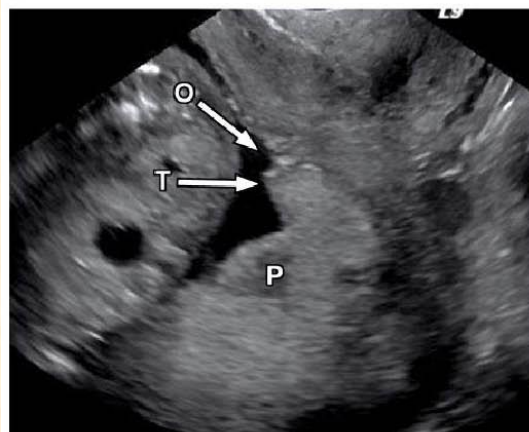
d.



b.



e.



c.

Accreta spectrum disorder

Proposal for standardized ultrasound descriptors of abnormally invasive placenta (AIP)

Members of the European Working Group on Abnormally Invasive Placenta

<i>US finding</i>	<i>EW-AIP suggested standardized definition</i>
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)

Figo Consensus 2018



TABLE 1 Summary estimates of sensitivity and specificity of different ultrasound and MRI signs for the detection of PAS disorders.^a

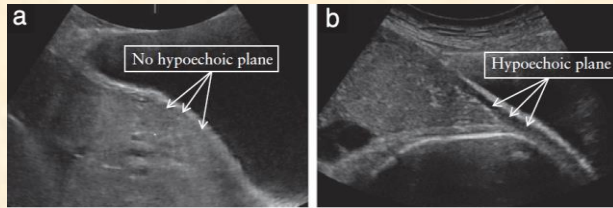
Detection signs	Studies (n)	Patients (n)	% Sensitivity (95% CI)	% Specificity (95% CI)
Ultrasound signs				
Placental lacunae	13	2725	77.4 (70.1–83.1)	95.02 (94.1–95.8)
Loss of hypoechoic space	10	2633	66.2 (58.3–73.6)	95.8 (94.9–96.5)
Abnormalities of uterus–bladder interface	9	2579	49.7 (41.4–58.0)	99.8 (99.5–99.8)
Color Doppler abnormalities	12	714	90.8 (85.2–94.7)	87.7 (84.6–90.4)
MRI signs				
Uterine bulging	5	119	79.1 (60.3–90.4)	90.2 (76.2–96.4)
Heterogeneous signal intensity	6	143	78.6 (57.7–90.8)	87.7 (50.4–98.0)
Dark intraplacental bands on T2	6	146	87.9 (70.9–95.6)	71.9 (55.6–84.0)
Focal interruption of myometrium	4	119	92.0 (79.2–97.2)	75.6 (50.4–90.4)
Tenting of the bladder	2	74	80.0 (28.0–99.5)	98.6 (92.2–100)

^aAdapted from D'Antonio et al.⁹ and D'Antonio et al.²⁸

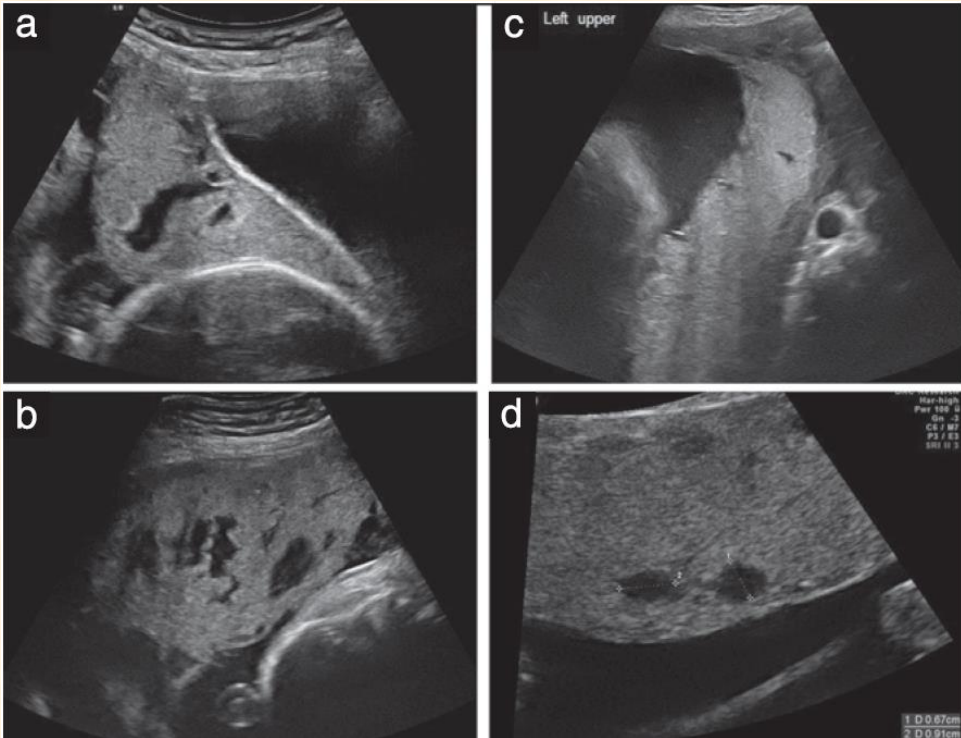
Ultrasound sings

1. Loss of clear zone
2. Abnormal placental lacunae
3. Bladder wall interruption
4. Myometrial thinning
5. Placental bulge/exophytic mass
6. Uterovesical and subplacental hypervascularity
7. Bridging vessels
8. Turbulent blood flow through the lacunae
9. 3D intraplacental hypervascularity

