

Türkiye Maternal Fetal Tıp ve Perinatoloji Derneği

# ULTRASONOGRAFİ KURSU



Maternal - Fetal Tıp ve Perinatoloji Derneği

Türkiye



2-4 KASIM 2017

HARBİYE ASKERİ MÜZE, İSTANBUL

*Prof. Dr. Hayri Ermiş*  
*Anısına...*

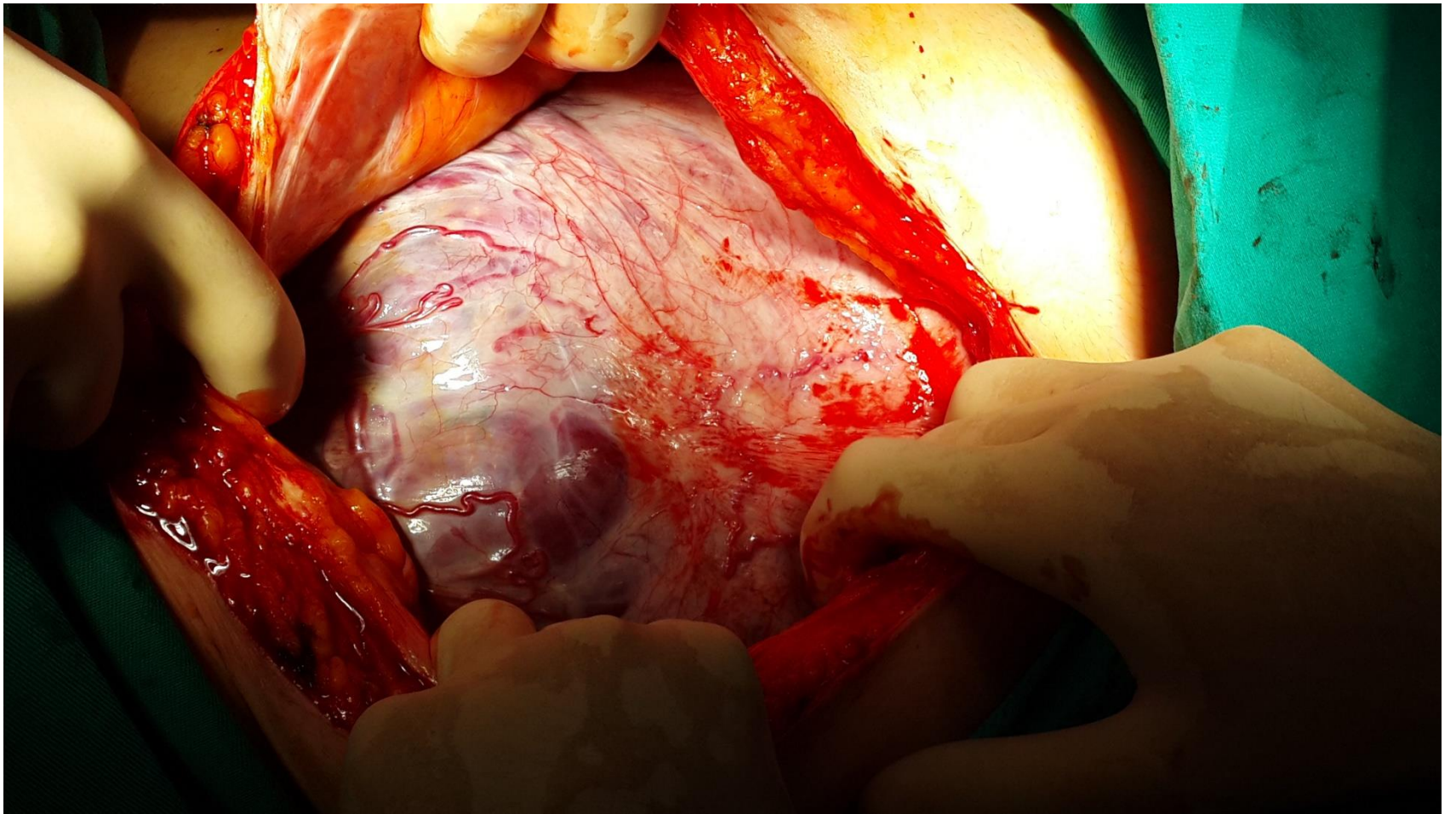


## Plasenta previa/akreata tanısı, hangi haftalarda nelere dikkat edilmeli?

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N.E. Üniversitesi Meram Tıp Fakültesi

Perinatoloji BD



# Plasenta Yapışma Anomalileri

## PYA KOMPLİKASYONLAR:

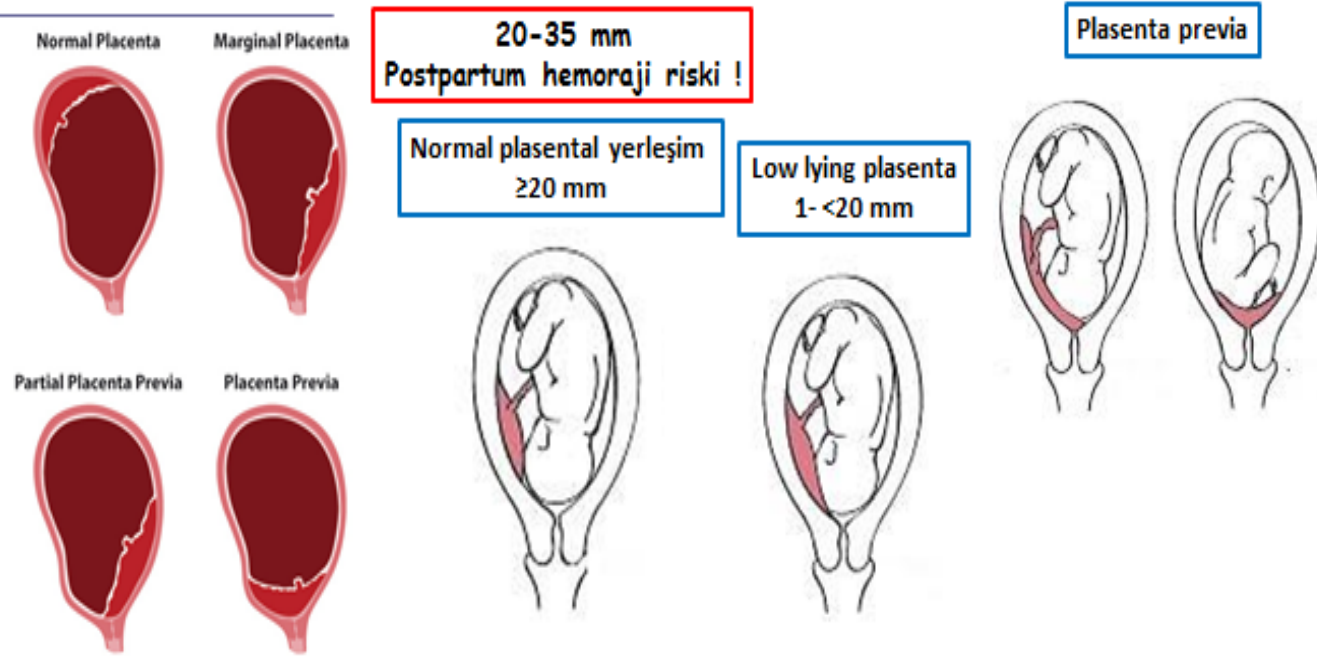
>10 Ü transfüzyon	%40
İnfeksiyon	%28
Perinatal ölüm	%9
Maternal ölüm	%7
Üreter ligasyonu veya	
Fistül oluşumu	%5
Spontan uterus rüptürü	%3

- O'Brien, JM, Barton, JR, Donaldson, ES. The management of placenta percreta: conservative and operative strategies. Am J Obstet Gynecol 1996; 175:1632-1638.

# Plasenta praevia

Sıklık %0.5 → CS'den sonra %5  
Ağrısız, ciddi kanama  
Genelde gebelikte tanı konur  
Plasenta accreta – increta –  
percreta nedenidir  
CS sırasında yaşamsal tehlike  
yaratan ciddi kanamalar  
Prenatal tanı ve planlı CS ile  
kanama daha az  
Peripartal histerektomi  
endikasyonu

## Plasenta Previa



Curli S. Cervical length and risk of antepartum hemorrhage in presence of low-lying placenta. J Matern Neonatal Med 2018;29:1018-2.  
Miyazawa S. Bleed less in low-lying placenta: placental edge to cervical internal os distance of less is more than 2 cm. J Perinatol Med 2008;30:107-11.  
MMA Imaging. Executive Summary of Joint RCOG, SOGC, SGO, ACOG, SFR, Society of Fetal Medicine in Ultrasound. Maternal Imaging. Obstet Gynaecol 2014;118:1070-82.

# TV/TA US

- TA-US'un plasenta previa tanısında FPR %25
- TA-US ile aşağı yerleşimli plasenta tanısı konulan hastalarda,
  - İkinci trimesterde %26–60
  - Üçüncü trimesterde %12.5 normal yerleşimli plasenta
  - Servikal os ile plasenta arası mesafe  $\leq 2$  cm ise TV-US yapılmalıdır
- İlk trimesterde görüntüleme TV-US ve dolu mesane ile color Doppler kullanılarak yapılmalıdır
- TV-US plasenta previa tanısında sensitivite %87, spesifite %98
- Alt uterin segmenti, servikal os ile plasenta ilişkisini ve plasental invazyonu değerlendirmede TV-US TA-US'dan daha etkinidir, önerilen geçerli standart uygulama olmalıdır

Smith RS, Transvaginal ultrasonography for all placentas that appear to be low-lying or over the internal cervical os. *Ultrasound Obstet Gynecol* 1997;9:22–4.

Lauria MR, The use of second-trimester transvaginal sonography to predict placenta praevia. *Ultrasound Obstet Gynecol* 1996;8:337–40.

Leerentveld RA, Accuracy and safety of transvaginal sonographic placental localisation. *Obstet Gynecol* 1990;76:759–62

American College of Obstetricians and Gynecologists. Placenta accreta. ACOG committee opinion no. 529. *Obstet Gynecol* 2012;120:207-11

# Plasental Migrasyon

- Placenta previa prevalansı 5.2/1000
- Midtrimesterde aşağı yerleşimli olarak tanımlanan plasentaların %90'ı üçüncü trimesterde normal yerleşimli olarak görülür
  - Alt uterin segment uzunluğu 20. haftada 0.5 cm → termde 5 cm
  - Trofotrofizm; trofoblastik dokunun fundusa yer değişimi
    - Posterior placenta varlığı ve geçirilmiş C/S ile ↓
- Asemptomatik placenta previa ve şüpheli invazyon olgularında 32. haftada US tekrarı önerilir
  - ≥26 gestasyonel haftada;
    - Placenta internal os'u 2 cm'den fazla geçiyor ise migrasyon görülmemiştir
    - internal servikal os'a uzaklık
      - >2 cm ise hepsinde migrasyon
      - < 2 cm ise %88.5 migrasyon

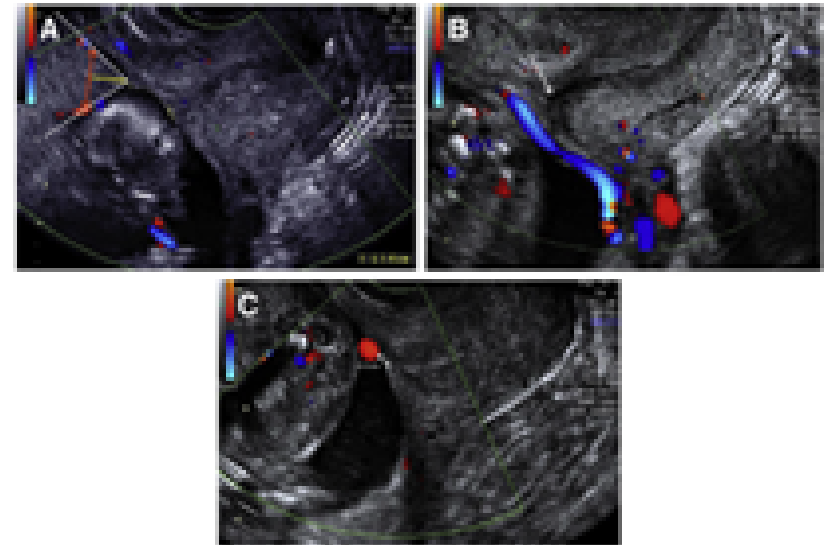
# PP-Antepartum Hemoraji Riski

- Aşağı yerleşimli plasenta varlığında antenatal kanama ve acil preterm C/S riski:
  - **Servikal os-plasenta arası mesafe  $\leq 10$  mm** olan hastalarda, 11-20 mm olanlar ile karşılaştırıldığında
    - kanama riski 11 kat fazladır (29% vs 3%; OR, 11.5; 95% CI, 1.6-76.7) ve preterm doğum oranı 73% vs 24%
  - **Plasental kalınlık  $>1$  cm / bazal ve koryonik plate arasındaki açı  $45^\circ$** , bazal ve koryonik plate birleşim yerinin 1 cm üstünde yapılan ölçümde  $>1$  cm ise “kalın plasental uç”
    - antepartum kanama (40% vs 88%),  $<36$  haftada acil C/S doğum (53% vs 26%), düşük doğum ağırlığı (1.93 vs 2.72),
    - plasental migrasyon %29 vs %5.8

