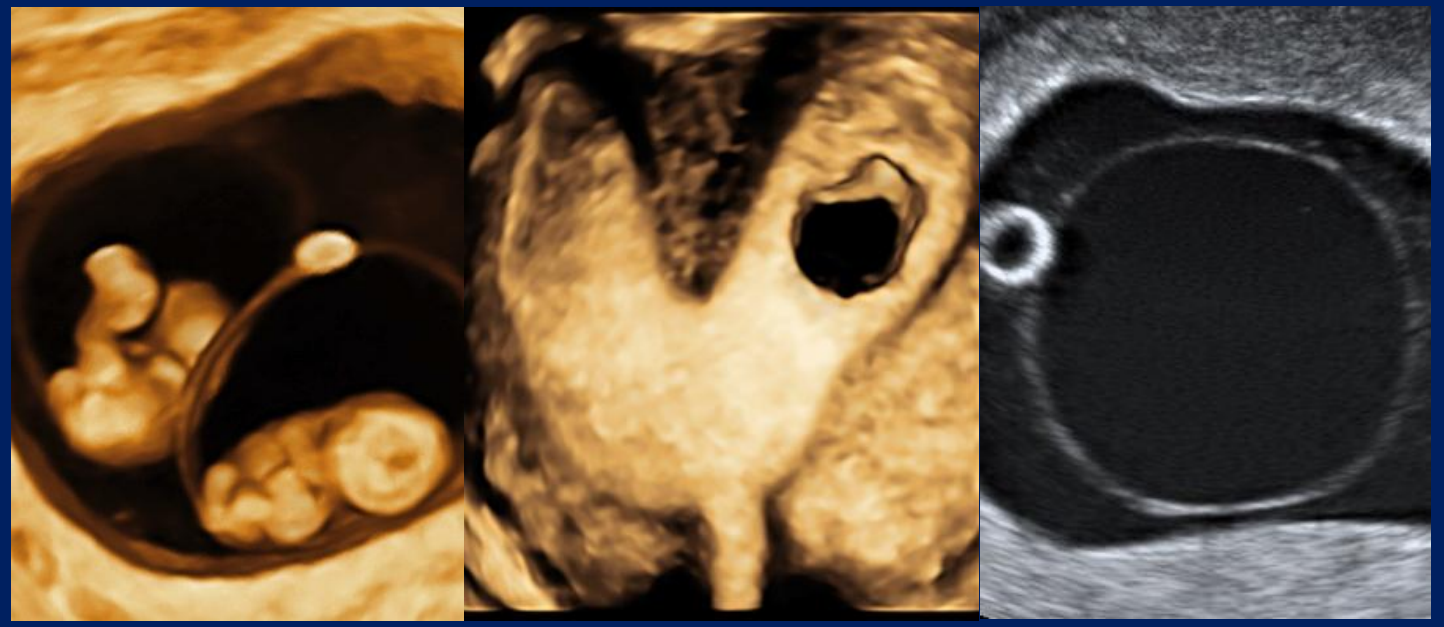
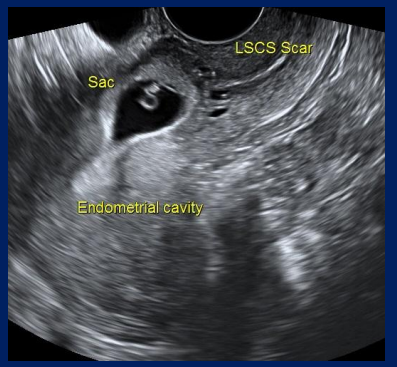


Diagnosis and Misdiagnosis of Early Pregnancy Loss: Classification of Scan Findings

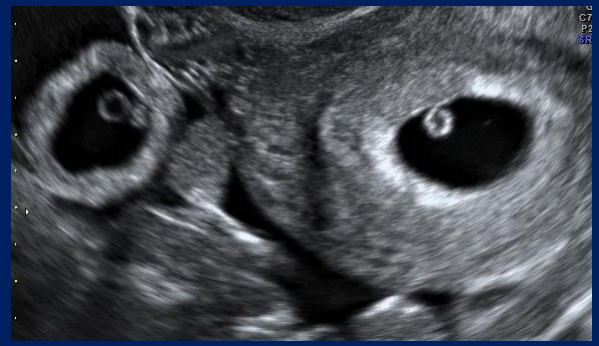
- Emma Kirk MBBS BSc MD FRCOG
- Royal Free Hospital

Ultrasound in early pregnancy

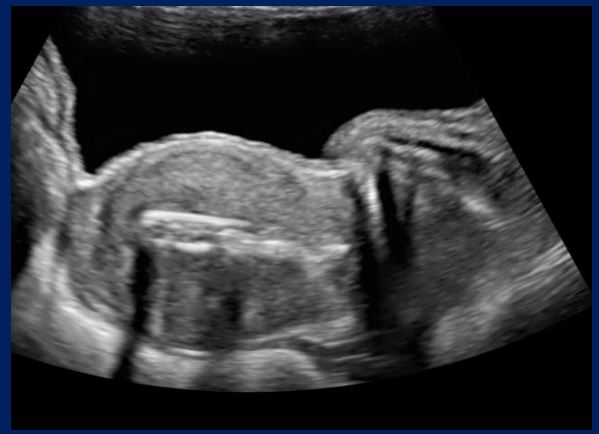
- Assessment of women:
  - Bleeding
  - Pain
  - Previous early pregnancy complication



- Follow-up:
  - Non-surgical management of miscarriage and ectopic pregnancy
  - Adnexal pathology

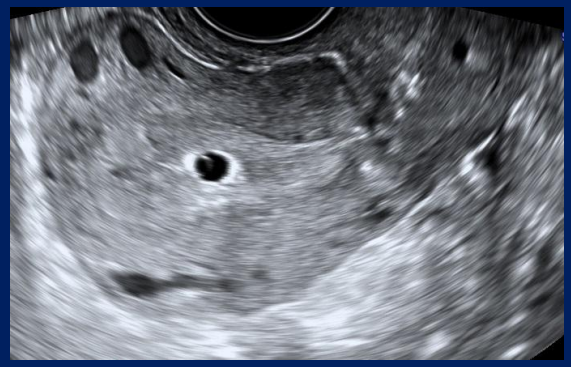


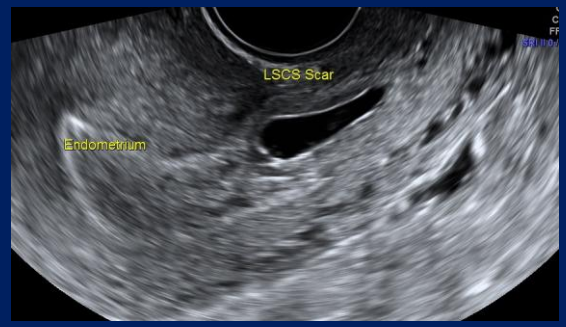
- Surgical procedures:
  - Surgical management of miscarriage / ectopic pregnancy

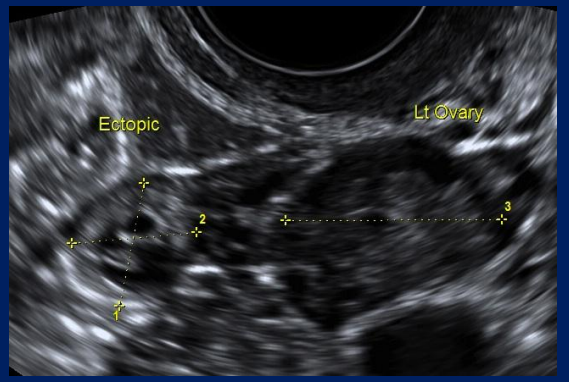


Aims of the early pregnancy scan

- Confirm pregnancy location
- Establish viability
- Determine number of embryos
- Determine gestational age
- Reassure about absence of complications







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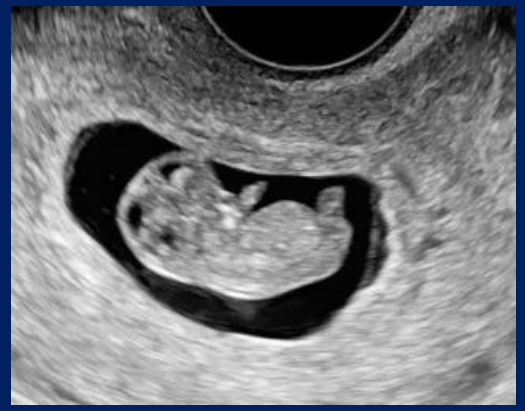

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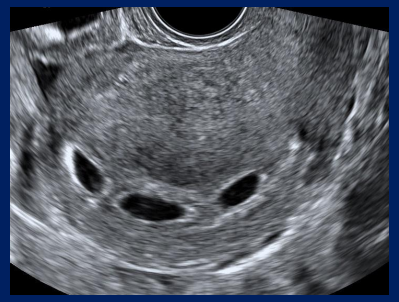

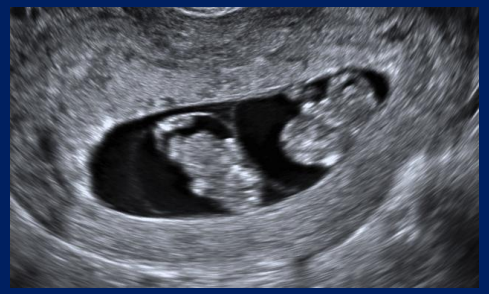

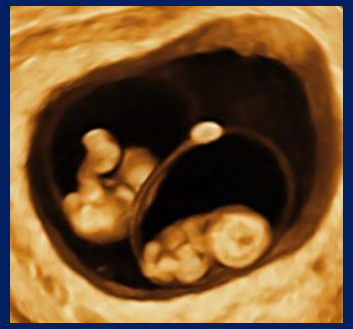

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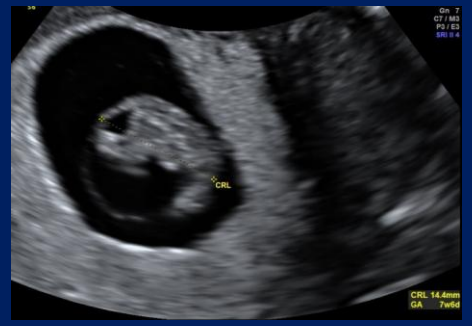

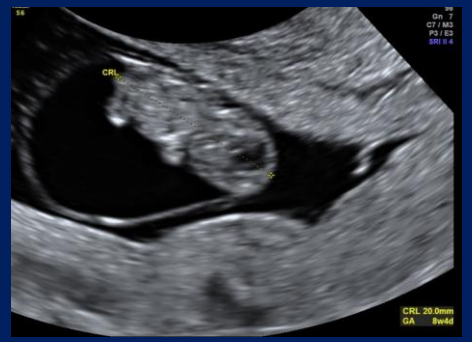

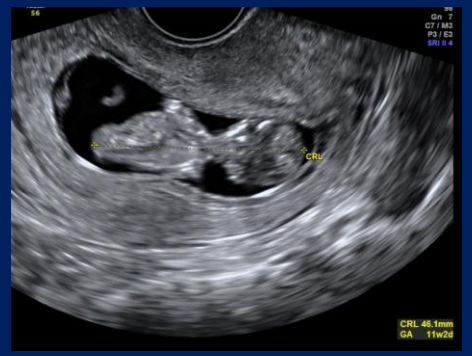

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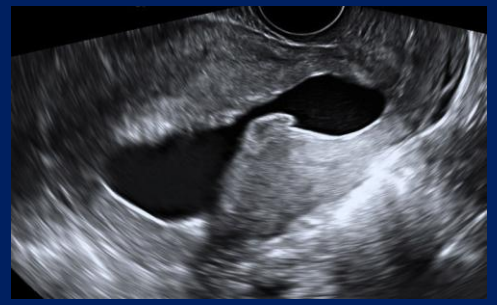

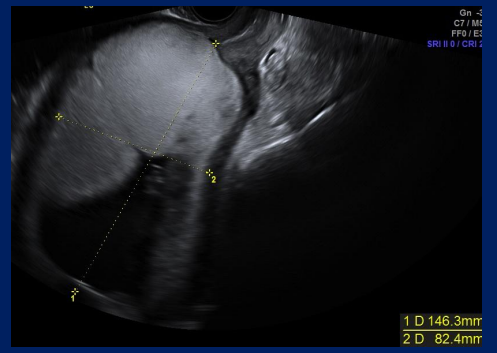

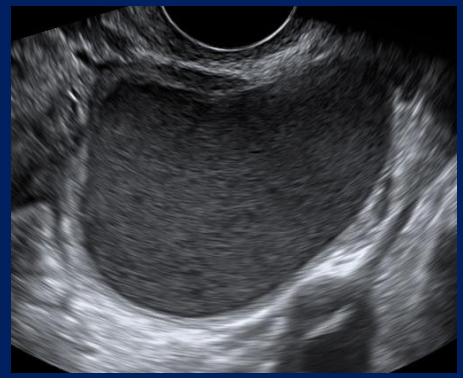

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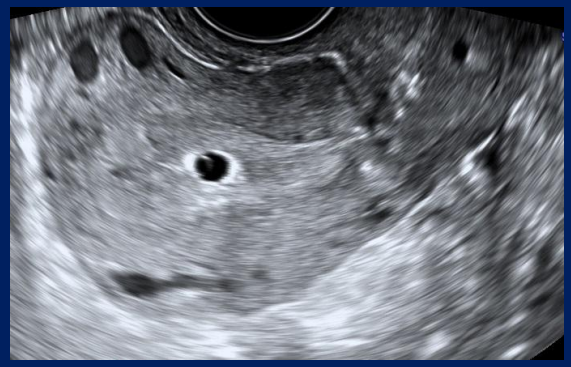
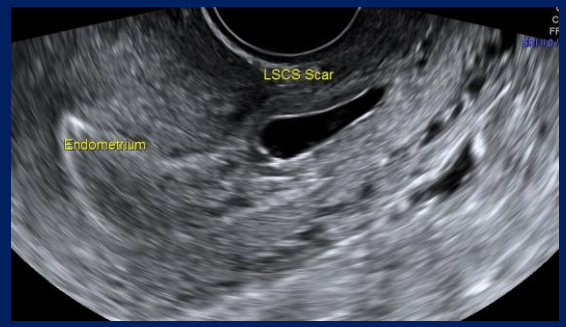
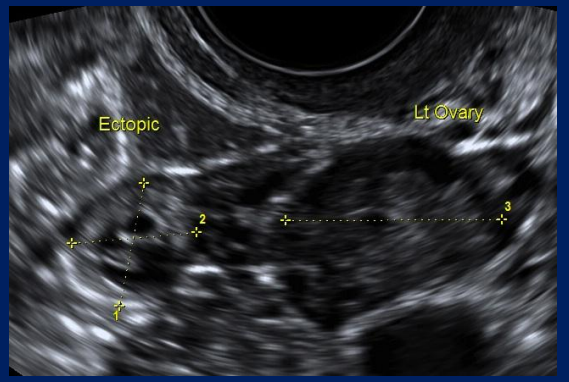






Pregnancy location

A mother's nightmare as baby born deformed after doctors misdiagnose ectopic pregnancy and inject foetus with abortion drug

By DAILY MAIL REPORTER
UPDATED: 02:24, 25 January 2012

Share Tweet Pin it +1 Share 111 View comments

A mother is suing the obstetrician who she claims misdiagnosed her pregnancy as ectopic and injected her foetus with an abortant, resulting in birth defects.

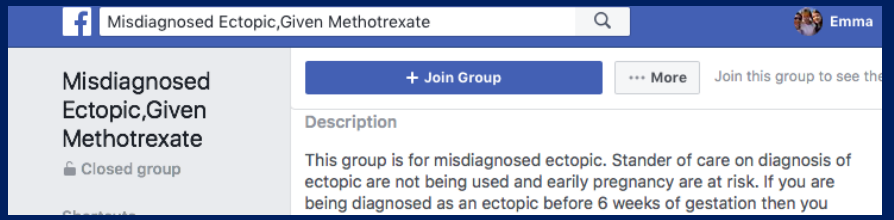
Baby Born Deformed After Misdiagnosed Ectopic Pregnancy

Jan. 24, 2012

By KATIE MOISSE via **GOOD MORNING AMERICA**

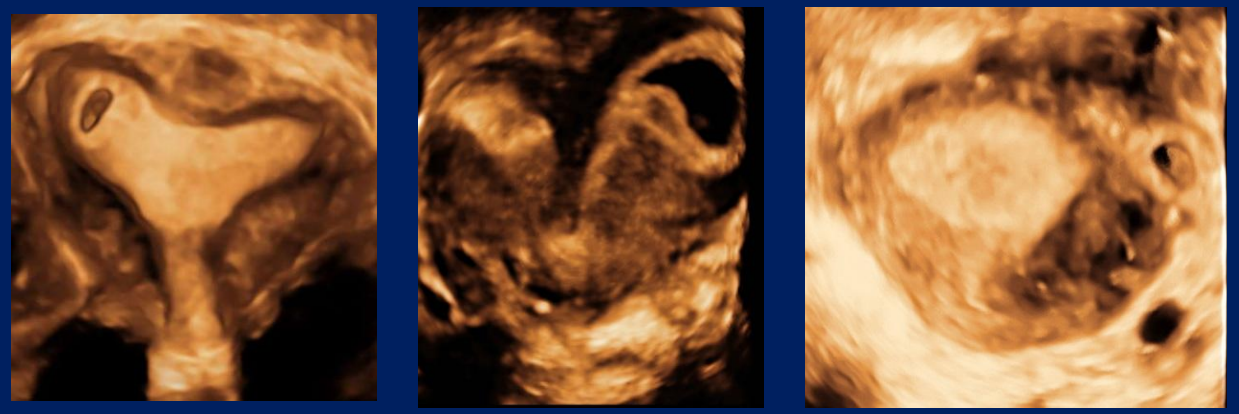
Rachel Schoger of Caldwell, Idaho, had been trying to have a baby for two years and eight months -- a grueling wait interrupted by three positive pregnancy tests and three unexplained miscarriages.

ews.go.com/Health/w_ParentingResource/baby-born-deformed-misdiagnosed-ectopic-pregnancy/story?id=15421441", completed 176



Confusing terminology

- Cornual ectopic
- Interstitial ectopic
- Angular pregnancy



ESHRE Good Practice Recommendations

Human Reproduction Open, Vol.00, No.0, pp. 1–21, 2020
doi:10.1093/hropen/hoaa055

human reproduction open

ESHRE PAGES

Terminology for describing normally sited and ectopic pregnancies on ultrasound: ESHRE recommendations for good practice

The ESHRE working group on Ectopic Pregnancy, Emma Kirk[1], Pim Ankum[2], Attila Jakab[3], Nathalie Le Clef [4], Artur Ludwin [5], Rachel Small[6], Tina Tellum[7], Mira Töyli[8], Thierry Van den Bosch[9,10], and Davor Jurkovic [11,*]

Download summary

Links

Meet the Working Group

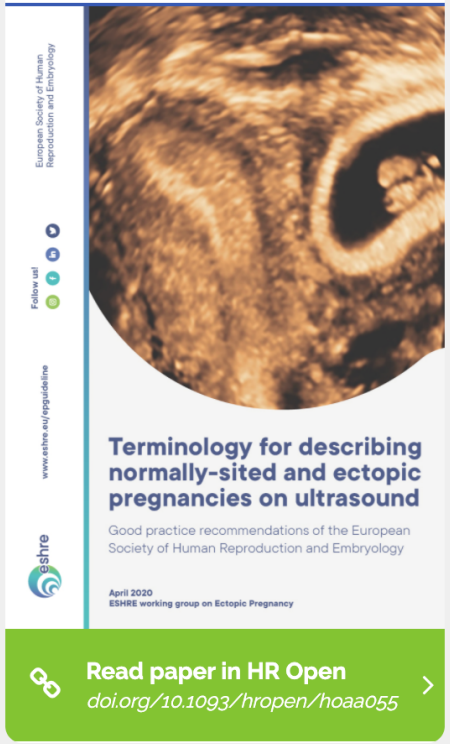
Terminology for describing normally-sited and ectopic pregnancies on ultrasound: recommendations for good practice

A working group of selected ESHRE members of the **ESHRE Special Interest Group Implantation and Early Pregnancy** and invited experts prepared recommendations on the nomenclature of ectopic pregnancy, based on a survey among members of the SIG Implantation and Early Pregnancy regarding current practice and in accordance to the manual for good practice recommendations.

The present ESHRE document provides recommendations on the diagnosis of pregnancy location and the differentiation between normally and abnormally sited pregnancies on ultrasound. The document also provides recommendations on how to record morphology and how to measure ectopic pregnancies. The development of this terminology will help to reduce the risk of misdiagnosis and inappropriate treatment.

The paper "**Terminology for describing normally-sited and ectopic pregnancies on ultrasound: recommendations for good practice**" is published in HROpen. In addition to the GPR paper, you can also download the **review report**.

