Title
Tutorial : Ultrasound Diagnosis of Placenta Accreta.

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Tutorial:
Ultrasound Diagnosis of Placenta Accreta

Independent Study Project
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Placenta Accreta:
The clinical condition when part of the placenta, or the entire placenta, invades and is inseparable from the uterine wall

Accreta: Placental villi in direct contact with myometrium
Increta: Subtype extending into the myometrium but not to serosa
Percreta: Subtype extending to within one cell layer or beyond the serosa

Thought to be due to a defect in the decidua basalis, most commonly from prior uterine surgery

Complicated by massive hemorrhage unless managed with cesarean hysterectomy

Risk Factors

- Prior uterine surgery or instrumentation
  - Cesarean section, myomectomy, D & C
- Placenta previa
- Advanced maternal age
- Grand multiparity
- Conception by in vitro fertilization

Any of these risk factors should prompt a sonographic search for accreta

Diagnosis: Ultrasound

Diagnosis is typically by ultrasound in the 2nd or 3rd trimester, but may also be possible in the first trimester.

TA = Transabdominal ultrasound
TV = Transvaginal ultrasound

Diagnosis: MRI

In the case of ambiguous ultrasound findings, MRI may be a helpful adjunct.

Findings on MRI
- Uterine bulging (mass effect)
- Heterogeneous placenta
- Placental bands
- Obliteration of normal tissue planes (invasion of placenta into adjacent structures)

Goals for this module

- Unfortunately, the diagnosis of placenta accreta can be easily missed, even by experienced imagers.
- This tutorial is intended to educate medical providers on the sonographic appearance of placenta accreta, with attention to criteria for an adequate study and common pitfalls.

Module Overview

- Normal images
  - Fundal placenta
  - Gross pathology correlate
  - Posterior placenta
  - Placenta previa (detailed)

- Sample images by finding
  - Low Implantation
  - Placental Lakes
  - Myometrial Thinning
  - Interrupted Serosa
  - Color Doppler

- Pitfalls Quiz

What is normal?
Normal Placental Anatomy with Fundal Placenta

Gross Pathology Correlate

Normal placenta
Normal myometrium
Placenta
Normal myometrium

*This patient had a focal percreta – a normal area is shown
Path & TVUS images from patient #7 at 35w0d, Percreta

Myometrium is hypoechoic compared to placenta because it is less dense, with numerous larger vessels

Sonographic appearance of myometrium varies from entirely echolucent to shades of gray - it is always less echogenic than the placenta
Note the smooth hyperechoic bladder interface.

Normal Lower Uterine Segment with Posterior Placenta

Placenta Previa without Accreta

The vast majority of accretas occur in the setting of placenta previa.
Previa: Lower Uterine Segment

An acceptable transabdominal ultrasound (US) view needs to include the bladder, placenta, and cervix.

Serosa should be a smooth, uninterrupted hyperechoic line between bladder and myometrium.
There should be a hypoechoic region between retroplacental vessels and serosa - the myometrial “clear space”

A clear space measuring less than 1 mm has been shown to be predictive of accreta

Previa: Lower Uterine Segment

Myometrial vessels should not be mistaken for placental lucencies.
Placenta accreta should not be ruled out without visualization of the bladder interface in two views; disruption of the serosa is most commonly seen at the bladder interface, and can be tricky to recognize.

**Signs of Accreta on Ultrasound**

1. Low implantation in 1st trimester
2. Placental lakes
3. Myometrial thinning
4. Irregular placental interface
5. Abnormal color doppler
1. Low Implantation

Even in the early 1st trimester, accreta is suggested by low implantation of the gestational sac.

1. Early low implantation

Implantation should be near the fundus – a gestational sac closer to the cervix should raise concern for placenta accreta.

Note that an adequate image requires visualization of the sac, fundus and cervix.
2. Placental Lakes

As the first thing to catch your eye, placental lakes should remind you to ask the patient about risk factors (i.e. surgical procedures), and prompt a search for less obvious signs.

Numerous lakes, known as placental lucencies, give a “moth eaten” appearance.

Normal placentas have a homogenous echotexture – though they may have a small number of less prominent lakes, particularly in the third trimester.
2. Placental Lakes

Lakes may be seen as early as the first trimester

The images above are from the same placenta – at left in the 1st trimester, and at right in the 3rd trimester

PITFALL
Note that myometrial vessels could be mistaken for placental lucencies
3. Myometrial Thinning

Myometrial thinning may be the only sign of an accreta in an initial scan but is frequently subtle; we suggest a low threshold for follow up.

Both images above are from the same percreta patient; the left is transabdominal & the right is transvaginal.
3. Myometrial Thinning

Another example of classic myometrial thinning, with transvaginal and transabdominal images from the same patient.

4. *Interrupted Serosa*

Most commonly seen in the bladder view, but may be present anywhere along the placental interface.
4. Interrupted Serosa

This patient has no visible serosa at the bladder interface; the placenta has penetrated into the bladder.
Invasive placenta

These placentas are clearly invasive.

Few accreta patients have this finding; interrupted bladder serosa is much more common.

Path specimen corresponding to upper left image, after delivery seven weeks later.

PITFALL: In the LUS view the bladder’s curvature can produce refractive artifacts mimicking loss of serosa, as seen in the normal patient below.

Area with absent serosa

Area with normal echogenicity

Above is true loss of serosa, because the shadow does not travel beyond the bladder into the cervix area.
5. Abnormal Color Doppler

Look for an internal comparison – verify that there is a change from normal to accreta portions of the placenta, as normal can vary from patient to patient.

Color doppler is abnormal due to chaotic flow or the contour & direction of flow.
PITFALL: One normal image doesn’t rule out accreta!

The images above are from the same scan - left shows abnormal flow (directed from the body of the placenta into the area of accreta), and right is normal (smooth contour and no markedly chaotic flow).

Using this internal comparison helps define normal for this patient, making the case for accreta more convincing.

QUIZ
How do we know this is an accreta?
Can you point out the findings?

- Irregular interface, placenta bulging into bladder
- Loss of serosa
- Lakes
- Flow with irregular contour, directed from inside placenta toward interface

This is an example of an inadequate image. Placenta accreta cannot be ruled out here because the bladder interface is not seen.

At right is a better image; the bladder interface is visualized, allowing us to rule out accreta in this patient with previa.
Both pregnancies are 8w5d
Which is the accreta?

#26, 8w5d ACCRETA

#27, 8w5d NORMAL

Are these placental lucencies or normal myometrial vessels? How could we tell the difference?

Answer: These are placental lucencies, but just the one image doesn’t definitely tell you that.

This is tricky – the image on the left could be read as showing myometrial vessels, but when compared with the transverse view on the right it is more clearly part of the placenta, again demonstrating the need for multiple views.
Why do we suspect accreta?

- Hypoechoic myometrium
- Thinning & loss of myometrium
- Normal myometrium

Is this interrupted bladder serosa?

- We cannot say based on this image, as there is refractive artifact obscuring the area of the bladder serosa.
- A cleaner image shows that this percreta patient does have loss of serosa (she also has an irregular anterior interface).
Label each image based on color doppler: Normal or suspicious for accreta?

Quiz

#4, 20w1d TV, Increta

#9, 19w0d TV, NORMAL

#24, 33w1d TV, NORMAL

#4, 20w1d TV, Increta

References