# PP- Antepartum Hemoraji Riski

- **Servikal uzunluk  $\leq 30$  mm**
  - kanama (79% vs 28%), preterm doğum (69% vs 21%), AİP nedeniyle sezaryen histerektomi (31% vs 8%).
  - servikal uzunluk  $>30$  mm  $\rightarrow$  %80 term ( $>37$  hafta),  $\leq 30$  mm %31 term
- **Servikal os üzerinde süngerimsi alan color Doppler ile plasenta sınırında artmış vaskülarizasyon olmadığı görülmelidir.**  
Vakaların %83'ünde ani masif kanamaya ile preterm doğuma neden olabilir
- **3. trimesterde servikal uzunlukta kısalma görülmesi**

FIGURE 2  
Ultrasound pictures of low-lying placenta and vasa previa



A, Measurement of the distance between internal os and placental edge is  $L = 1.41$  cm (internal cervical os and placental edge are marked by + signs); measurement of placental edge thickness (red double arrow) in low-lying placenta is performed within 1 cm (yellow line = 1 cm); the angle (white dotted lines) between the basal and chorionic plate is  $>45$  degrees. Vasa previa—aberrant fetal vessel is running B, exactly behind internal cervical os (arrow) or C, in close proximity (0.3 cm) to internal cervical os.

Yoshida. Using ultrasound in clinical management of placental implantation abnormalities. Am J Obstet Gynecol 2011.



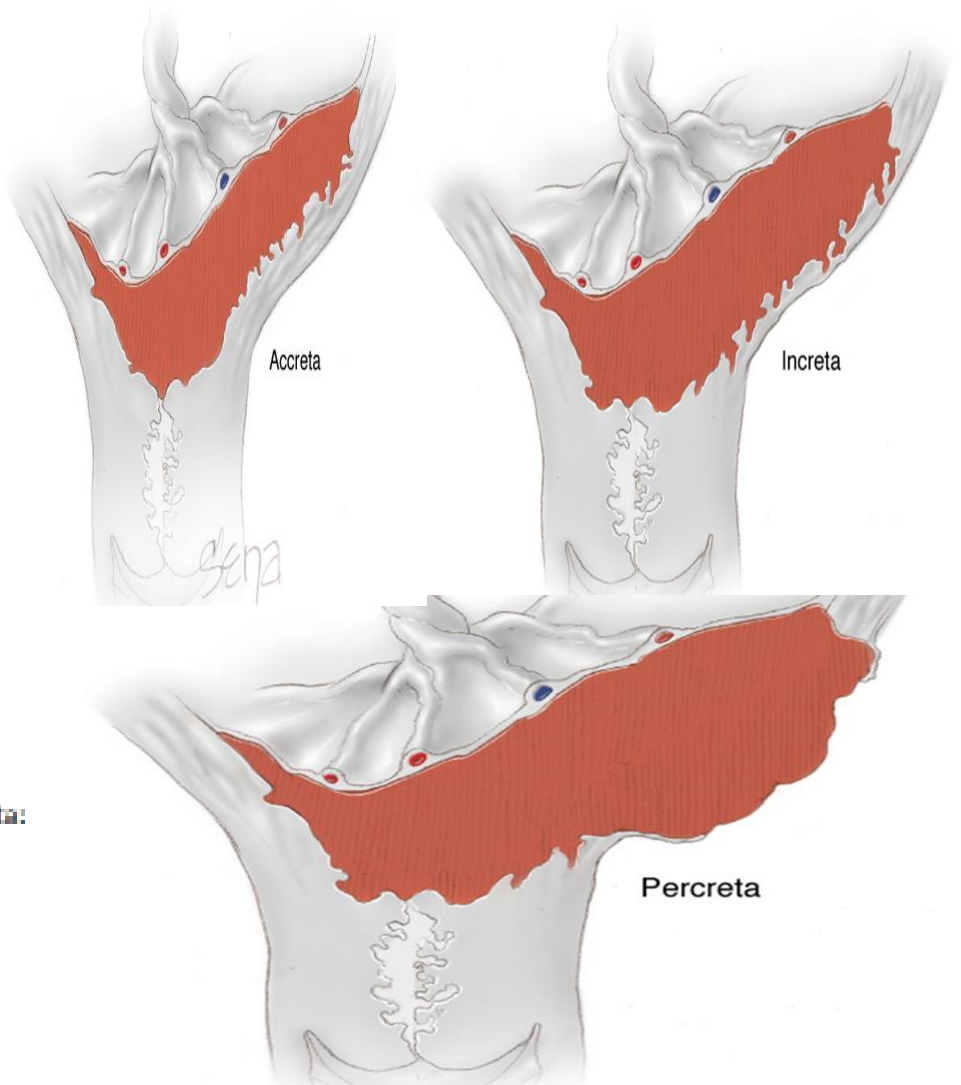
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NECMETTİN ERBAKAN  
ÜNİVERSİTESİ

# Plasenta Yapışma Anomalileri

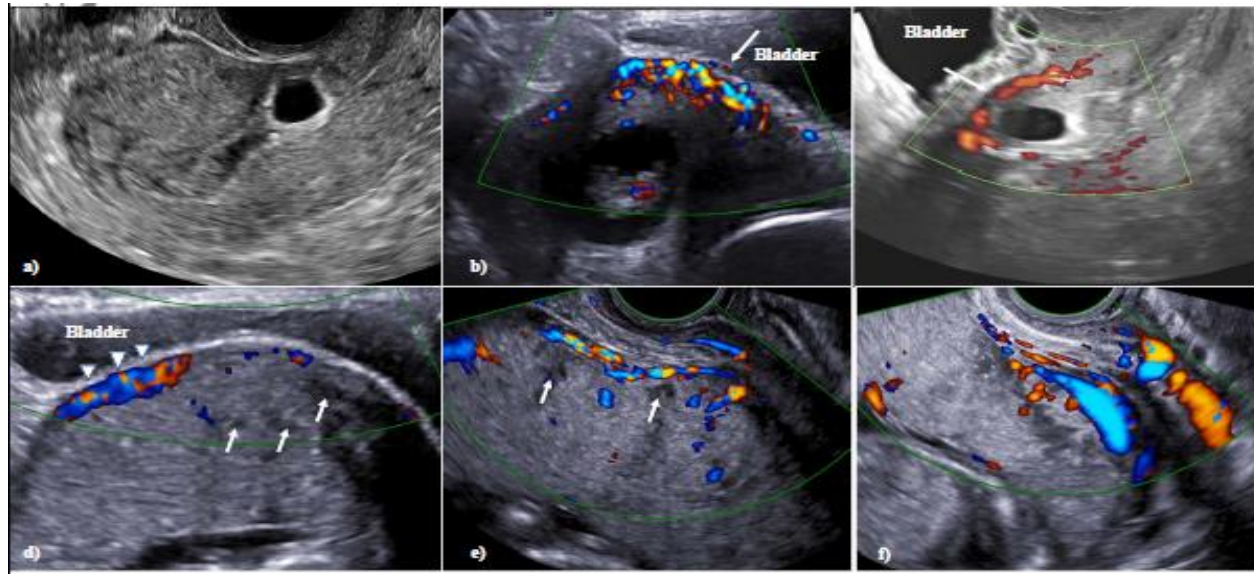
- PYA plasental dokunun uterusun endometrial hattının ötesine anormal penetrasyonu olarak tanımlanmaktadır
- Spekturum içinde 3 varyant görülmektedir:
  - ◆ Plasenta akreata vera (%75-80)
    - \* Plasentanın myometriuma muskuler invazyon olmadan tutunması
  - ◆ Plasenta inkreata (%15)
    - \* Koryonik villuslar myometriumu invaze eder
  - ◆ Plasenta Perkreata (%5)
    - \* Koryonik villusların serozaya doğru penetrasyonu
    - \* Mesaneyi, rektumu, parametriumu invaze edebilir

• Mazouni C, Gorincour G, Juhan V, Bretelle F. Pla- centa accreta: review of current advances in prenatal diagnosis. *Placenta* 2007;28(7):599-603



# AIP- ilk Trimester

- Ultrasound criteria to diagnose CSP and AIP during the first trimester
  - a) Low implantation of the gestational sac, implanted in the location of the prior CS scar
  - b,c) Rich vascular pattern in the area between the CS scar and the placenta. The myometrium beneath the placental mass is irregular. No intra-placental lacunae can be detected.
  - d,e) TA scan at 14 weeks of gestation. The abnormal location of the gestational sac is more difficult to be appreciated with advancing gestation. The myometrium beneath the placenta is not entirely visible in some areas and there is also increase sub-placental vascularity (arrowheads); intra-placental lacunae can be seen at this stage as hypoechoic spaces within the parenchyma. (arrows).
  - f) TA scan at 17 weeks of gestation showing the classical second trimester signs of AIP, such as intra-placental lacunae, abnormal uterine bladder interface with increased vascularity and absence of the retro-placental clear space



# AİP- İlk Trimester

- 7 çalışma, 551 gebelik
- En az bir US bulgusu vakaların %91.4'ünde (95% CI 85.8-95.7)
- İlk trimesterde en sık karşılaşılan bulgu skar hattına yakın aşağı yerleşimli gestasyonel kese %82.4 (95% CI 46.6-99.8)
- **Aşağı yerleşimli gestasyonel kese varlığında AİP riski 19 kat artmıştır, (OR:19.6, 95% CI 6.7-57.3), sensitivite %44.4 (95% CI 21.5-69.2) spesifite %93.4 (95% CI 90.5-95.7)**
- İntraplasental lakunler %46 (95% CI 10.9-83.7)
- Azalmış myometrial kalınlık %66.8 (95% CI 45.2-85.2)
- 11. haftadan önce dahi AİP US bulguları mevcuttur

# Plasenta Yapışma Anomalileri

## PYA TANISI:

### ◆Biyolojik Belirteçler:

- \*Kreatin kinaz, AFP (Açıklanamayan yükseklik), HCG, Serbest Fetal DNA
- \*Etkinlikleri, kullanılabilirlikleri sınırlı
- \*Maliyet problemi mevcut

### ◆Görüntüleme Yöntemleri:

- \*Ultrason
- \*Manyetik Rezonans

**◆Hiçbir yöntem %100 tanı koydurmaz!!**



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# Görüntüleme Önerileri:

- Ultrason PYA için birincil tanısal araçtır.
- Ultrasonun duyarlılığı %77-93, özgüllüğü %71-96.
- Ultrason ve MR, PYA'yı tanımlamada eşit oranda etkindirler.
- MR duyarlılığı %80-88, özgüllüğü %65-100.
- Derin infiltrasyonu değerlendirmede MR daha üstündür.
- Posterior plasentada değerlendirmede MR daha üstündür.
- Öncesinde myomektomi, septum rezeksiyonu gibi cerrahi veya enstrümantasyon hikayesi varlığında MR öncelikli düşünülmelidir.
- Previa/anterior plasenta için renkli doppler ile transvajinal ultrason kullanımı düşünülmelidir.
- 2-3 hafta aralıkla seri ultrason takibi önerilir.

**Plasenta akreata vera, plasenta perkreata'ya doğru ilerleyebilir!!**

•Levine, D., et al., Placenta accreta: evaluation with color Doppler US, power Doppler US, and MR imaging. Radiology, 1997. 205(3): p. 773-6.