Read the recommendations



Read paper in HR Open
doi.org/10.1093/hropen/hoaa055

Supplementary data

Recommendations on terminology for normally sited and ectopic pregnancies

01 Normally sited pregnancy

Location

- A pregnancy which is located within the uterine cavity should be described as a normally sited (eutopic) pregnancy

Viability

- A pregnancy which is located within the uterine cavity with embryonic/foetal heart pulsations should be described as a live normally sited (eutopic) pregnancy
- A pregnancy which is located within the uterine cavity without a visible embryo which has the potential to develop normally should be described as an early normally sited (eutopic) pregnancy
- The term miscarriage should be used to describe a normally sited (eutopic) pregnancy <22 weeks' gestation with abnormal development resulting in embryonic/foetal loss

02 Ectopic pregnancy

Viability

- An ectopic pregnancy which contains an embryo/foetus with evidence of heart pulsations should be described as a live ectopic pregnancy.
- The term miscarriage should not be used for an ectopic pregnancy. Ectopic pregnancy with clinical, ultrasound and/or biochemical signs of regression should be described as a failing ectopic pregnancy

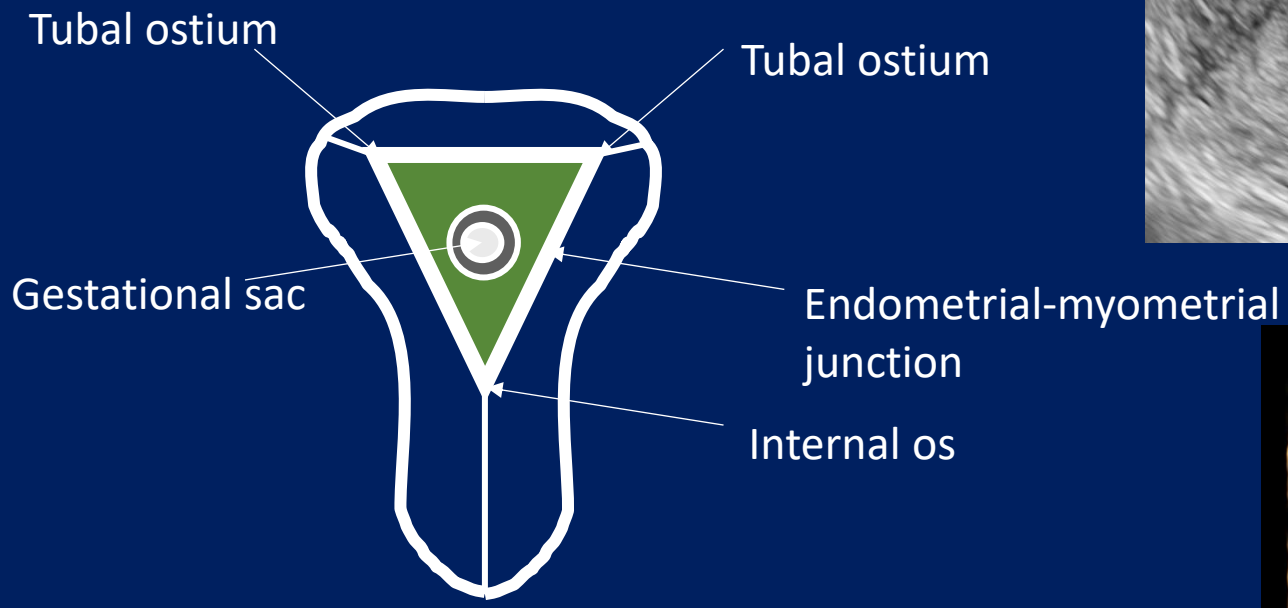
Location

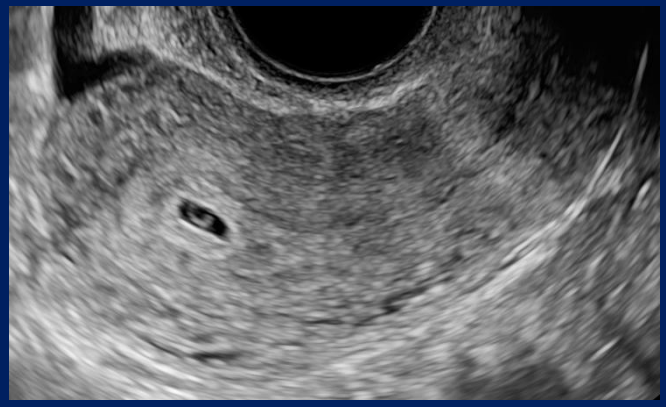
- Ectopic pregnancies should be classified as uterine or extrauterine.
- Previous classification of ectopic pregnancies as tubal and non-tubal should be abandoned
- The term angular pregnancy should be abandoned
- Cervical, caesarean scar, intramural and interstitial ectopic pregnancies should be described as partial or complete
- The term intramural pregnancy should be used to describe a pregnancy which is located within the uterus, but breaches the endometrial–myometrial junction and invades the myometrium of the uterine corpus above the internal os.
- The terms caesarean scar and cervical pregnancies should be used to describe pregnancies which invade myometrium in the vicinity or below the level of the internal os. Caesarean scar pregnancies are implanted anteriorly at the visible or presumed site of transverse lower segment uterine scar, whilst cervical pregnancies could be located either anteriorly or posteriorly
- Tubal ectopic pregnancies should be described as either interstitial, isthmic or ampullary.
- All pregnancies within the confines of the uterine cavity should be classified as normally sited regardless whether the uterus in normally formed or anomalous. The only exception is a pregnancy located in a rudimentary horn of a unicornuate uterus which should be classified as a rudimentary horn ectopic pregnancy
- The term 'residual ectopic pregnancy' should be used for an ectopic pregnancy which presents as a discrete mass on ultrasound in a woman with a negative pregnancy test.
- The term 'chronic ectopic' should not be used in clinical practice
- In all ectopic pregnancies, measurements of the gestational sac size and trophoblastic mass should be routinely carried out. In tubal ectopic pregnancies, the size of haematosalpinx should be reported when present. All measurements should be performed in three perpendicular planes. The haemoperitoneum should be estimated semi-quantitatively

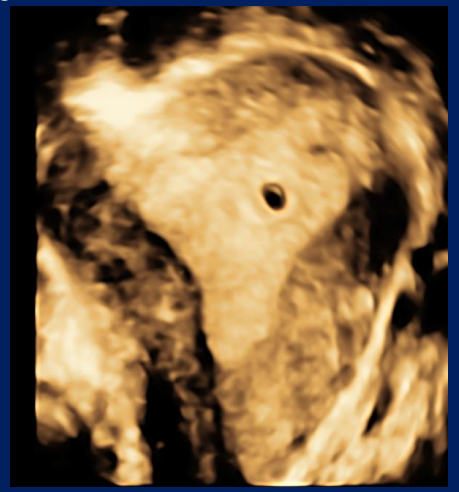
These recommendations are extracted from a paper "Terminology for describing normally sited and ectopic pregnancies on ultrasound: ESHRE recommendations for good practice" developed by the ESHRE working group on Ectopic Pregnancy. The paper further includes schematic representations and examples of each type of ectopic pregnancy.
More information is available on www.eshre.eu/EPGuideline

European Society of Human Reproduction and Embryology

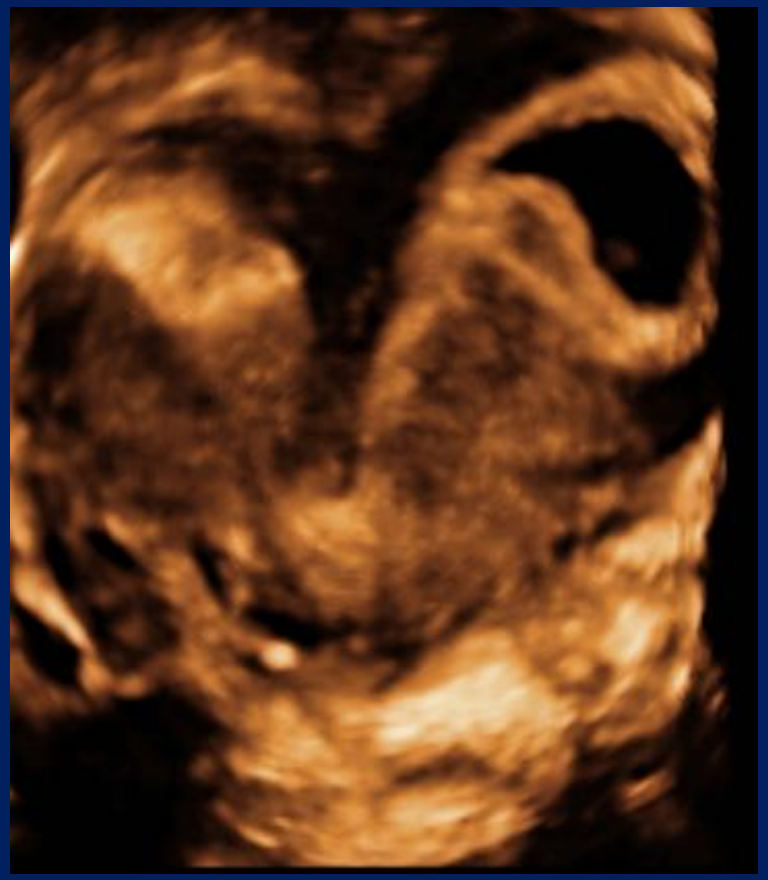
Normally sited pregnancy

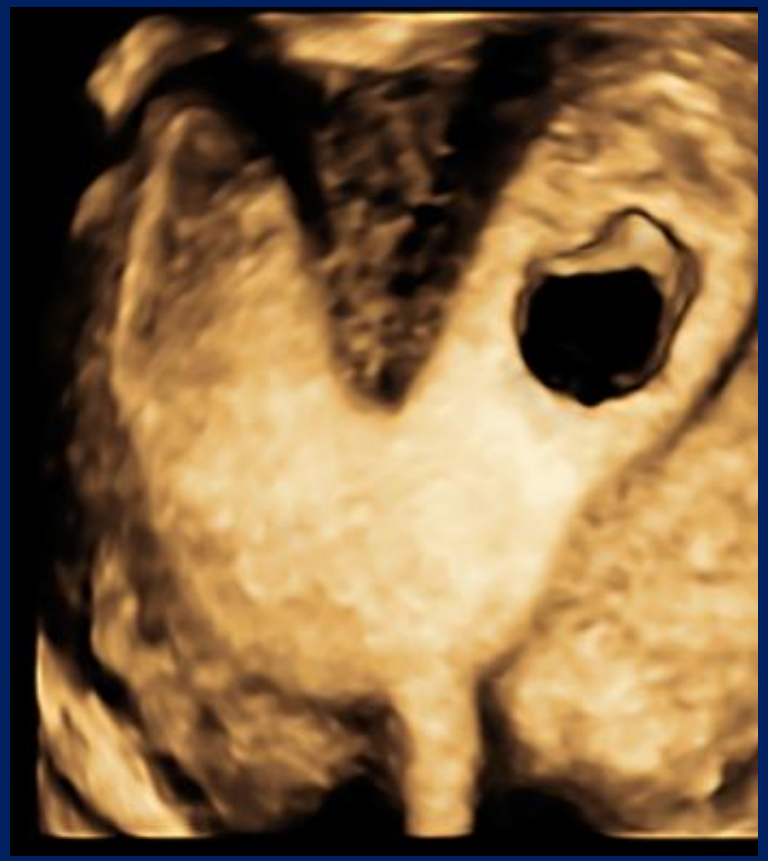


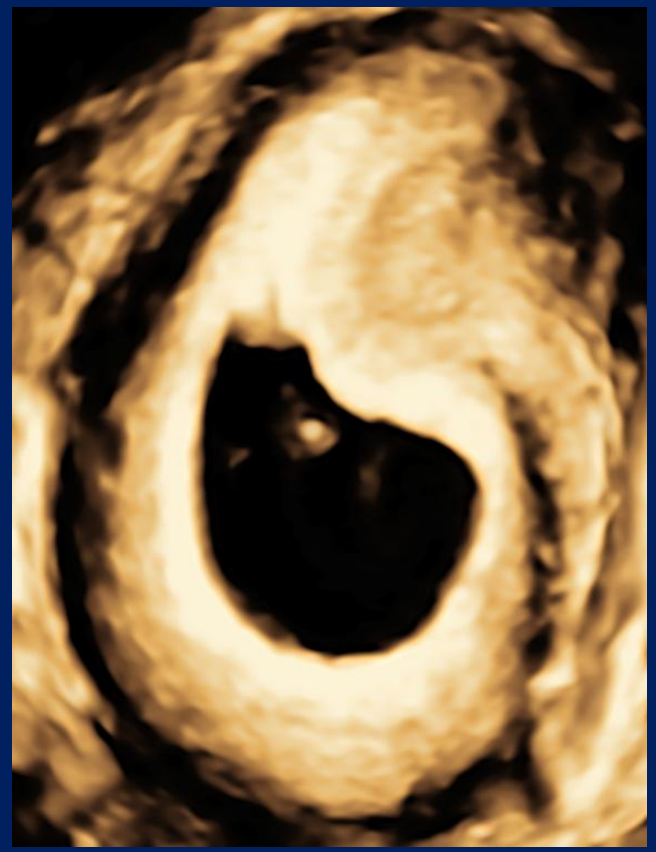




Normally sited pregnancy in an abnormally shaped uterus

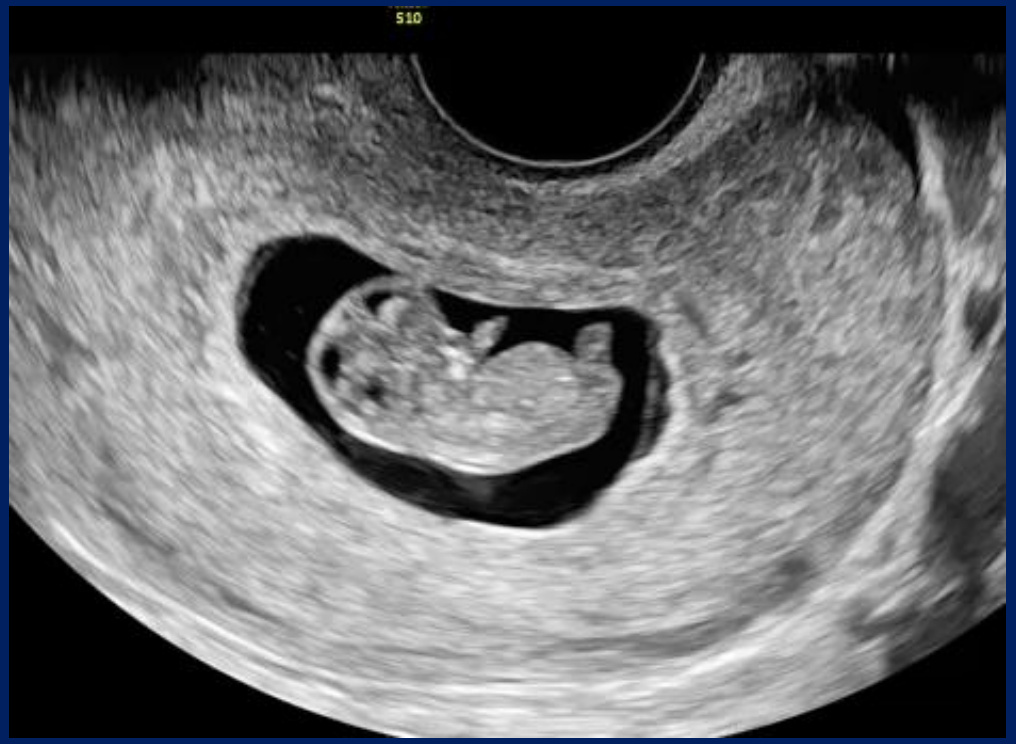






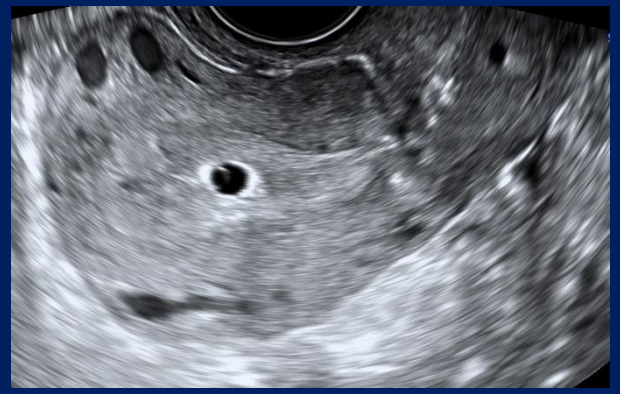
Normally sited pregnancy

- Normally sited pregnancy
- Normally sited intrauterine pregnancy
- Normal pregnancy
- Intrauterine pregnancy
- Intracavitary pregnancy
- Viable pregnancy
- Live pregnancy
- Ongoing pregnancy
- Entopic *(ento – within, topos –place, correct)* pregnancy
- Eutopic *('normal position')* pregnancy

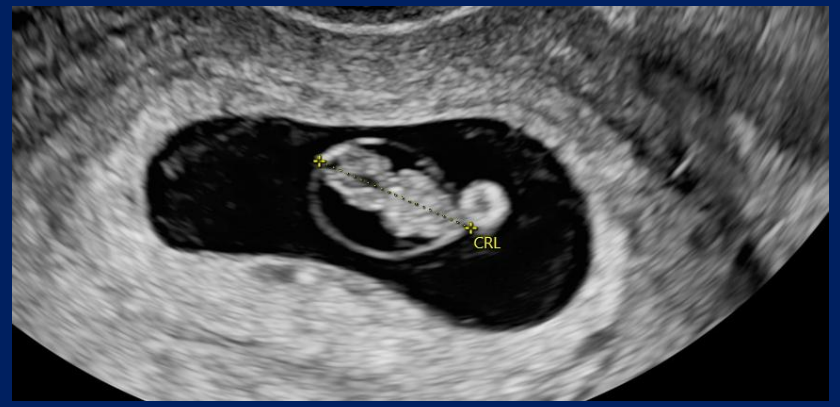


Normally sited pregnancy

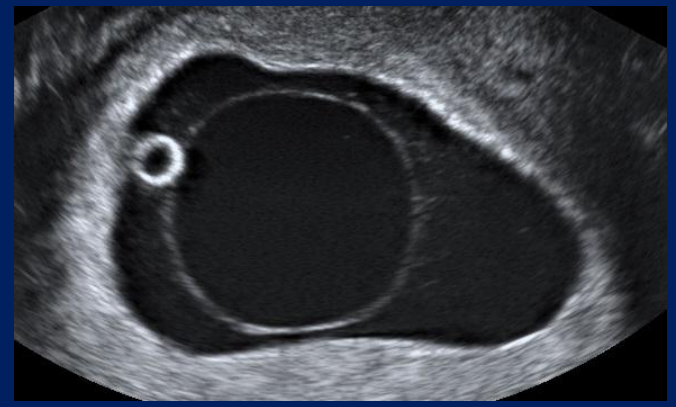
- Early normally sited (eutopic) pregnancy



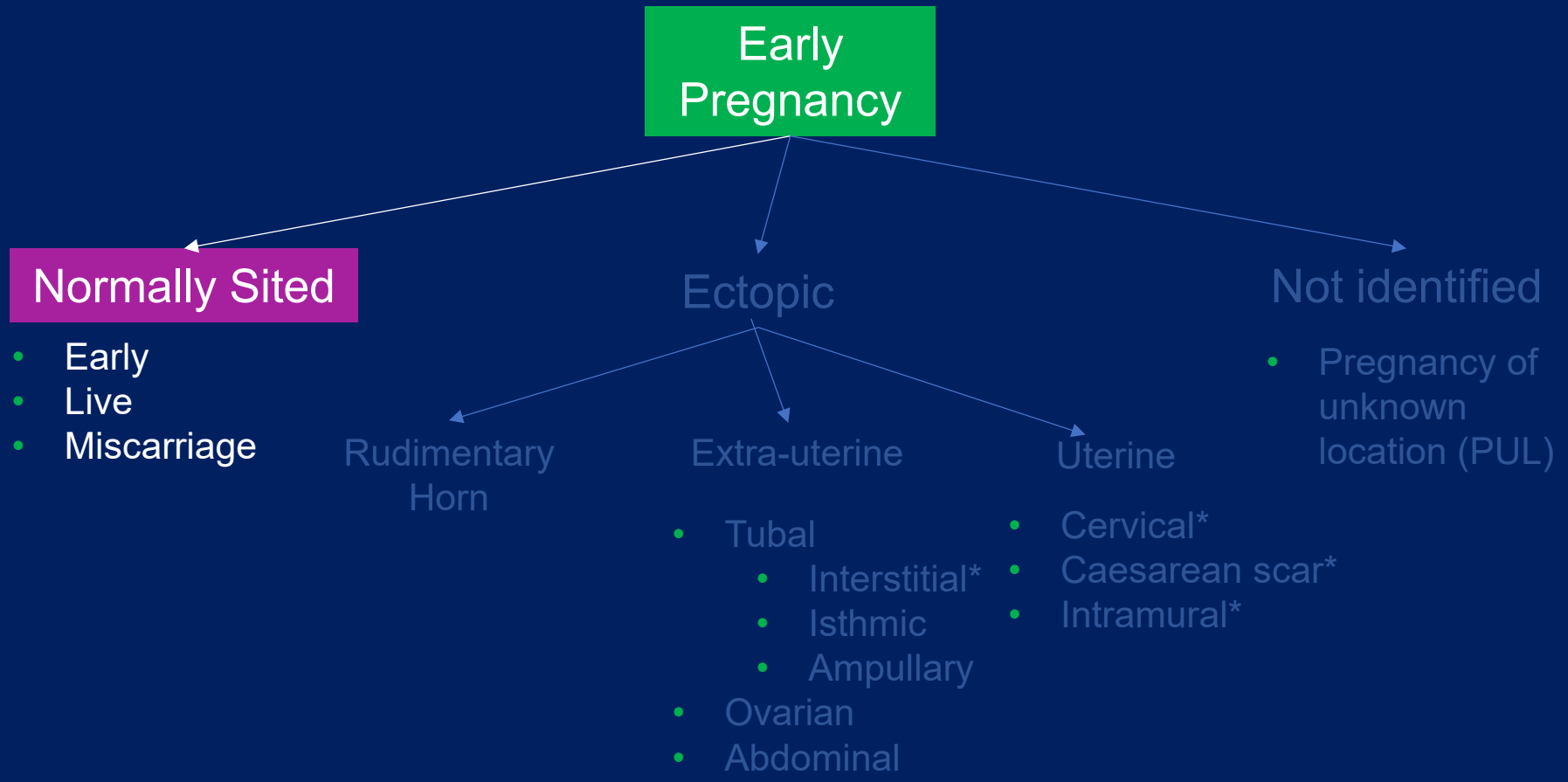
- Live normally sited (eutopic) pregnancy