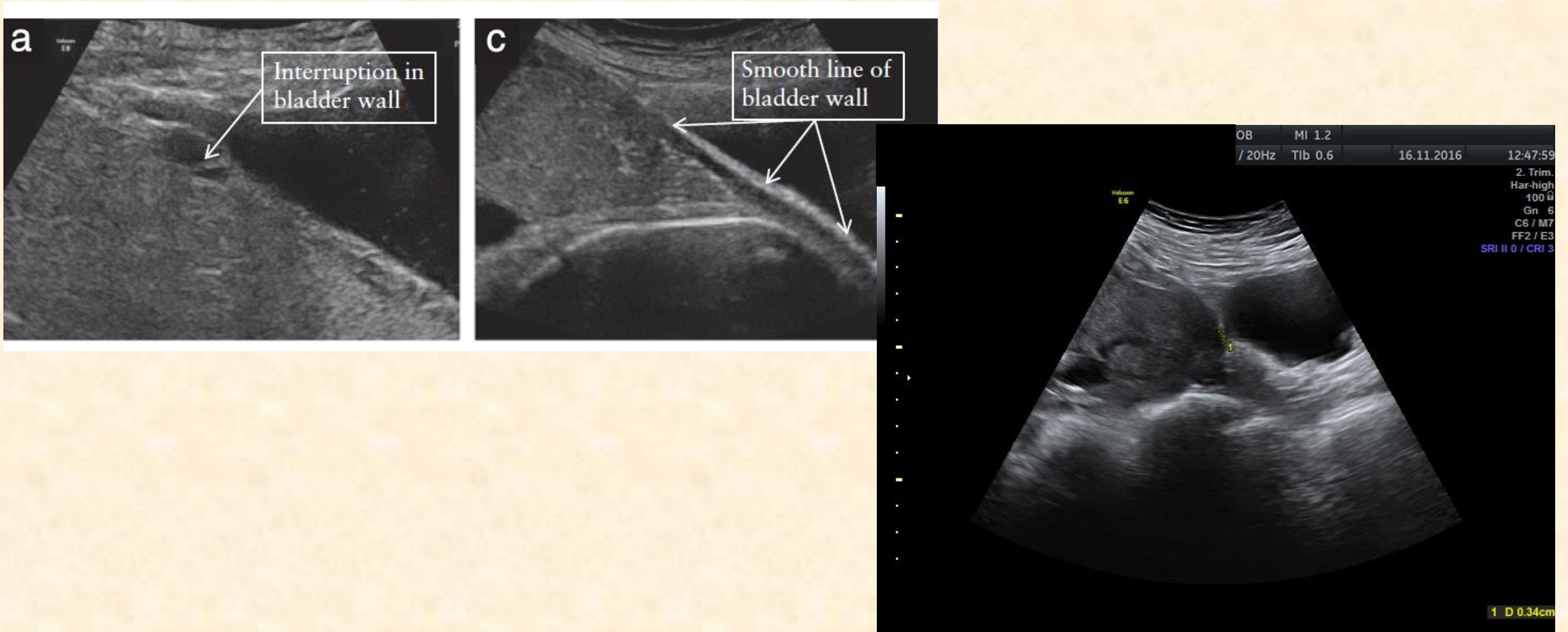
1. Loss of clear zone



Abnormal placental lacunae

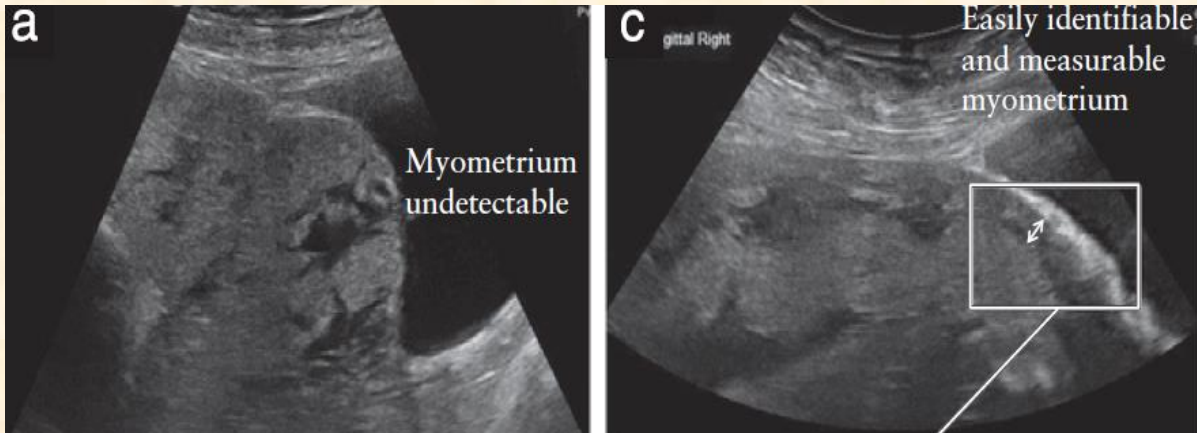


Bladder wall interruption



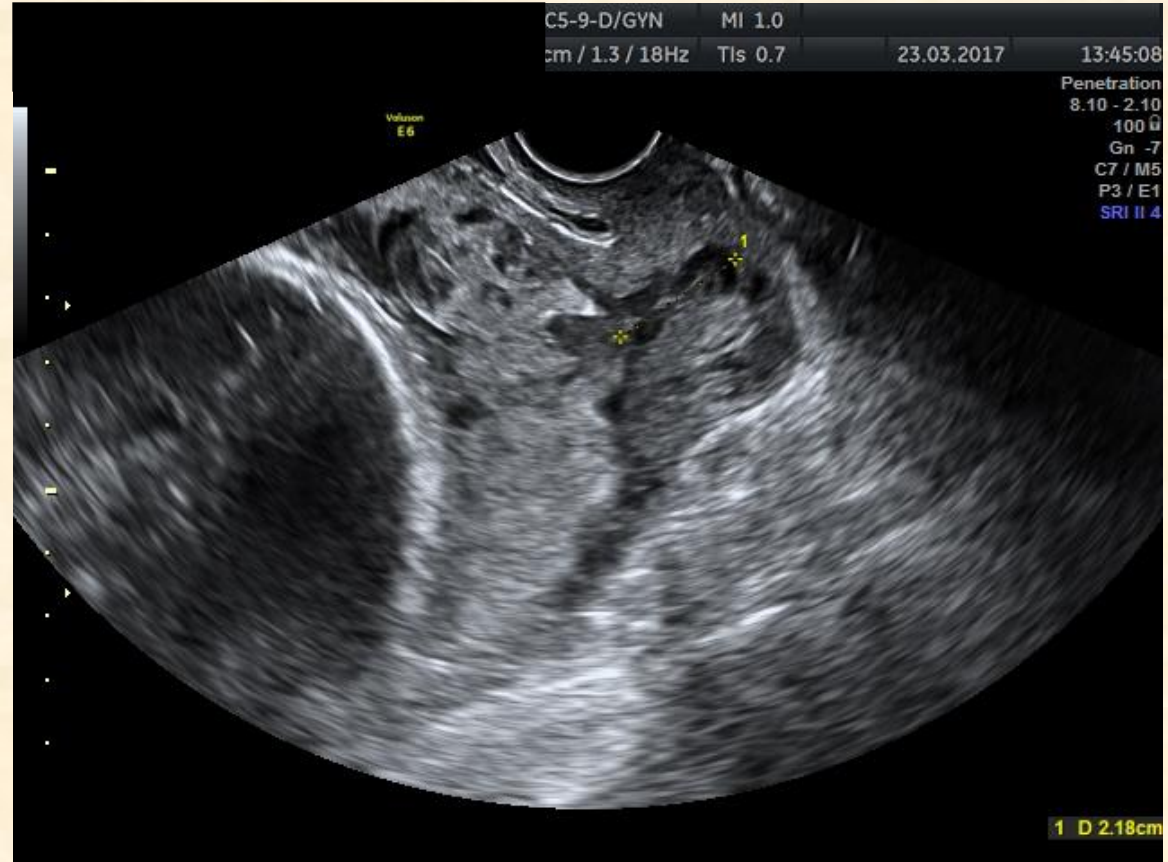
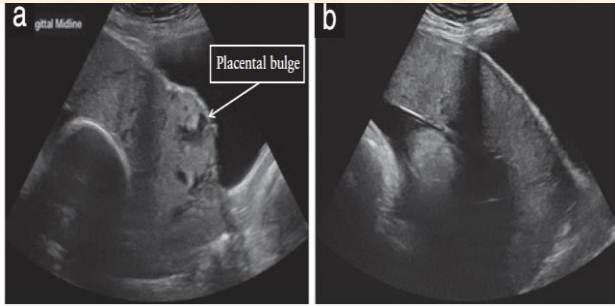


Myometrial thinning

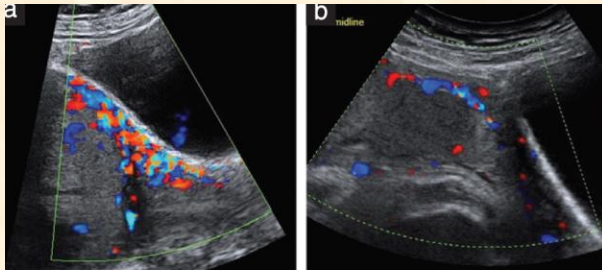


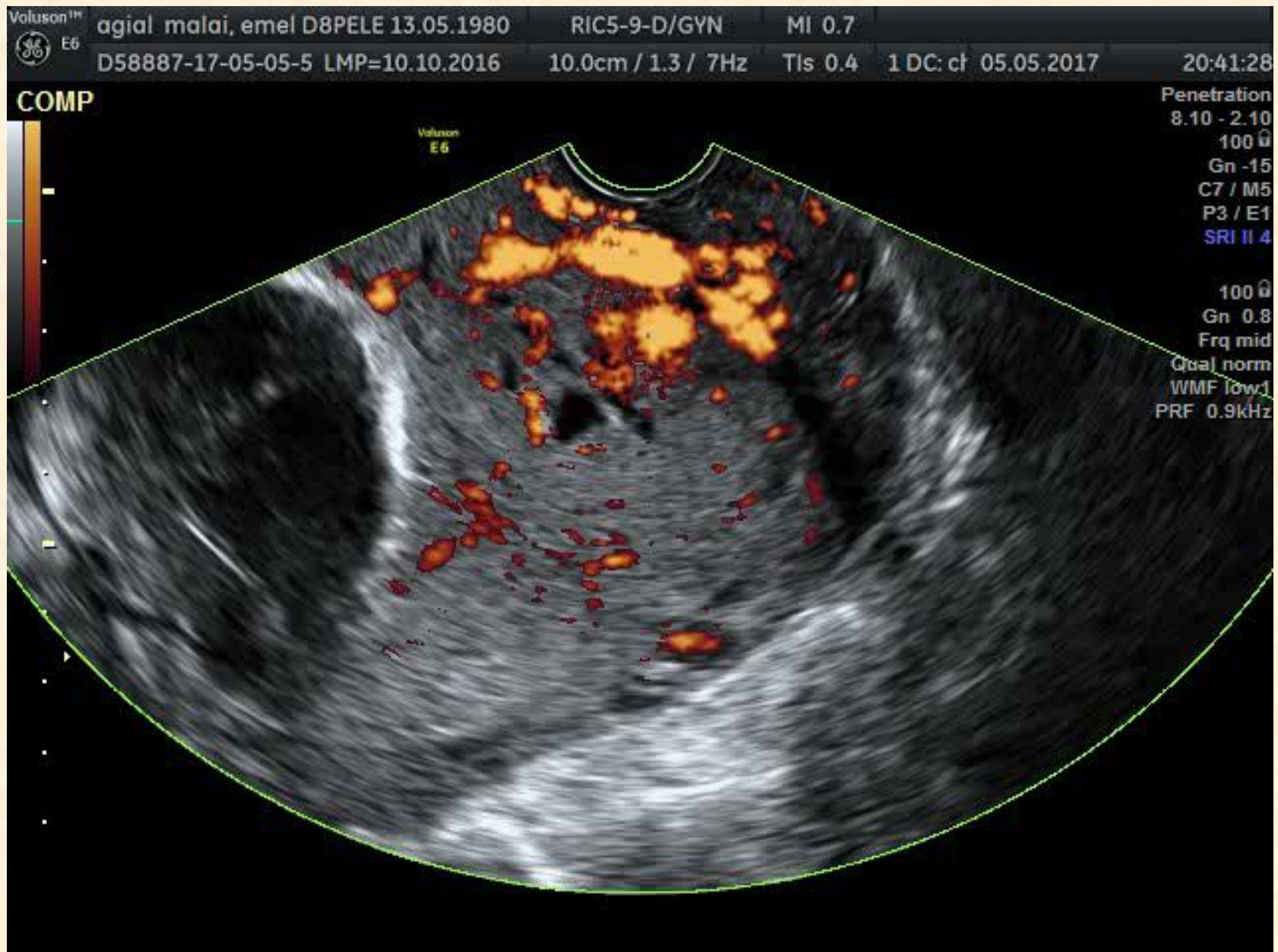


Placental bulge/exophytic masses



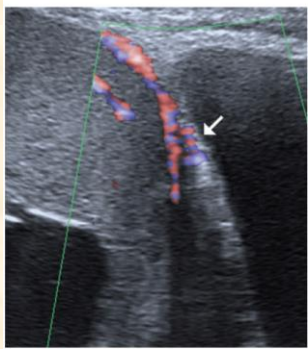
Uterovesical and subplacental hypervascularity