•Palacios Jaraquemada, J.M. and C.H. Bruno, Magnetic resonance imaging in 300 cases of placenta accreta: surgical correlation of new findings. Acta Obstet Gynecol Scand, 2005. 84(8): p. 716-24.

# Tanı

- Ultrasonografi (TA.TS)

a- geniş irreguler birden fazla lakünler

b-retroplesantal hipoekojenik zonun kaybı

c-retroplasental myometriumun ileri derecede incelmesi

d-uterus kavite sınırları dışında plasental parankim izlenmesi

- Doppler ultrasonografi

a- lakünler içerisinde türbülant akım

b- uterus eksenine dik plasenta-myometrium veya komşu organlar doğrultusunda seyreden damarların varlığı

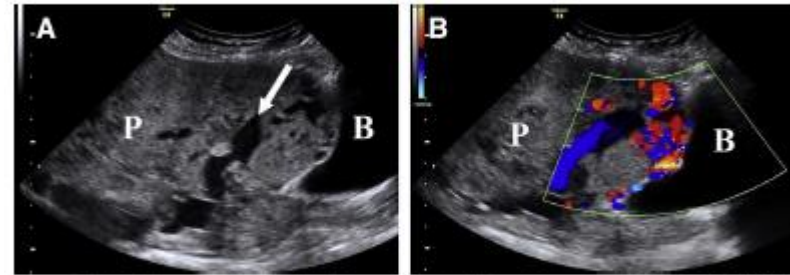
- MR

- 3D

# Plasental Lakünler

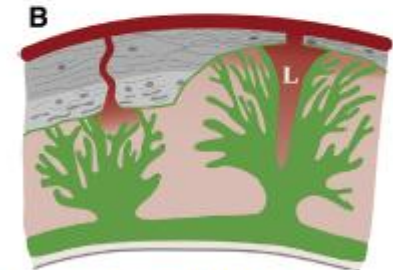
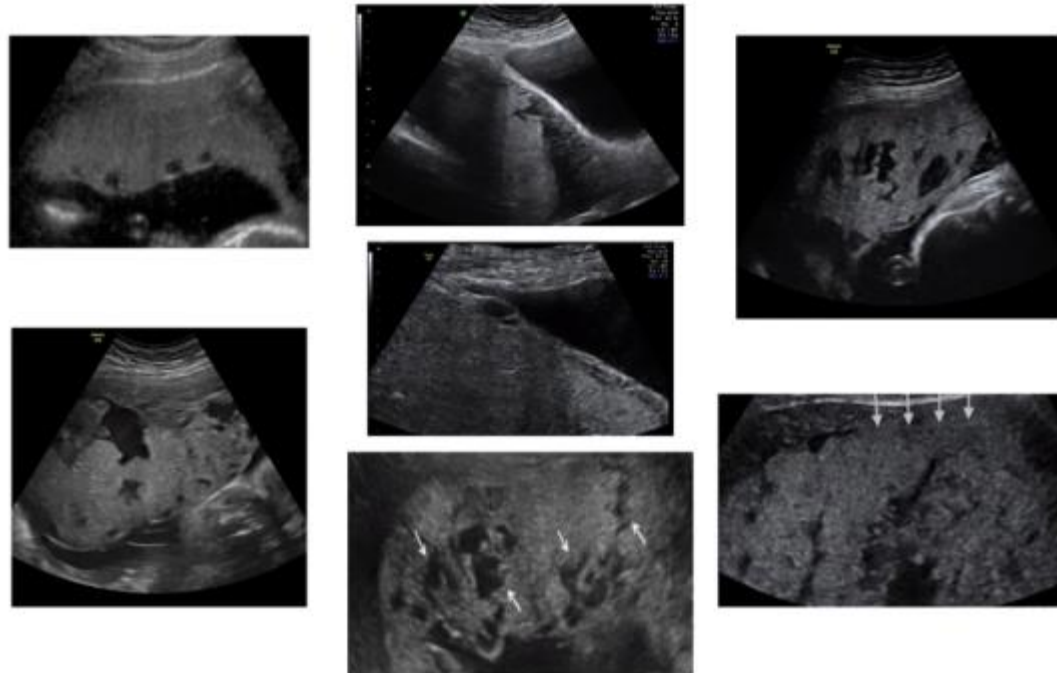
**EW-AIP: Sıklıkla turbulan akım içeren, çok sayıda, geniş ve düzensiz intraplasental lakünler**  
**Sensitivite %77.4 spesifite %95**

**FIGURE 10**  
**Moth-eaten features in invasive placenta previa**



Transabdominal ultrasound longitudinal views of placenta (P) previa accreta at 36 weeks. **A**, "Moth-eaten" area with numerous lacunae of different size and shape secondary; and **B**, high-velocity, turbulent blood flow within lacunae on color Doppler imaging next to bladder (B).

*Jainiaux. Pathophysiology and ultrasound imaging of placenta accreta spectrum. Am J Obstet Gynecol 2017.*



Placental cotyledon in **A**, normal and **B**, increta placentation reaching deep myometrial circulation. Note distortion of normal cotyledon anatomy in increta placentation with loss of intercotyledon septa and formation of lacuna (L).

*Jainiaux. Pathophysiology and ultrasound imaging of placenta accreta spectrum. Am J Obstet Gynecol 2017.*

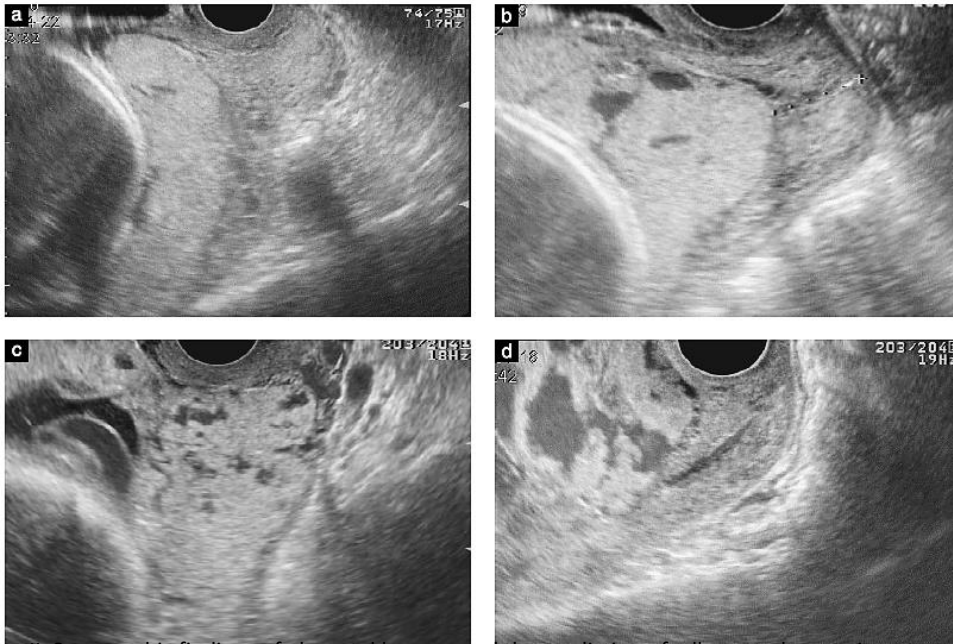
# Plasental Lakün/Grading

**Grade 0: lakün yok (1a)**

**Grade 1: 1-3 adet küçük lakün (1b)**

**Grade 2: 4-6 adet geniş ve düzensiz lakün (1c)**

**Grade 3: Fazla sayıda geniş, düzensiz turbulan akım içeren lakünler (1d)**

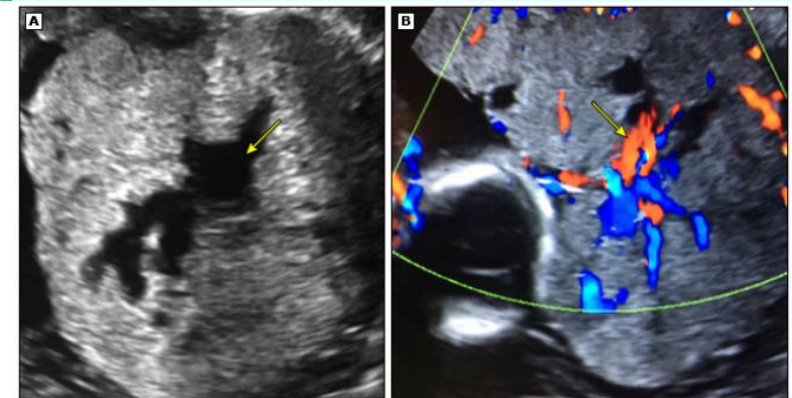


**Table 3** Diagnostic accuracy of adherent placenta according to lacunae

	<i>Sensitivity (%)</i>	<i>Specificity (%)</i>	<i>PPV (%)</i>	<i>NPV (%)</i>
Diagnosis of adherent placenta when lacunae were $\geq$ Grade 1	86.9	78.6	76.9	88.0
Diagnosis of increta, or percreta when lacunae were $\geq$ Grade 2	100	97.2	93.8	100

NPV, negative predictive value; PPV, positive predictive value.

**Placental lacuna in placenta increta on US**



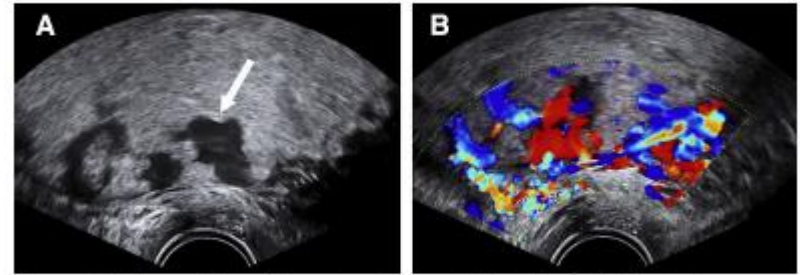
A transverse transabdominal ultrasound (A) demonstrates tortuous placental lacuna (arrow) confirmed on the color Doppler (B).

# Plasental Lakun İçerisinde Kan Akımı

**EW-AIP: Plasental lakunler içerisinde turbulan akıma neden olan ve myometriumdan kaynaklanan yüksek hızlı (>15 cm/s) akım**

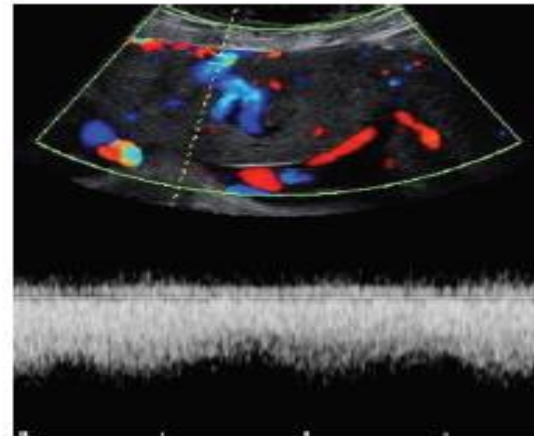
**FIGURE 11**

Lacunae distorting several cotyledons in a placenta previa increta



Transvaginal ultrasound views of placenta previa increta at 20 weeks. A, "Moth-eaten" appearance of placenta with numerous lacunae of different size and shape secondary (arrow); and B, high-velocity, turbulent blood flow within lacunae on color Doppler imaging.

