



FIRST TRIMESTER OB

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What Should I be Seeing?

Table 2 – Ultrasound findings in early pregnancy

Sonographic sign	Gestation (from LMP)	Beta-hCG (mIU/mL)
Gestational sac (transvaginal)	4.5 - 5 weeks	>1000 - 1500
Gestational sac (transabdominal)	6 weeks	>6500
Yolk sac	5 - 6 weeks	>7200
Fetal pole/fetal heart tones	5.5 - 7 weeks	>10,800

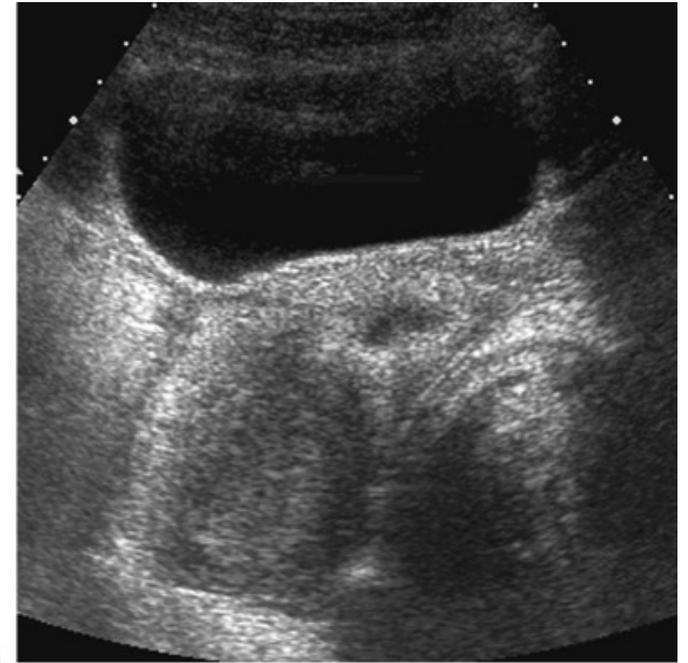
LMP, last menstrual period; beta-hCG, beta-human chorionic gonadotropin.

Gestational Age	Milestone Visible on Ultrasound
4 weeks	Possible endometrial thickening; ultrasound may show no evidence of pregnancy.
5 weeks	Gestational sac becomes detectable.
5.5-6 weeks	Yolk sac appears.
5.5-6.5 weeks	Fetal pole appears; possible fetal heart beat by vaginal ultrasound.
6.5-7 weeks	Feta heartbeat detectable by ultrasound.

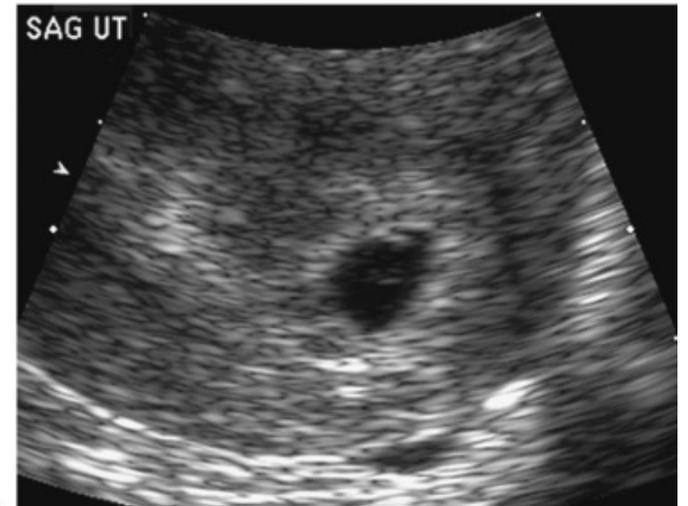
TA vs TV 6 wk GS Retroverted UT

A most difficult challenge is the retroverted uterus with only a TA approach.

During a return examine 2 weeks later, the sac and embryo size increase may allow accurate dating at that time along with the definite location and number of embryos/babies

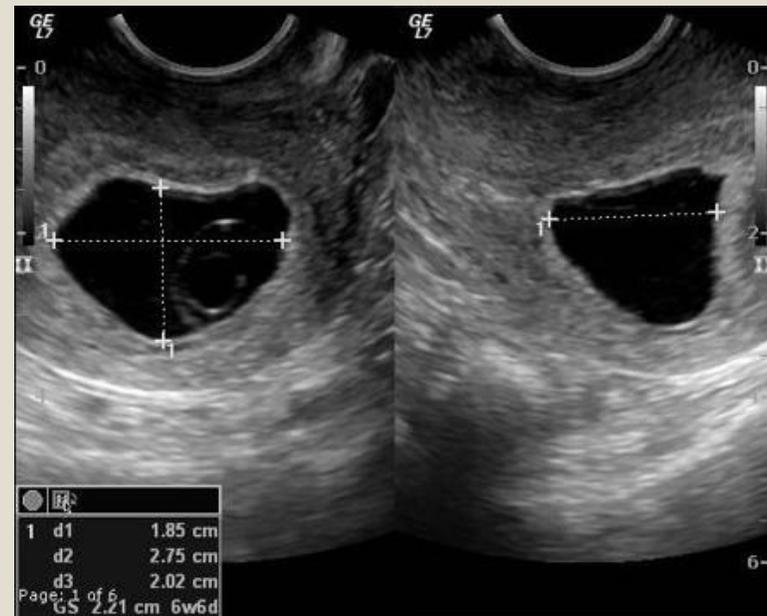
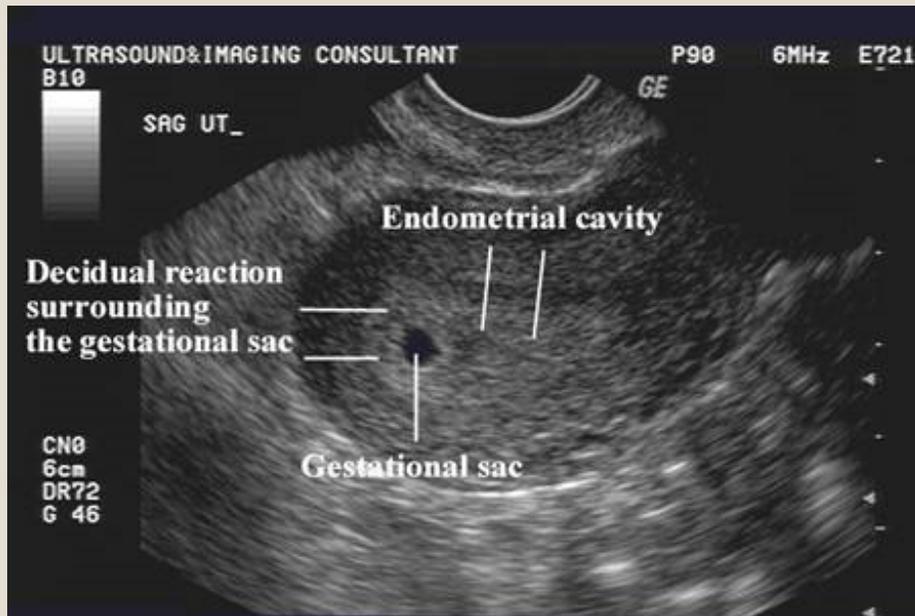