- Miscarriage



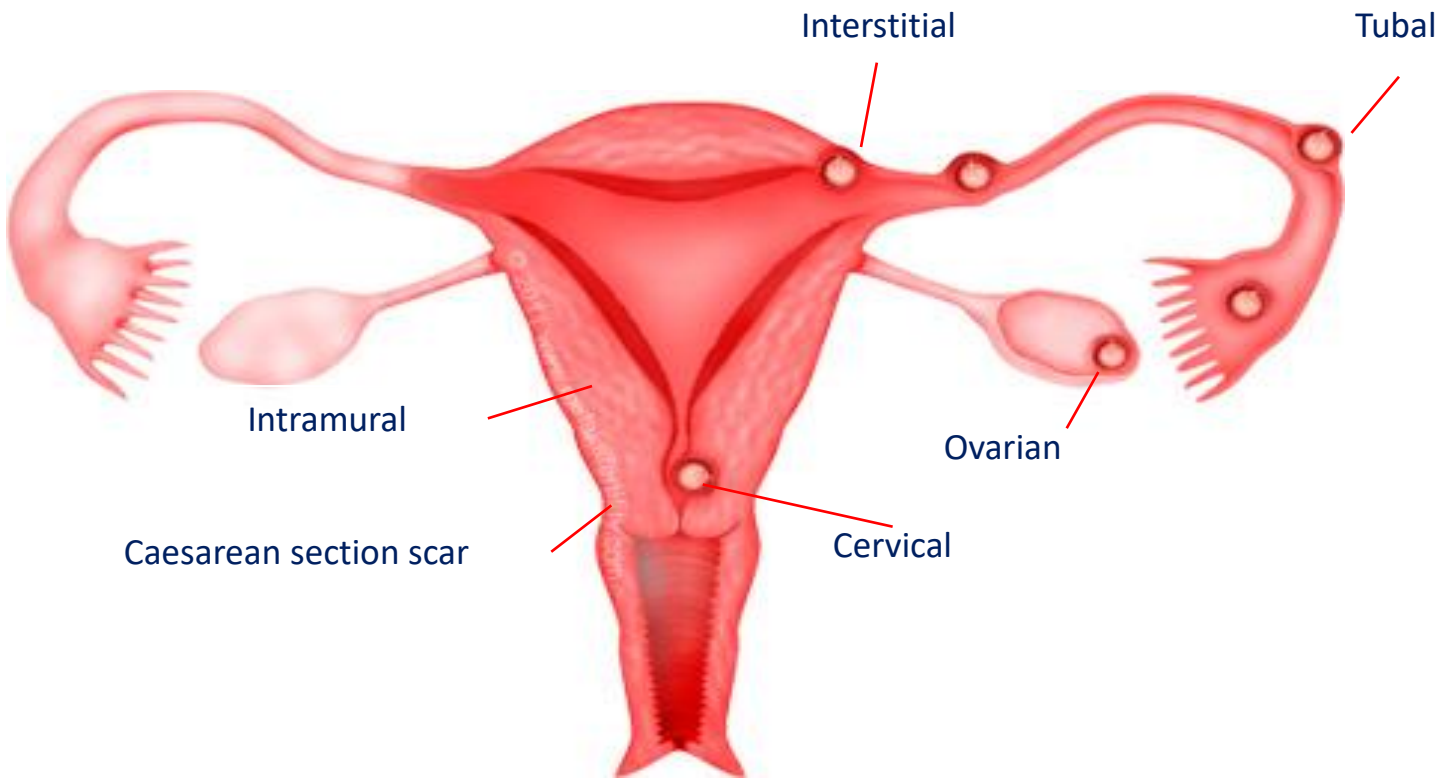
Classification system for early pregnancy



*partial or complete

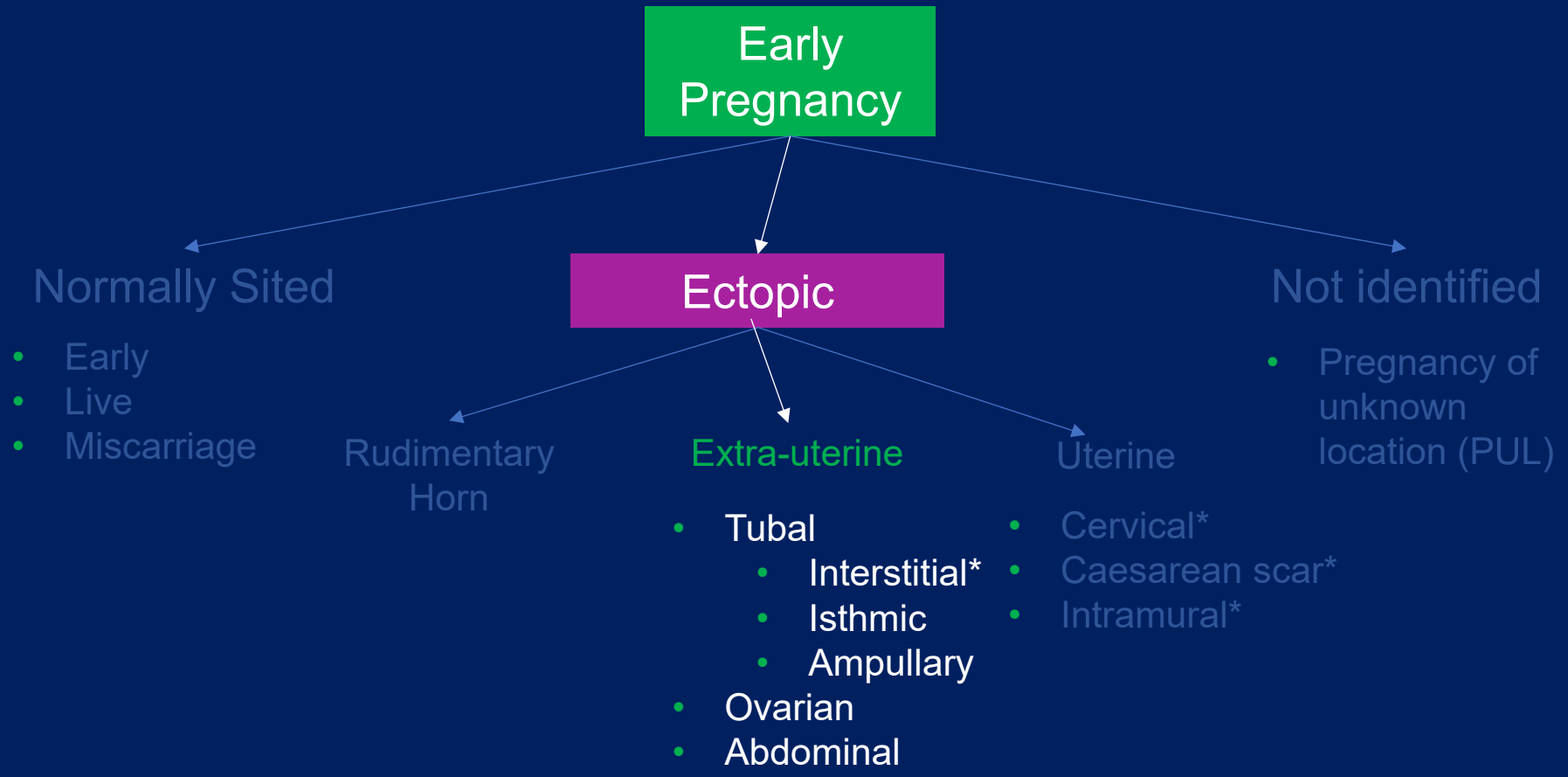
Ectopic Pregnancy

- Ectopic pregnancy no longer synonymous with extra-uterine pregnancy



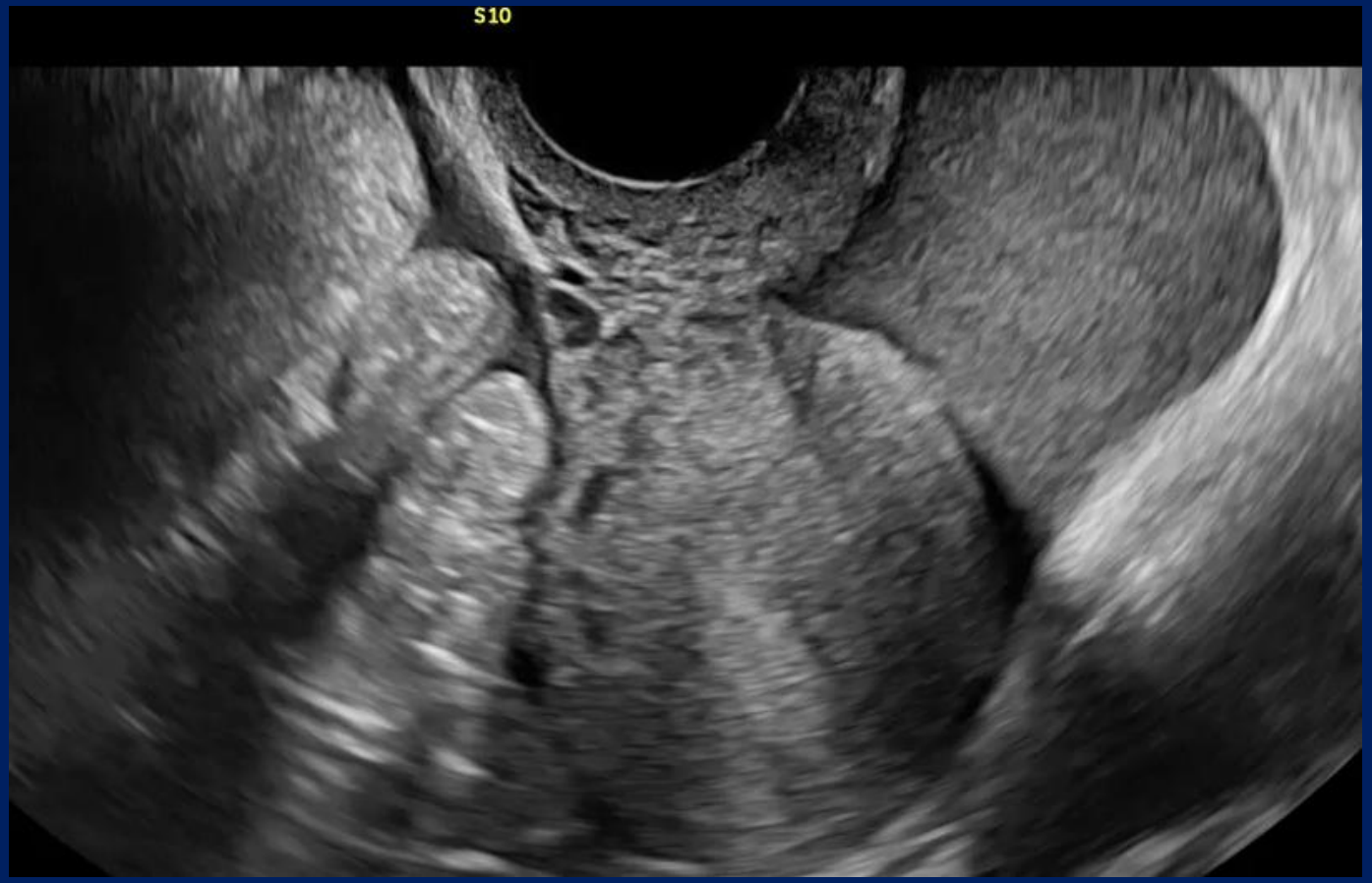
- Ectopic pregnancies should be classified as uterine or extra-uterine

Classification system for early pregnancy



*partial or complete

Extra-uterine ectopic pregnancy



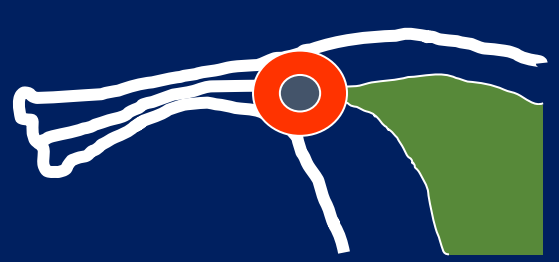
- Tubal
  - Interstitial
  - Isthmic
  - Ampullary
- Ovarian
- Abdominal

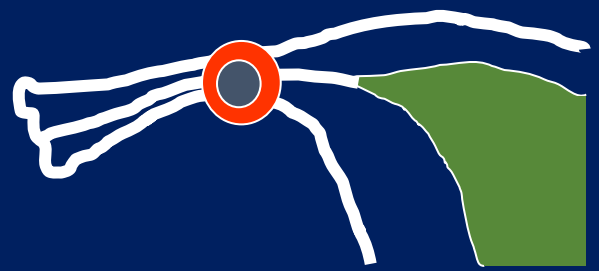
Tubal ectopic pregnancy

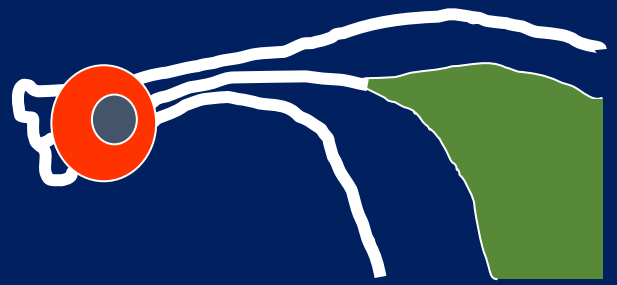
Interstitial

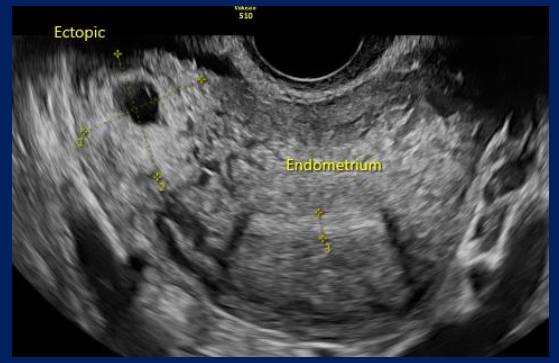
Isthmic

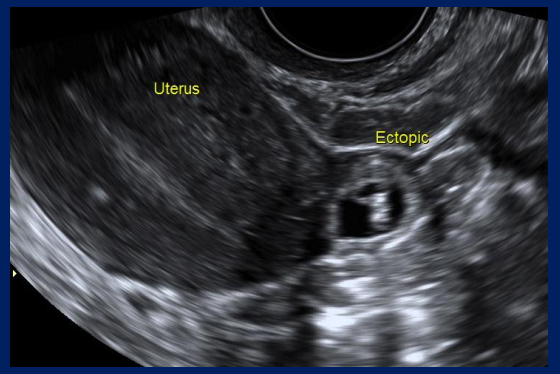
Ampullary

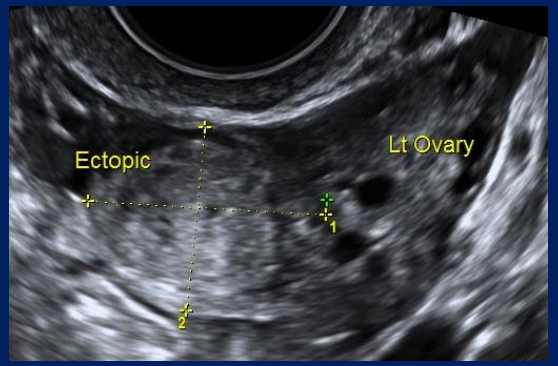




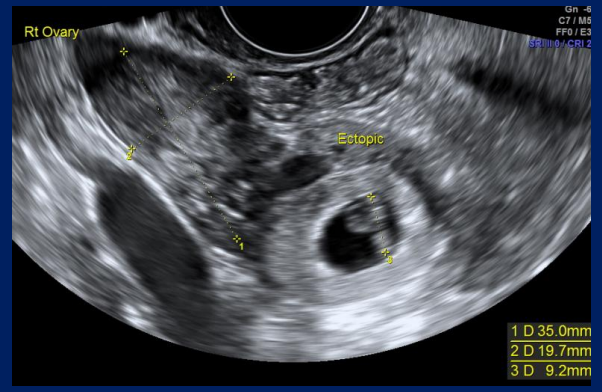
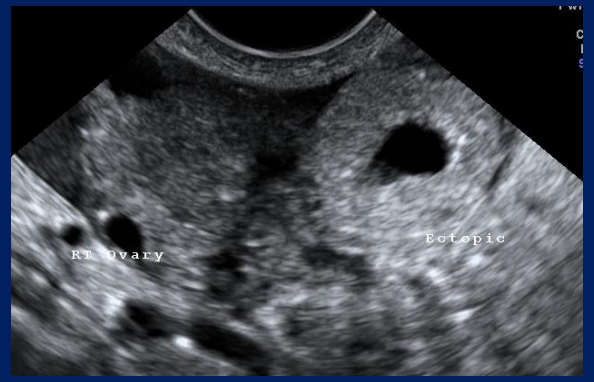
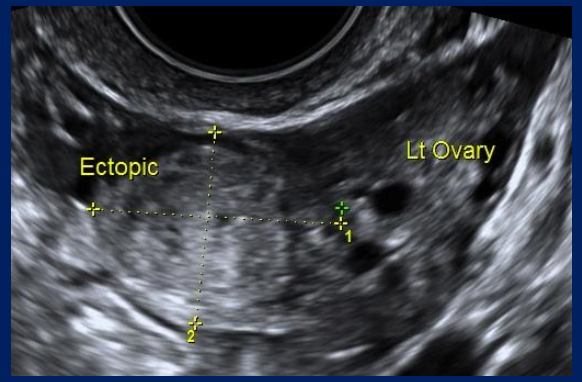




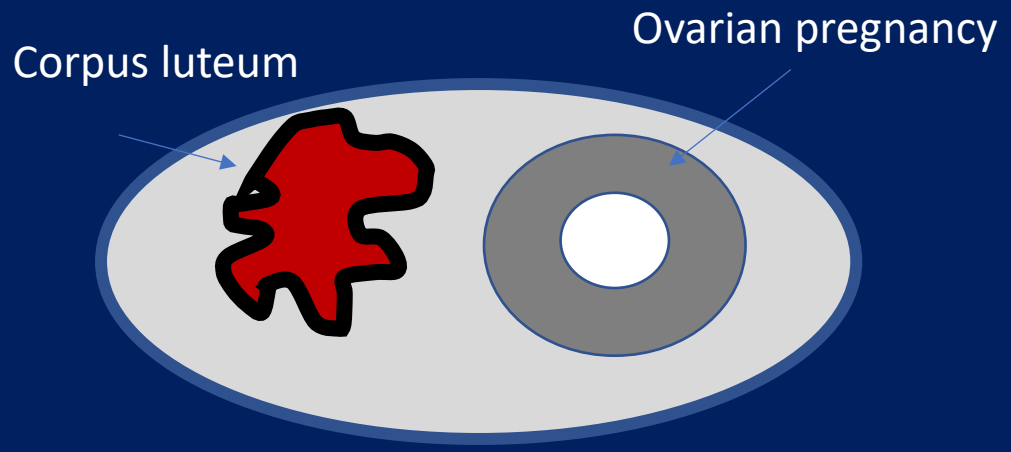


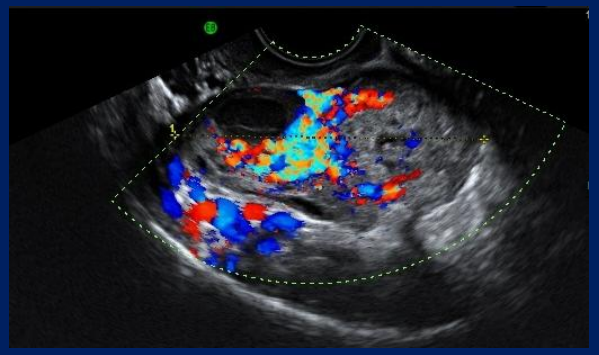


Tubal ectopic pregnancy morphology

Gestational sac and yolk sac / CRL	Empty gestational sac	Inhomogeneous mass
		
~20%	~20%	~60%

Ovarian ectopic pregnancy

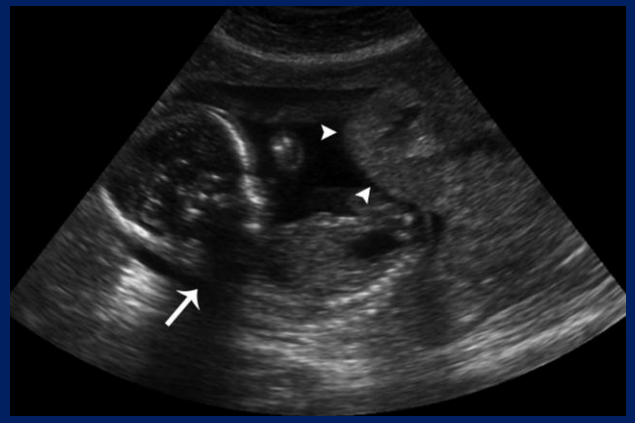




- Empty uterine cavity
- Gestational sac or trophoblastic mass with a wide echogenic ring on or within the ovary, generally seen surrounded by ovarian cortex and seen separately from the corpus luteum

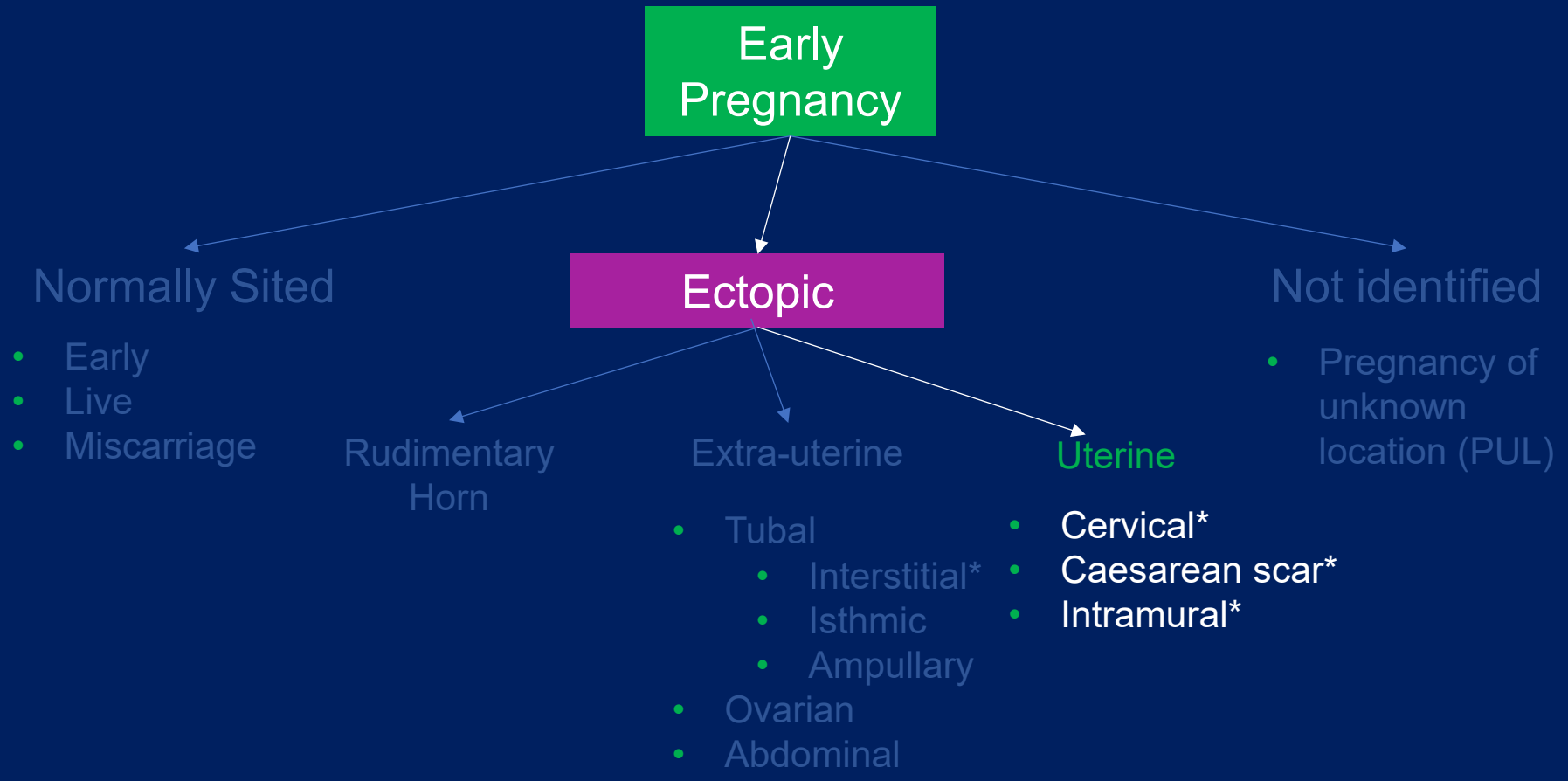
Abdominal ectopic pregnancy

- Empty uterine cavity
- No evidence of a dilated Fallopian tube or complex adnexal mass
- Gestational sac or trophoblastic mass surrounded by loops of bowel and separated by peritoneum