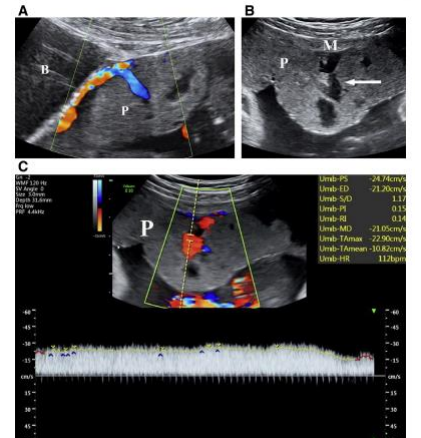
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**Figure 10 Placental lacunae feeder vessels on color Doppler imaging.**

**FIGURE 13**

Lacunae and corresponding feeding artery in invasive placentation



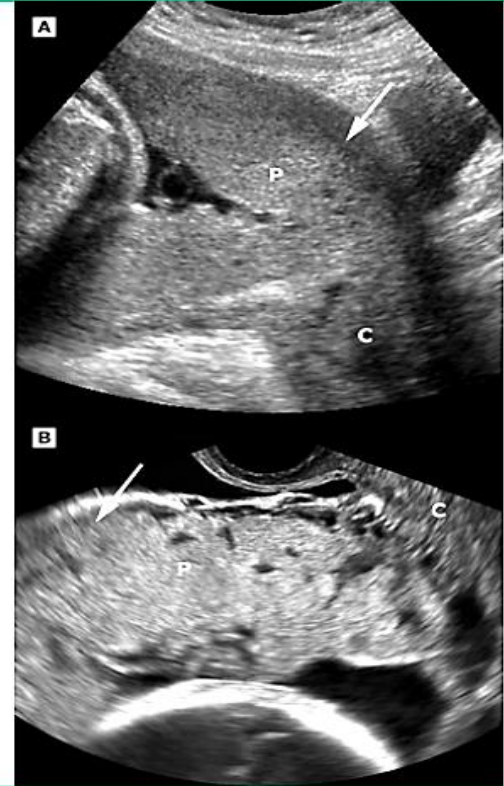
Transabdominal ultrasound longitudinal views of placenta P1 at 20 weeks with feeding artery from anastomotic circulation between P and bladder (B) entering lacuna. B, Centrocotyledon lake at 28 weeks' gestation in uncomplicated pregnancy. Note presence of uterine myometrium (M). C, Velocity flow entering lake from corresponding feeder spiral artery.

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# Normal Retroplental Alan

- Plasenta myometriümdan daha ekojenik görünümündedir
- Plasenta ile myometriüm arasında desidua basalis işaret eden ince subplental hipoekoik alan mevcuttur
- Color Doppler → Normal retroplental myometrial akım myometriüme paralel, düzenli ve devamlıdır, aralıklı olarak plasentaya damar girişleri görülebilir

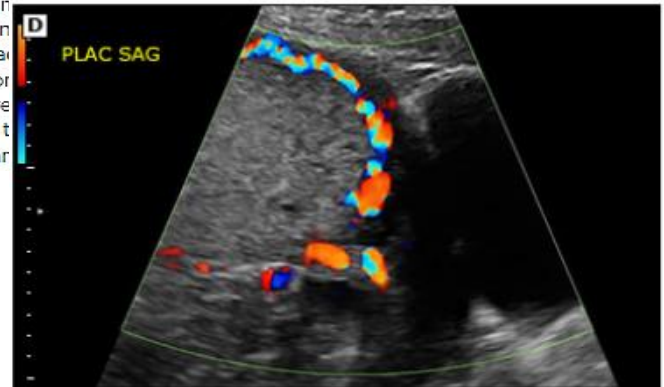
Sonogram of placenta previa and placenta previa accreta



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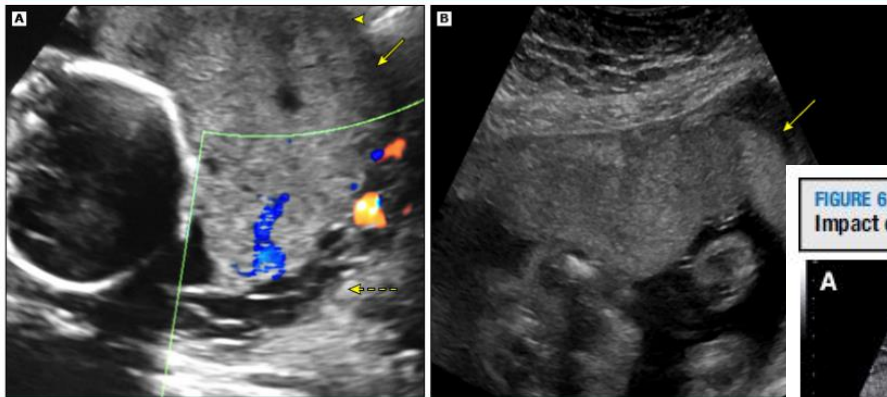


# Retroplacental Alan 'Clear Zone'

**EW-AIP: Placenta yerleşim alanında bulunan myometriümda hipoekoik sınır kaybı/ düzensiz görünümü**  
**Sensitivite %66.24, Spesifite %95.76**



Placenta increta and normal placenta on US



A sagittal view on ultrasound in a patient with placenta increta (A) demonstrates the normal hypoechoic line (arrow) that be (arrowhead). In addition, the placenta is covering the cervical os (dashed arrow), demonstrating a complete placenta previa. Transabdominal ultrasound of a normal placenta (B) demonstrates a normal uninterrupted thin hypoechoic line at the inner myometrium representing the normal retroplacental clear space (arrow).

**FIGURE 6**  
Impact of probe pressure and bladder filling on placental bed ultrasound features



Transabdominal ultrasound longitudinal views of same part of placental (P) bed of low-lying P at 32 weeks using same machine settings. Full bladder (B) with A, minimal and B, increased probe pressure. C, Empty B and minimal probe pressure. Note changes in clear zone (arrows).

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# Myometrial Kalınlık

**FIGURE 4**  
Smallest myometrial thickness

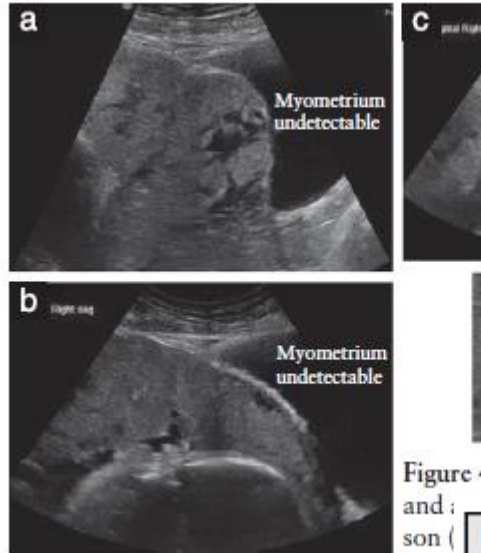
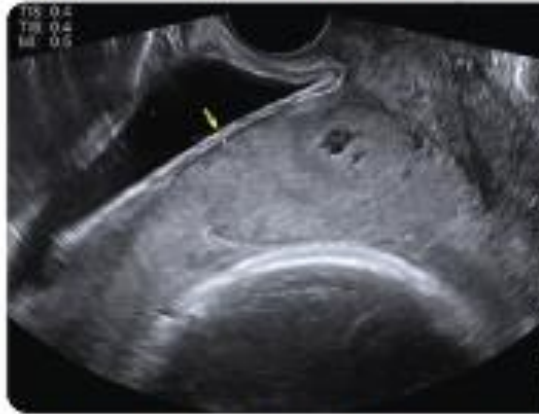
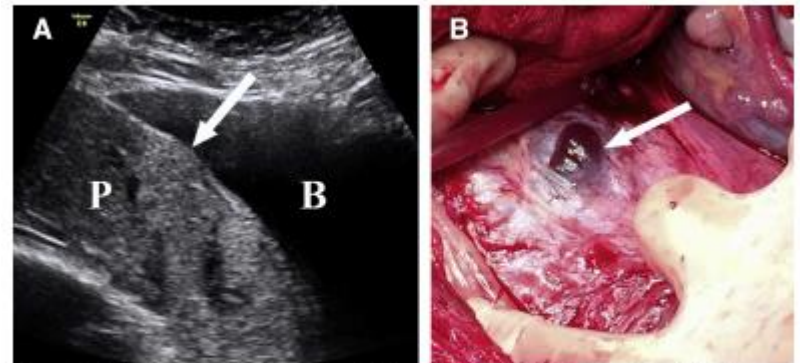


Figure 4 and ; son (

**FIGURE 8**  
Myometrial thinning under placental bed and cesarean scar defect



Myometrial thinning secondary to uterine thinning at scar defect. **A** Transabdominal ultrasound longitudinal view of placenta (P) previa at 36 weeks showing myometrium defect (arrow) under bladder (B). Note absence of clear zone and myometrium in area. **B**, Findings at surgery later same day of "uterine window" (arrow).

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Retroplacental myometrium is thin as result abnormal ingrowth of placenta. Smallest myometrial thickness in sagittal plane is measured. Measurement of smallest thickness is <1 mm.

*Roc. Placenta Accreta Index. Am J Obstet Gynecol 2015.*

**EW-AIP: Ekojenik serosa ve retroplasental hipoekoik zon arasında ölçülen myometrial kalınlık <1 mm**

# Mesane Sınırı

**EW-AIP: Uterin serosa ve mesane lümeni arasındaki hiperekoik parlak sınırdaki düzensizlik /kayıp**

**FIGURE 2**  
**Irregularity of uterine-bladder interface**



Arrows point to *dot-and-dash* appearance of echogenic uterine-bladder interface. This irregularity is caused by abnormal bridging vasculature that is easily seen with Doppler velocimetry.

Rac. Placenta Accreta Index. Am J Obstet Gynecol 2015.