A



B

Gestational Sac



Mean Sac Diameter measurement is used to determine gestational age before a Crown Rump Length (CRL) can be clearly measured. The average sac diameter is determined by measuring the length, width and height then dividing by 3.

Yolk Sac



- Appears within the gestational sac, but outside the amniotic membrane
- Visualization of a yolk sac is useful in distinguishing an intrauterine pregnancy (IUP) from a pseudogestational sac or an anembryonic pregnancy, as a yolk sac is only seen in an intrauterine pregnancy

YS should **not** be calcified, misshapen or $>5\text{mm}$ from the inner to inner diameter.

TA 6wk GS, YS and Embryo



Fetal Pole/Crown Rump Length (CRL)



The fetal pole grows at a rate of about 1 mm a day, starting at the 6th week of gestational age. Thus, a simple way to "date" an early pregnancy is to add the length of the fetus (in mm) to 6 weeks. Using this method, a fetal pole measuring 5 mm would have a gestational age of 6 weeks and 5 days.

8 wk OB TA vs EV Detail Comparison

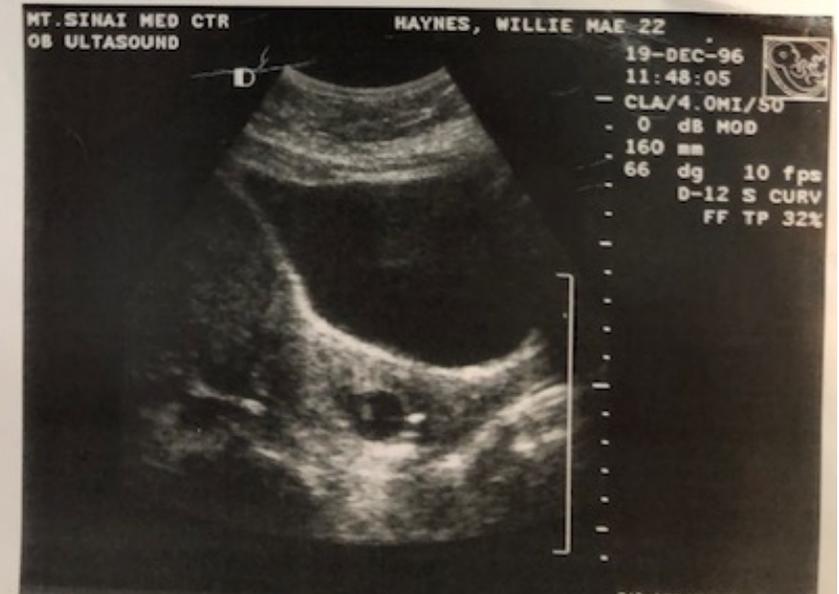
Top Image TA with full
bladder

Bottom image EV increased
detail and contrast



Cervical Pregnancy 0.15-1% of Ectopics

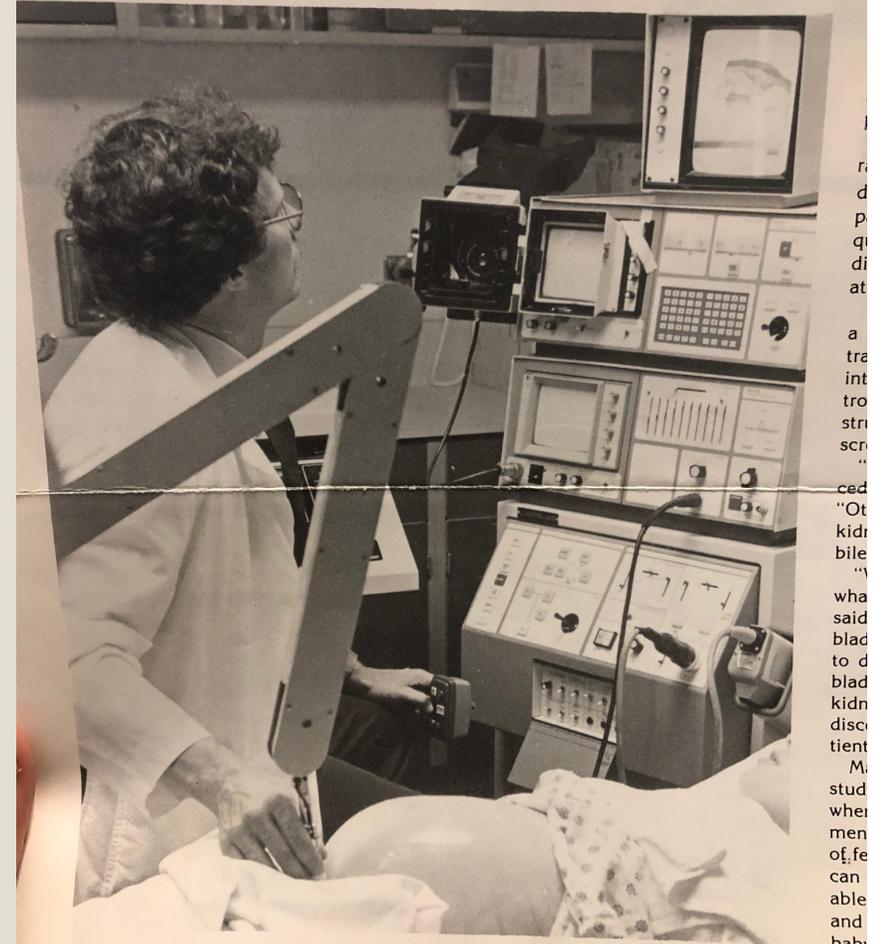
Top EV Image of Cervix
Only, could stop too soon
Bottom TA Image showing
Cervix with pregnancy with
Vagina and Uterus for
reference.