- 1°– original implantation site is within the peritoneal cavity
- 2° – result of tubal abortion and re-implantation into the abdominal cavity

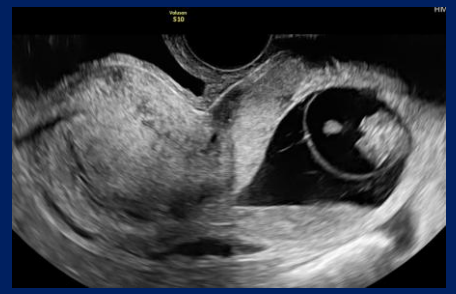
Classification system for early pregnancy



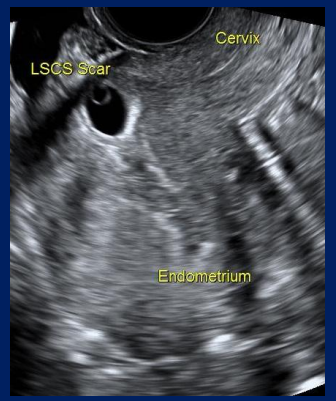
*partial or complete

Uterine ectopic pregnancy

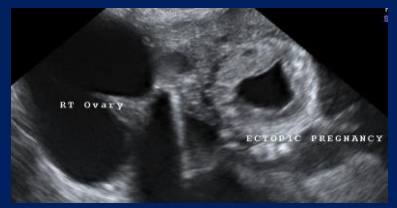
Cervical



Scar

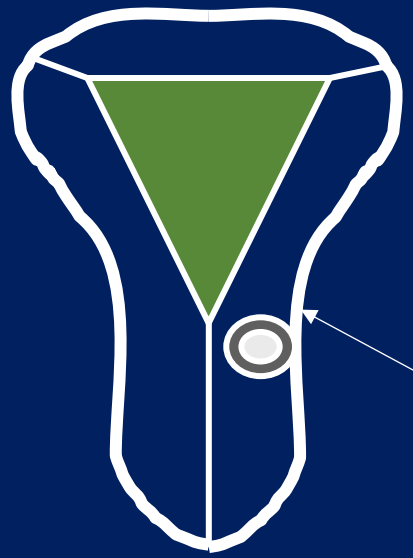


Intramural

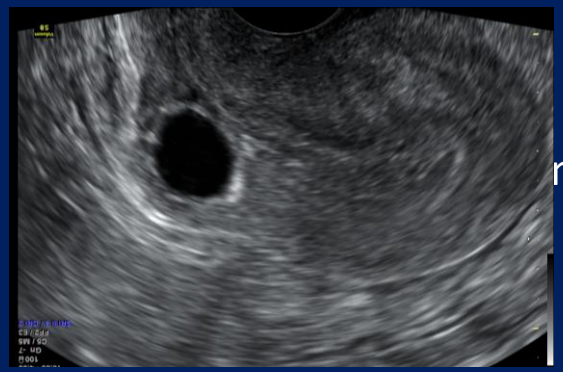


LSCS Scar pregnancy

Complete

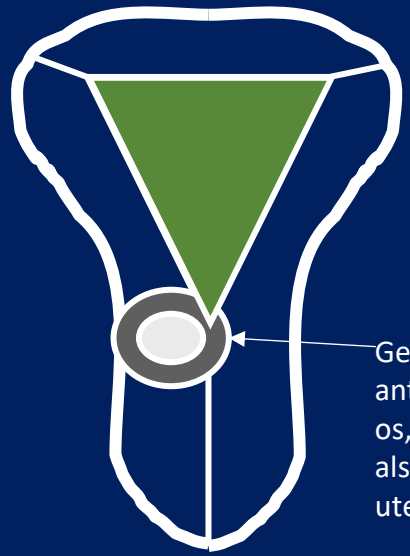


Gestational sac completely implanted within the anterior myometrium, close to the interior os

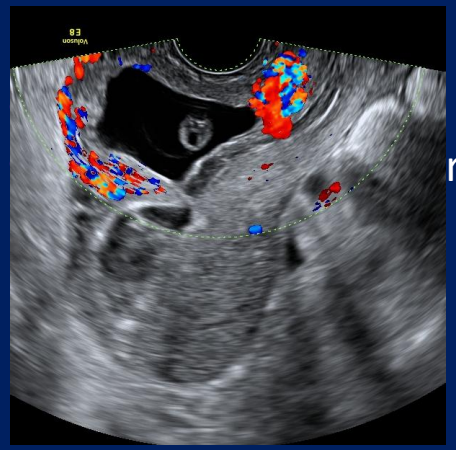


ment

Partial



Gestational sac implanted anteriorly, close to the interior os, invading the myometrium but also partly protruding into the uterine cavity

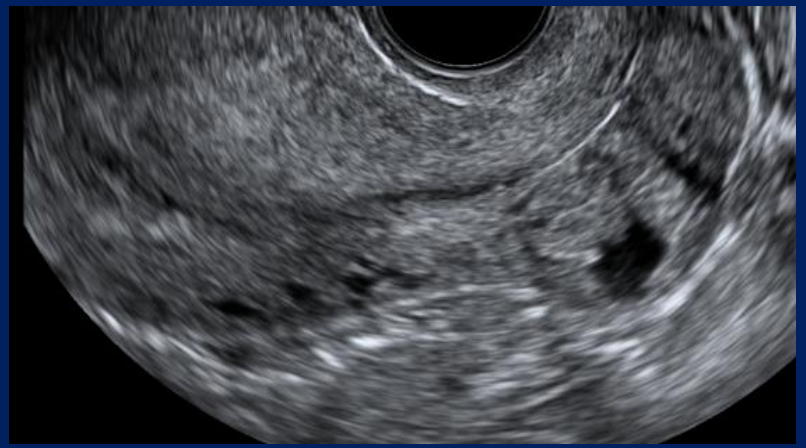


rvical

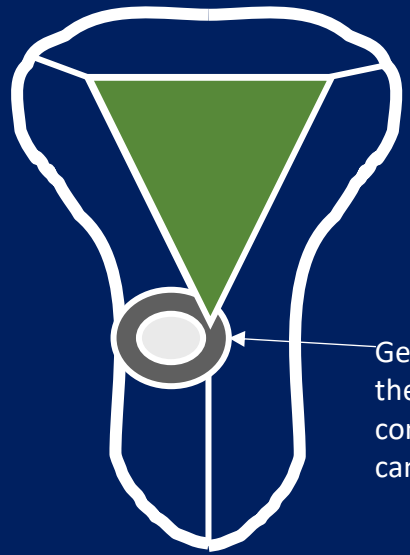
Cervical ectopic pregnancy

Complete

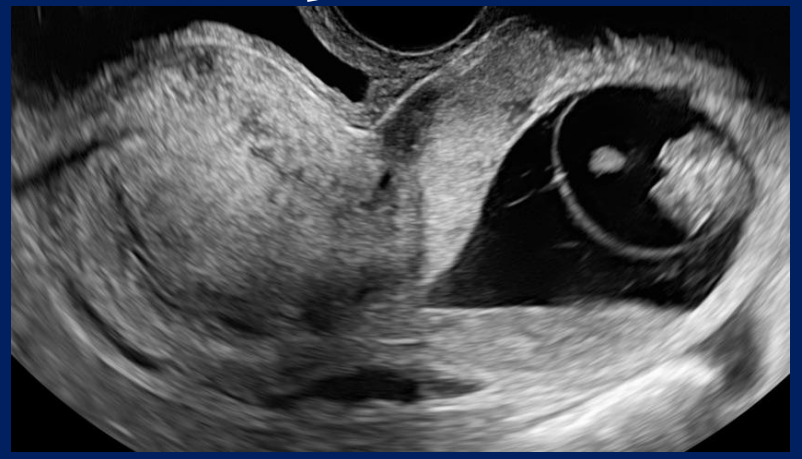
Gestational sac implanted below the level of the internal os, completely surrounded by myometrium



Partial



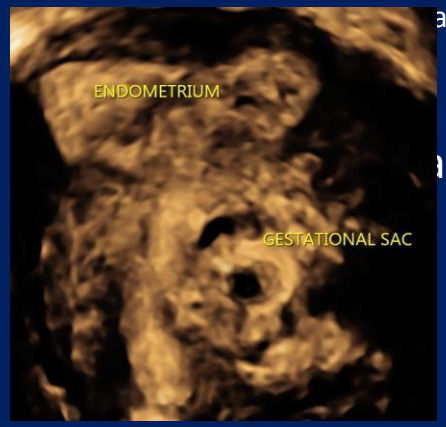
Gestational sac implanted below the level of the internal os, communicating with the cervical canal



Intramural ectopic pregnancy

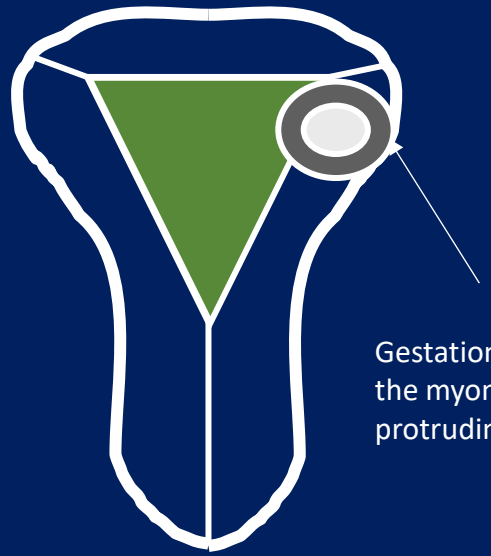
Complete

Gestational sac completely implanted within the myometrium, above the level of the internal os and not in the interstitial portion of the allopian tube

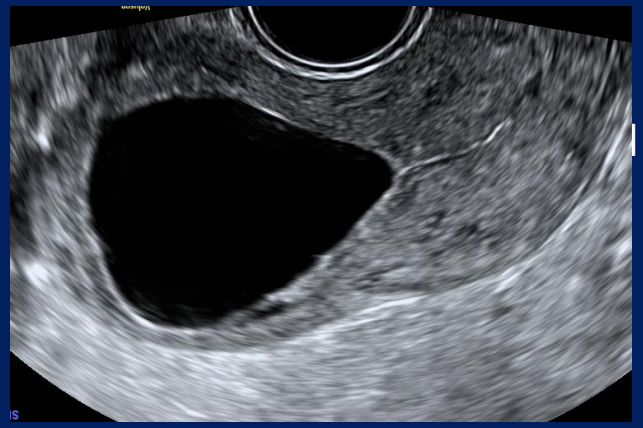


agement

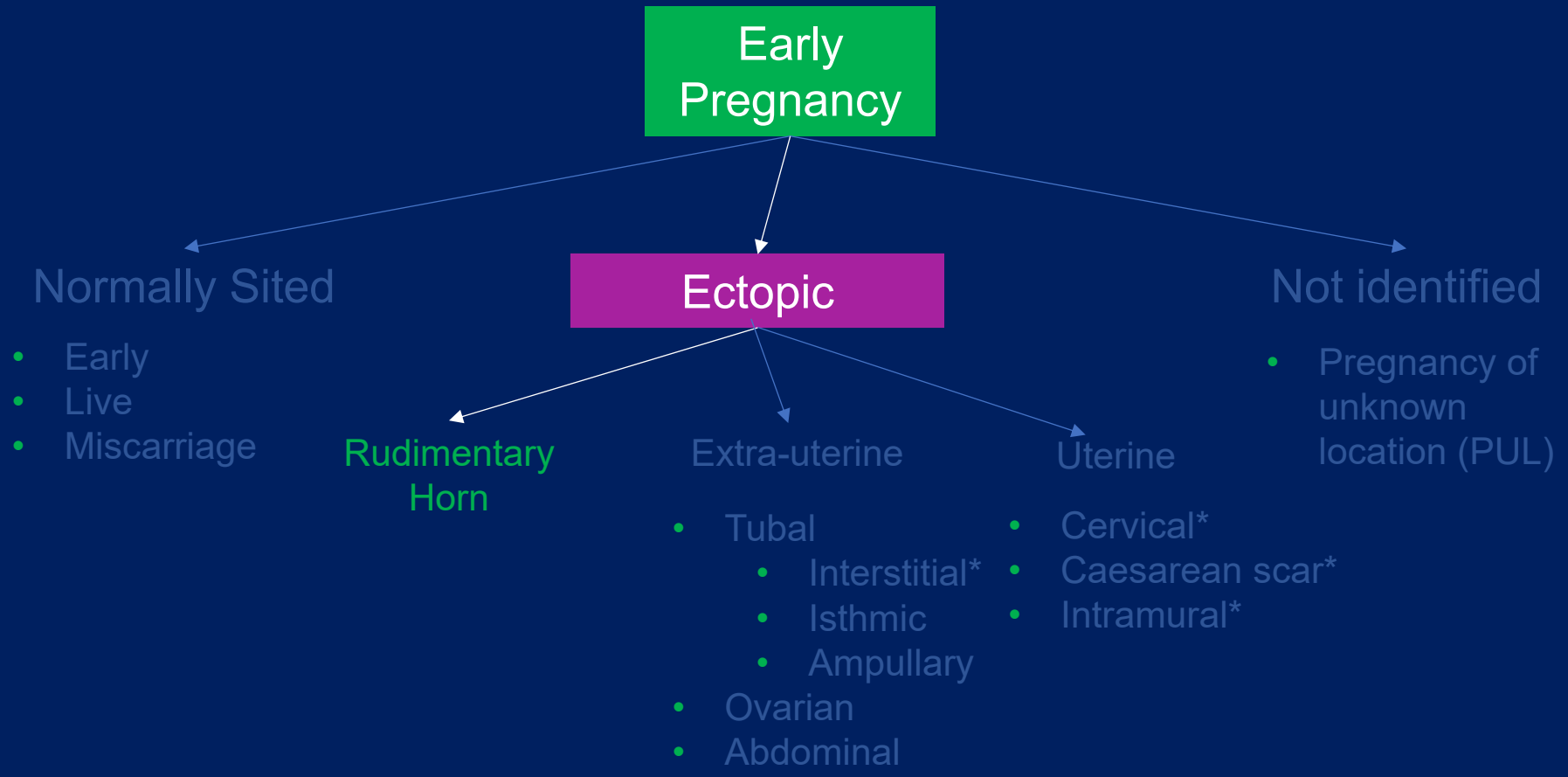
Partial



Gestational sac implanted within the myometrium but partly protruding into the uterine cavity

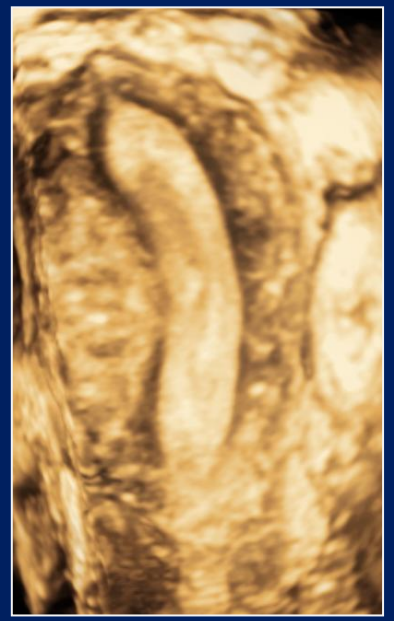


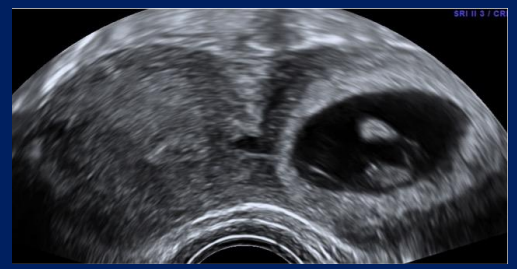
Classification system for early pregnancy



*partial or complete

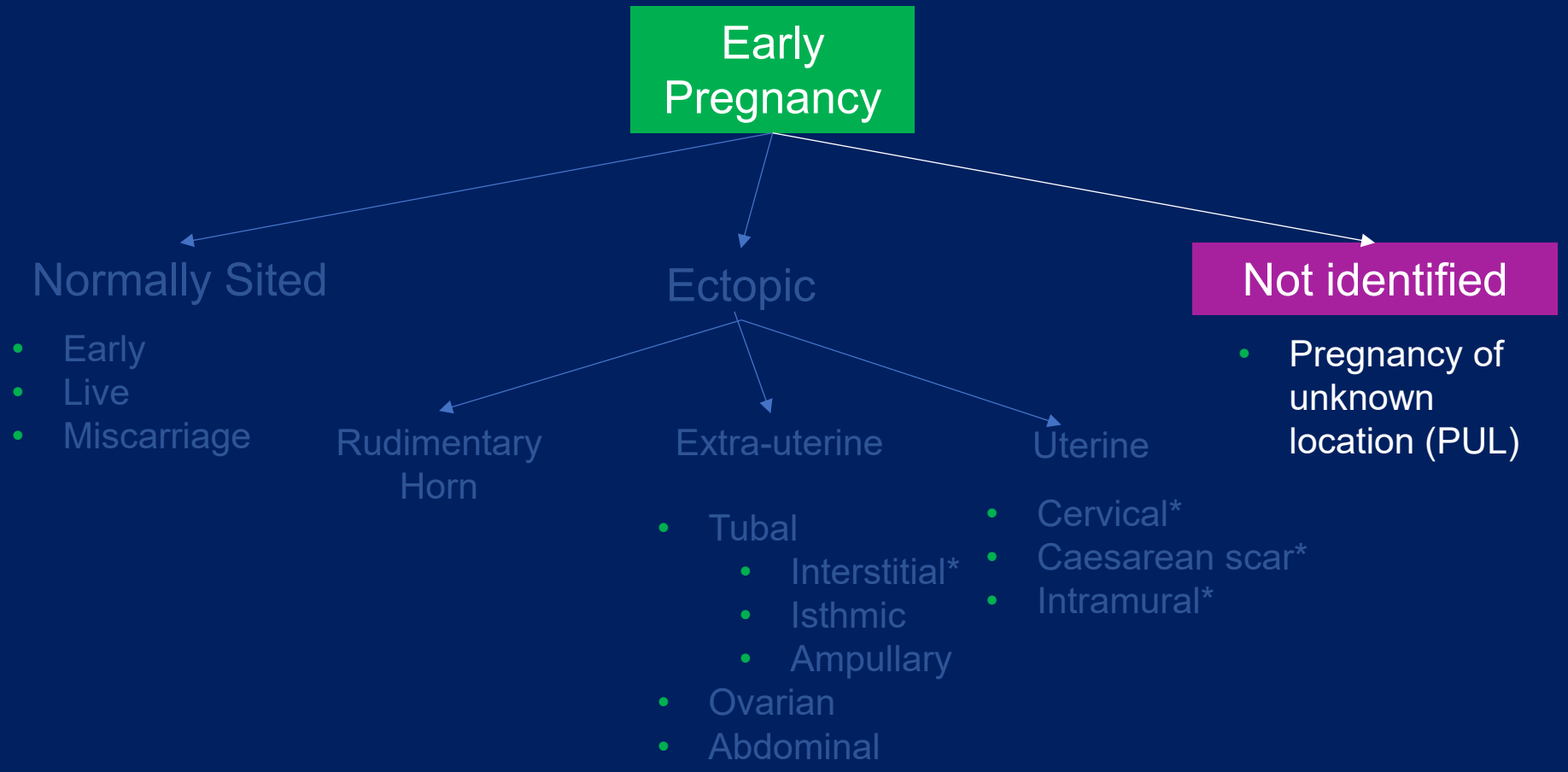
Rudimentary horn pregnancy





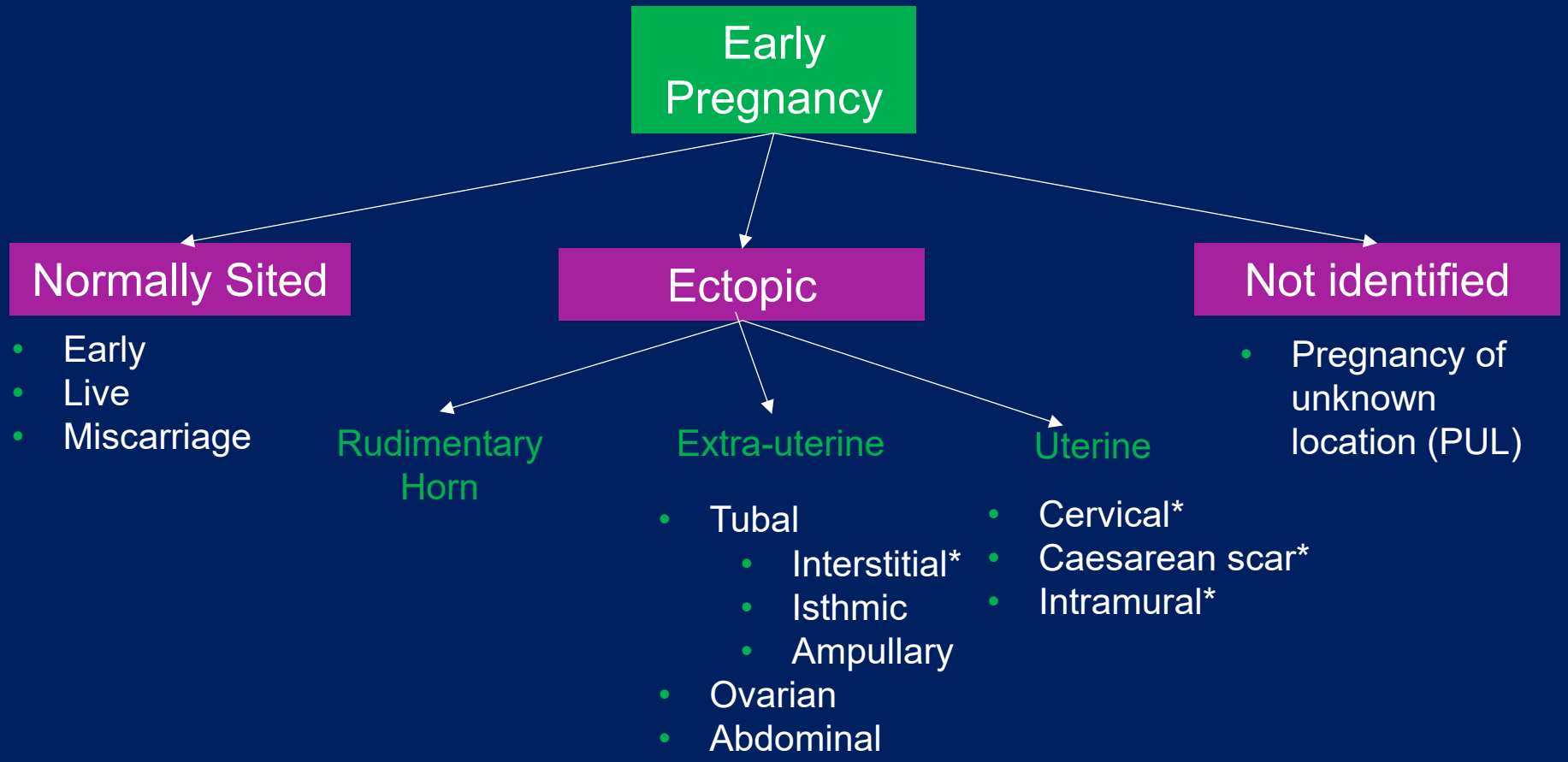
- A single interstitial portion of Fallopian tube in the main uterine body
- A gestational sac or trophoblastic mass mobile and separate from the main uterine body but surrounded by myometrium
- A vascular pedicle joining the gestational sac to the unicornuate uterus