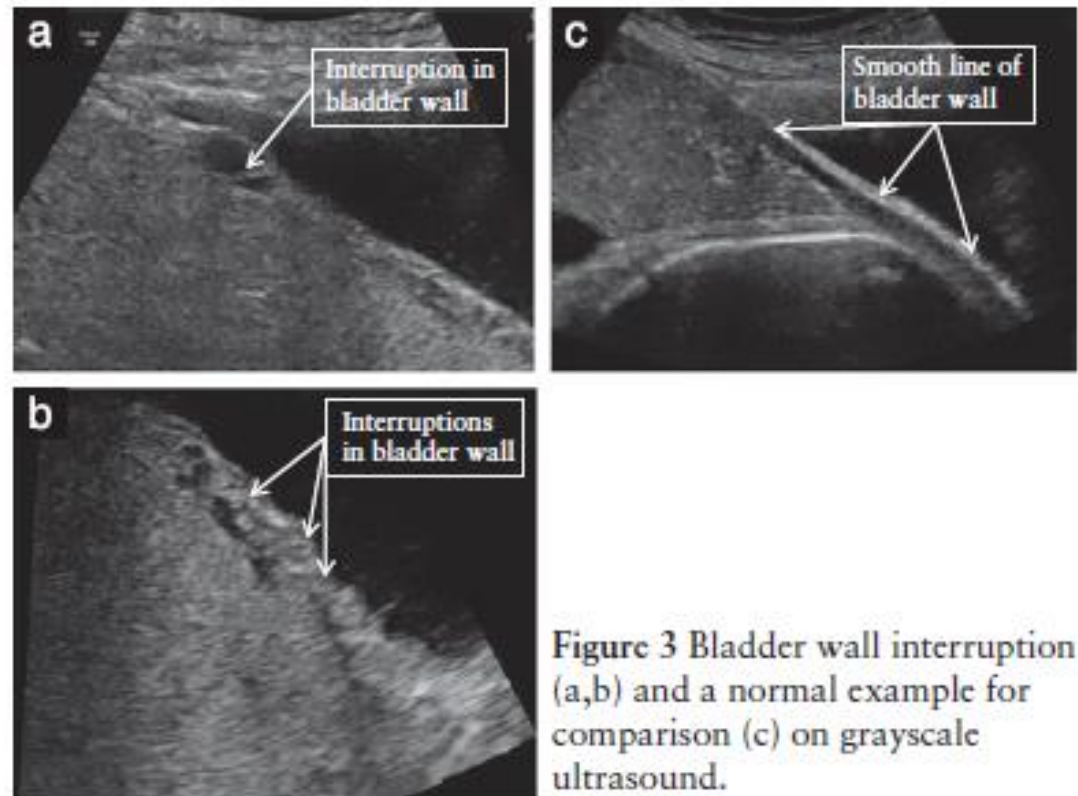
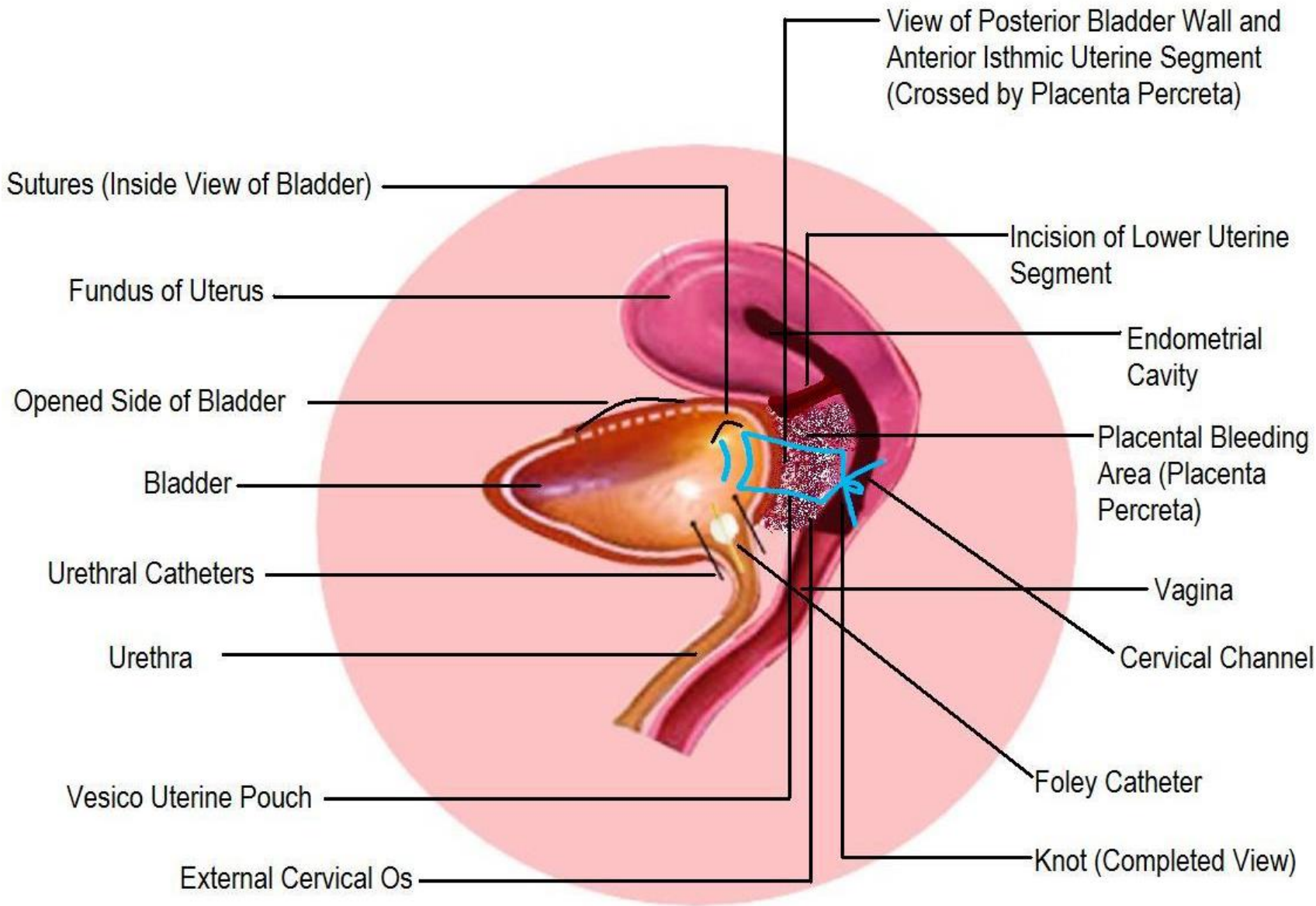
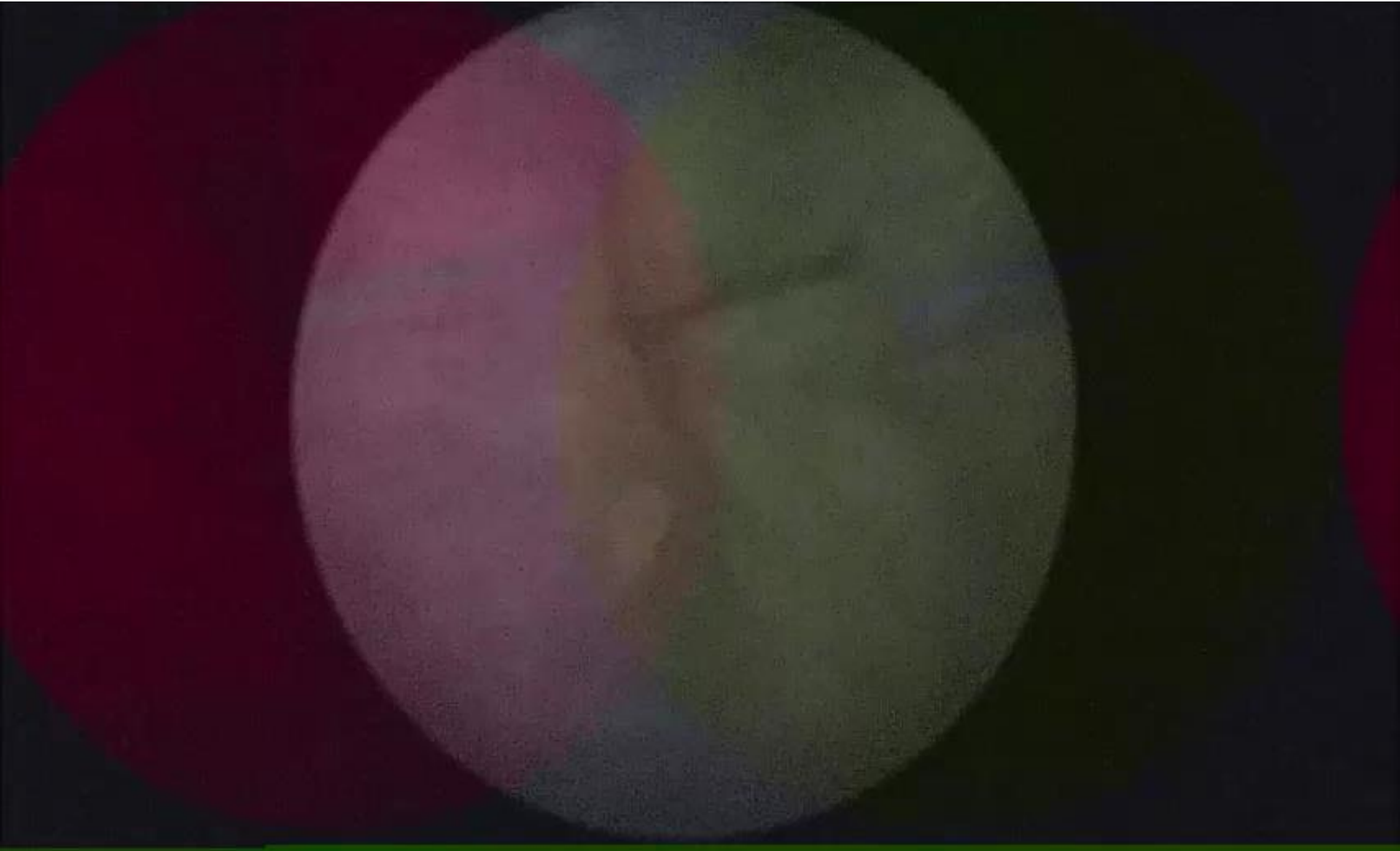


Figure 3 Bladder wall interruption (a,b) and a normal example for comparison (c) on grayscale ultrasound.





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# A new surgical approach for the management of severe postpartum hemorrhage due to uterine atony: preliminary results in 27 cases

A. Acar, R. Karatayli, B. Sayal, A. Elçi

*Necmettin Erbakan University Meram Medical School, Department of Obstetrics and Gynecology, Konya (Turkey)*

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## Summary

*Purpose of investigation:* To demonstrate a new suturing technique that effectively reduces severe postpartum hemorrhage secondary to uterine atony. *Materials and Methods:* The study consisted of 27 patients with persistent postpartum bleeding due to uterine atony which was unresponsive to medical treatment. The patients were treated with  $\infty$  compression sutures that passed through entire uterine wall on which the placenta was located and were knotted within uterine cavity. Demographic properties, complications, operative results are demonstrated. *Results:* Uterine bleeding was controlled in 26 of 27 cases (%96.3). Total abdominal hysterectomy was performed

- Planned conservative management of placenta Accreta/percreata; Intracavitary surgery approached analyzed **OF 62 CASES**
- 
- NECMETTİN ERBAKAN UNIVERSITY MERAM MEDICAL SCHOOL, DEPARTMENT OF OBSTETRICS AND GYN
- ECOLOGY KONYA/TURKEY
- 
- **ABSTRACT**
- **Objective:** in order to leave the uterus we approach intracavitary for the planned plasenta acreata cases .analyses of the 62 cases
- **Objective:** To evaluate and describe a new surgical technique for uterine preservation with management of the planned plasenta acreata cases .analyses of the 62 cases
- **Materials and Methods:** Women with placenta previa overlying previous cesarean scar who desired uterine conservation were included. For cases with accreta confirmed during cesarean delivery.the data including demographic properties, complications and the operative results. Among 62 who had placental insertion anomalies and who were treated with intrakaviter suture technique after clamping of peripheral uterine and overial vessels
- We use two different suture technique: (a.acar method
- 1-.We start suturation from intrauterin cavity and

# Uterine Preservation and Management of Postpartum Hemorrhage due to Placenta Invasion Abnormalities with a New Surgical Technique

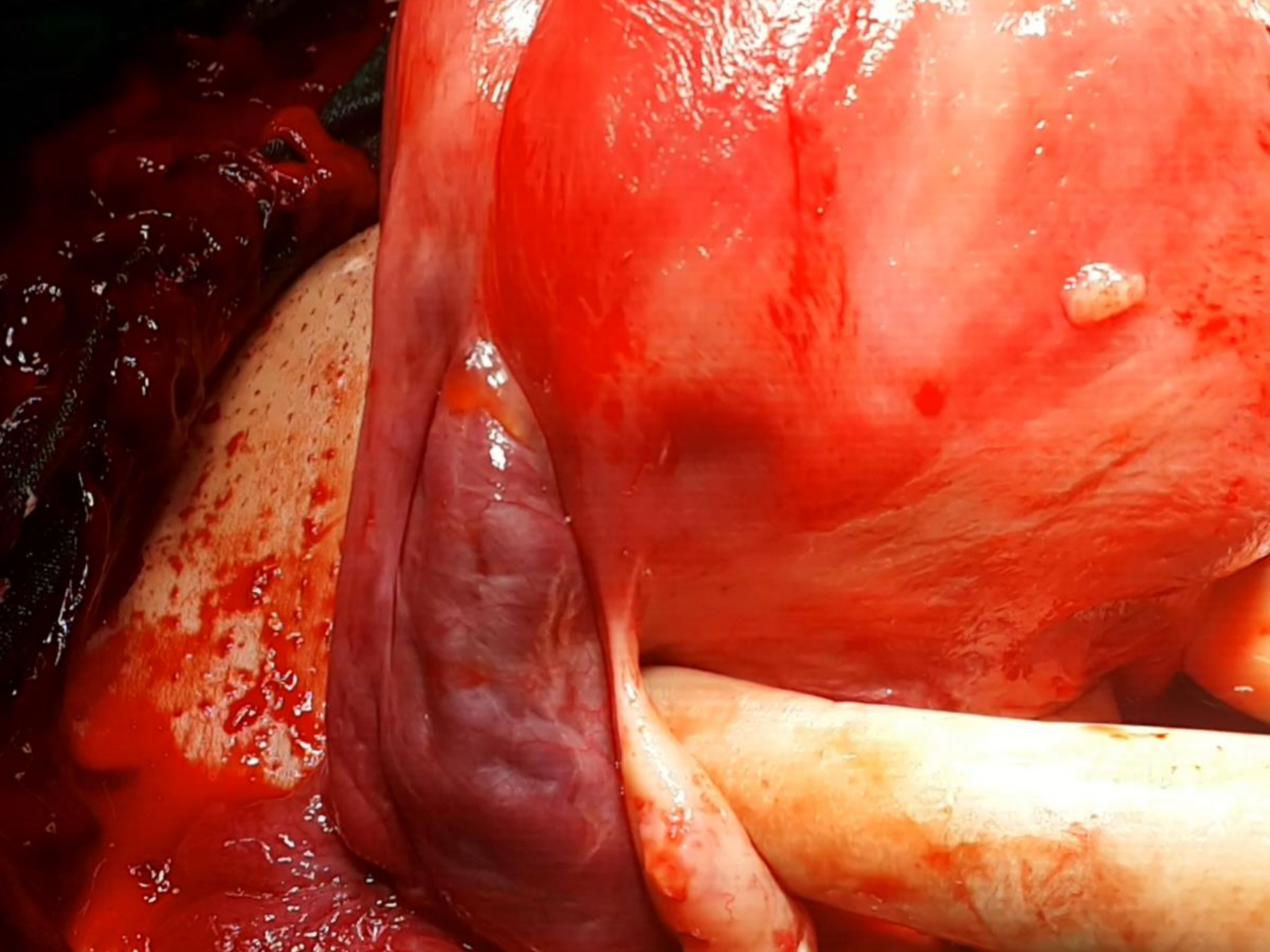
Adeviye Elçi Atılğan, Ali Acar, Emine Türen Demir, Fedi Ercan