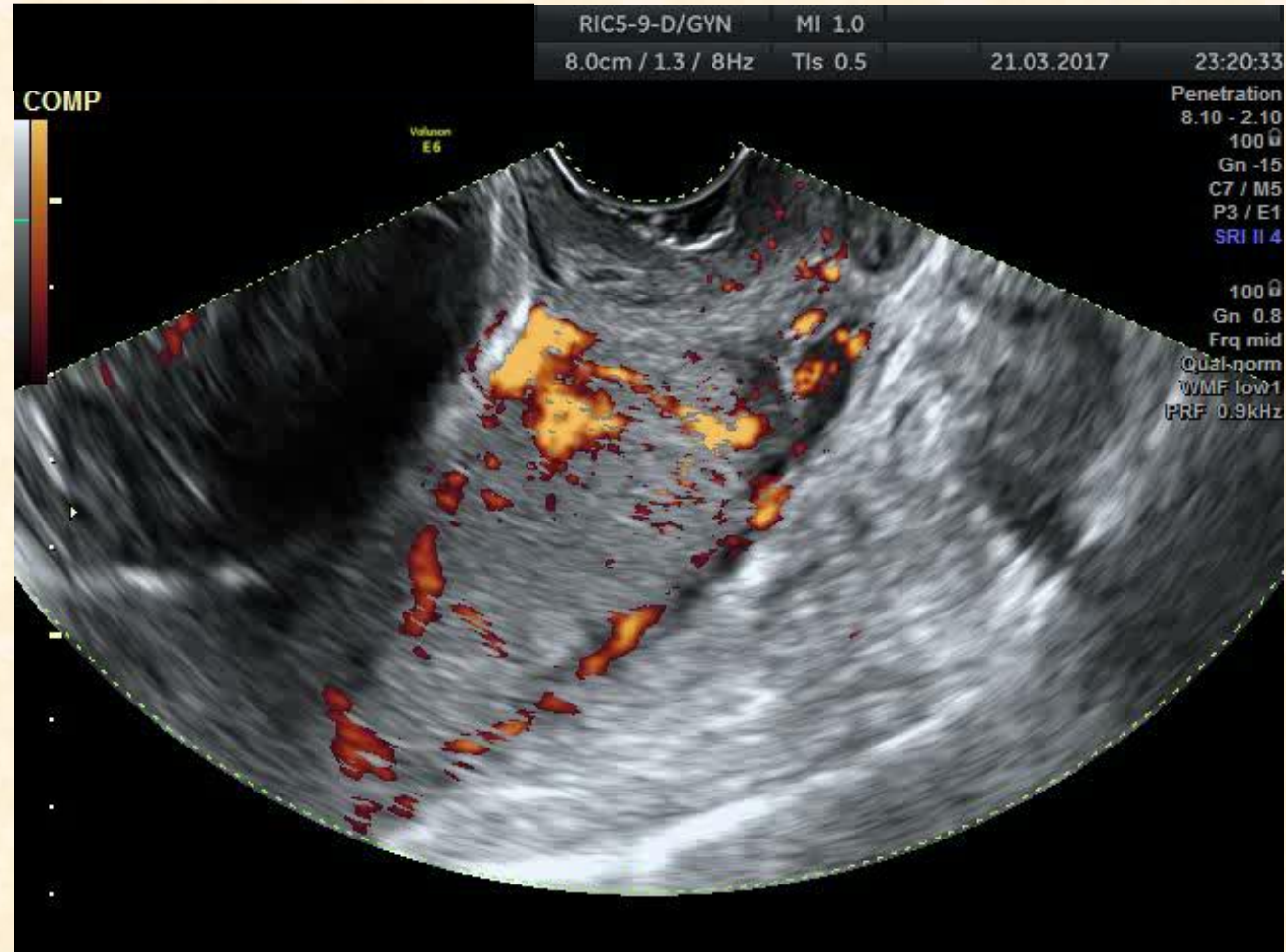
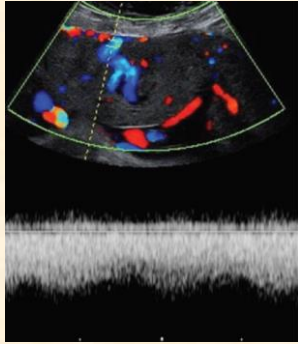


