How to Approach a 1st Trimester Dating Ultrasound

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RAD-AID

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How To Approach a 1St Trimester Dating Ultrasound

Prepared for Rad Aid
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Topics to review:

1. Knobology
2. Normal Pelvic Anatomy
3. What should I see... when?
4. My approach: 1st trimester ultrasound
5. Intrauterine Pregnancies
6. Complications
   a. Multi gravid uterus
   b. Ectopic pregnancies
   c. Miscarriage
   d. Embryonic demise
   e. Fibroids
   f. Molar pregnancies
7. Take away message
Declarations:

- All images have been taken by me or colleagues who have shared these unique cases with me along my ultrasound journey in my practice. If the image is not an original image, the source has been referenced at the end of my slides.
- Intention is to educate and be of service by sharing knowledge from my personal experience
- No conflicts of interest
Knobology
Knobology:

Let us start at the beginning:

What is the LMP?

Are you using the correct probe?

Which setting is appropriate for the gestational age?
Knobology

Things to keep in mind:

Body habitus

How full is the bladder?

What is the gestational age of the pregnancy?

Will you be performing an endovaginal (EV) exam?
Knobology

My most commonly used buttons:

Freeze, print, split screen

Depth, sector width, zoom

Calculation package (measure)

Gains and TGC’s

M-Mode
Normal Pelvic Anatomy
Normal Pelvic Anatomy: Non Gravid Uterus
Ovaries:
Changes to the pelvic structures with pregnancy

ovaries

Endometrial lining

Rumac et al. (2005)
Normal IUP
What should I be seeing? When?

- **Double decidual sign** 4-5 weeks on EV; >2mm, echogenic rim
- **Gestational sac** 5 weeks
- **Yolk Sac** seen at 5 weeks until 11 weeks; should never be >5mm
- **Fetal pole** 6 weeks - fetus appears like a thickening adjacent to YS “diamond ring sign” from weeks 6 and 7 the fetus appears almost like a grain of rice or a jelly bean
- **Cardiac activity** 6 weeks
- **Limb buds** - 8 weeks, they begin to appear, looks like a gummy bear
Double Decidual sign @ 5w1d transabdominal vs 5w4d weeks on EV
Normal GS and YS
CRL measurement; best practice

- Dating ultrasound is most accurate between 7-14 weeks from LMP
- CRL >10mm is the most accurate predictor of menstrual age (from 1st day of last period)
- Measure from the top of the head to the bum
Why do we do 1st trimester ultrasounds?

- Accurate Dating (unsure LMP)
- Viability / suspected demise
- Complications (multiples, ?ectopic ?molar pregnancy)
- Assess location and size of Fibroids
- Follow up to confirm demise 10-14 days after initial ultrasound
When do we perform 1st trimester ultrasounds?

6w0d - 10w6d

Sometimes though we get thrown a curveball and dating turns into a detailed anatomy scan.
How I approach a dating scan

Start with the big picture and focus in

1. LNMP to calculate the estimated gestational age
2. TA - Evaluate the Uterus ?fibroids, IUP, endometrium, cervix
   a. GS, YS, FHR, FP
   b. Ovaries (?CLC) and adnexae (?free fluid, anechoic vs with internal echoes)
3. EV - repeat TA evaluation with the internal
How I approach a dating scan
Fetal Pole and Cardiac Activity

At our facility: 110-170bpm is the normal acceptable range
Mean Sac Diameter (MSD)

Use calcs package, measure in 3 dimensions sagittal, transverse and anterior / posterior

5 weeks 4 days, Endovaginal

9 weeks 0 days transabdominal
Crown Rump Length (CRL)

- The most accurate estimate of gestational (menstrual) age in early pregnancy
- Use CRL until 84mm
- Mid / sagittal view from head to bum; Coronal not accurate, head should be neutral
Complications
Multiple Gestation

Important to determine chorionicity as early in the pregnancy as possible so as to give the patient the best prenatal care possible!

Di chorion / Di amnion: Two gestational sacs within the endometrium, you can see a thick echogenic band of tissue separating the two sacs. A yolk sac should be identified in each sac.