Department of Obstetrics and Gynecology, Necmettin Erbakan University, Meram Faculty of Medicine, Konya, Turkey

## Abstract

**Objective:** The objective of the study is to evaluate and describe a new surgical technique for uterine preservation with the management of postpartum hemorrhage due to placenta accreta or percreta in 62 cases. **Materials And Methods:** We analyzed the data of patients diagnosed with placenta invasion abnormalities (placenta accreta and percreta) during pregnancy and also intraoperatively undergo cesarean section which Acar technique used to manage postpartum hemorrhage at the Necmettin Erbakan University Hospital between 2012 and 2016. **Results:** The Acar technique was successful in preserving the uterus and stopping the uterine hemorrhage due to placenta accreta and percreta in 58 cases of total 62 cases, the success rate was 93.54%. Four cases had to manage C-Section Hysterectomy. Seven cases placenta percreta with bladder invasion and bladder injury was encountered in which treated conservatively. **Conclusion:** Acar technique is effective, safe, and uterine preserving approach that can be simply applied in all hospitals and by ever expert to manage the postpartum hemorrhage and preservation of uterus in patients with placenta accreta and also placenta percreta.

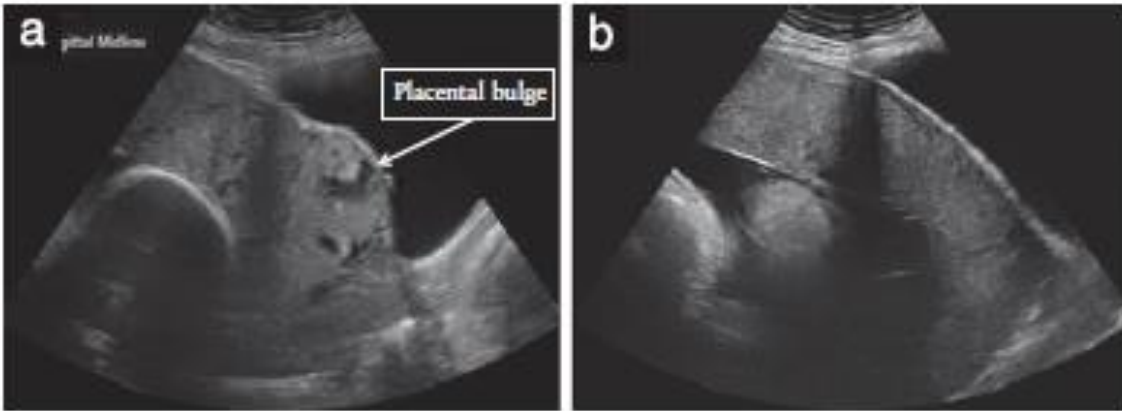
**Keywords:** Placenta accreta, placenta invasion abnormalities, placenta percreta, postpartum hemorrhage, uterine conservation



# Plasental 'Bulging' Protruzyon

**EW-AIP: Plasental dokunun protruzyonu ile intakt uterin serozanın komşu organ üzerine deviasyonu**

**TV-US, dolu mesane ile sensitivite %70, spesifite %99**

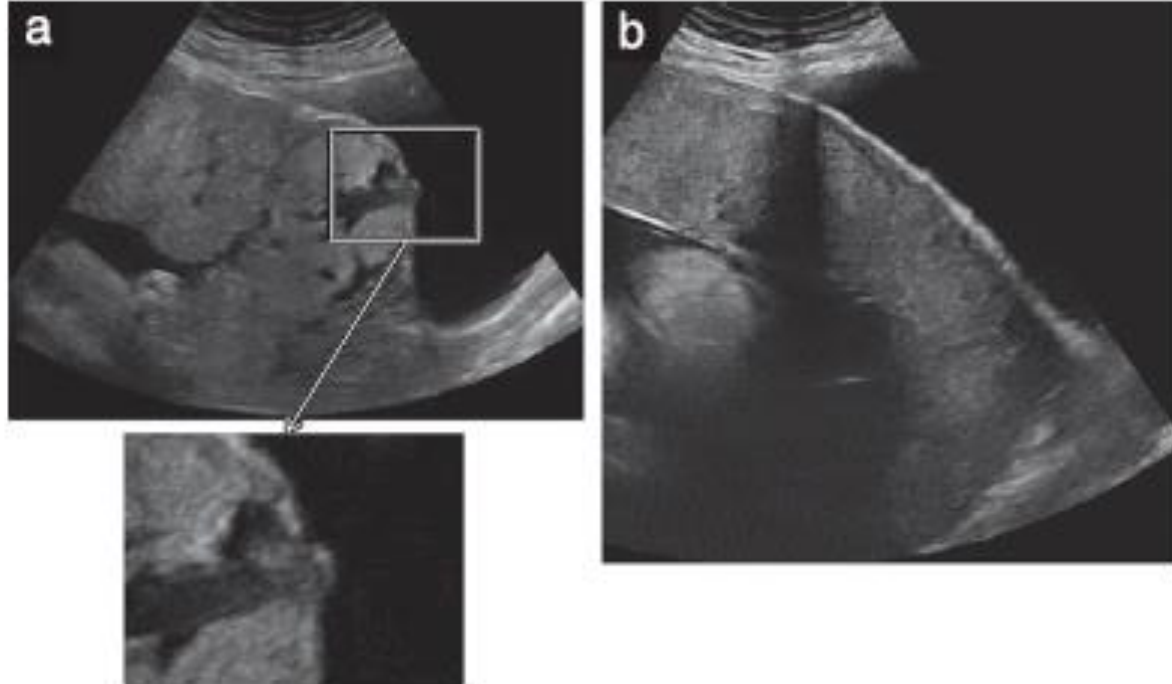


**Figure 5** Placental bulge (a) and a normal example for comparison (b) on grayscale ultrasound.

# Eksofitik Kitle

**EW-AIP: Uterin serozada defekt ile plasental dokunun mesane içerisine protruzyonu**

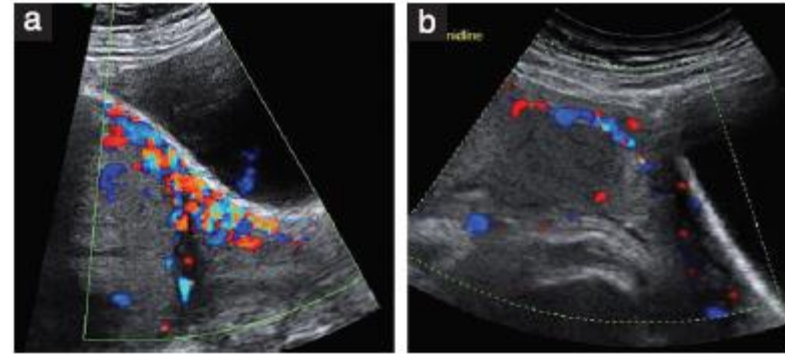
**Uterus– mesane arayüzünde anormal bulgu varlığında sensitivite %49.66, spesifite %99.75**



# Utero-Vezikal Hipervaskülarite

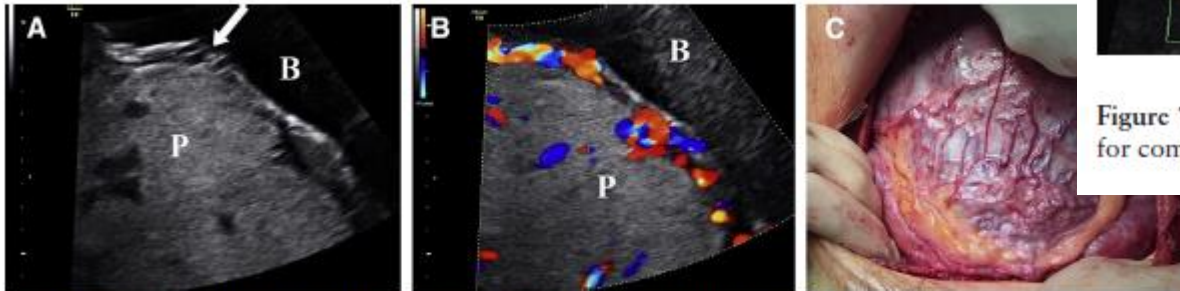
**EW-AIP: Myometrium ve mesane arka duvarı arasında color Doppler'de artmış kan akımı, çok yönlü akım ve aliasing artefaktı gösteren tortuöz damarlar**

**Color Doppler'de anormal bulgu varlığında, sensitivite % 90.74, spesifite %87.68**



**Figure 7** Uterovesical hypervascularity (a) and a normal example for comparison (b) on color Doppler imaging.

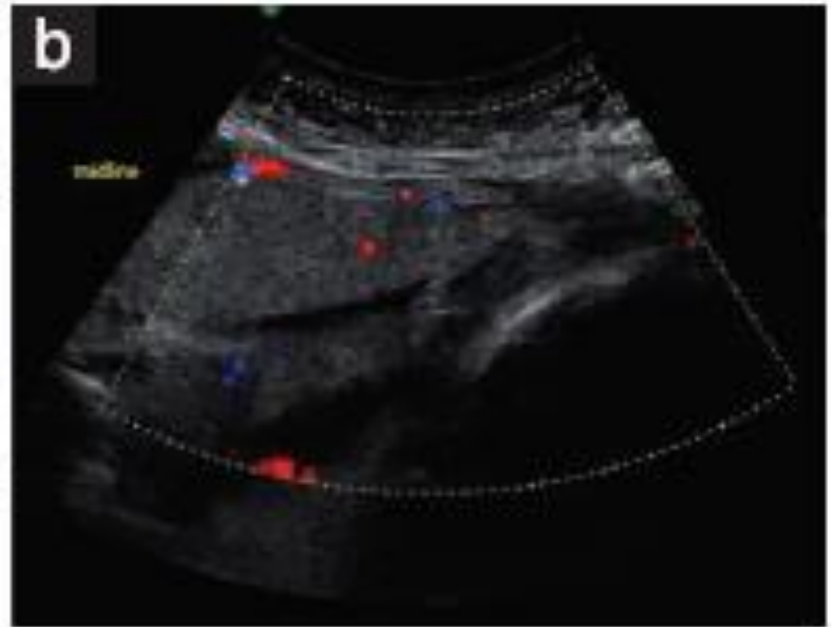
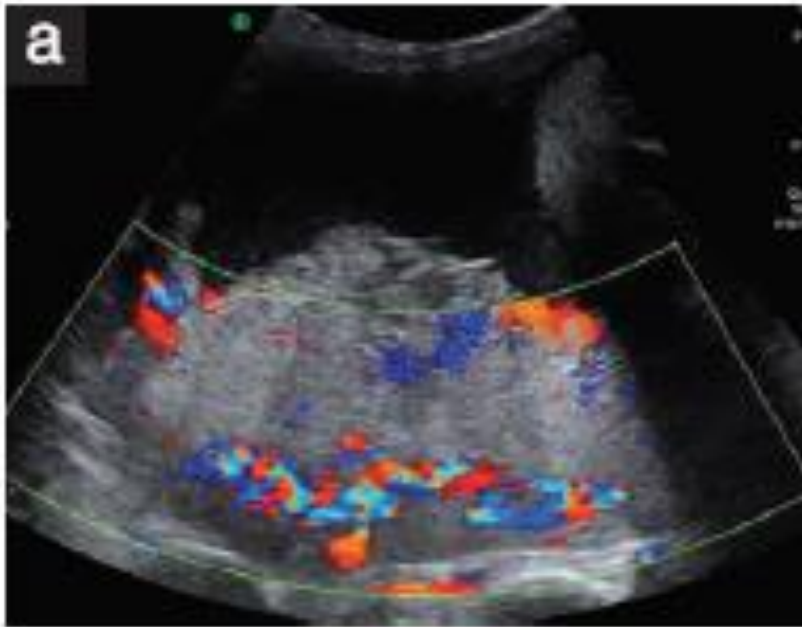
**FIGURE 14**  
Ultrasound and macroscopic impact of invasive placentation on the utero-bladder interface



Placenta (P) previa increta. Transabdominal ultrasound longitudinal views at 28 weeks. A, Bladder (B) bulge demonstrating B wall interruption (arrow) and B, bridging vessels on color Doppler imaging. C, Surgery at 34 weeks showing extensive neovascularity and myometrial distension over increta area.