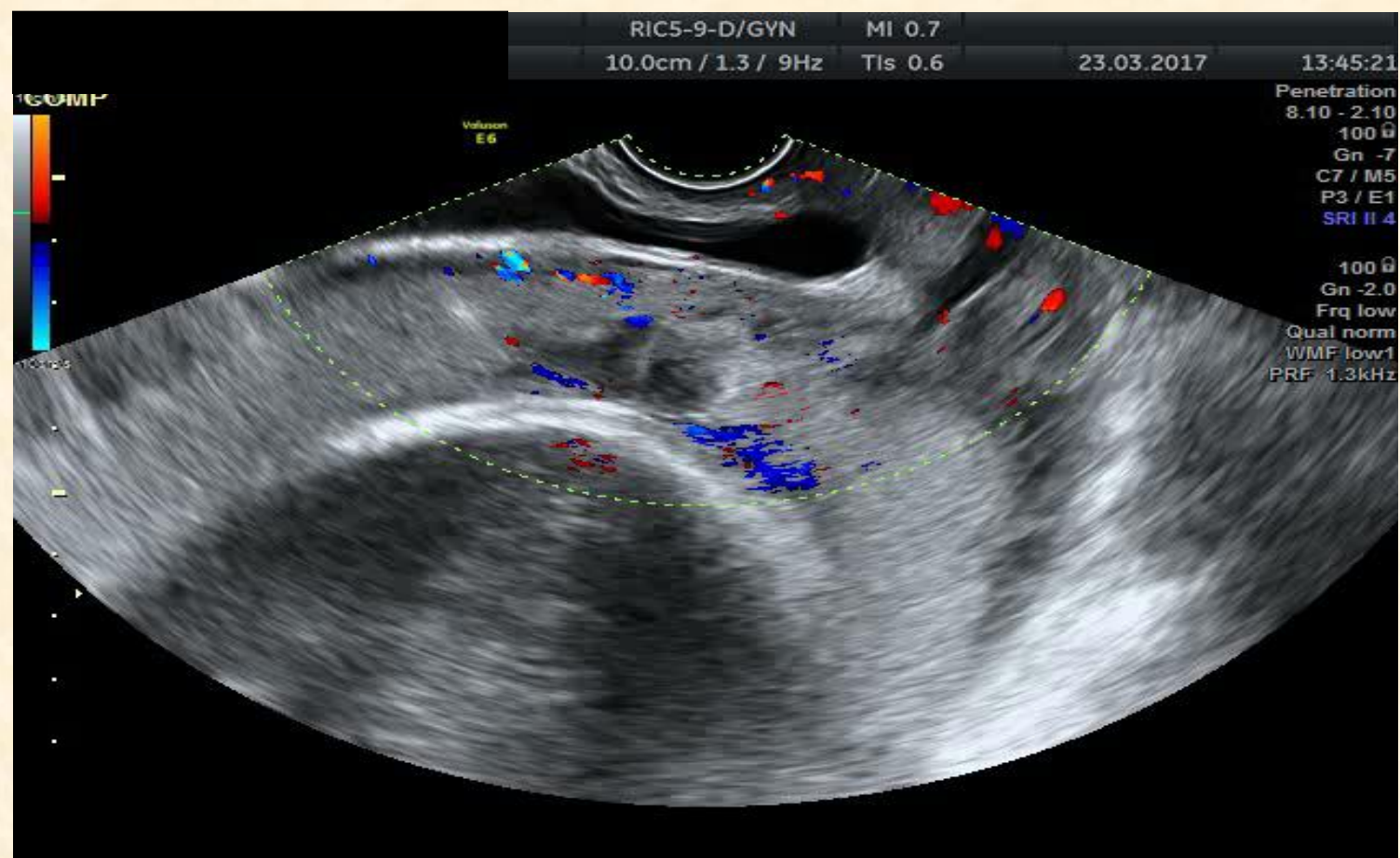


Bridging vessels

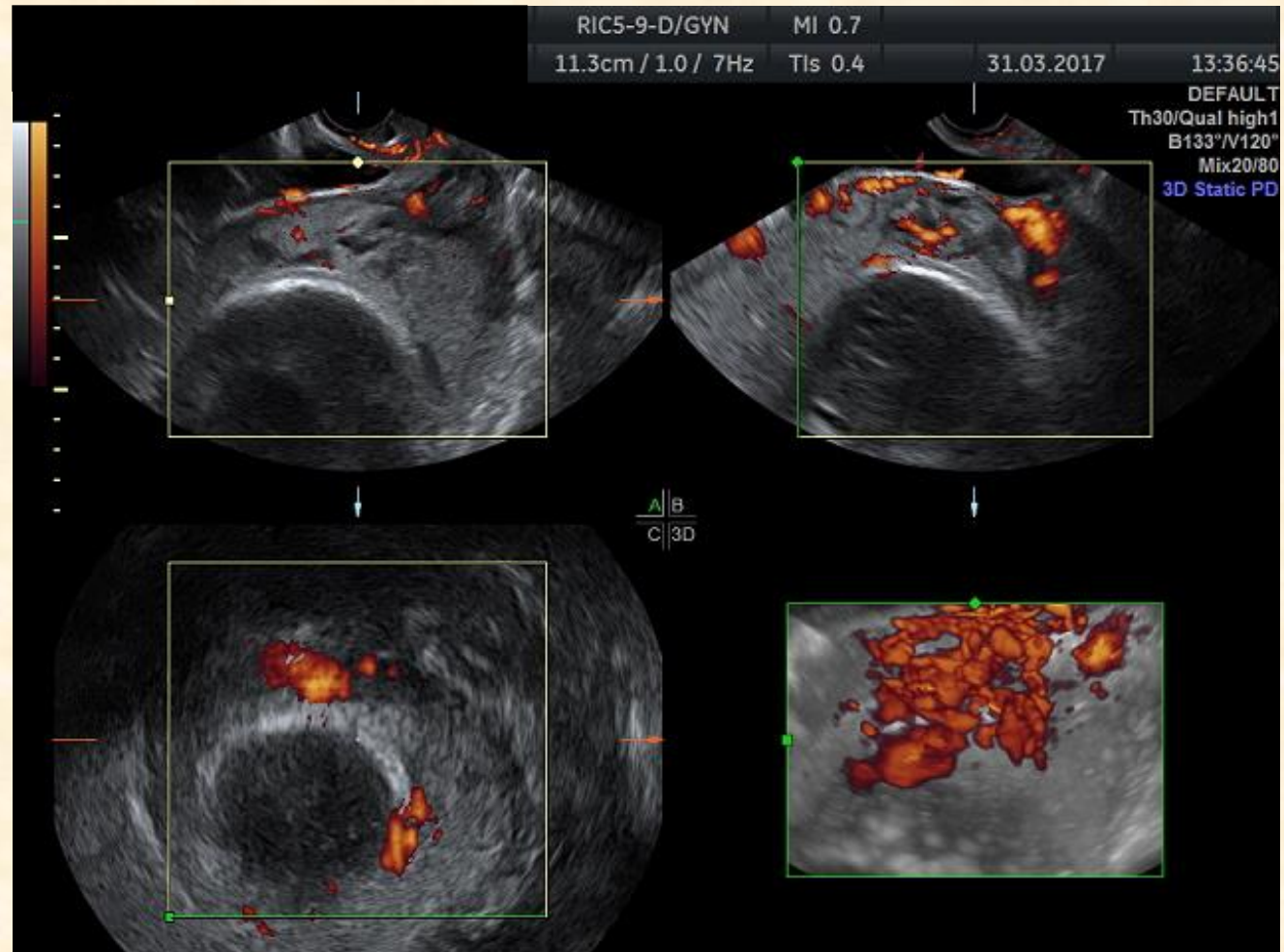
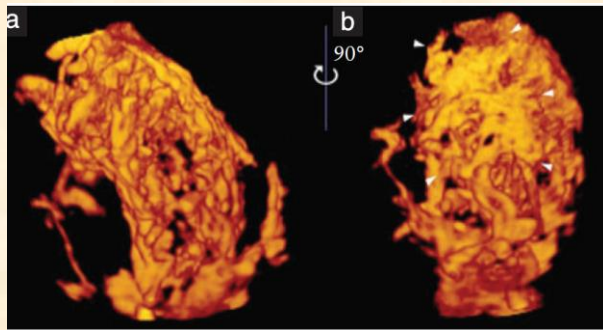


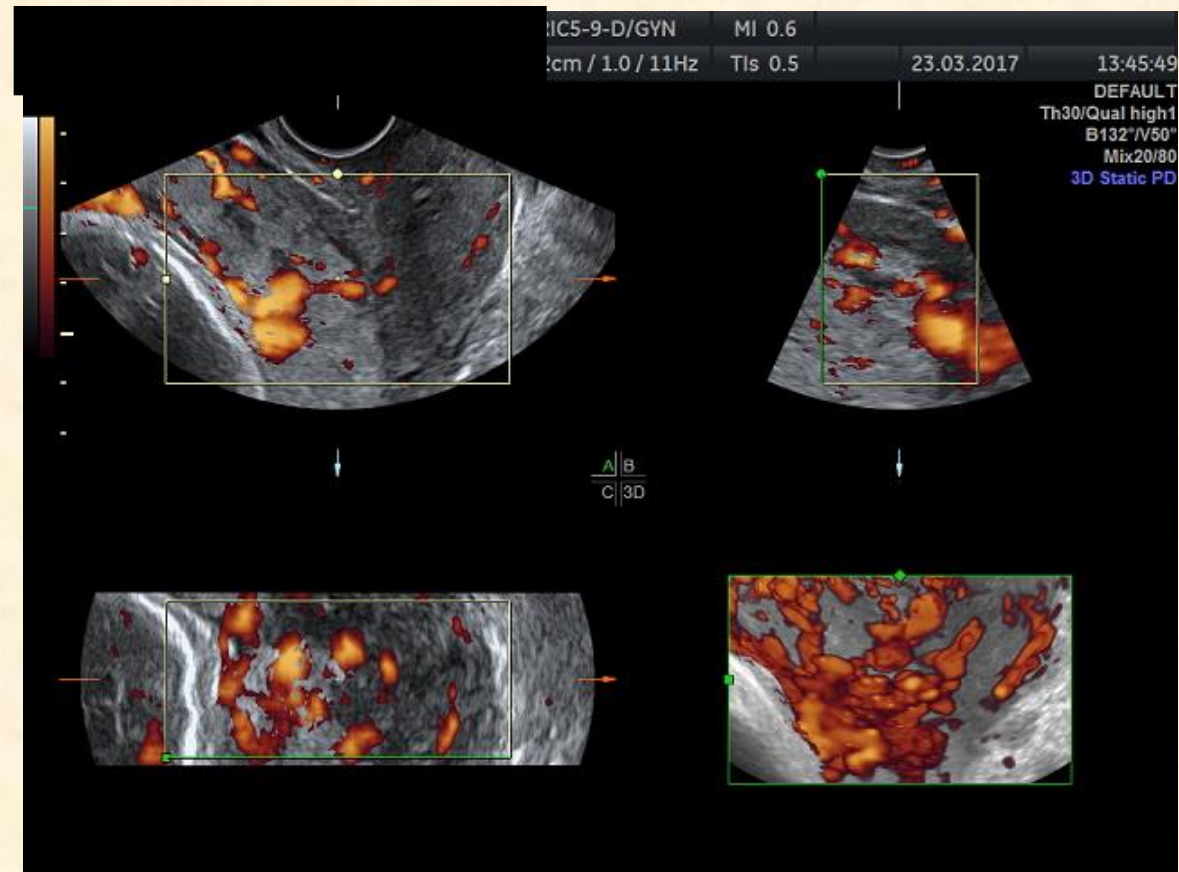
Turbulent blood flow through the lacunae