You Think US is Challenging...Try 1975 Technology!

- NO Real-time Imaging
- DRAW Like Etch-a-Sketch
- Mineral Oil, Not Gel
- Black on White Background
- Filled Half a Room!

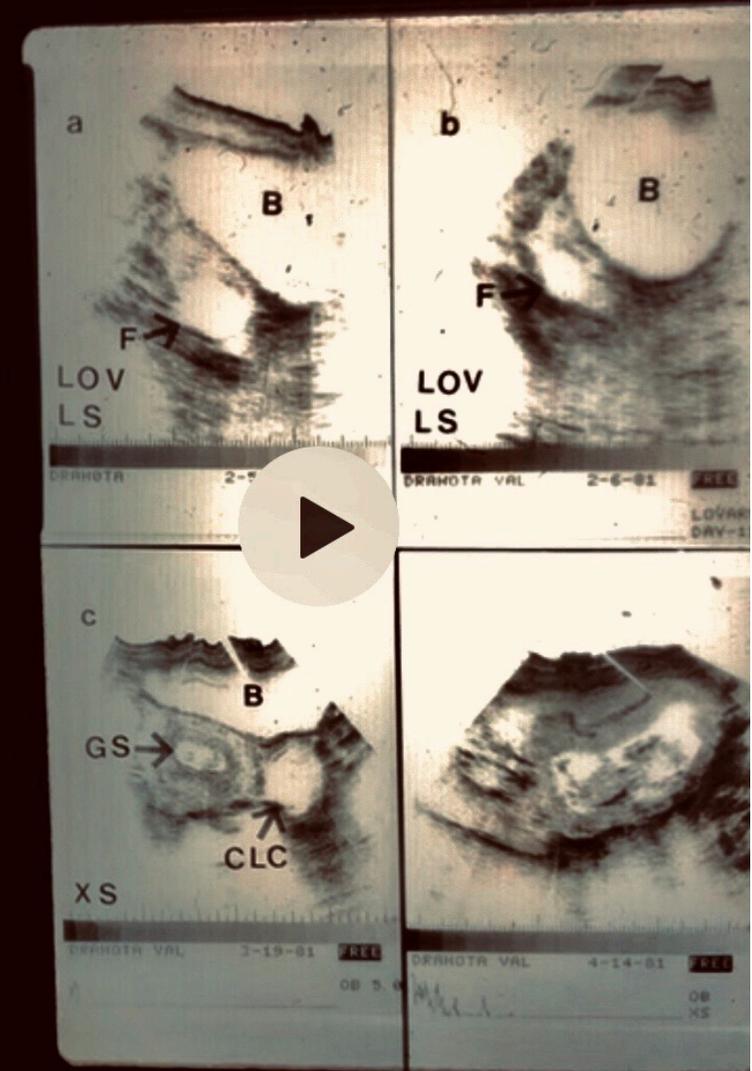
Ultrasound Assists Physicians



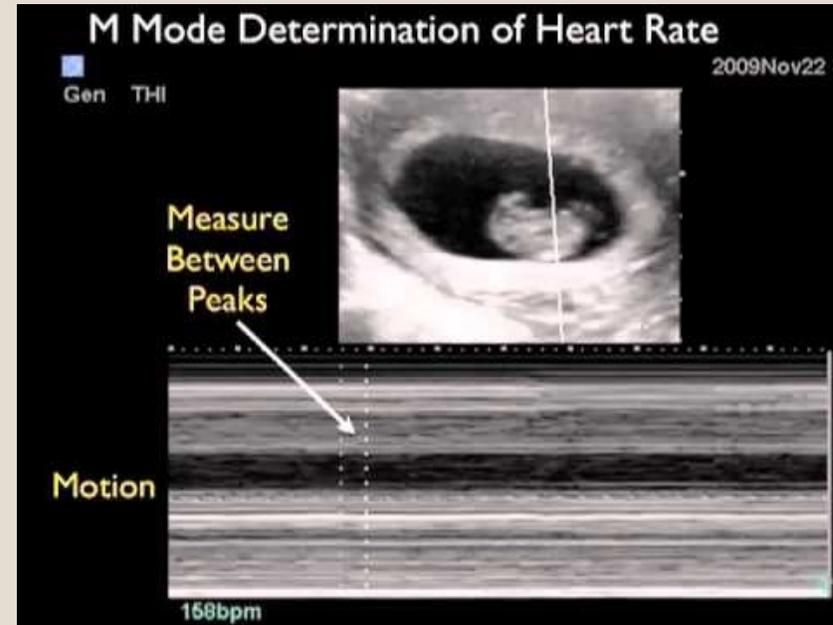
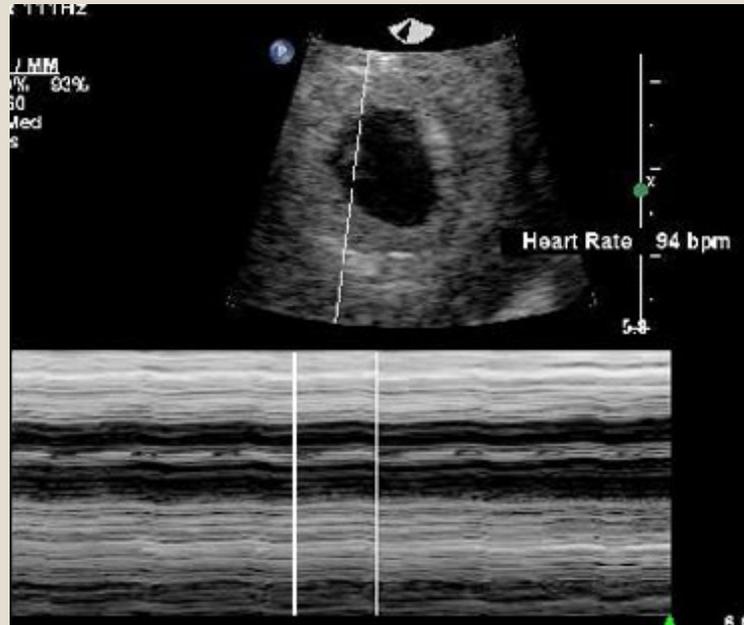
Mark Muilenburg, director of Nuclear Medicine/Ultrasound, performs an obstetric ultrasound to determine the baby's position and due date.