Mono chorion / Di amnion: A single gestational sac within the endometrium. Two amnion are noted, and two yolk sacs seen

Mono chorion / mono amnion: Most complex and rare twin pregnancy
Twins? Triplets?...!! Chorionicity??
Twins, type?

6 week pregnancy
Triplets
Triplets, same pregnancy, at 8 weeks
Non-viable Pregnancies:

With symptoms of bleeding or pain, you may get a referral for viability.

Whether or not the fetus is viable, you should always perform a high quality imaging study. Ensure you’re doing an internal exam to achieve the best quality images for your patient, and to confirm the diagnosis.
Non-viable Pregnancies

Supposed to be 9w2d
Fetal demise
Embryonic Demise

In calgary, we have an amazing not for profit organization called the Pregnancy and Infant Loss Support Centre.

https://pilsc.org
We believe in the power of connection & community

The journey through loss is complex and we know that not everyone heals in the same way. We also understand that having options on the path to healing is imperative. For this reason, Pregnancy & Infant Loss Support Centre connects people who have experienced pregnancy and infant loss to community specialized peer support groups, traditional and alternative healing, and educational opportunities.

The Pregnancy and Infant Loss Support Centre is a charitable organization that serves as a safe space for individuals and families to connect to their community and truly know, see, and feel that they are not alone.

We are dedicated to serving people at ALL stages of loss. People of all faiths, ethnicities, abilities, sexual orientation, and gender identities.

OUR CENTRE PROVIDES
Pregnancy & Infant Loss Coaching
Specialized peer support groups
Peer Mentorship Program
Workshops
Community Events
Yoga for Loss
Reiki
Meditation (individual & group)
Massage
Acupuncture
Reflexology
Volunteer Opportunities
Drop-In Hours
A physical Space for connection...all the connection!

strength. support. together
Fibroids in pregnancy

Women diagnosed with fibroids tend to have normal pregnancies, sometimes they can cause complications.

Clinical presentation: Pain (most common), bleeding, miscarriage, placental abruption, preterm delivery

Fibroids tend to grow during the first trimester of pregnancy due to the spike in estrogen.

When performing an ultrasound, it's important to document the fibroids and where they are located. The most concerning fibroids would be cervical or lower uterine fibroids. We need to watch them to ensure they are not obstructing the birthing canal.
Fibroids in early pregnancy

EPOS& Trade (2010)
Ectopic Pregnancies

Who is at risk for an ectopic pregnancy?

A. Women with previous tubal pregnancy
B. Women with reconstructive surgery of the fallopian tubes
C. Women with an IUCD
D. Women with abnormal tubes - scarring or blockages
E. Women who’ve had a previous c-section
F. Woman with advanced maternal age and multiparus
Ectopic Pregnancy: Clinical Presentation

How do they present?

- Pain
- Bleeding
- Positive pregnancy test
- History of unprotected sex
Sonographic Findings
Caution!

Don’t make any assumptions if you see a gestational sac within the endo without an embryo or yolk sac.... you must ensure you check for an ectopic, as it may just be a pseudo-sac!
Live ectopic!!

One moment as I transition to my email
and load the video
Molar pregnancies

They’re rare, but they can happen!

Clinical presentation: Hyperemesis, nausea, bleeding and elevated Bhcg (>100000 mIU/mL for a complete mole), hyperthyroidism

Ultrasound appearance: “sac of grapes” many cystic areas demonstrated by the red arrows

G. Ycesoy (2018)
Take home message

Your ultrasound exam is only as good as your images **ALWAYS OPTIMIZE**

CRL in the first trimester is the most accurate predictor of the gestational age

Use all of the information you have available to you (BHCG, prev ultrasound exams, good history)

If you’re not seeing a gestational sac, correlate with Bhcg and wait a few more days or weeks to re-image.
References

2. You tube video: https://www.youtube.com/watch?v=kWHAzsYec6o
3. Rumac et al. (2005). Diagnostic Ultrasound Vol 2, (3rd ed.). Elsevier Mosby. Figure 32-1
5. Fibroids in pregnancy; website: https://www.webmd.com/women/uterine-fibroids/what-if-i-have-uterine-fibroids-while-pregnant
Thank you!