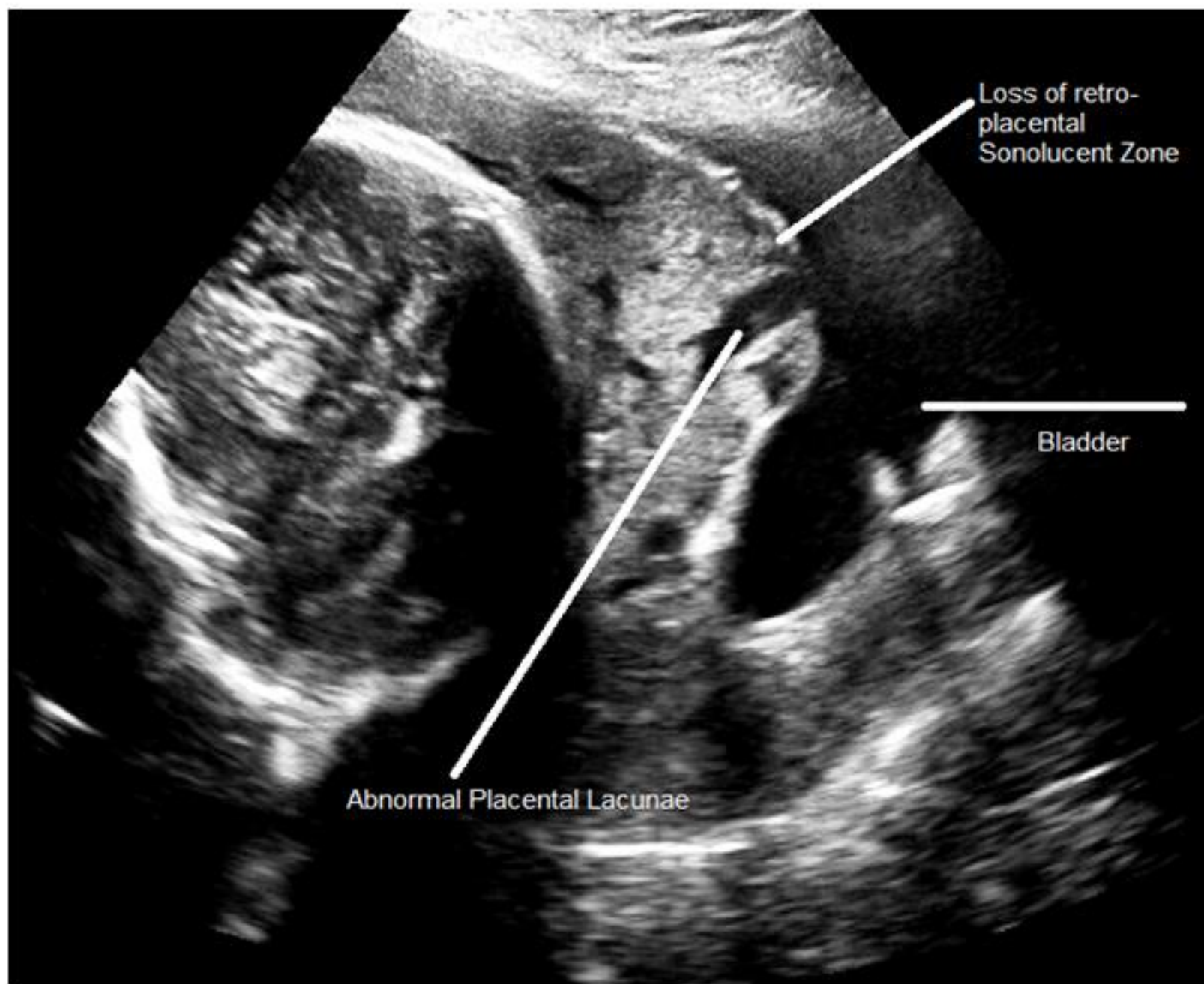




3D intraplacental hypervascularity

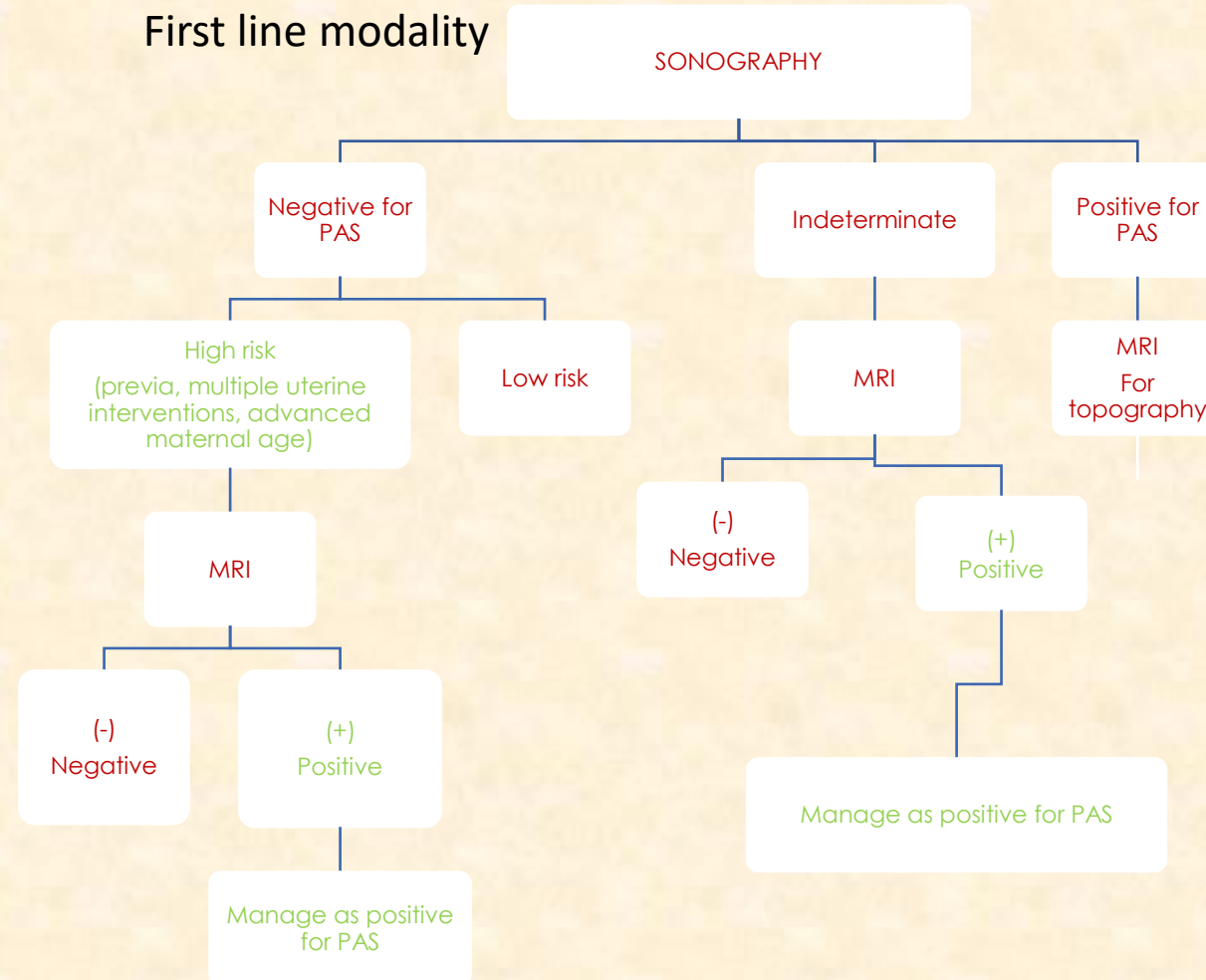






Diagnostic algorithm

Management based on
US results



Accreta spectrum disorder Management

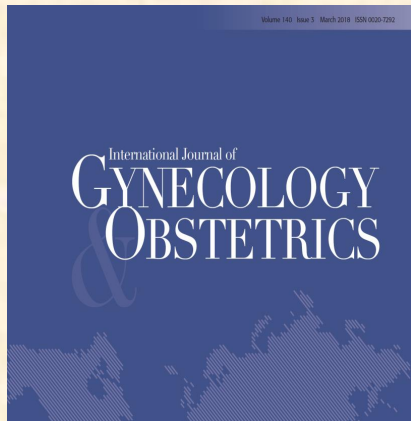
Accreta spectrum disorder

Multidisciplinary management

TABLE 2 Components of multidisciplinary team care within Centers of Excellence for placenta accreta spectrum (PAS) disorders.

Component	
Universal access to multidisciplinary team care	24/7 access to the care team to enact care plan in urgent/emergent situations
Standard care plan	Consistent and standardized care plan should be established, this can be aided by use of checklists to guide prenatal, intrapartum and postpartum care
Radiologic expertise for diagnosis	Ultrasound and/or MRI
Experienced obstetrician/maternal–fetal medicine specialist	For prenatal diagnosis, prepartum, intrapartum, and postpartum management
Surgical Expertise for complex surgery (Gynecologic oncology, pelvic surgeon, urogynecologist)	Skills for retroperitoneal dissection, ureterolysis, internal iliac artery ligation, ureteral stent placement
Anesthetist (obstetrical or trauma)	Experienced in management of massive hemorrhage as well as perioperative management of pregnant women
Neonatal intensive care unit and neonatologists	To manage both planned late preterm delivery and unplanned preterm delivery
Adult intensive care unit and intensivists	Surgical and medical intensive care unit for postoperative care as required
Massive transfusion capacity	Access to blood products/bank, massive transfusion protocol, transfusion medicine specialists/blood bank pathologists
Additional surgical expertise when required: urology, vascular surgery, general surgeon, trauma surgeon	Management of complications: ureteral reimplantation, bowel resection, vascular injury
Interventional radiology	For possible placement of intravascular balloons or postoperative selective arterial embolization
Cell saver and perfusionists	If available, may be cost-effective depending on frequency of transfusion of allogenic blood