You Think US is Challenging...But Still Began Reproductive Medicine in 1981

- Top Row Ovulation
- Bottom row shows results. 8 wk gestation and it's progression to 12 weeks

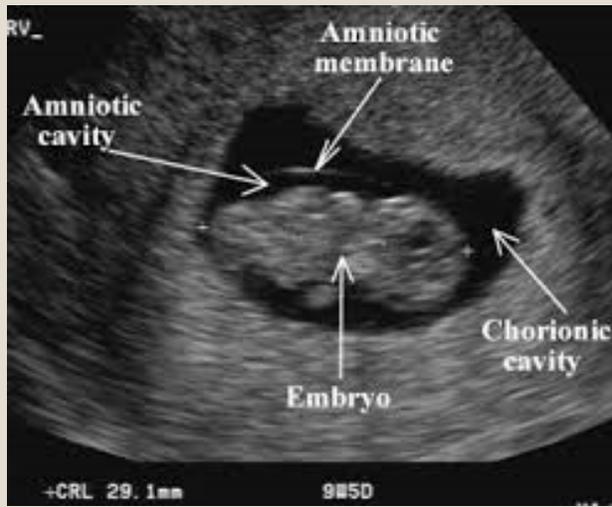
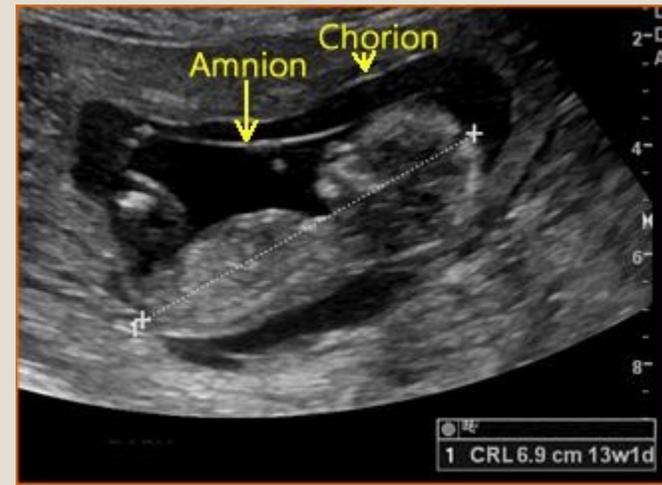
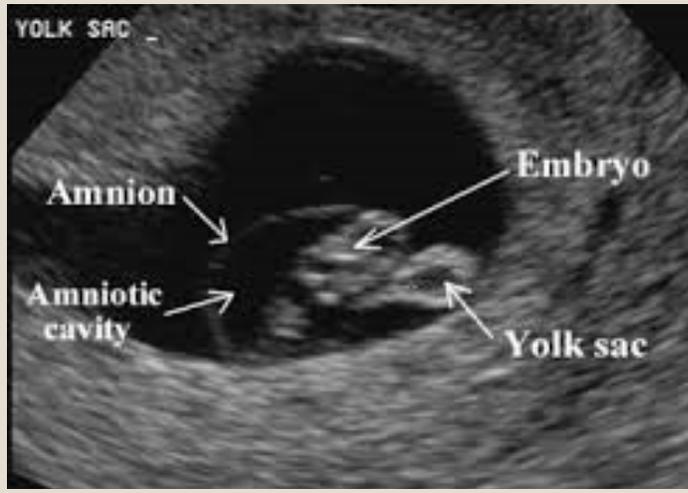


Fetal Heart Motion



The fetal heart beat can sometimes be seen flickering before the fetal pole is even identified. It will be seen alongside the yolk sac. It may be below 100 beats per minute but this will increase to between 120-180 beats per minute by 7 weeks. In the early scans at 5-6 weeks just visualizing a heart beating is the important thing. Failure to identify fetal cardiac activity in a fetus whose overall length is greater than 4 mm is an ominous sign.