Classification system for early pregnancy



*partial or complete

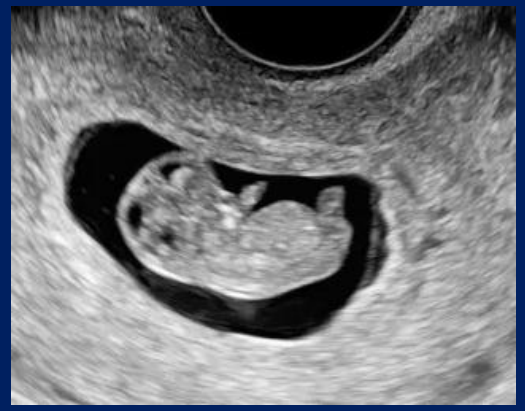
Classification system for early pregnancy



*partial or complete

Aims of the early pregnancy scan

- Confirm pregnancy location
- Establish viability
- Determine number of embryos
- Determine gestational age
- Reassure about absence of complications



Pregnancy viability

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'Hundreds of women may have aborted perfectly healthy babies' after NHS staff at a major teaching hospital routinely failed to make vital checks

- Women at the University Hospital of Wales were given botched scans, which could have wrongly told them they had miscarried their babies
- Emily Wheatley, 31, almost went through with an abortion, but a scan at a different hospital showed that her baby was alive and well
- An investigation by the Ombudsman of Wales found that the hospital had been using outdated guidelines when diagnosing miscarriages
- It is now feared hundreds of women could have lost their babies

By KIERAN CORCORAN

PUBLISHED: 14:43, 1 November 2013 | **UPDATED:** 14:44, 1 November 2013

Hundreds of women may have aborted healthy babies after NHS blunder

The University Hospital of Wales told Emily Wheatley she had suffered a silent miscarriage, but scans elsewhere found her baby was still alive

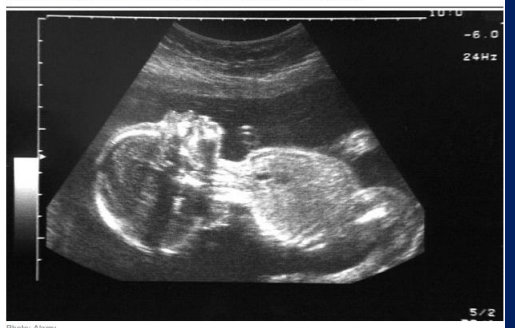

Photo: Alamy

By Theo Merz and news agencies
11:18AM GMT 01 Nov 2013

3 Comments

Hundreds of women may have been forced to abort healthy babies after an NHS hospital was found to be following "outdated guidelines".

Print this article | Share 17 | Facebook 7 | Twitter 10

By Julia McWatt | 1 Nov 2013 06:26

Damning report for hospital who wrongly told a woman she had miscarried

The Public Services Ombudsman report into Cardiff's University Hospital of Wales said the woman only discovered the information was incorrect when she opted to have the treatment at another hospital in South Wales

Mirror NEWS

Real news, real entert

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News · UK News · Pregnancy

By Jessica Best, Julia McWatt | 1 Comment | 1 Nov 2013 11:26

Mum-to-be told she had miscarried found out by chance her unborn baby was HEALTHY

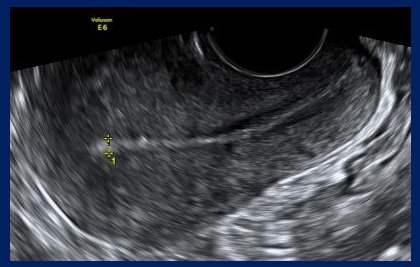
University Hospital of Wales apologises after wrongly telling patient Emily Wheatley she had miscarried

The hospital has set up a helpline for other women who fear they may have been affected

CHARLIE COOPER | FRIDAY 01 NOVEMBER 2013

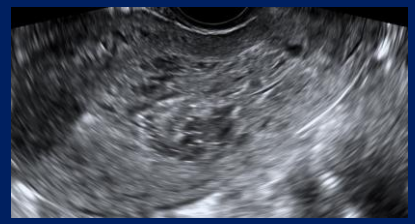
Miscarriage

Complete miscarriage



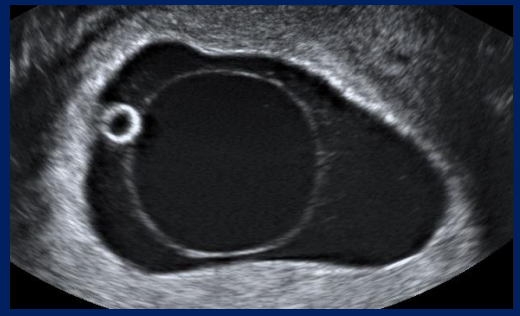
- Empty uterus
- Previously visualised normally sited pregnancy

Incomplete miscarriage



- Inhomogeneous echoes within the endometrial cavity

Missed miscarriage



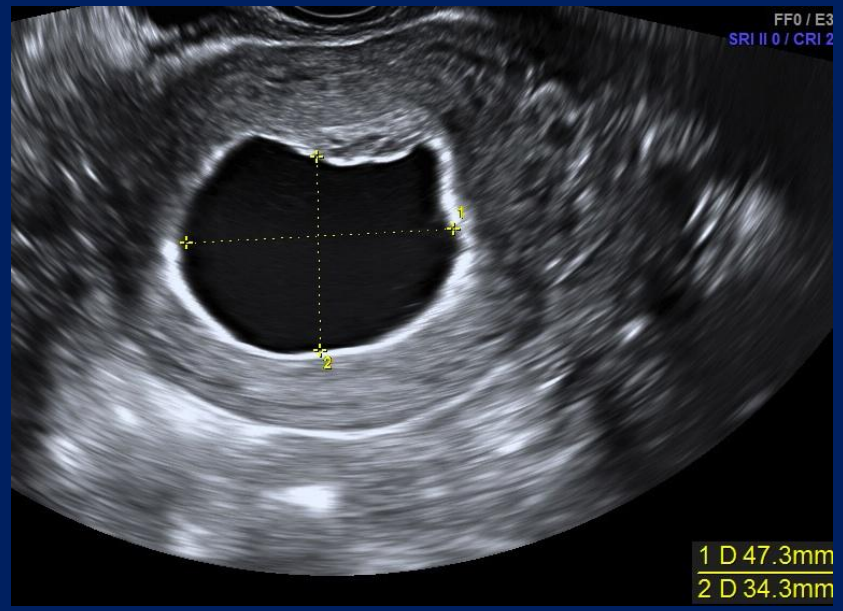
- Non viable normally gestation sac
- Mean sac diameter >25mm with no embryo
- Or
- Embryo greater than 7mm with no cardiac activity

Pregnancy viability

Diagnostic criteria

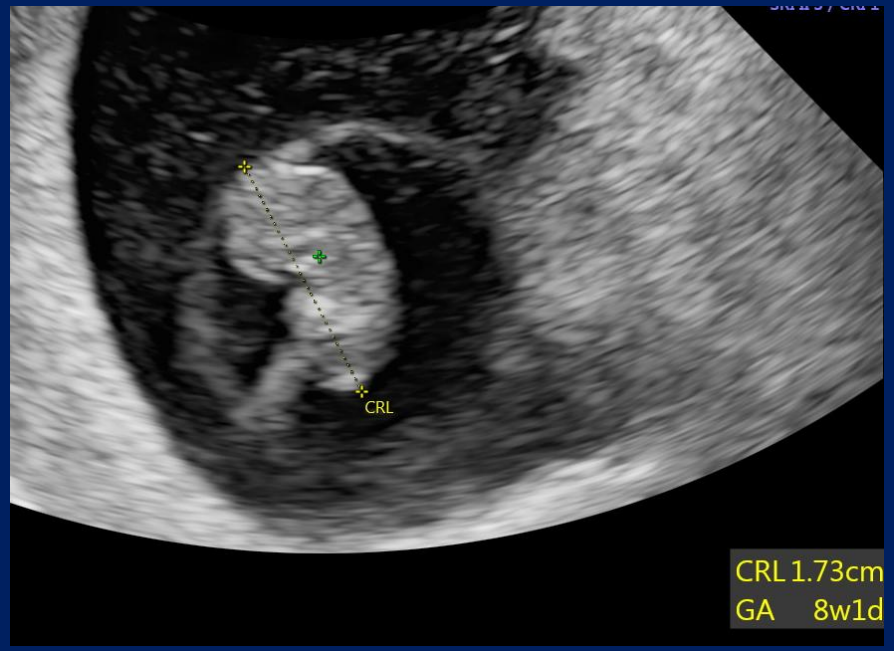
Empty Sac

(Empty GS ≥ 25 mm diameter)



Missed Miscarriage

(CRL ≥ 7mm no FH)

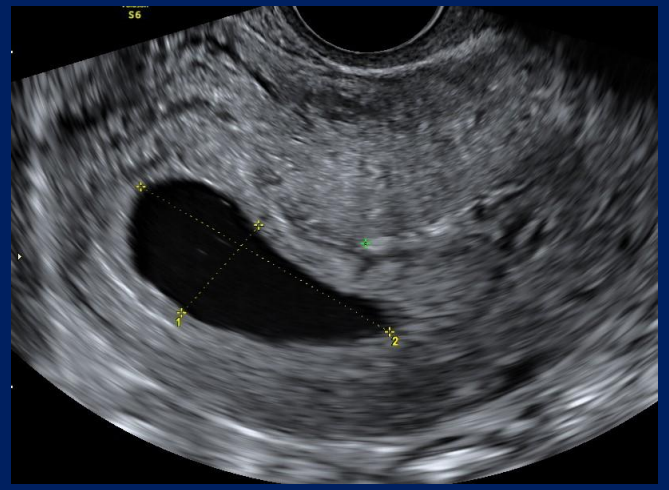


Pregnancy viability

Known gestational age > 70 days

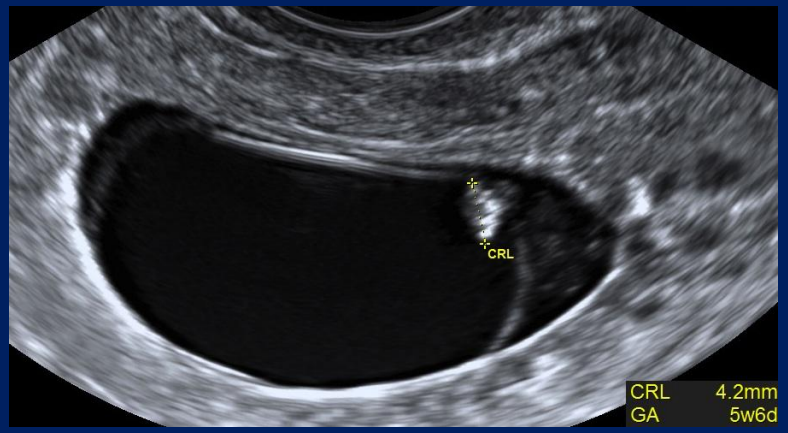
Empty Sac

(Empty GS ≥ 18 mm diameter)



Missed Miscarriage

(CRL ≥ 3mm no FH)



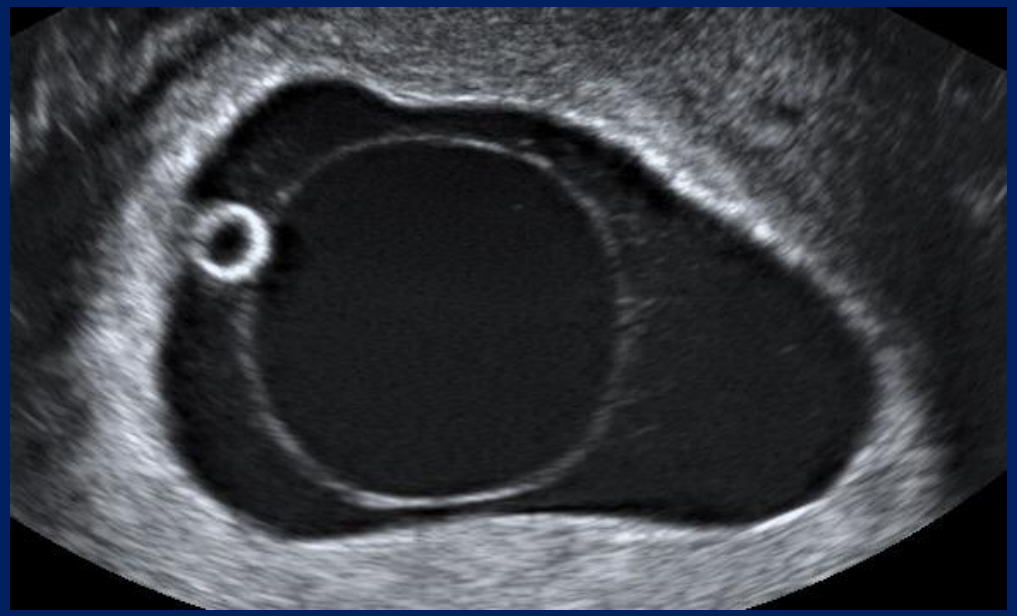
Observational Study > BMJ. 2015 Sep 23;351:h4579. doi: 10.1136/bmj.h4579.

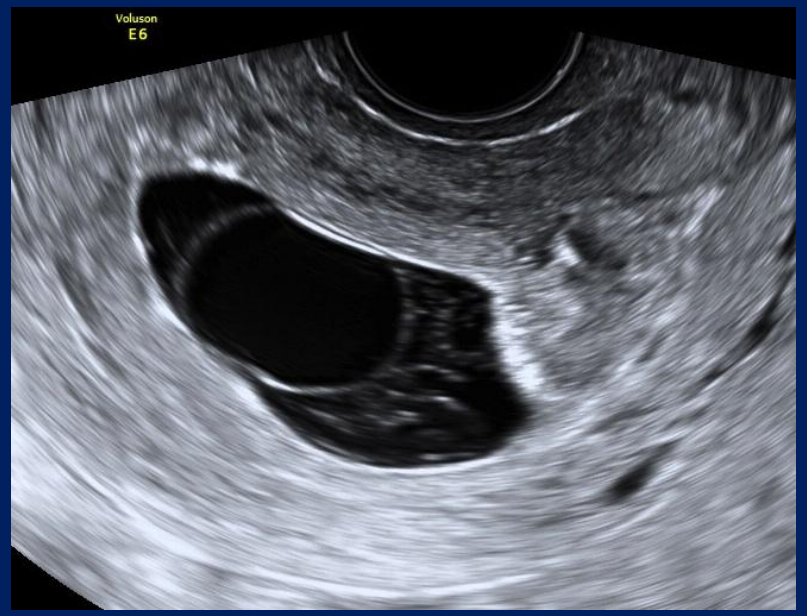
Defining safe criteria to diagnose miscarriage: prospective observational multicentre study

Jessica Preisler [1], Julia Kopeika [2], Laure Ismail [3], Veluppillai Vathanan [4], Jessica Farren [1], Yazan Abdallah [1], Parijat Battacharjee [5], Caroline Van Holsbeke [6], Cecilia Bottomley [4], Deborah Gould [7], Susanne Johnson [8], Catriona Stalder [1], Ben Van Calster [9], Judith Hamilton [2], Dirk Timmerman [10], Tom Bourne [11]

Pregnancy viability

Empty Amniotic Sac





› Ultrasound Obstet Gynecol. 2021 Jan;57(1):149-154. doi: 10.1002/uog.23533.

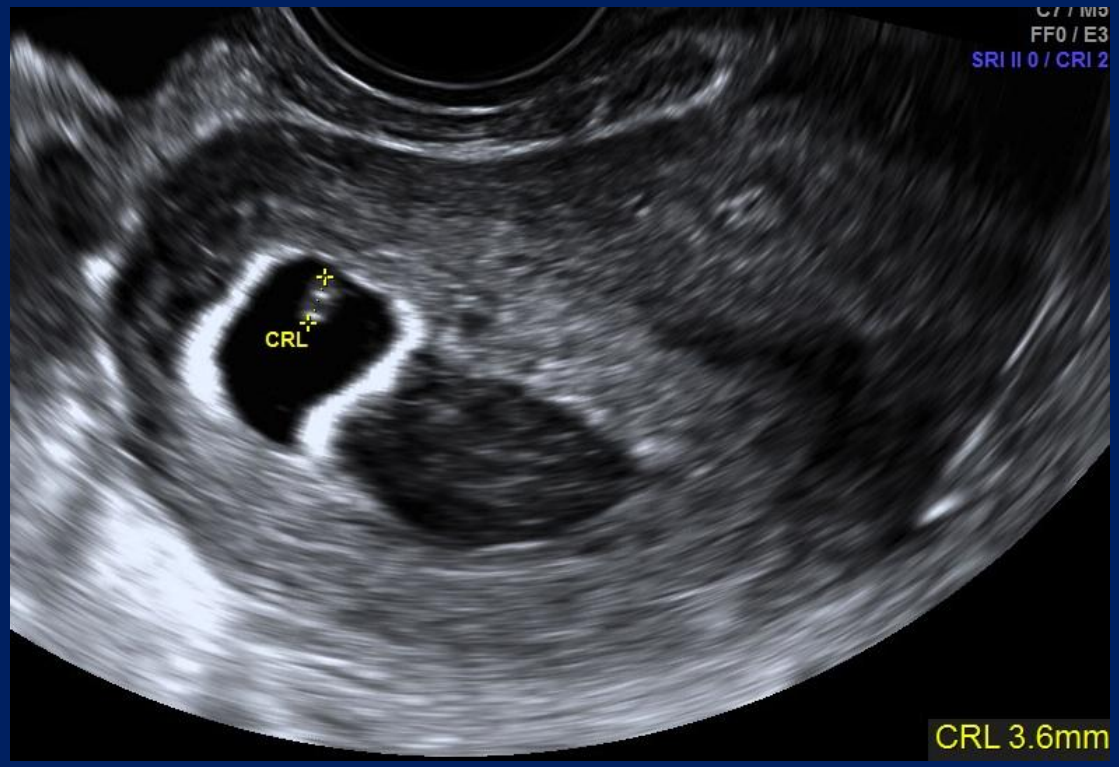
Predictive value of presence of amniotic sac without visible embryonic heartbeat in diagnosis of early embryonic demise

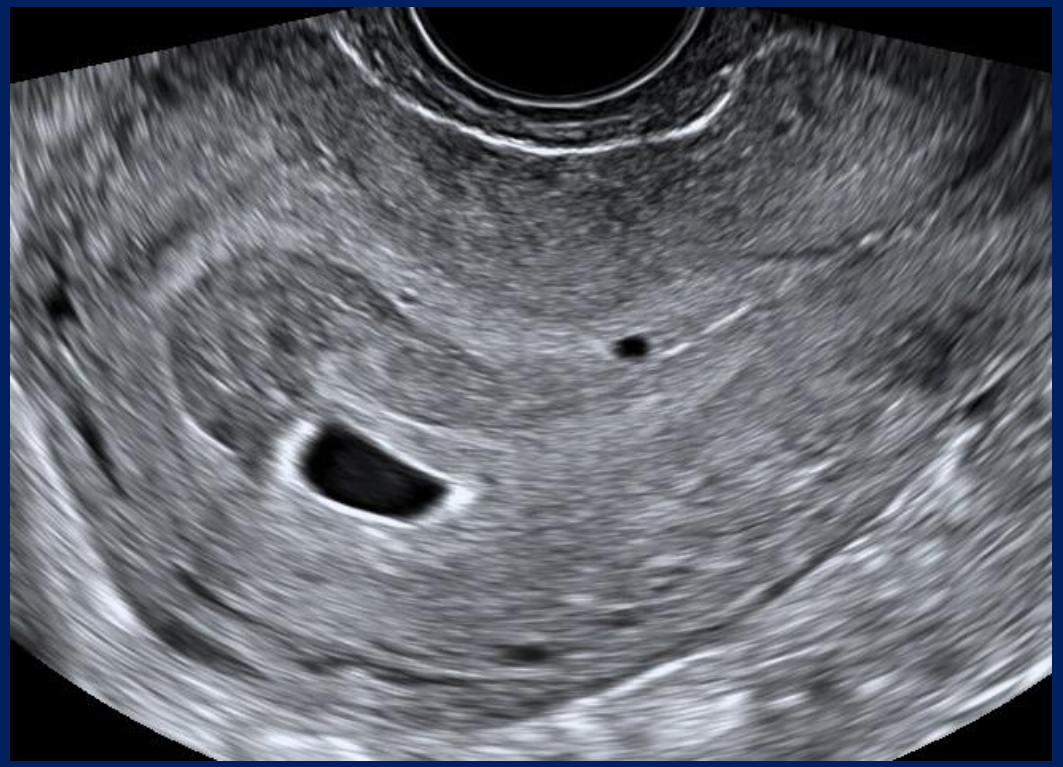
W M Dooley [1], L De Braud [1], N Thanatsis [1], M Memtsa [1], E Jauniaux [1], D Jurkovic [1]