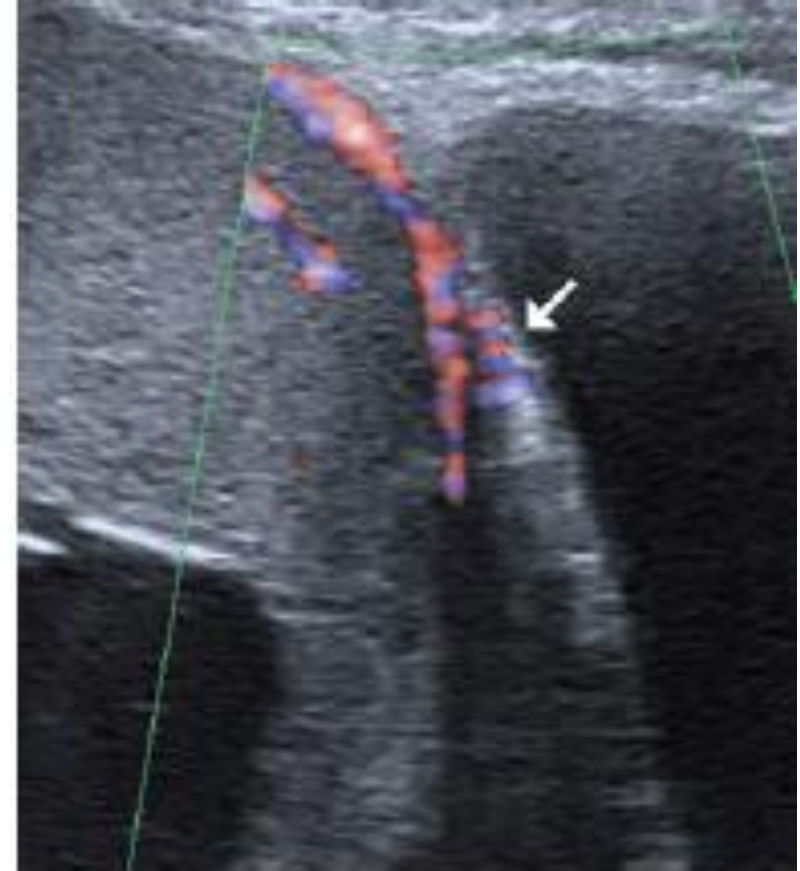
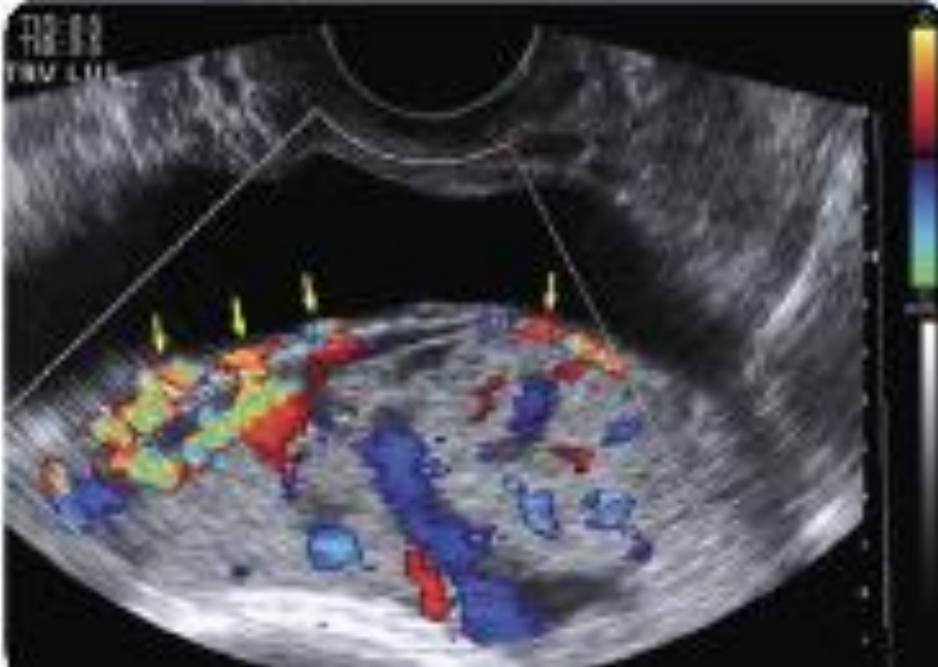
# Subplasental Hipervaskülarite

**EW-AIP: Retroplasental alanda artmış kan akımı, çok yönlü akım ve aliasing artefaktı gösteren tortuöz damarlar**



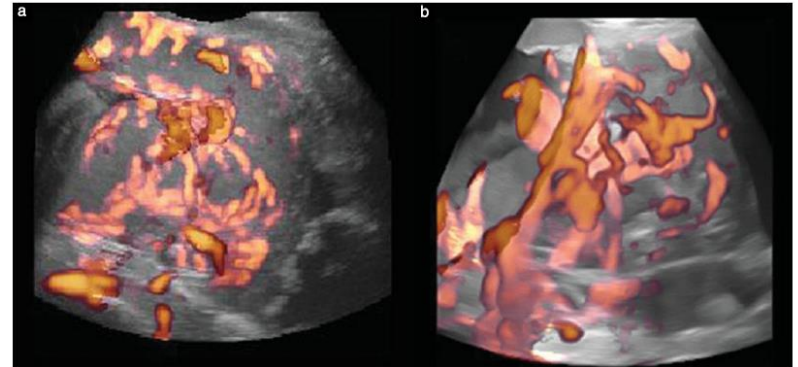
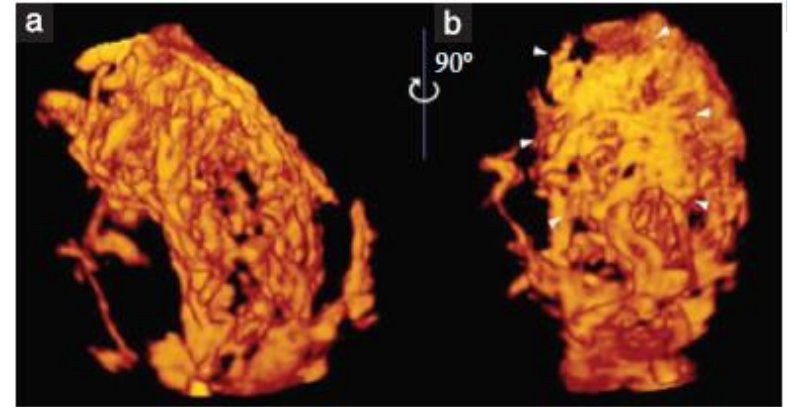
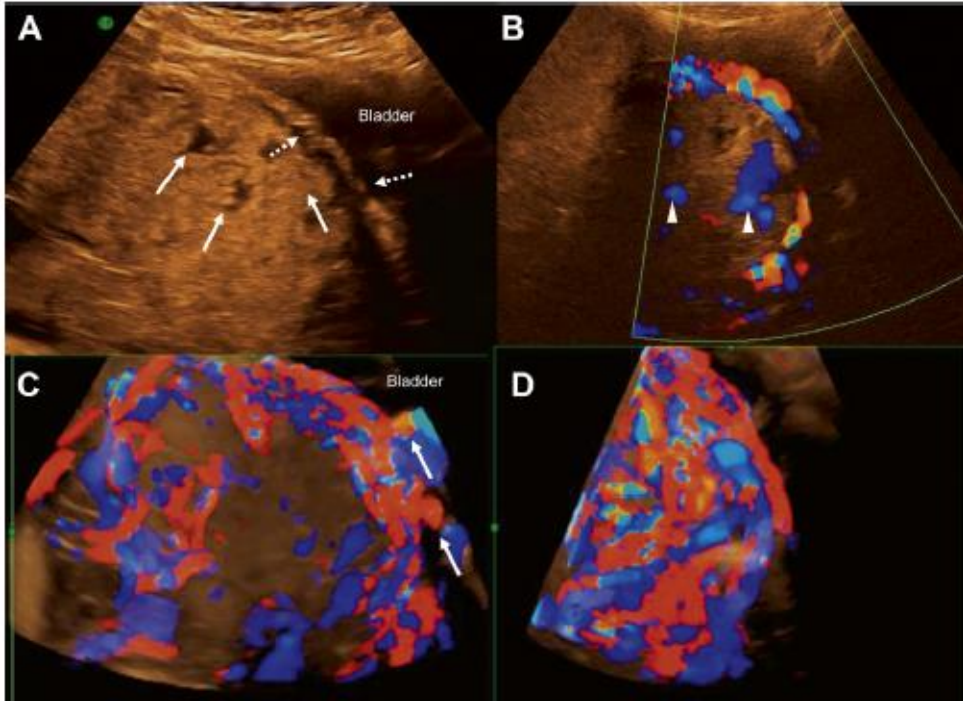
# Bridging Vessels

**EW-AIP: Sıklıkla myometriuma dik, plasentadan myometriuma uzanan, köprüleşen damarlar**

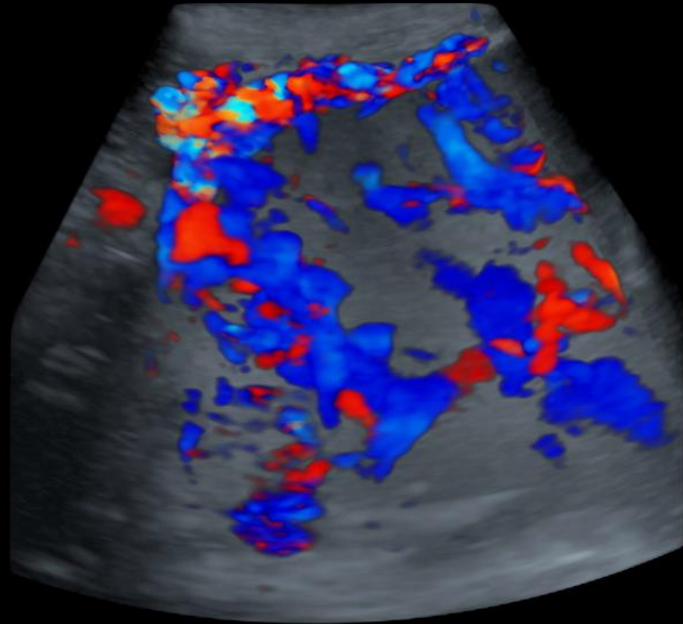


# 3D Power Doppler Damar Yapısı

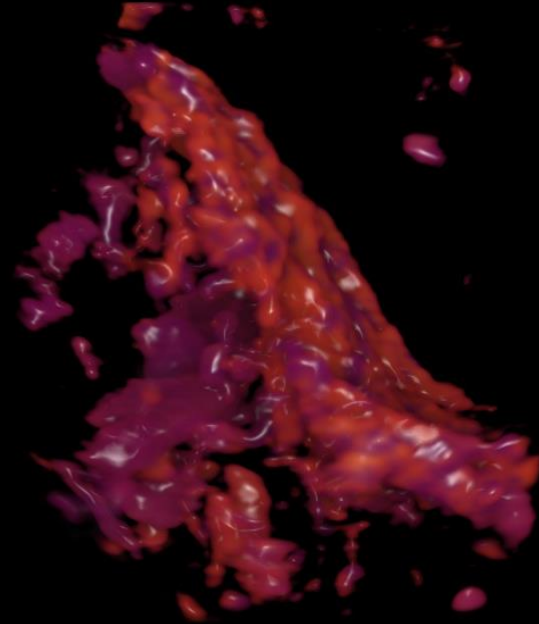
EW-AIP: Çok sayıda, farklı genişliklerde ve tortuoz yapıda irreguler plasental damarlar