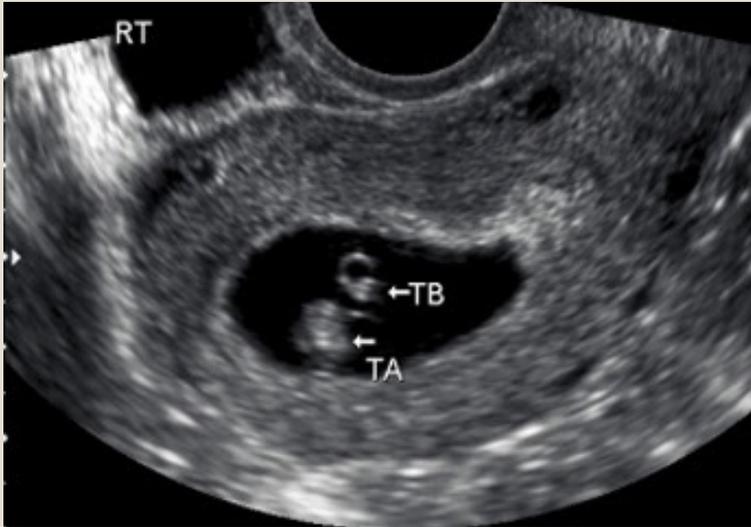
Amnion



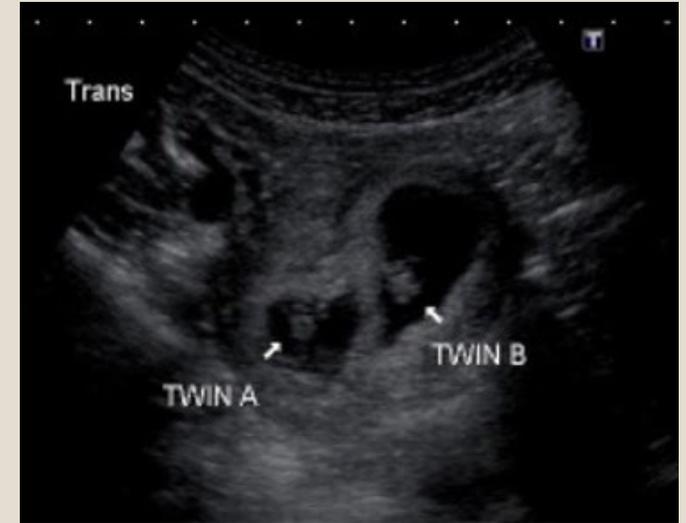
The outer chorion contains the developing placenta. The inner amnion usually fuses with the chorion by around 14 weeks, obliterating the residual yolk sac.



Multiples



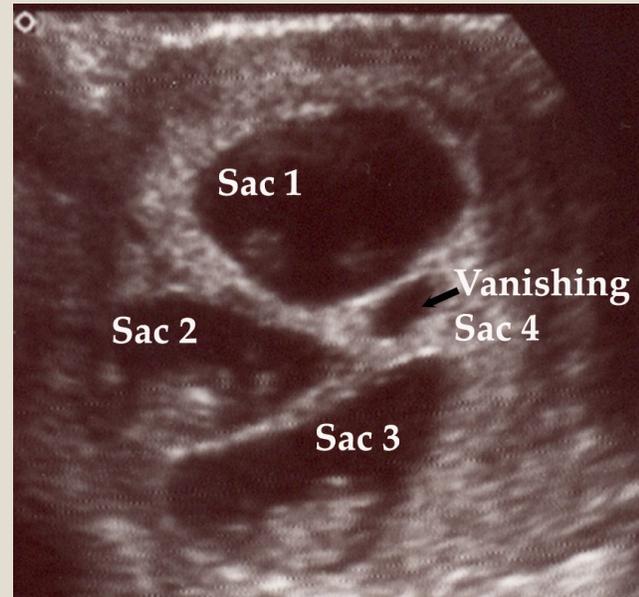
Monoamniotic, Monochorionic



Diamniotic, Dichorionic

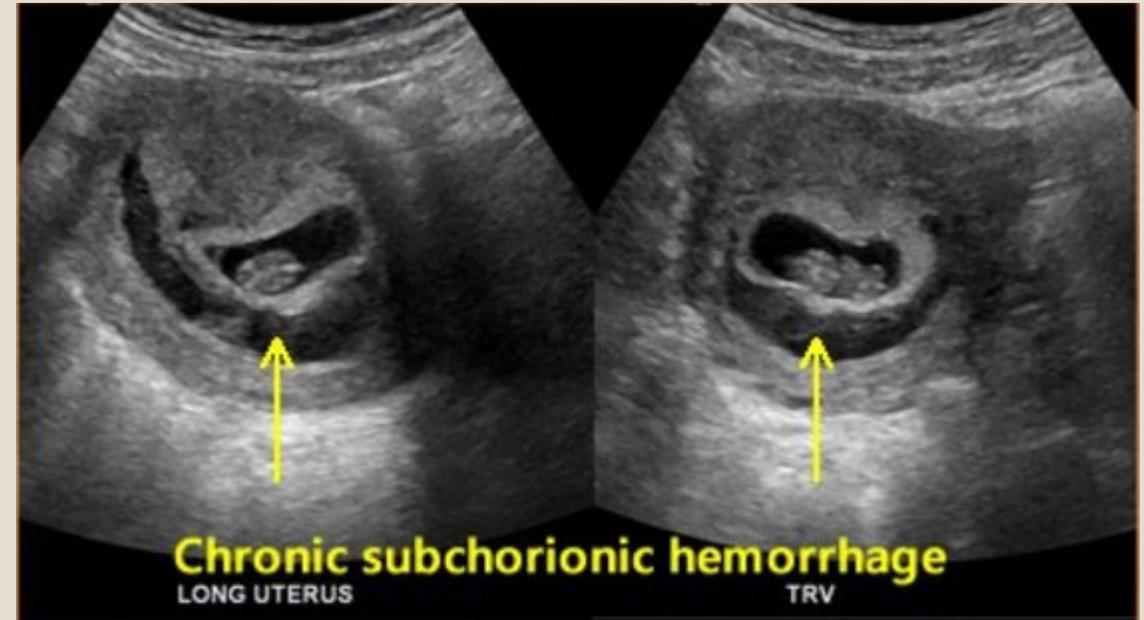
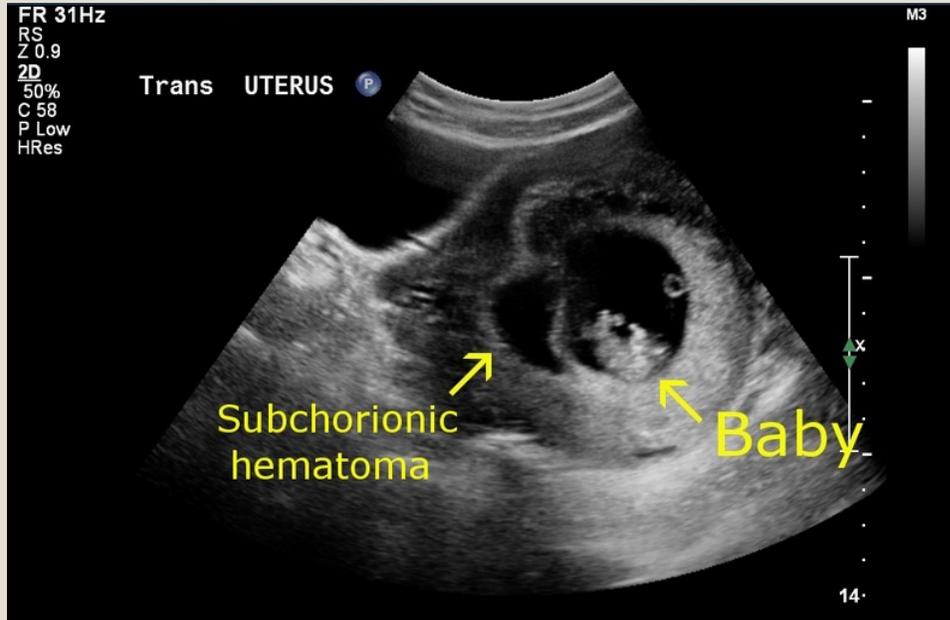