Figo Consensus 2018



Non conservative method

Obstetrical hysterectomy

Decision before incision of the uterus based on clinical grading

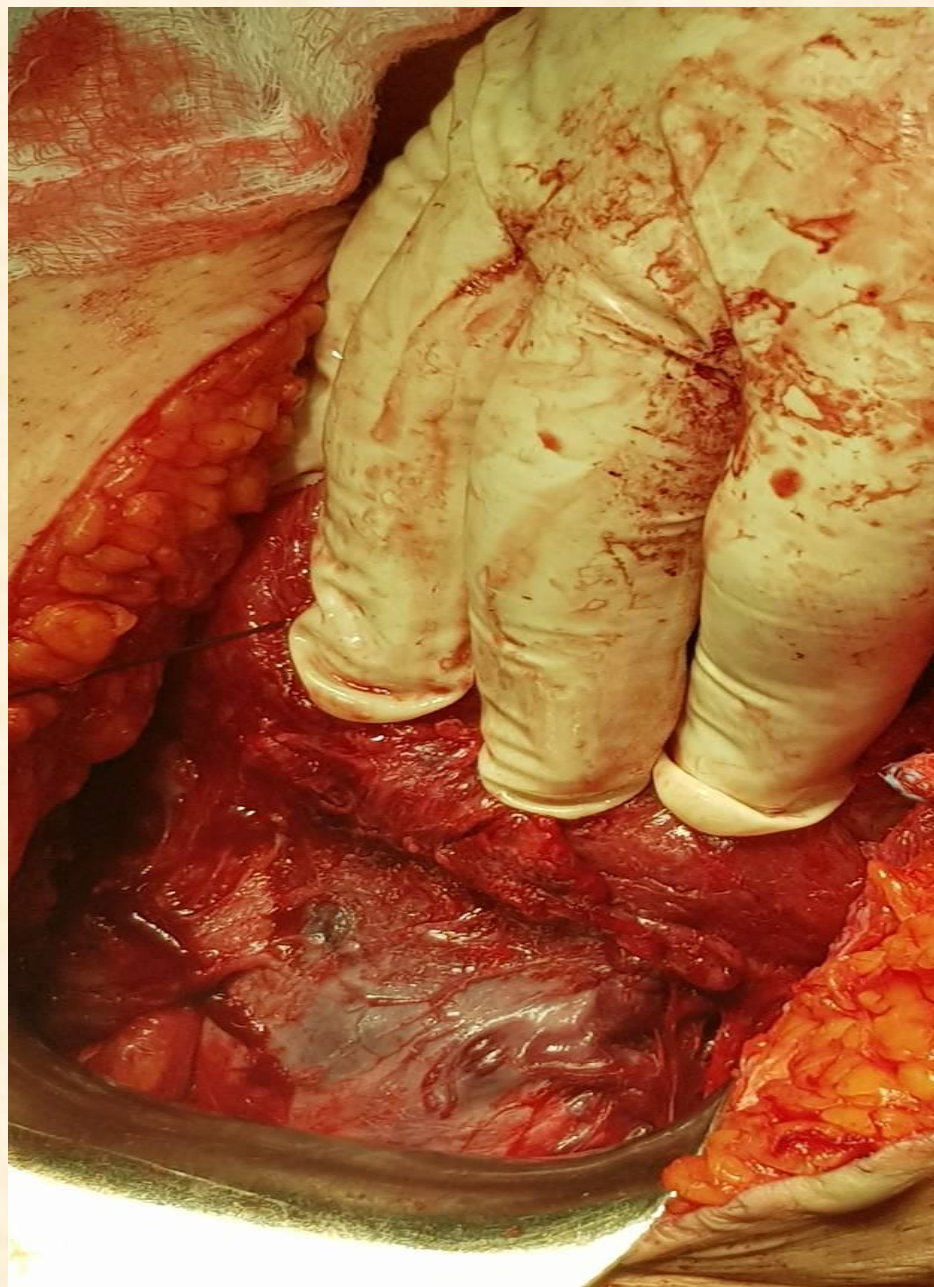


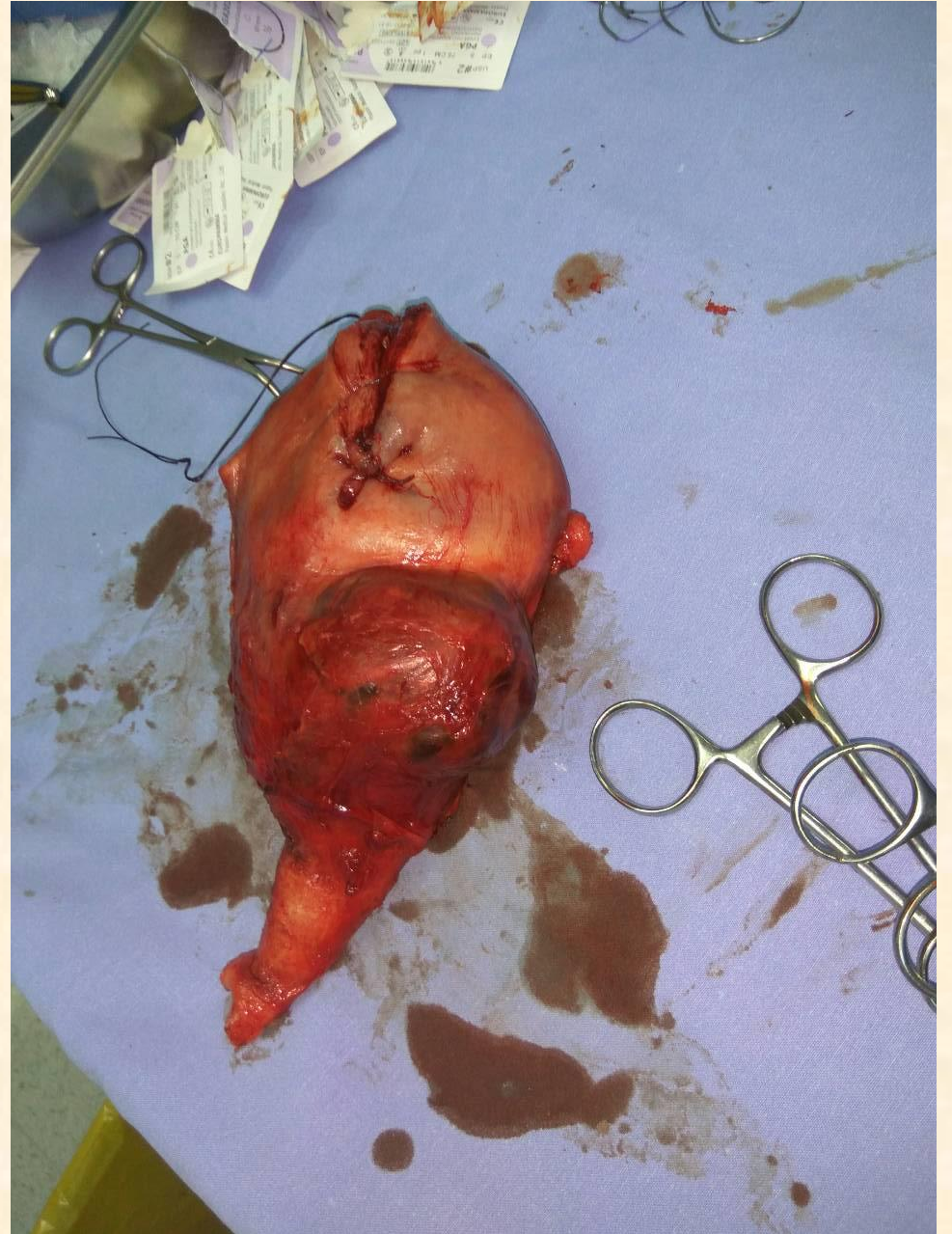
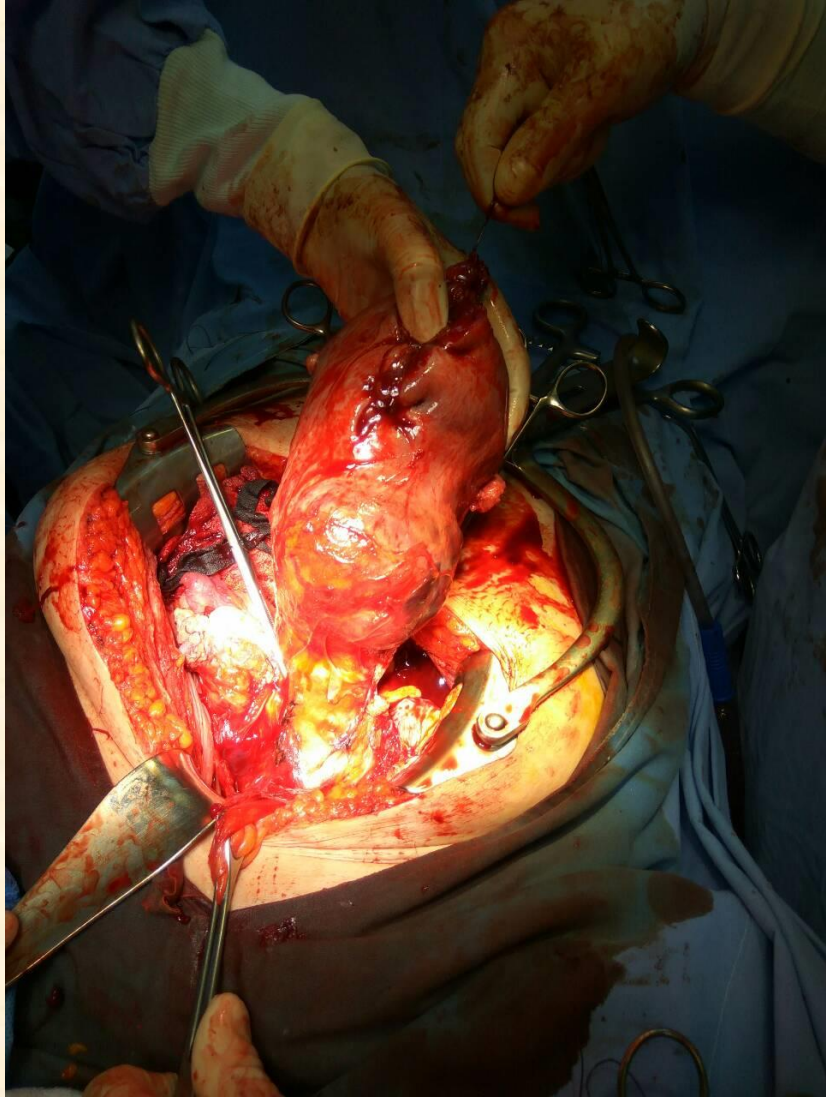
TABLE 1 A clinical grading system to assess and categorize placental adherence or invasion at delivery.^a

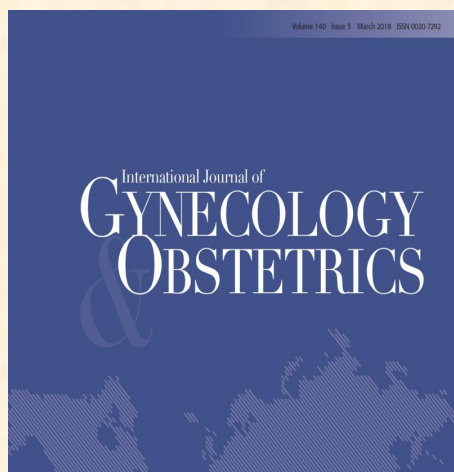
Grade	Definition
1	<i>At cesarean or vaginal delivery:</i> Complete placental separation at third stage. Normal adherence of placenta
2	<i>(A) Cesarean/laparotomy:</i> No placental tissue seen invading through the surface of the uterus. Incomplete separation with uterotonics and gentle cord traction, and manual removal of placenta required for remaining tissue and parts of placenta thought to be abnormally adherent <i>(B) Vaginal delivery:</i> Manual removal of placenta required and parts of placenta thought to be abnormally adherent
3	<i>(A) Cesarean/laparotomy:</i> No placental tissue seen invading through the surface of the uterus. No separation with uterotonics and gentle cord traction with manual removal of placenta required and the whole placental bed thought to be abnormally adherent <i>(B) Vaginal delivery:</i> Manual removal of placenta required and the whole placental bed thought to be abnormally adherent
4	<i>Cesarean/laparotomy:</i> Placental tissue seen to have invaded through the serosa of the uterus but a clear surgical plane can be identified between the bladder and uterus to allow nontraumatic reflection of the urinary bladder at surgery
5	<i>Cesarean/laparotomy:</i> Placental tissue seen to have invaded through the serosa of the uterus and a clear surgical plane cannot be identified between the bladder and uterus to allow nontraumatic reflection of the urinary bladder at surgery
6	<i>Cesarean/laparotomy:</i> Placental tissue seen to have invaded through the serosa of the uterus and infiltrating the parametrium or any organ other than the urinary bladder