Affiliations

Pregnancy viability

Subchorionic haematoma

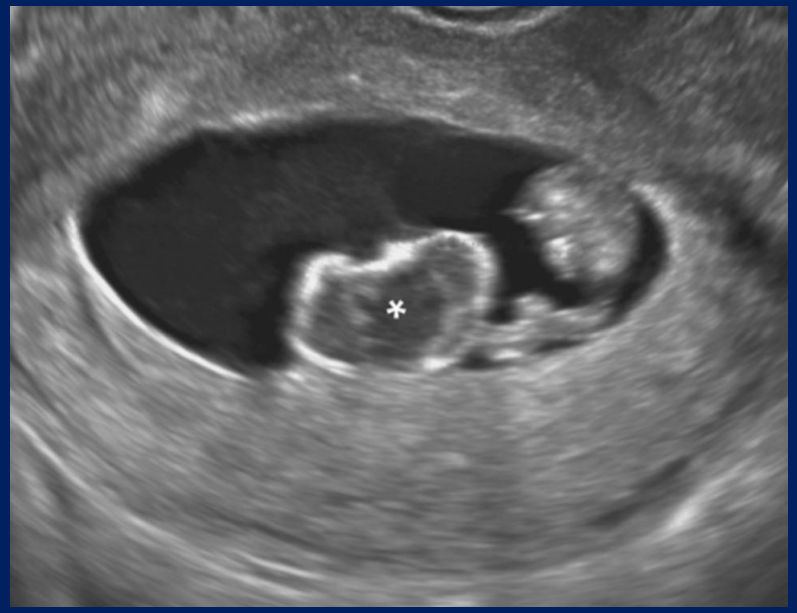


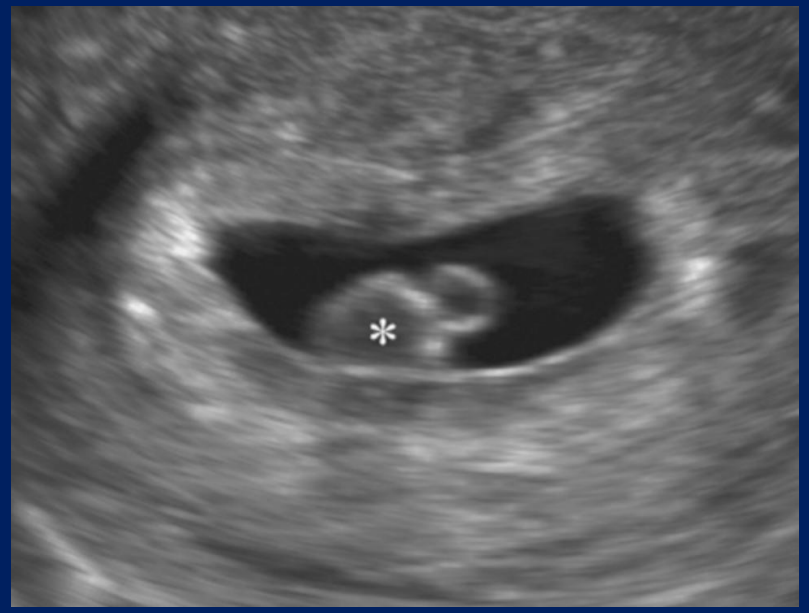


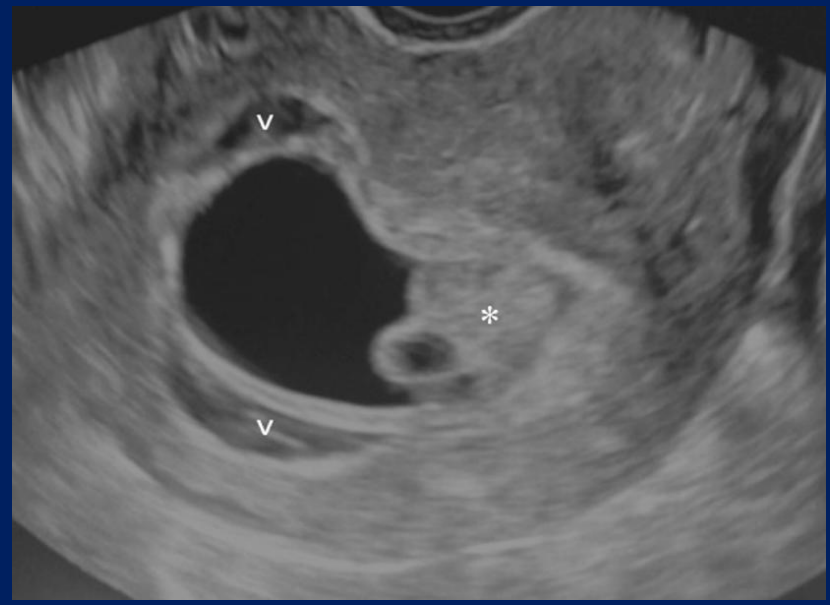
- Hypoechoic, crescent-shaped area separating the uterine wall and chorion.
- Frequently associated with vaginal bleeding.
- Also associated with adverse perinatal outcome.

Pregnancy viability

Chorionic bumps





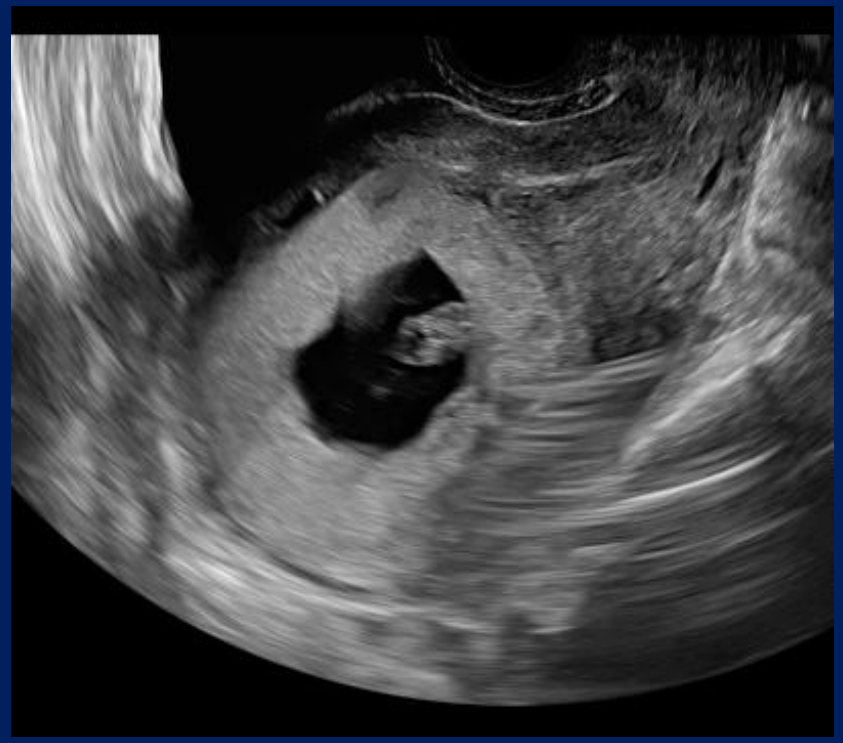


- Irregular, hyperechogenic bulge from the choriodecidual surface into the gestation sac.
- Associated with first and second-trimester miscarriage.

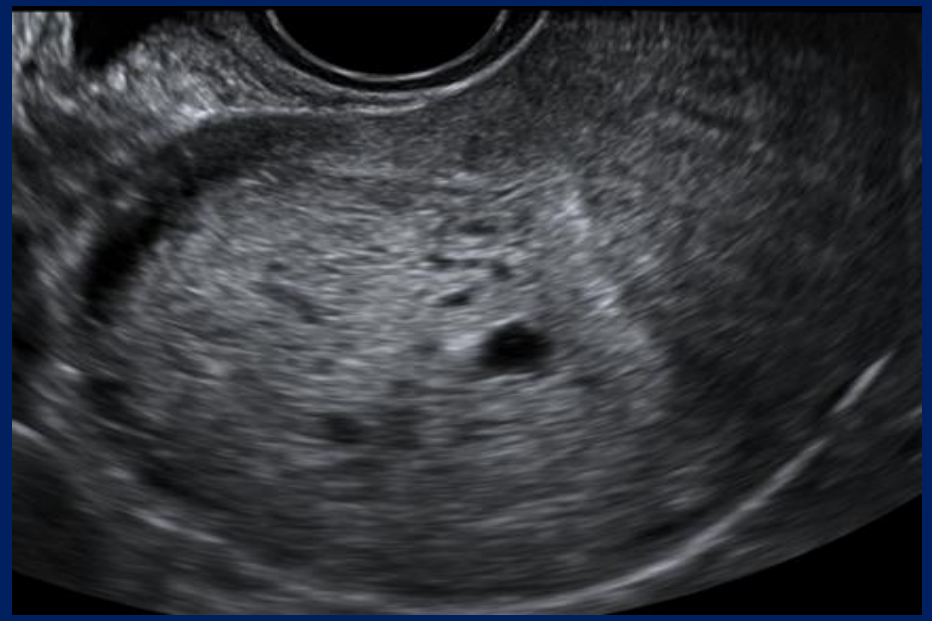
Pregnancy viability

Suspected molar pregnancy

Thickened trophoblast



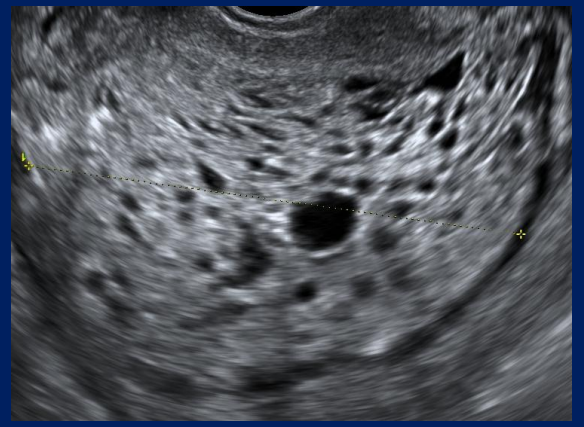
Cystic spaces in the endometrium

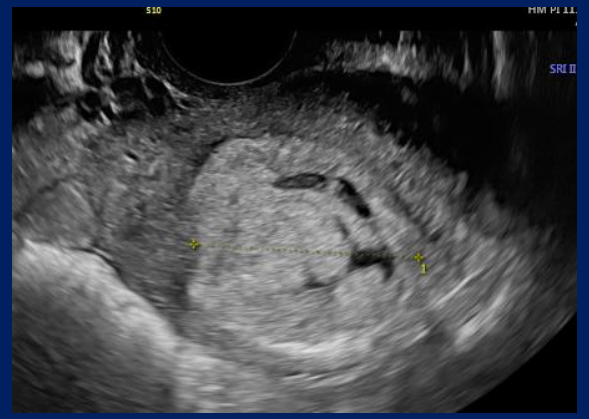


Pregnancy viability

Complete hydatidiform mole

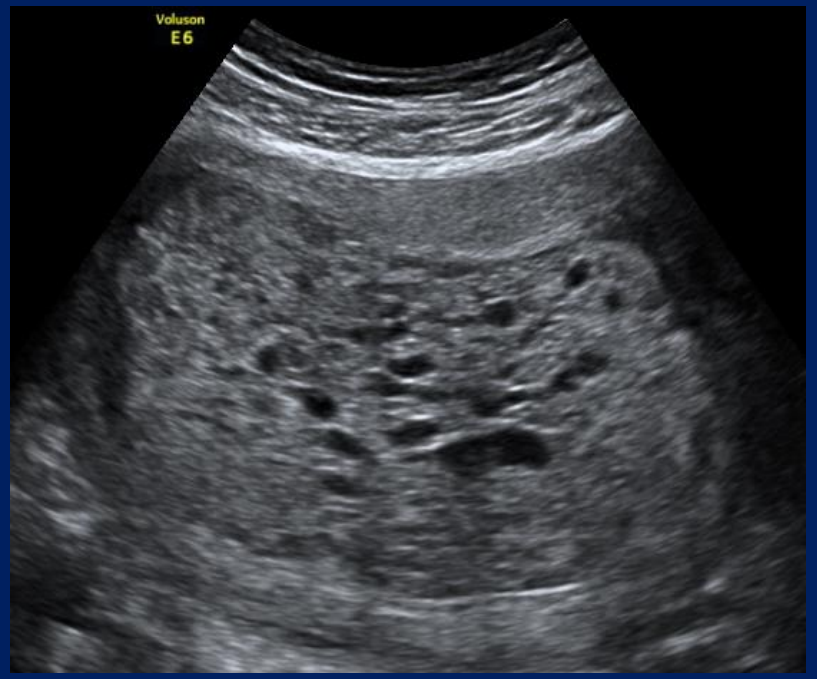
- Thickened cystic appearance to the endometrial cavity with no identifiable gestational sac
- Only placental tissue develops
- 15% theca lutein cysts
- 50% hCG > 100,000 IU/L

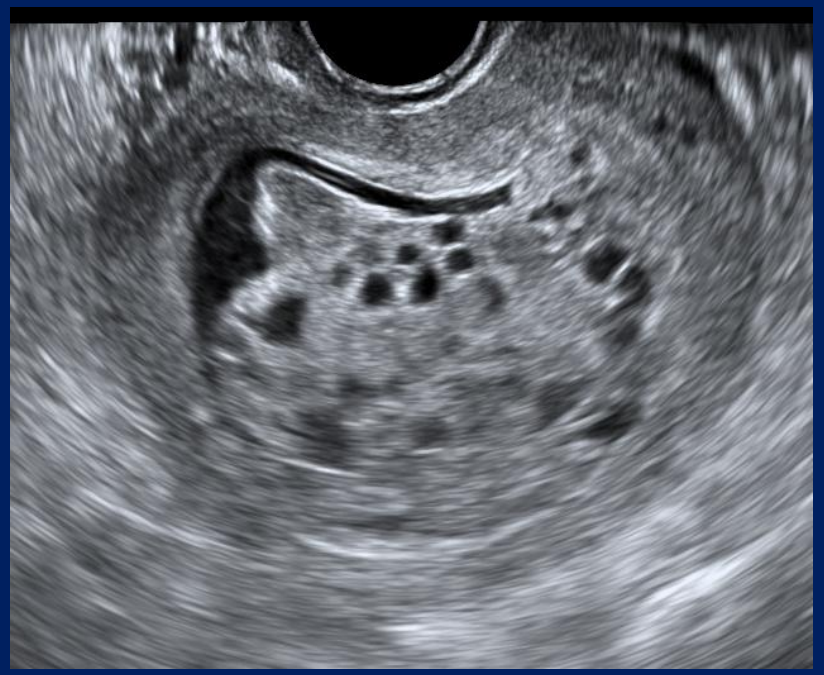


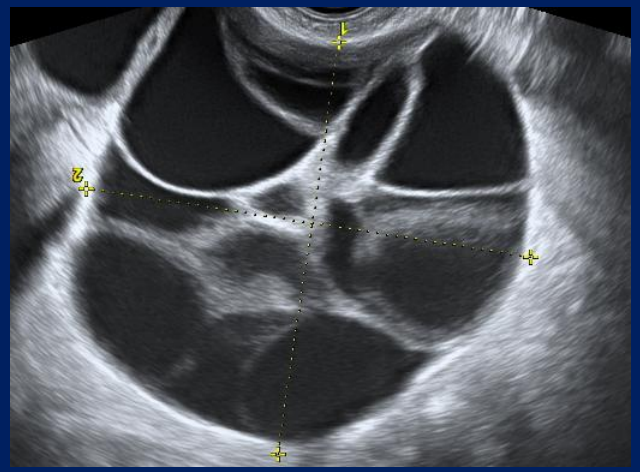


Pregnancy viability

Complete hydatidiform mole



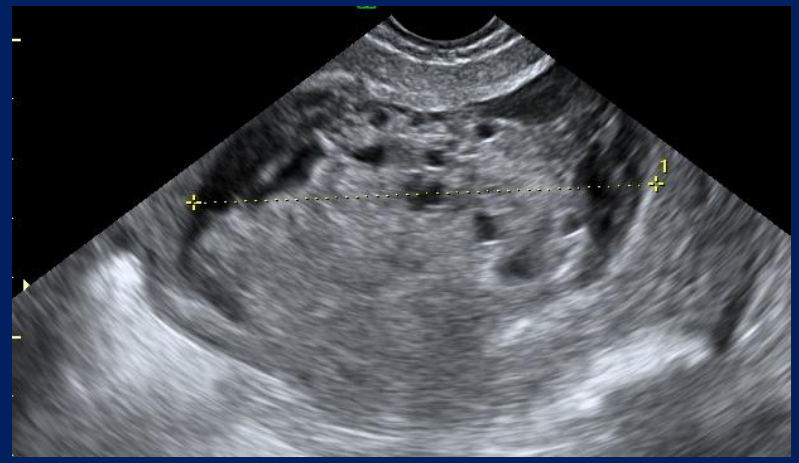


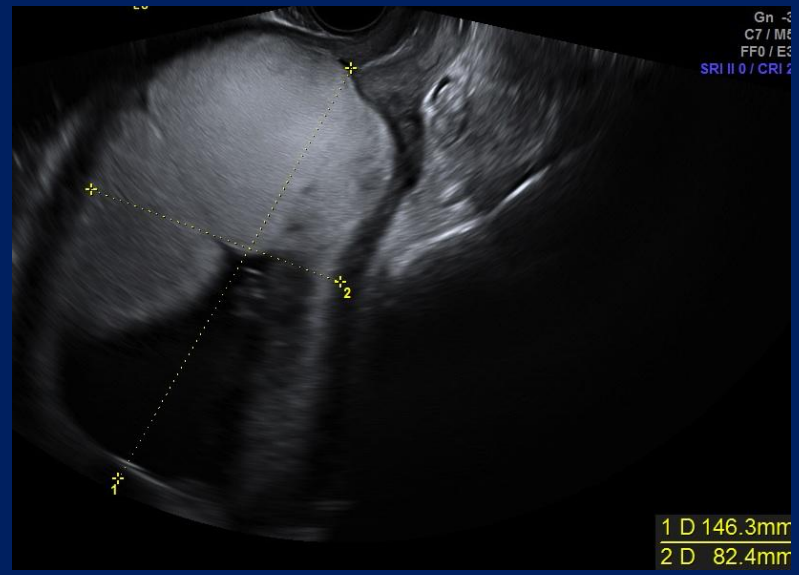


Pregnancy viability

Partial hydatidiform mole

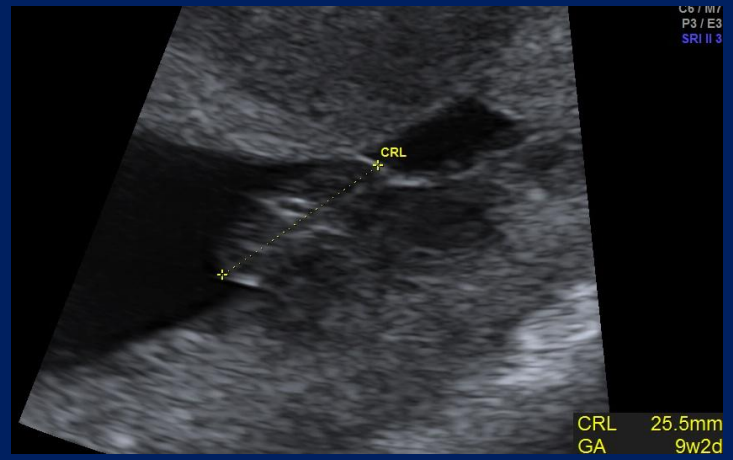
- Enlarged placenta or cystic changes within the decidual reaction in association with either an empty sac or a missed miscarriage
- Rarely theca lutein cysts
- Increase in transverse diameter of GS
- 10% hCG > 100,000 IU/L