Vanishing Twin



A “vanishing twin” occurs in about 20% of twin pregnancies. In these cases, one of the twins fails to grow and thrive. Instead, its development arrests and it is reabsorbed, with no evidence at delivery of the twin pregnancy.

Subchorionic Hemorrhage



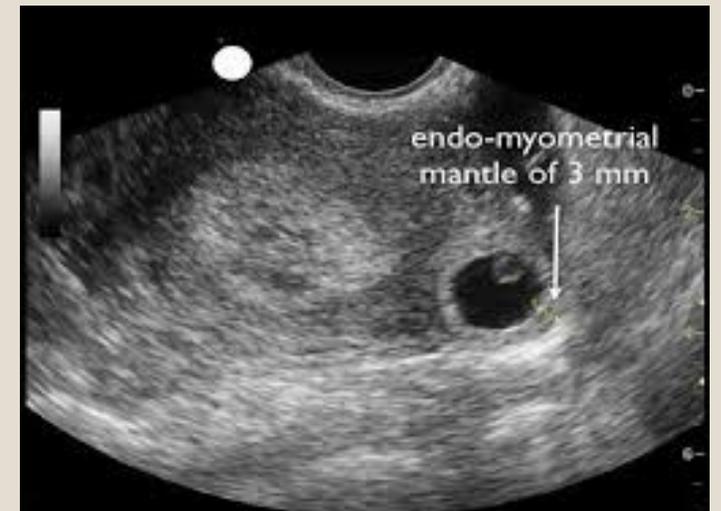
- Small = 20 percent of the size of the gestational sac
- Medium = 20 to 50 percent of the size of the gestational sac
- Large = more than 50 percent of the size of the gestational sac

Anembryonic Pregnancy

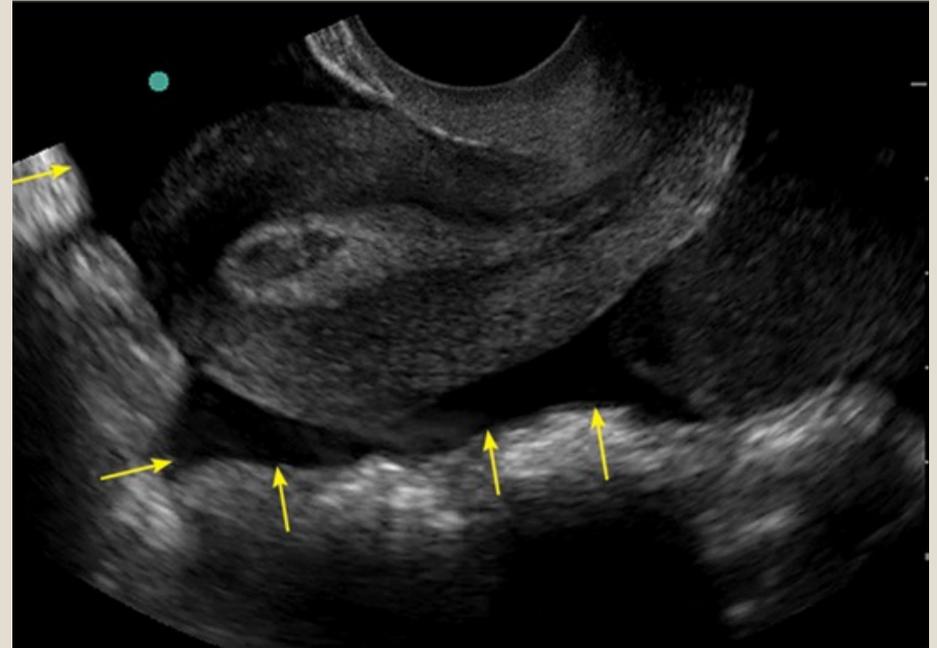


A fertilized egg implants in the uterus but doesn't develop into an embryo. It is diagnosed when there is no embryo seen in a gestational sac with mean sac diameter (MSD) ≥ 25 mm.