^aModified from Collins et al.⁷¹

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Recommendations	Resource settings	Quality of evidence and strength of recommendation
Women presenting with PAS disorders with or without placenta previa should have their delivery scheduled in a Center of Excellence with a dedicated multidisciplinary team and care plan	High	Moderate and Strong
The care plan for women with PAS disorders should include logistic support for access to blood products, capacity to perform complex pelvic surgery, intensive care facilities (adult and neonatal), and obstetric anesthetists	High	Moderate and Strong
Surgical expertise in complex pelvic surgery should be available throughout the surgical procedure	All	Moderate and Strong
Scheduled nonemergent delivery is advisable for women with PAS disorders as it is associated with a reduction in complications related to blood loss	All	Low and Strong
Deliberate cystotomy and excision of involved bladder may be considered in cases of percreta villous tissue involving the bladder	All	Low and Strong
A midline skin incision should be considered for invasive PAS disorders and anterior low-lying placenta or previa accreta when the superior margin is outside the lower uterine segment	All	Low and Weak
Where available, tranexamic acid should be administered (1 g slow IV or 1000–1300 mg orally) immediately prior to or during cesarean delivery for PAS disorders	All	High and Strong
The role of bilateral internal iliac artery ligation at the time of cesarean hysterectomy for PAS disorders is currently unclear	All	Low and Weak
When available, cell salvage may be utilized or be on “stand-by” during cases of cesarean delivery for PAS disorders	High	Low and Strong
In the absence of spontaneous placental separation, the placenta should be left in situ to minimize blood loss during planned immediate cesarean hysterectomy and uterotonics should not be used	All	Moderate and Strong
Total hysterectomy with placenta in situ is preferred over subtotal hysterectomy in cases of placenta previa increta or percreta	All	Low and Strong
In cases of placenta percreta with extensive pelvic invasion, delayed hysterectomy with placenta in situ may be considered	High	Low and Weak

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Conservative treatment

THE EXTIRPATIVE TECHNIQUE

forcibly removing the placenta manually in an attempt to empty the uterus at delivery.

it is recommended as one of the first steps to manage postpartum hemorrhage.

In cases of PAS disorders,

this procedure often results in massive obstetric hemorrhage and DIC

most experts in the management of PAS disorders consider that attempts at manual removal of the placenta should be avoided in cases of planned cesarean hysterectomy

“LEAVING THE PLACENTA IN SITU”

This approach consists of leaving the placenta in situ and waiting for its complete spontaneous resorption.

It was initially called the “conservative treatment of placenta accreta”.

Maternal morbidity after conservative methods

Characteristics	PAS disorders including percreta No. (%)
Placenta left in situ	167 (100)
Partially	99 (59.3)
Entirely	68 (40.7)
Primary postpartum hemorrhage	86 (51.5)
No additional uterine devascularization procedure	58 (34.7)
Additional uterine devascularization procedure	109 (65.3)
Pelvic arterial embolization	62 (37.1)
Vessel ligation	45 (26.9)
Stepwise uterine devascularization	15 (9.0)
Hypogastric artery ligation	23 (13.8)
Stepwise uterine devascularization and hypogastric artery ligation	7 (4.2)
Uterine compression suture	16 (9.6)
Balloon catheter occlusion	0
Methotrexate administration	21 (12.6)
Primary hysterectomy	18 (10.8)
Cause of primary hysterectomy	
Primary postpartum hemorrhage	18/18 (100)
Postpartum prophylactic antibiotic therapy >5 d	54 (32.3)
Transfusion patients	70 (41.9)
Units of packed red blood cells transfused >5	25 (15.0)
Transfer to intensive care unit	43 (25.7)

Infection	47 (28.1)
Septic shock	1 (0.6)
Sepsis	7 (4.2)
Vesicouterine fistula	1 (0.6)
Uterine necrosis	2 (1.2)
Deep vein thrombophlebitis or pulmonary embolism	4 (2.4)
Secondary postpartum hemorrhage	18 (10.8)
Delayed hysterectomy	18 (10.8)
Median interval from delivery to delayed hysterectomy, d	22 (9–45)
Cause of delayed hysterectomy	
Secondary postpartum hemorrhage	8/18 (44.4)
Sepsis	2/18 (11.1)
Secondary postpartum hemorrhage and sepsis	3/18 (16.7)
Vesicouterine fistula	1/18 (5.6)
Uterine necrosis and sepsis ^d	2/18 (11.1)
Arteriovenous malformation	1/18 (5.6)
Maternal request	1/18 (5.6)
Death	1 (0.6)
Success of conservative treatment	131 (78.4)
Severe maternal morbidity	10 (6.0)

^aModified from Sentilhes et al.²

- **Gentle attempted removal of the placenta**
- **Methotrexate adjuvant treatment**
- **preventive surgical or radiological**
- **uterine devascularization**
- **Systematic hysteroscopic resection of**
- **retained accreta tissue**

One-step conservative surgery

Box 1 One-step conservative surgery approach for placenta accreta spectrum (PAS) disorders.^a

1. Vascular disconnection of newly-formed (feeder) vessels and the separation of invaded uterine tissues from invaded vesical tissues.
2. Upper-segmental hysterotomy and delivery of the fetus.
3. Resection of all invaded myometrial tissue and the entire placenta in one piece with previous local vascular control.
4. Surgical procedures for hemostasis.
5. Myometrial reconstruction in two planes.
6. Bladder repair if necessary.

^a Modified from Palacios-Jaraquemada.⁵²

The Triple-P procedure

The aim of this procedure is to avoid incising through the vascular placental venous sinuses, and to excise the myometrium with PAS disorder tissue and to reconstitute the uterine defect.

The main steps of this procedure include:

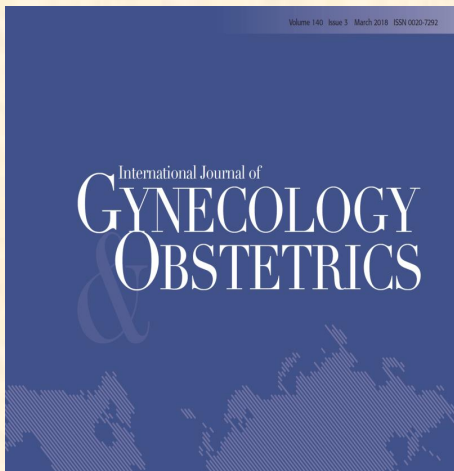
- (1) Perioperative placental ultrasound localization of the superior edge of the placenta;
- (2) pelvic devascularization involving preoperative placement of intra-arterial balloon catheters (anterior division of the internal iliac arteries);
- (3) no attempt to remove the entire placenta with large myometrial excision and uterine repair.

If the posterior wall of the bladder is involved, the placental tissue invading the bladder is left in situ to avoid cystotomy

Conservative management

TABLE 2 Recommendations for conservative management of placenta accreta spectrum (PAS) disorders.

Recommendations	Resource settings	Quality of evidence and strength of recommendation
Leaving the placenta in situ is an option for women who desire to preserve their fertility and agree to continuous long-term monitoring in centers with adequate expertise	High	Moderate and Strong
The extirpative approach or forcible manual removal of the placenta should be abandoned	All	High and Strong
When a conservative treatment is attempted in cases of PAS disorders diagnosed prenatally, the exact position of the placenta should be confirmed by a preoperative ultrasound and the equipment and expert surgical team should be on stand-by for an emergent hysterectomy	High	Moderate and Strong
After the delivery of the fetus, and only in cases with no clinical evidence of invasive PAS disorders, the surgeon may carefully attempt to remove the placenta by controlled cord traction and the use of uterotonics	All	Low and Strong
Postoperative antibiotic therapy (amoxicillin and clavulanic acid or clindamycin in case of penicillin allergy) should be administered prophylactically to minimize the risk of infection when the placenta is left in situ	High	Low and Weak
The use of methotrexate is not recommended until further evidence is available on its efficacy and safety	High	Moderate and Strong
Preventive surgical or radiological uterine devascularization is not recommended routinely	High	Low and Weak
There is insufficient evidence to recommend the use of magnetic resonance imaging and/or measuring serum β-hCG for the monitoring of conservative management cases	High	Low and Weak
Women who want another pregnancy should be advised that the recurrence risk of PAS disorders is high	All	High and Strong
The one-step conservative surgery is less reproducible than other conservative management approaches, mainly because the efficacy of hemostasis is operator dependent	High	Low and Weak