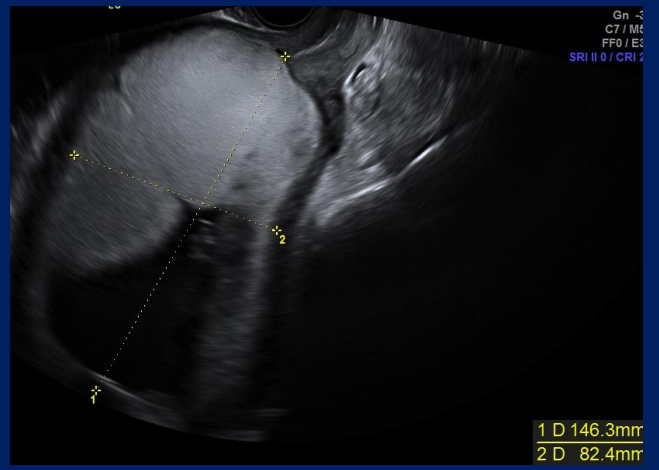


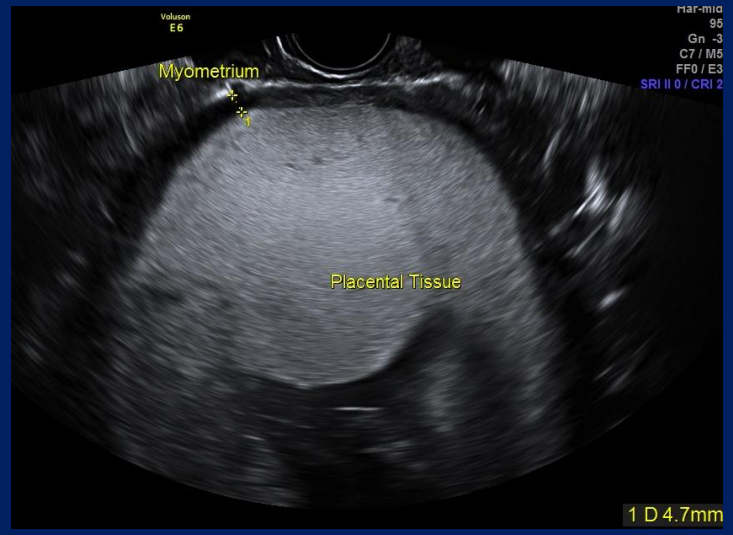


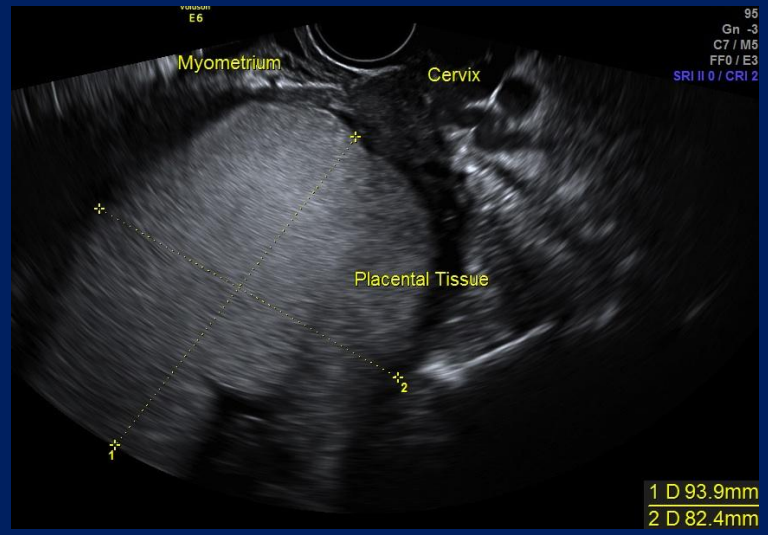
Pregnancy viability

Partial hydatidiform mole





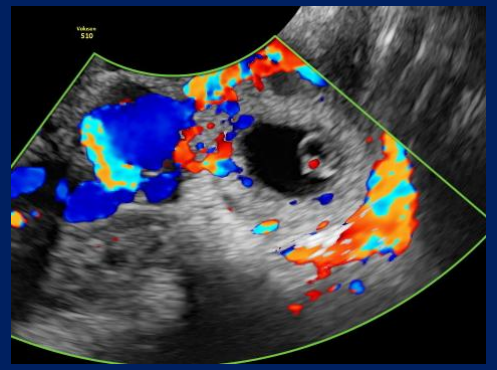




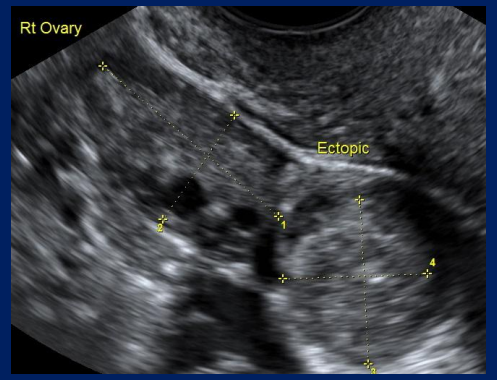
Pregnancy viability

Ectopic Pregnancy

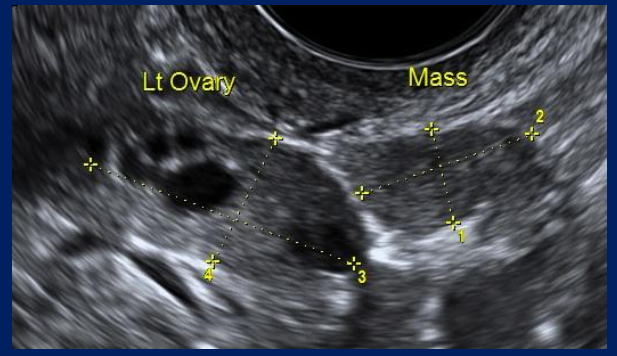
- Live ectopic pregnancy
  - Ectopic containing an embryo/fetus with heart pulsations



- Failing ectopic pregnancy
  - Ectopic with ultrasound and/or biochemical signs of regression

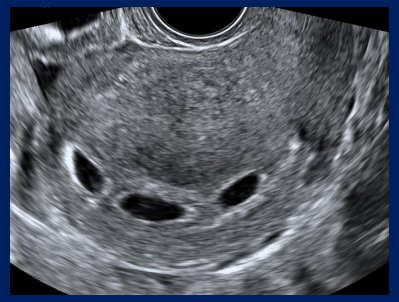


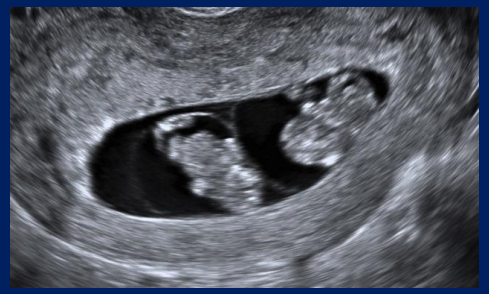
- Residual ectopic pregnancy
  - Ectopic which presents as a discrete mass in a woman with a negative pregnancy test

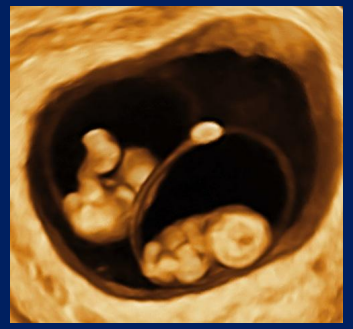


Aims of the early pregnancy scan

- Confirm pregnancy location
- Establish viability
- Determine number of embryos
- Determine gestational age
- Reassure about absence of complications







Multiple pregnancy

1. Define number of pregnancies

2. Define location of pregnancies

Twin / Triplet / Quadruplet etc

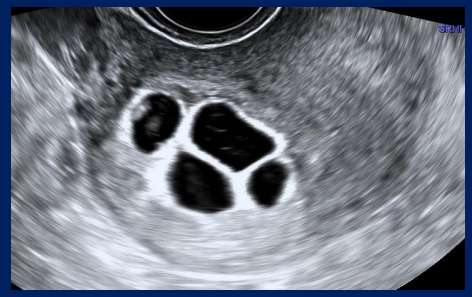
Both or all normally sited

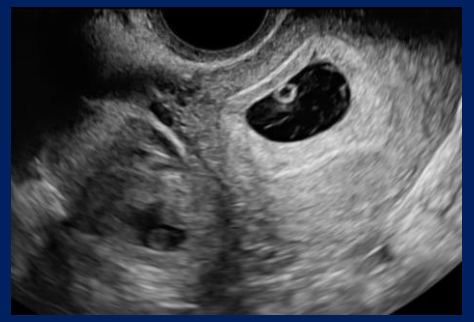
Heterotopic

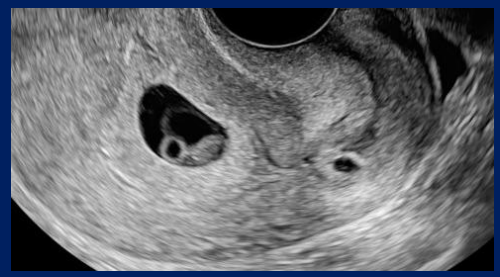
One/more normally sited and one/more ectopic pregnancy