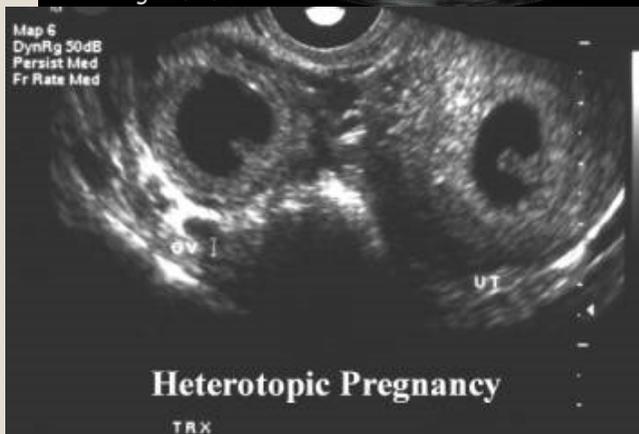
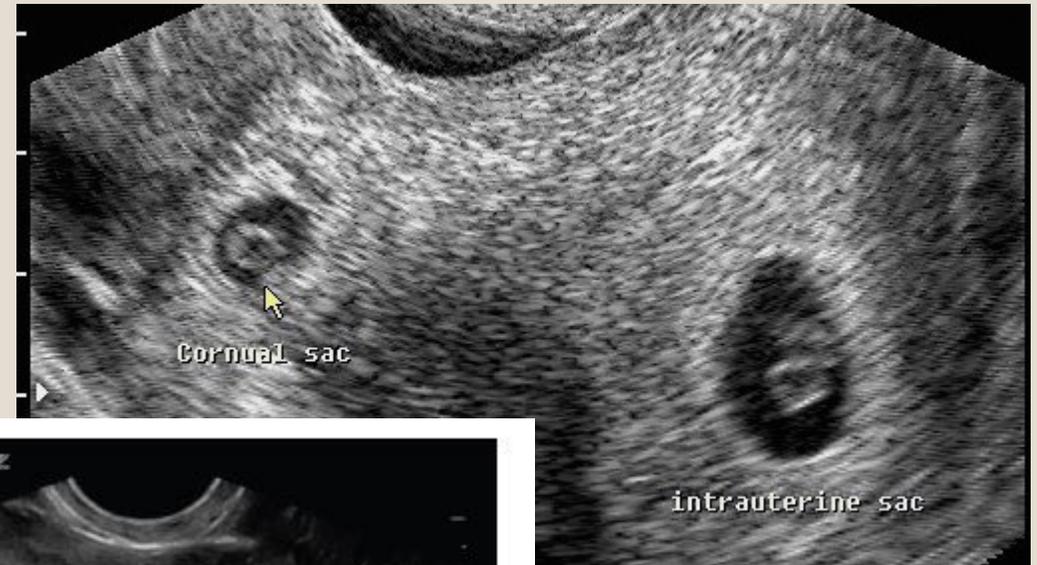
Ectopic



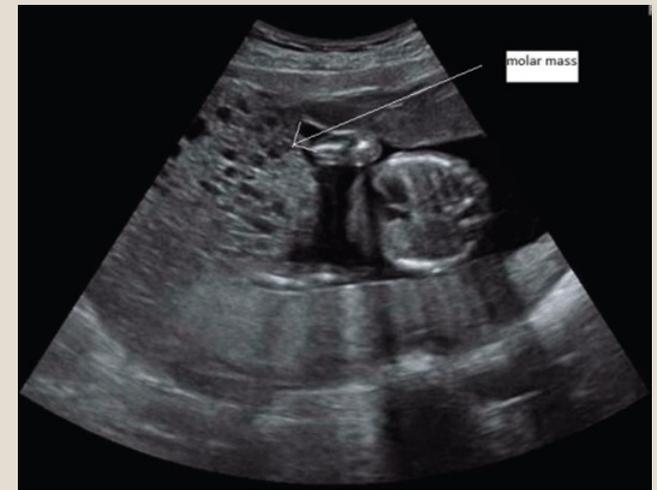
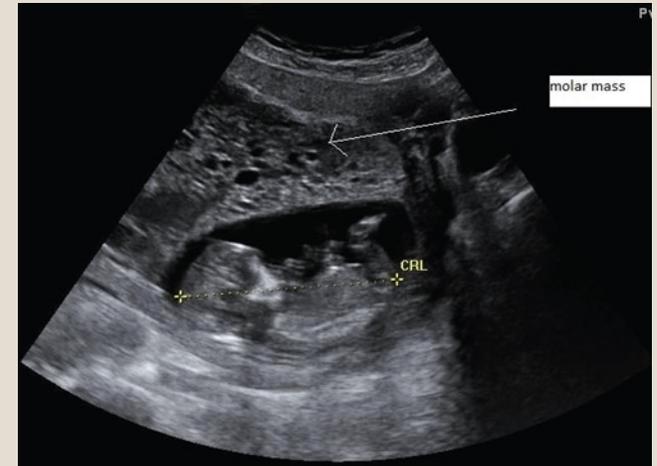
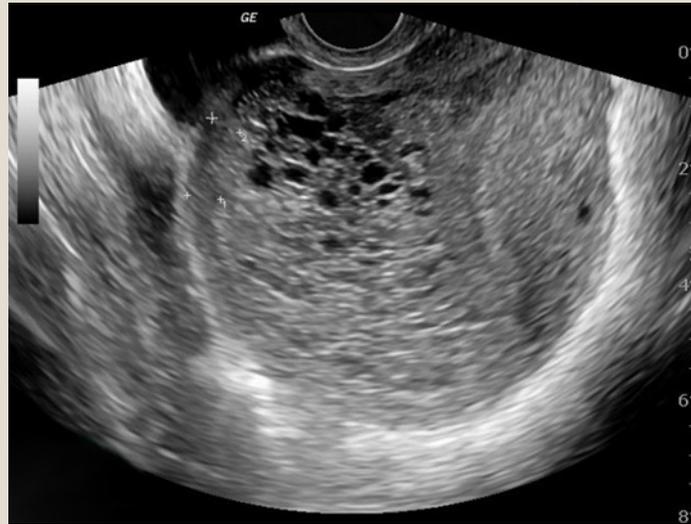
Ectopic – Secondary Signs