MERAM TIP FAK.PE



MERAM TIP FAK.PERINATOLO



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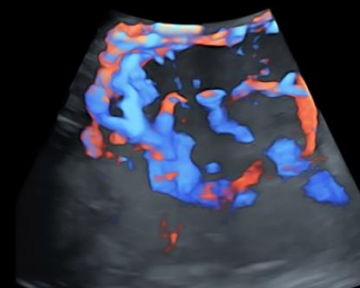
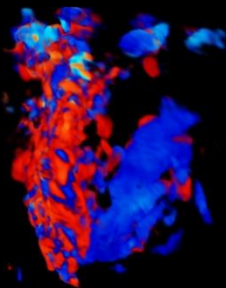
MERAM TIP FAK.PERINATOLOJI

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 Mid/100  
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 3D Static CFM

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 Mid/100  
 CRI 4/SRI 3D 3  
 3D Static HD Flow™



# Accreta placentation: a systematic review of prenatal ultrasound imaging and grading of villous invasiveness

Eric Jauniaux, MD, PhD; Sally L. Collins, MBBS, PhD; Davor Jurkovic, MD; Graham J. Burton, MD

- The wide heterogeneity in terminology used to describe the grades of accreta placentation and differences in study design limits the evaluation of the accuracy of ultrasound imaging in the screening and diagnosis of placenta accreta.
- A loss of clear zone (62.1%) and the presence of bridging vessels (71.4%) were the most common ultrasound signs in cases of **placenta accreta**.
- **In placenta increta**, a loss of clear zone (84.6%) and subplacental hypervascularity (60%) were the most common ultrasound signs, whereas placental lacunae (82.4%) and subplacental hypervascularity (54.5%) were the most common ultrasound signs in **placenta percreta**.
- No ultrasound sign or a combination of ultrasound signs were specific of the depth of accreta placentation.

# Center of excellence for placenta accreta

Robert M. Silver, MD; Karin A. Fox, MD; John R. Barton, MD; Alfred Z. Abuhamad, MD; Hyagriv Simhan, MD; C. Kevin Huls, MD; Michael A. Belfort, MD; Jason D. Wright, MD

TABLE 4

## Ultrasound findings suggesting morbidly adherent placenta

### First trimester

- Gestational sac that is located in lower uterine segment
- Multiple irregular vascular spaces noted within placental bed
- Implantation of gestational sac imbedded into cesarean delivery scar ("cesarean scar ectopic")

### Second trimester

- Multiple vascular lacunae within placenta

### Third trimester

- Loss of normal hypoechoic retroplacental zone
- Presence of multiple vascular lacunae within placenta (Swiss-cheese appearance)
- Abnormalities of uterine serosa–bladder interface (interruption of line, thickening of line, irregularity of line, and increased vascularity)
- Extension of villi into myometrium, serosa, or bladder
- Retro-placental myometrial thickness of <1 mm
- Turbulent blood flow through lacunae on Doppler ultrasonography
- Increased subplacental vascularity
- Vessels bridging from placenta to uterine margin
- Gaps in myometrial blood flow

# AİP-MR

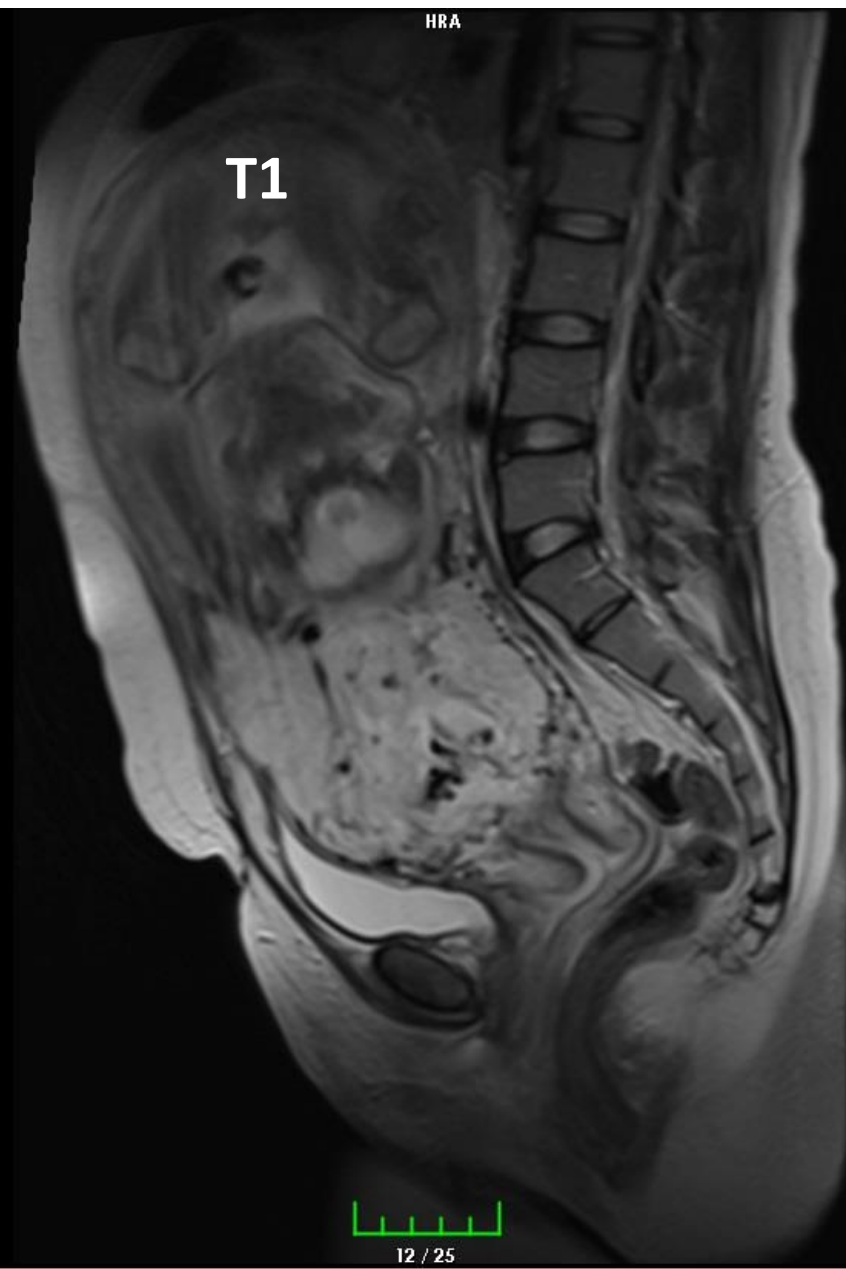
- **MRI** ile invazon sınırlarının daha iyi belirlenebildiği ve daha gerçekçi bir morfolojik ve topografik değerlendirmeye dayanan cerrahi planlama yapılabildiği keza parametrial invazyon tanısının da sadece bu modalite ile mümkün olduğu öne sürülmüştür.
- Manyetik rezonans (MR) görüntüleme, akreta önünden güçlü klinik kuşku varsa, sonografiye ek olarak kullanılır. Warshak ve arkadaşları (Warshak CR, Eskander R, Hull AD, et al: Accuracy of ultrasonography and magnetic resonance imaging in the diagnosis of placenta accreta. Obstet Gynecol 108:573, 2006) sonografinin yetersiz olduğu olgularda MR kullanımını içeren iki aşamalı bir protokol tanımlamışlardır.
- Plasenta akretalı 26 olgunun 24'ünün doğrulukla belirlendiğini ve 14 olgunun 14'ünde doğru bir şekilde dışlandığını bildirmişlerdir. Lax ve arkadaşları (Lax A, Prince MR, Mennitt KW, et al: The value of specific MRI features in the evaluation of suspected placental invasion. Magn Reson Imaging 25:872, 2007) akreta düşündürülen üç MR görüntüleme bulgusu tanımlamışlardır: (1) **uterin kabarıklık**, (2) **plasentada heterojen sinyal yoğunluğu** ve (3) **T2-ağırlıklı görüntüleme de koyu intraplasental bantların bulunması**.

0:7801430  
Name: YUMUSAK\* MUALLA  
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HRA



Study Date: 18.10.2017  
Study Time: 00:12:31  
Study Desc: MERAM TIP BODY^ ABDOMEN SYM



T1

T2

T2



Image: 12  
Slice Thickness: 7.0  
Slice Pos: -17.7487  
SAGITTAL  
-12\_IseTRA\_FS



12 / 25

546 x 824  
Contrast:  
TE: 100  
TR: 7550  
Zoom: 1.28x  
WC/WW: 425/900

# MR-Gadolinium

	Sensitivity (95% CI)	Specificity (95% CI)
Without injection*	75.0 (42.0–100)	47.9 (19.9–75.9)
With injection*	87.5 (57.1–100)	60.4 (33.9–87.0)

\*The overall performance of both sets of readers in detecting placental invasion was 75.0% (95% CI 42.0–100%) and 47.9% (95% CI 19.9–75.9%) increasing to 87.5% (95% CI 57.1–100%) and 60.4% (95% CI 33.9–87.0%) with gadolinium injection, respectively.  
\*\*The added value of gadolinium remained irrespective of the reader's experience (sensitivity and specificity of 87.5% and 62.5% versus 68.1% and 50%, respectively;  $P < 10^{-4}$ ).

- gadolinium contrast medium enhances the diagnostic accuracy of MRI by delineating the placental myometrial border.
- Among 18 academic centers in Europe, Asia and the USA, 33% used gadolinium in pregnant women, (67% in all three trimesters and 33% only in the third trimester) [42]. The European Society of Radiology (ESR) guideline concludes that gadolinium is probably safe during pregnancy, as excessive quantities are not expected to cross the placenta or to be toxic for the fetus if they do so
- Using of gadolinium in pregnancy is controversial given that the molecule crosses the placenta, enters the fetal circulation, and is excreted by the fetal kidney. Other studies have reported that gadolinium causes nephrogenic fibrosis, renal failure, and even mental retardation in high doses. Experimental animal studies that used high non-clinical doses of gadolinium-based agents, reported developmental, skeletal, and visceral abnormalities. Its use in pregnancy should be limited unless it is considered essential and ultrasound and unenhanced MRI cannot provide the required information.

# ACOG/SMFM

(1) Loss of normal hypoechogenic retroplacental zone  
(2) Multiple vascular lacunae (irregular "Swiss cheese" appearance)<sup>21-23</sup>  
(3) Blood vessels or placental tissue bridging the retroplacental interface, or crossing uterine serosa  
(4) Retroplacental myometrial thickness  
(5) Numerous coherent vessels visualized  
SMFM. Placenta accreta. Am J Obstet Gynecol 2010

- TV/TA US gerekli görüldüğü durumlarda tercih edilebilir
- TV-US güvenlidir ve alt uterin segmentin daha yeterli görüntülenmesini sağlar
- 15-20 gestasyonel haftalarda intraplasental düzensiz lakunlerin varlığı ve sayısı plasental invazyon için en prediktif bulgu olarak görülmektedir  
Sensitivite %79, PPV %92 (moth-eaten/Swiss cheese görünümü)
- US, plasental invazyonu tanımlamada yetrelidir, sensitivite %77-87, spesifite %96-98, PPV %65-93, NPV%98. Power Doppler, Color Doppler, 3D Power Doppler, tanısal duyarlılığı anlamlı şekilde arttırmamaktadır
- MRI is an adjunctive modality and adds little to the diagnostic accuracy of US.
  - US değerlendirme yetersiz ise, posterior yerleşimli plasenta varlığında, akreata, parametrial invazyon, komşu organ invazyonu şüphesinde tanıya katkı sağlayabilir.
  - American College of Radiology gebelikte kesinlikle gerekli görülüyor ise Gadolinyum kullanımından kaçınılması gerektiğini bildirmektedir.

# Sonuç

- Alt segment yerleşimli plasenta PIA riskini artırır
- 17.haftadan itibaren PIA tüm bulguları bulunabilir
- Plasental dinamik akım varlığı en önemli PIA bulgusudur
- Mesane invazyonu özellikle değerlendirilmelidir

Dinlediğiniz için Teşekkür Ederim