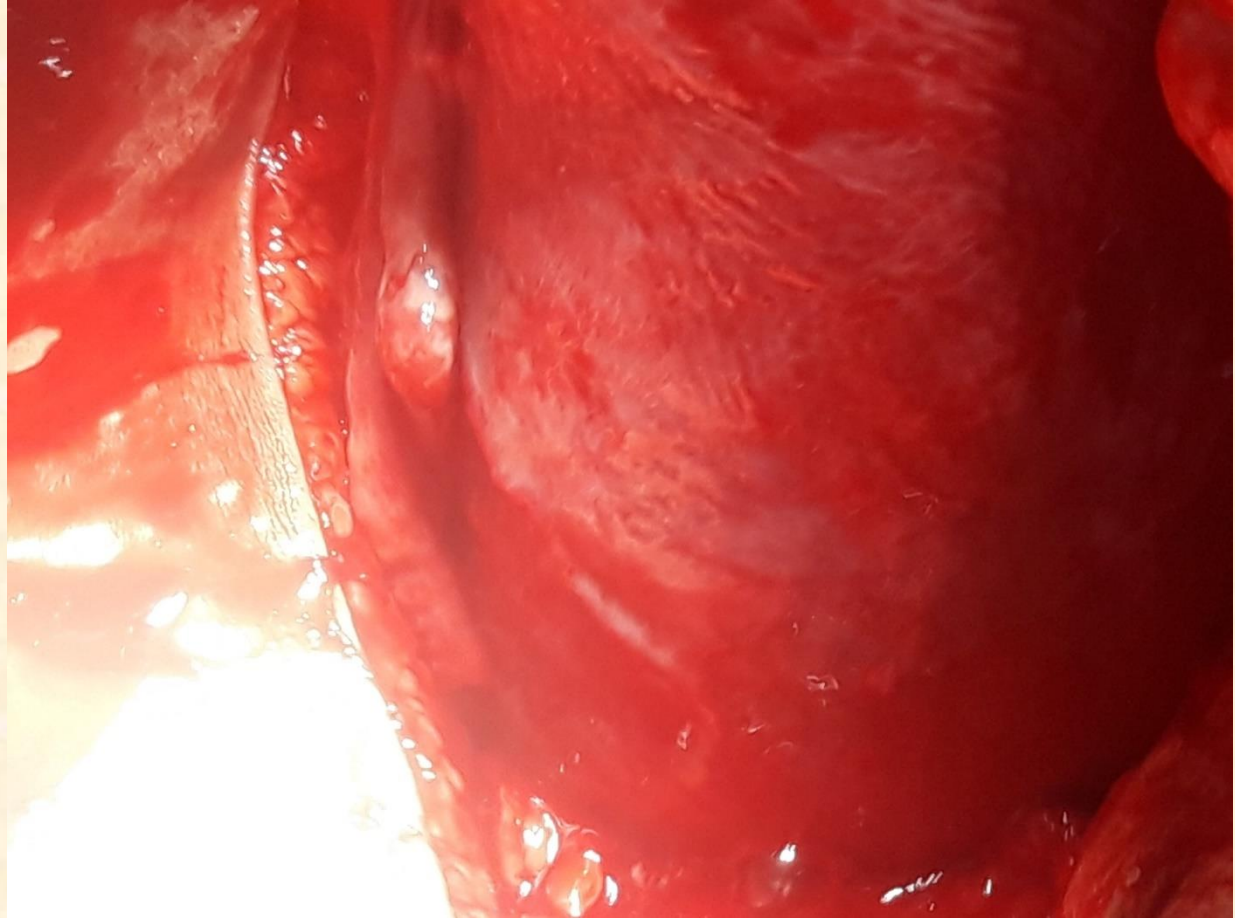
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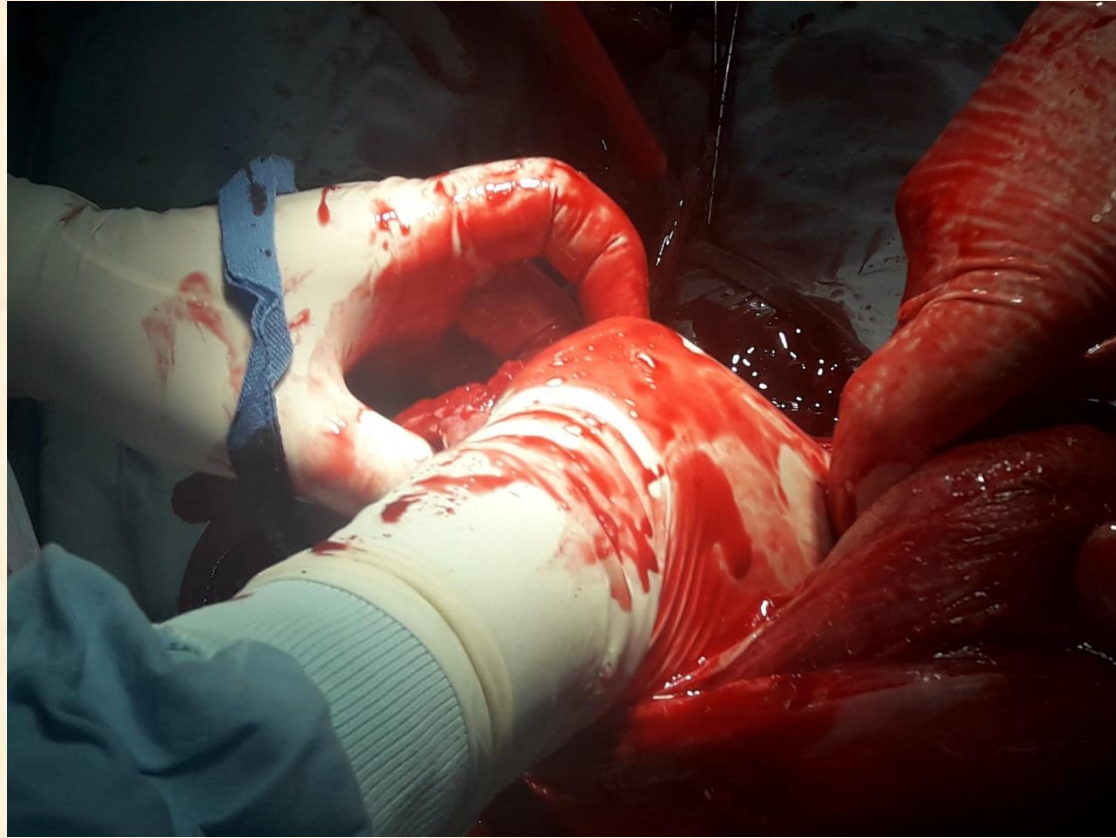
Conservative methods → fertility sparing

- Recurrence rate 22%- 26%
- Severe bleeding 24%
- Ashermann Syndrome and amenorrhea

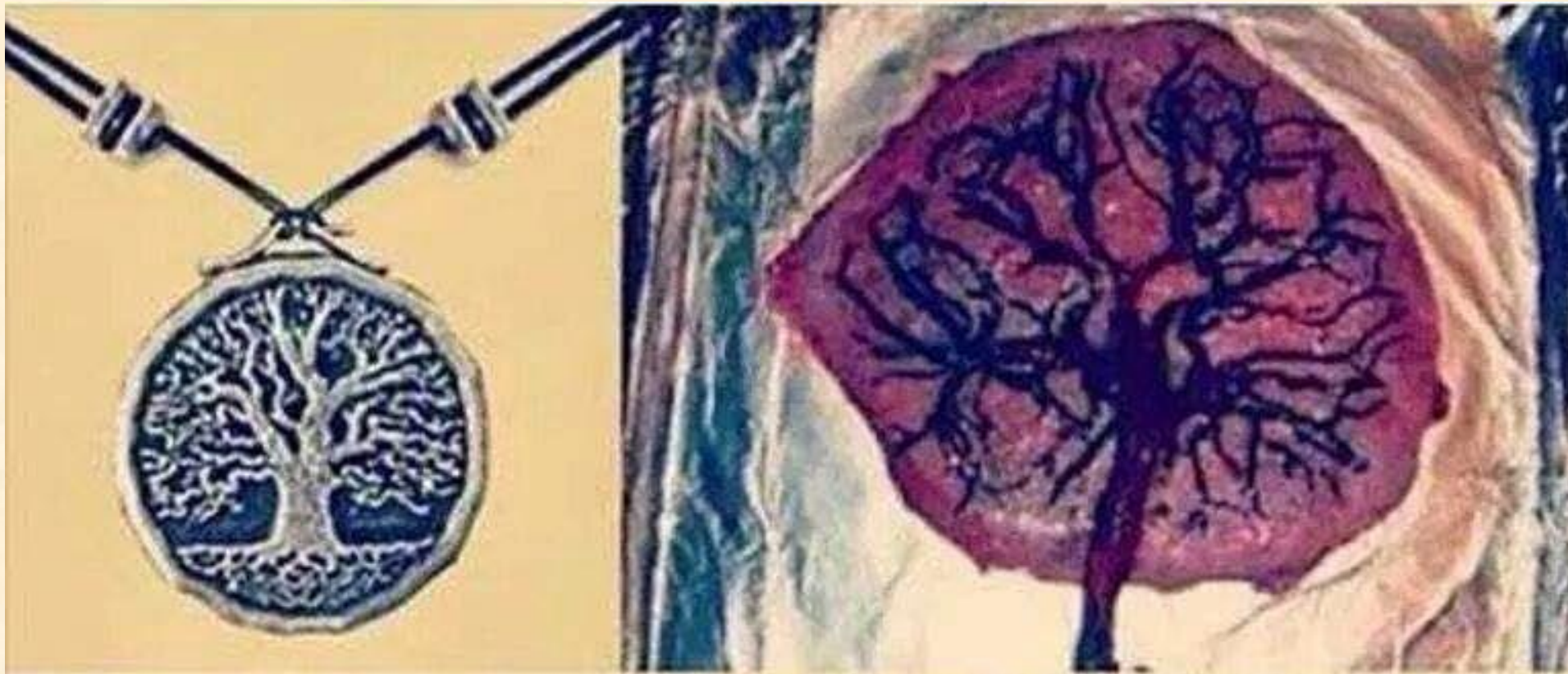
Conservative management

Ι τοκος ,
1 D&C
Επιπωματικός οπίσθιος









TREE OF LIFE

HUMAN PLACENTA

Thank you for your attention