Heterotopic Pregnancy

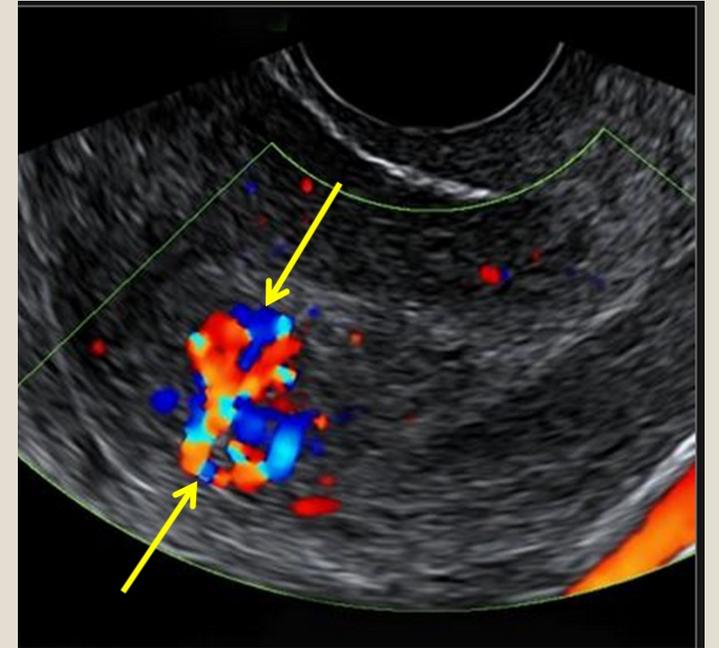
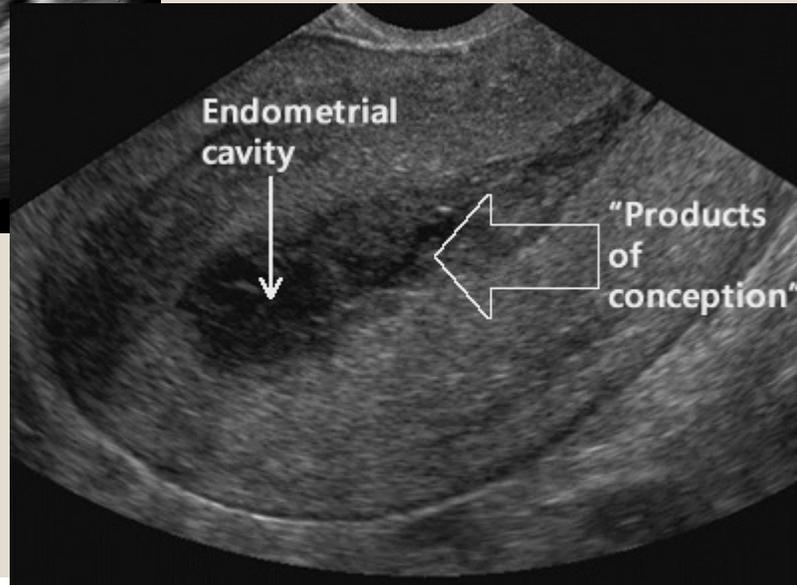
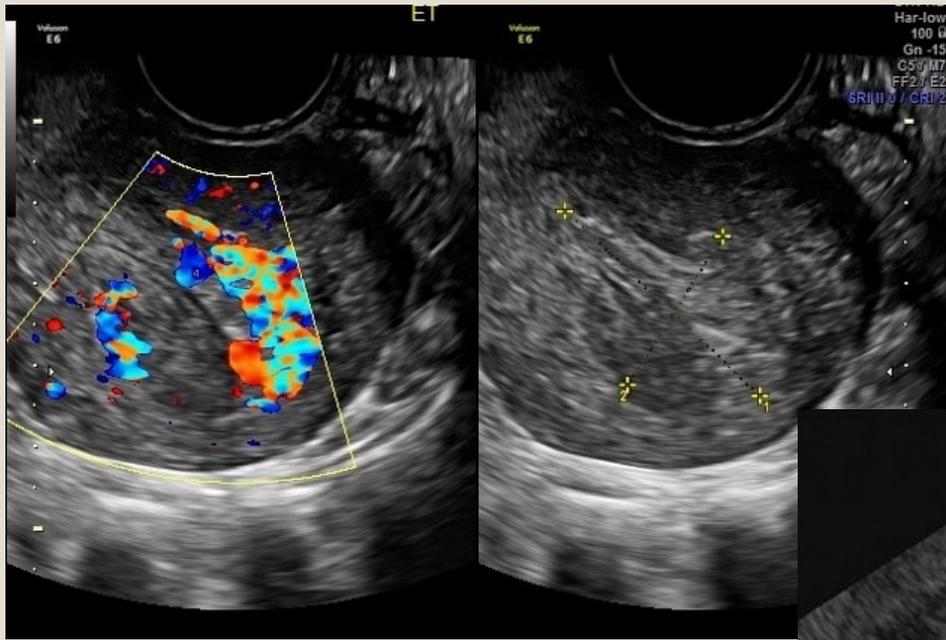


Molar Pregnancy



A molar pregnancy — also known as hydatidiform mole — is a rare complication of pregnancy characterized by the abnormal growth of trophoblasts, the cells that normally develop into the placenta.

Retained Products of Conception





THANK YOU!