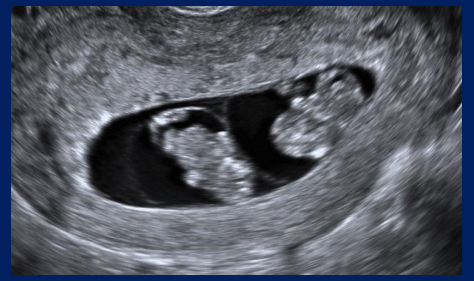
Coexistent ectopic pregnancies

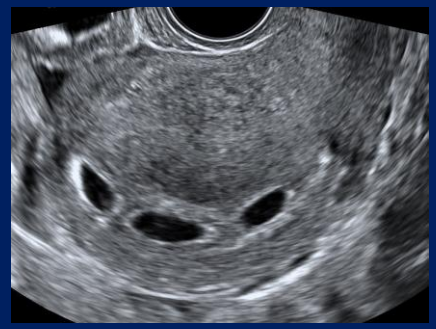
Both / all in abnormal locations

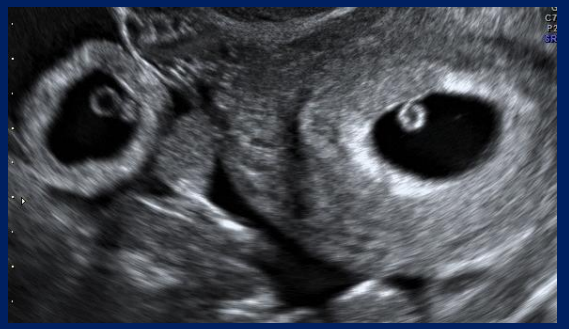








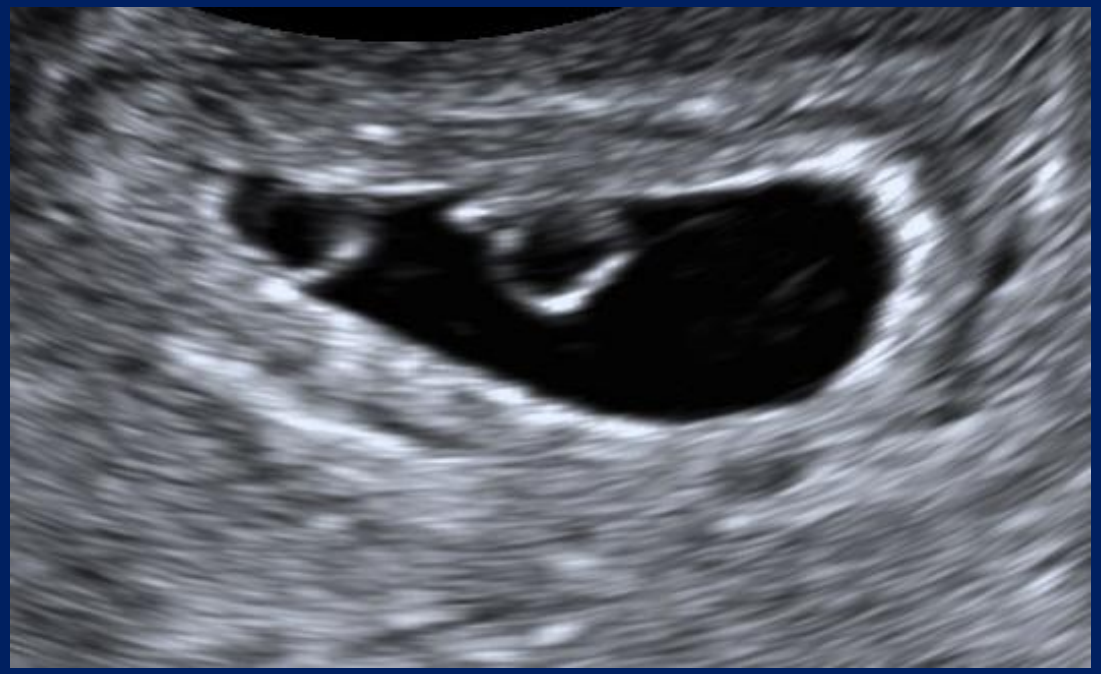




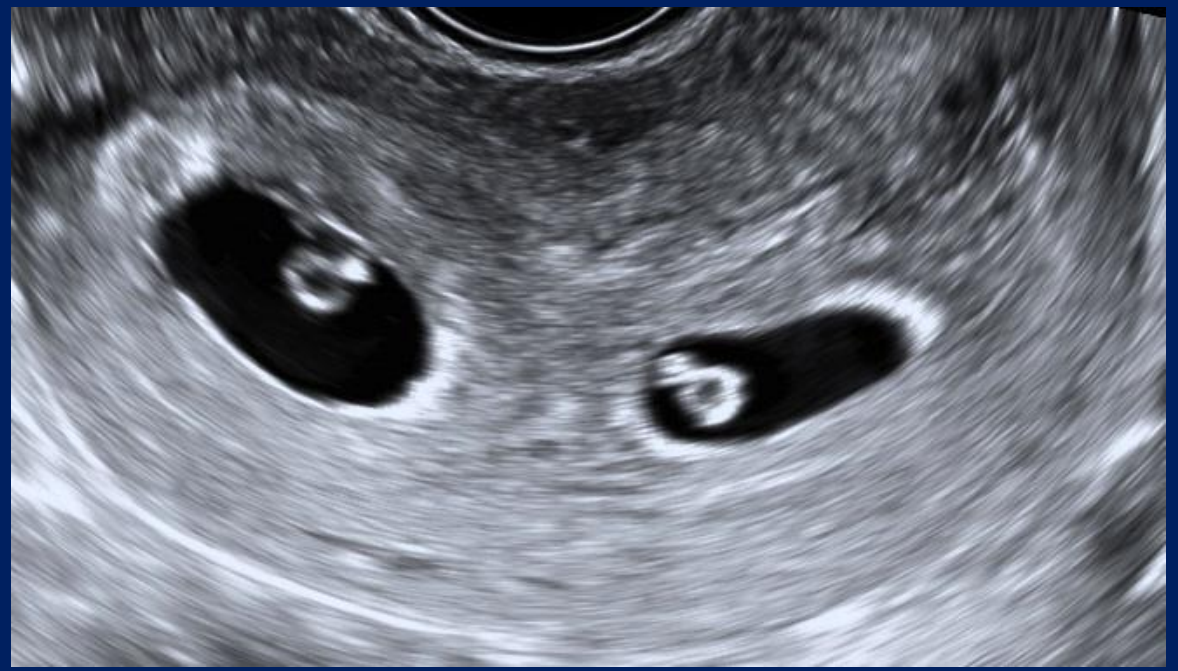
Multiple Pregnancy

Chorionicity

Monochorionic

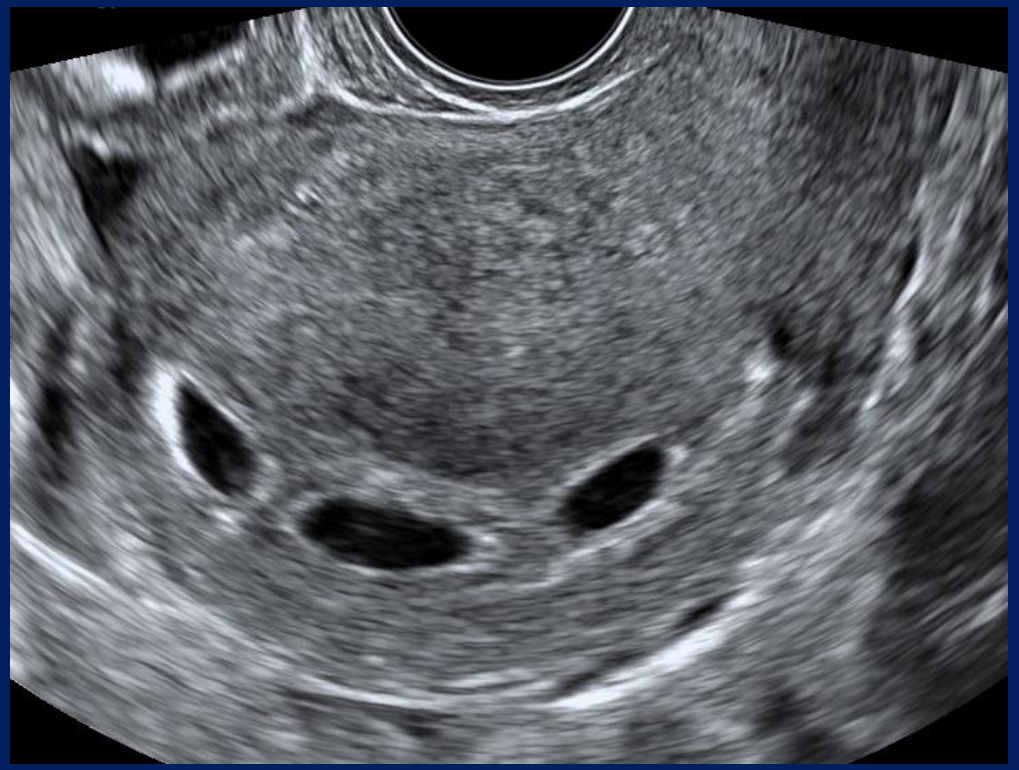


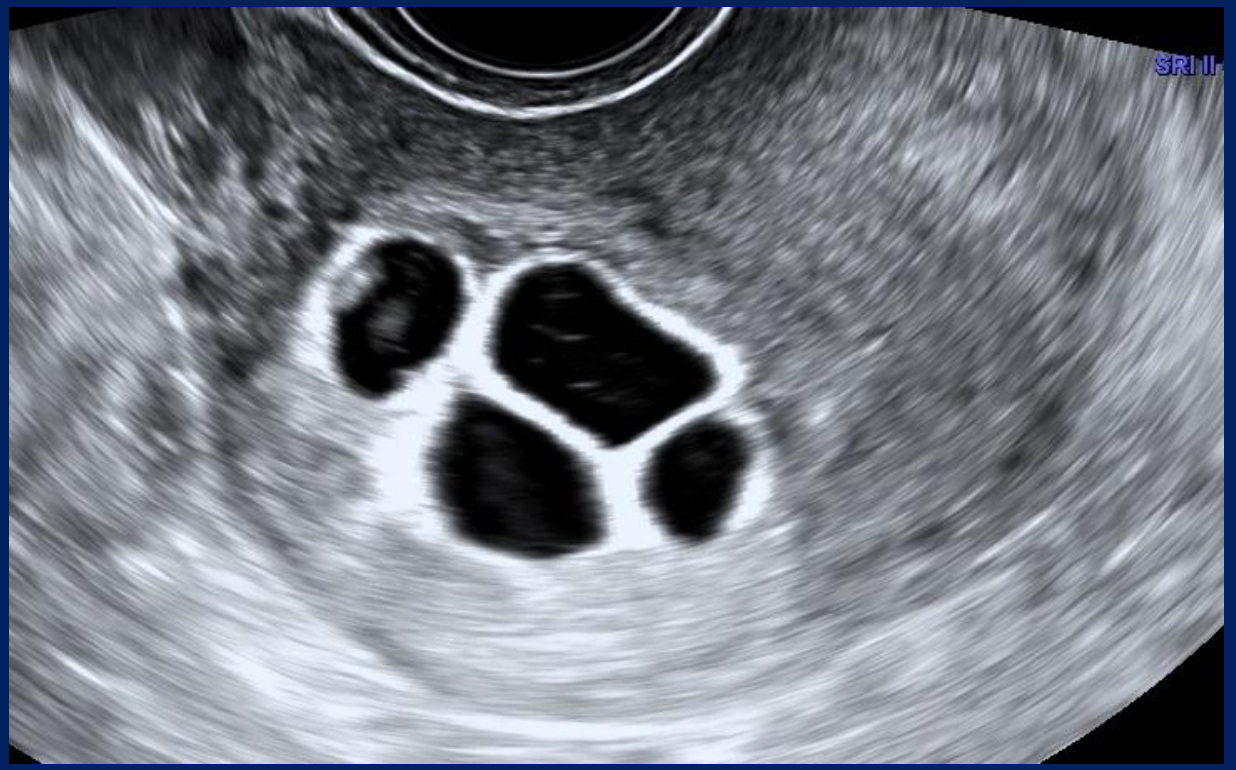
Dichorionic



Multiple Pregnancy

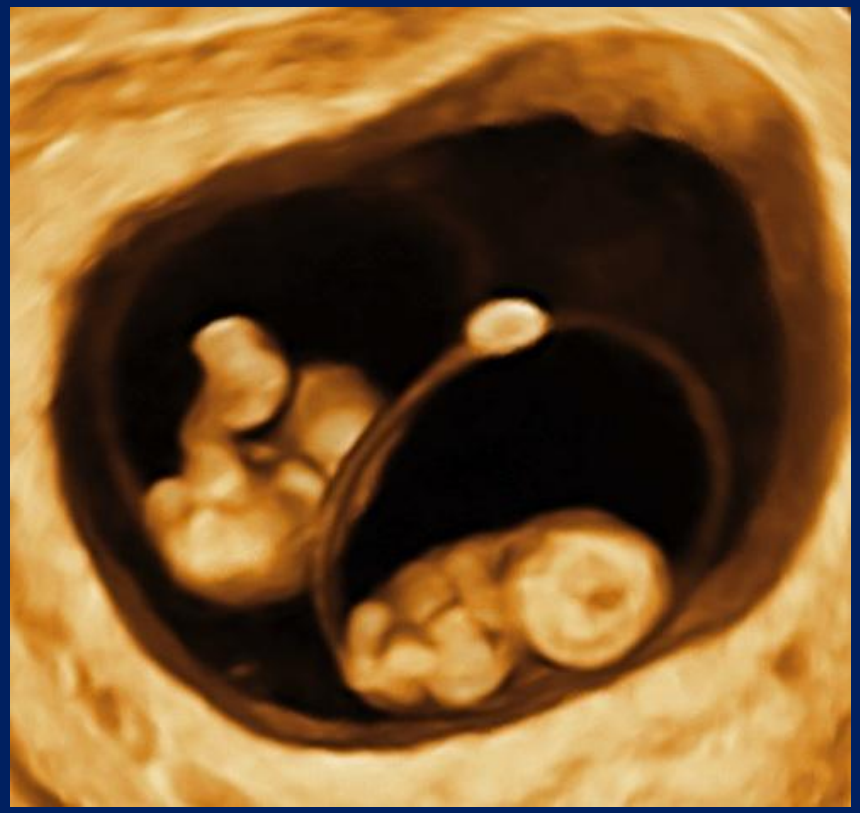
Chorionicity

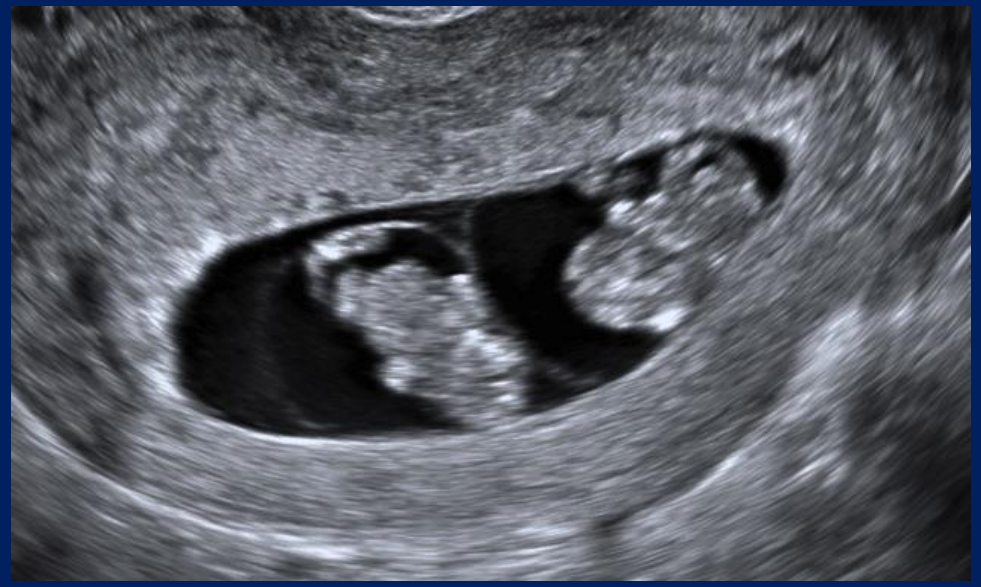




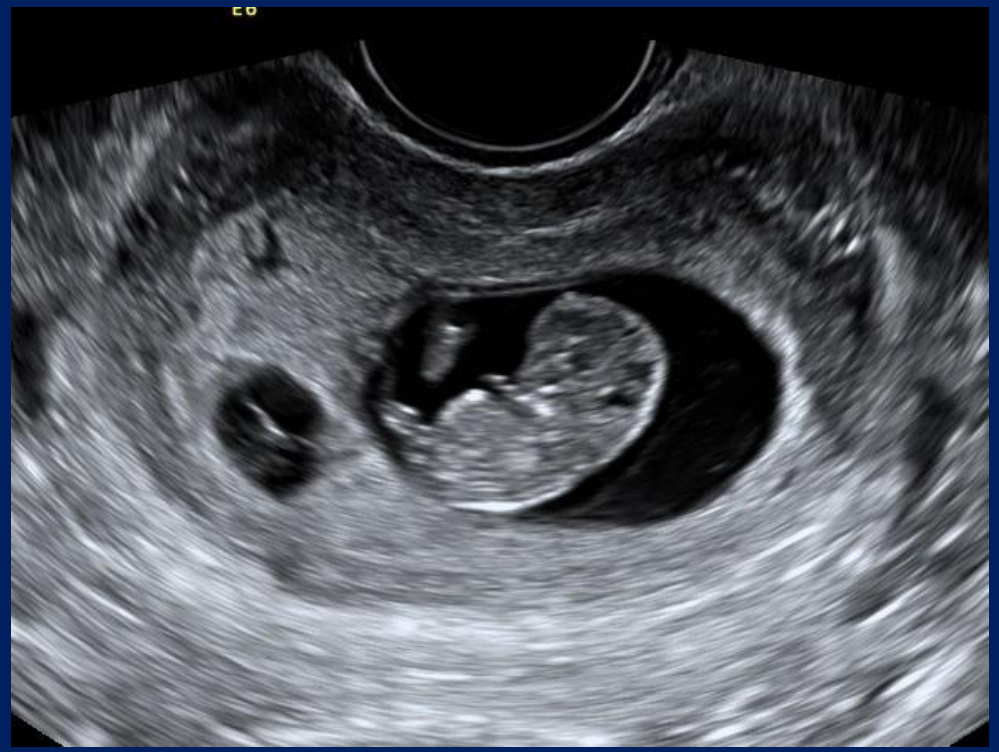
Multiple Pregnancy

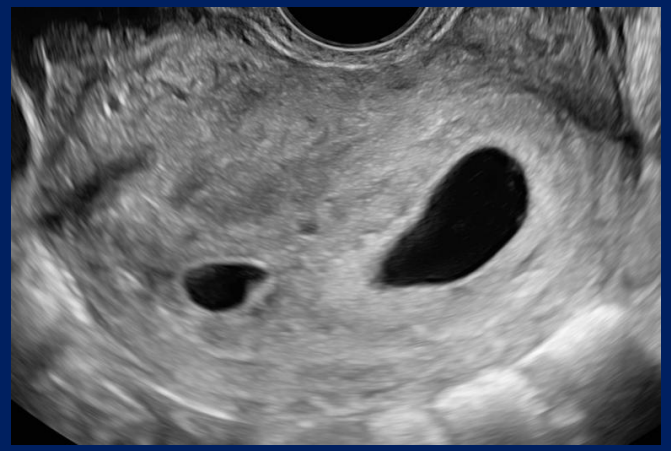
Amnionicity

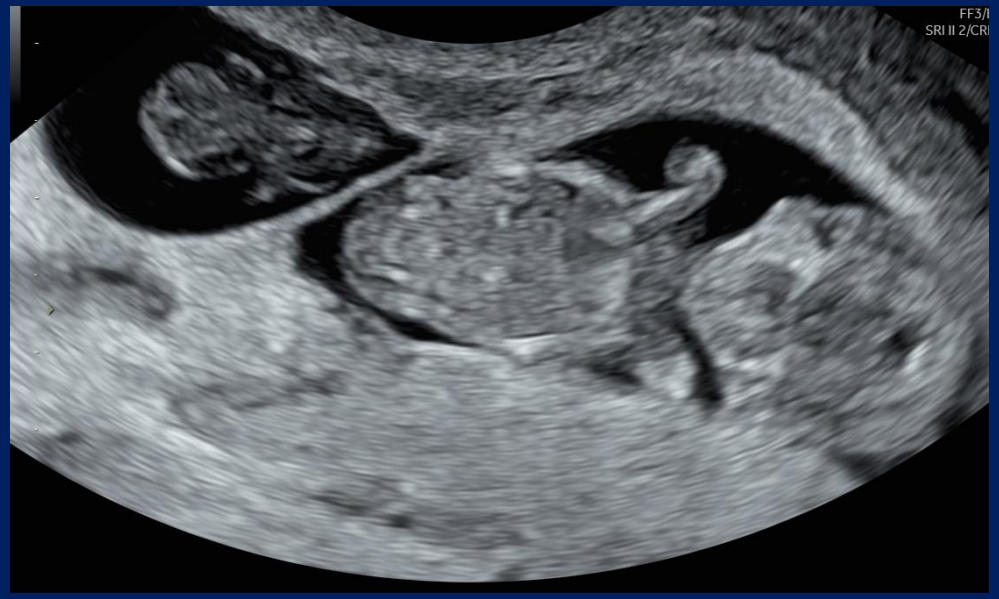


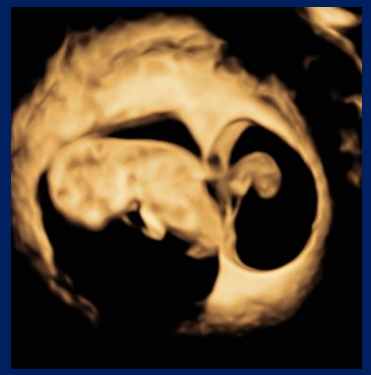


Multiple Pregnancy
‘Vanishing twin’



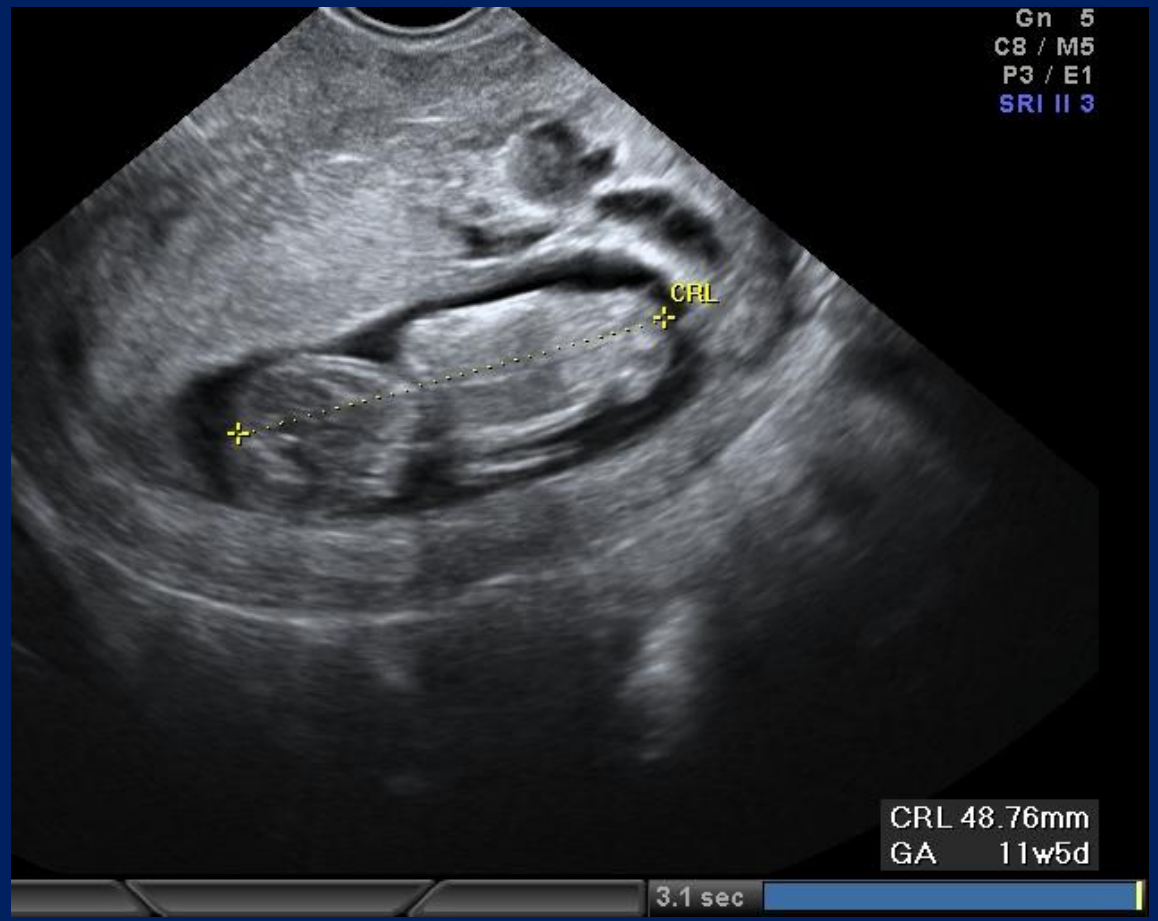


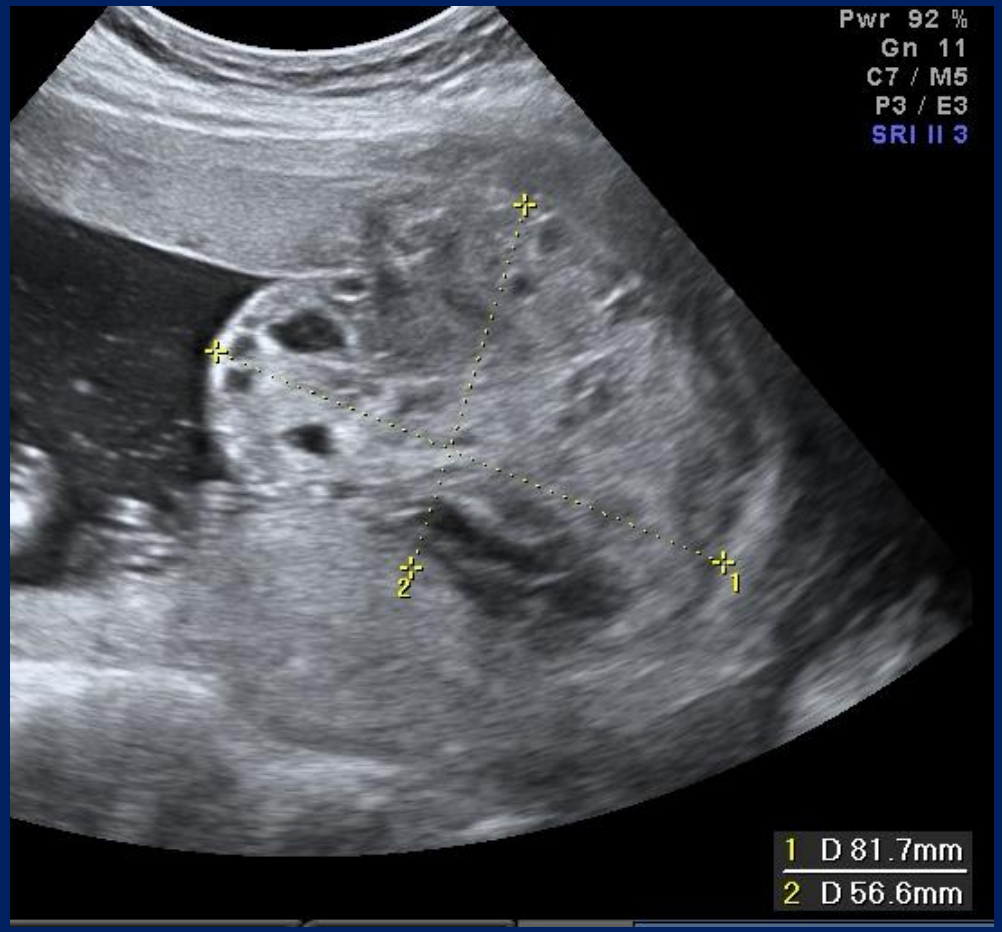




Multiple Pregnancy

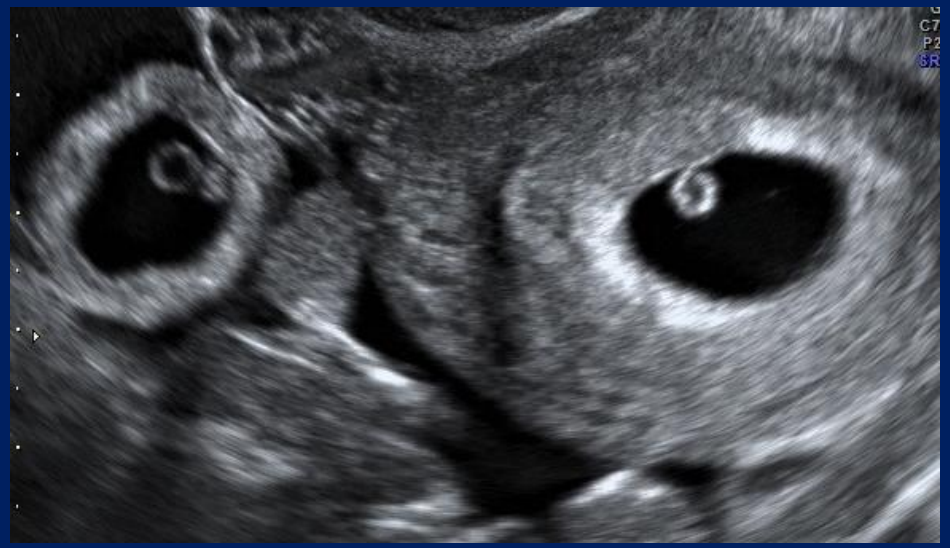
Co-existent molar pregnancy

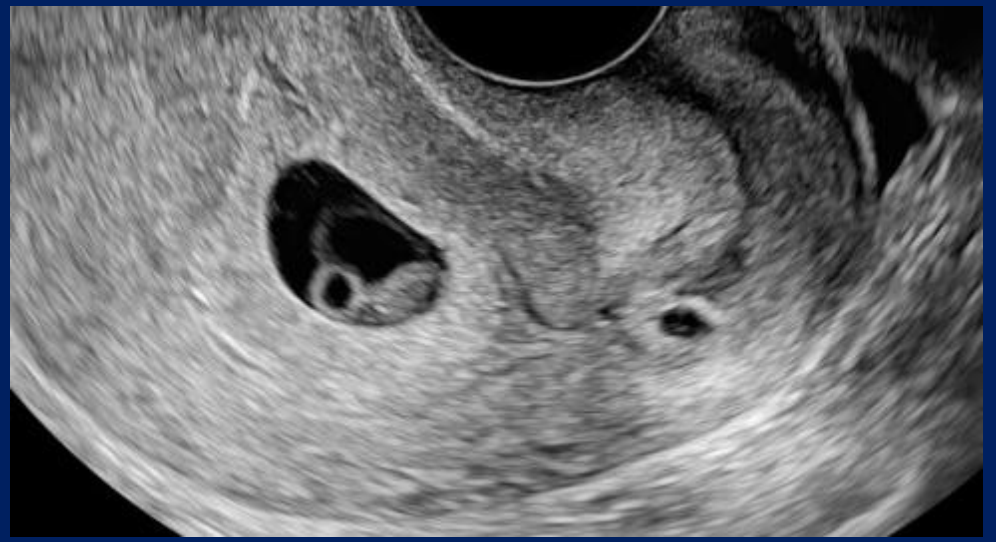




Multiple Pregnancy

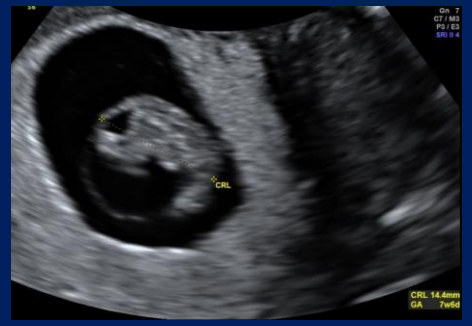
Heterotopic pregnancy

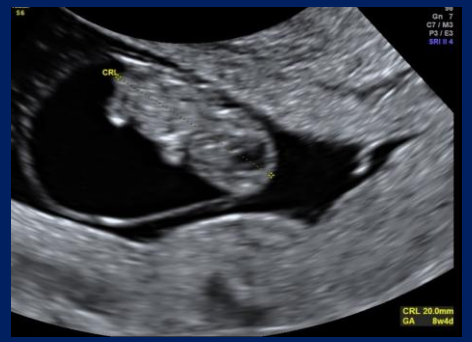


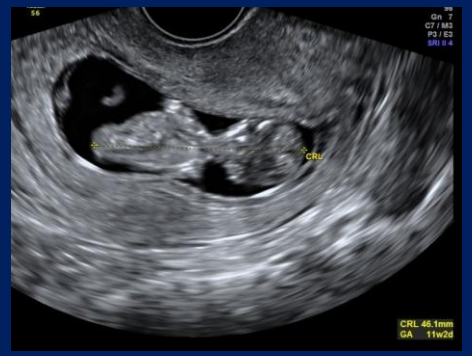


Aims of the early pregnancy scan

- Confirm pregnancy location
- Establish viability
- Determine number of embryos
- Determine gestational age
- Reassure about absence of complications







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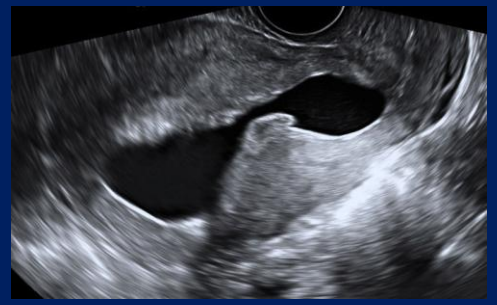
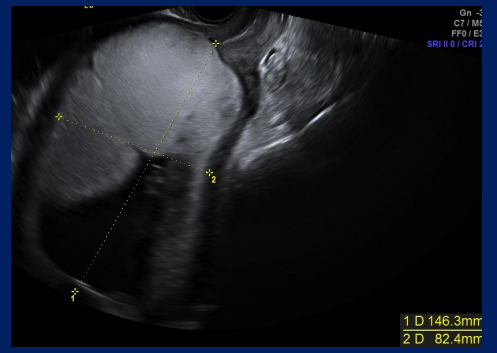
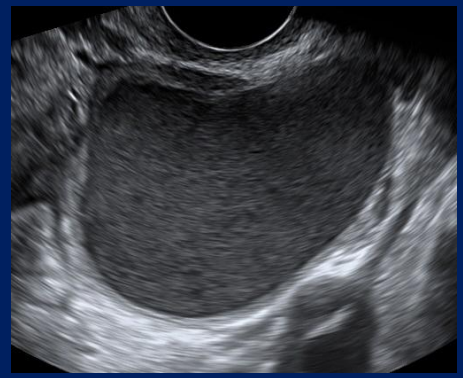


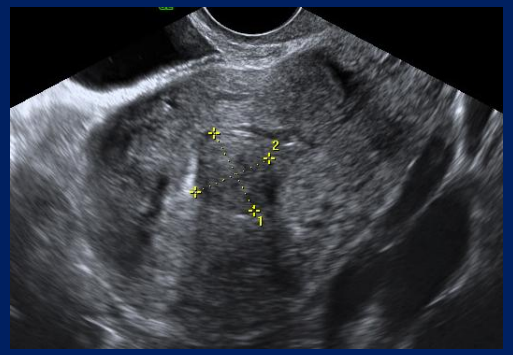


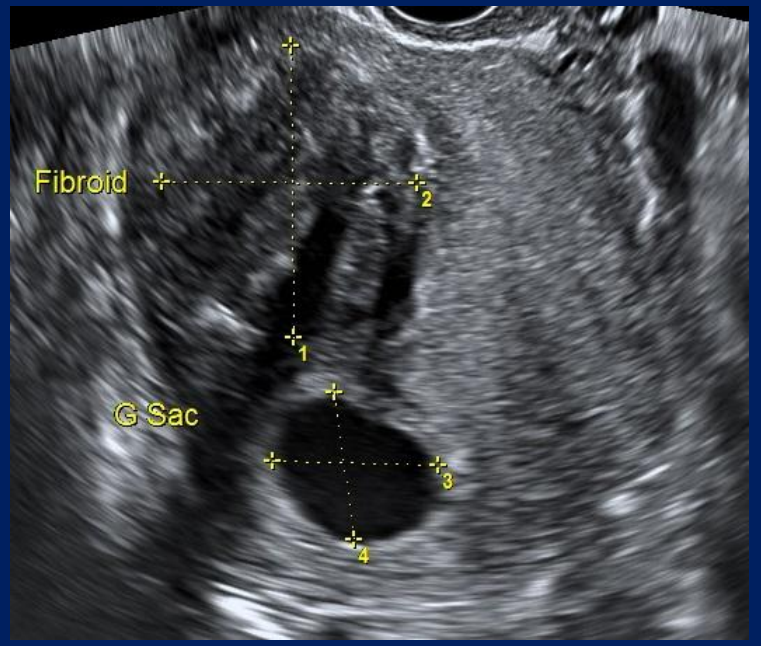


Other findings

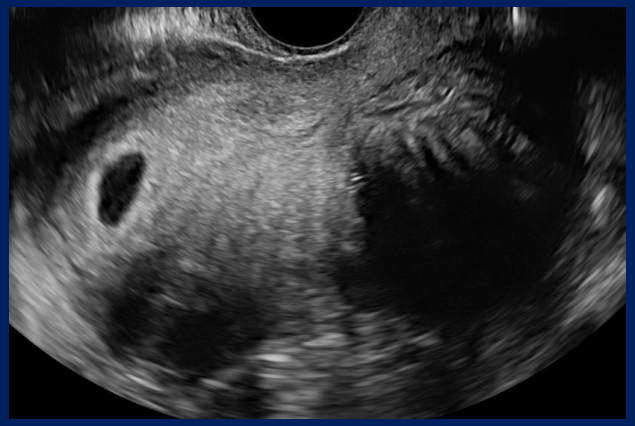
Uterine pathology

- Uterine Fibroids





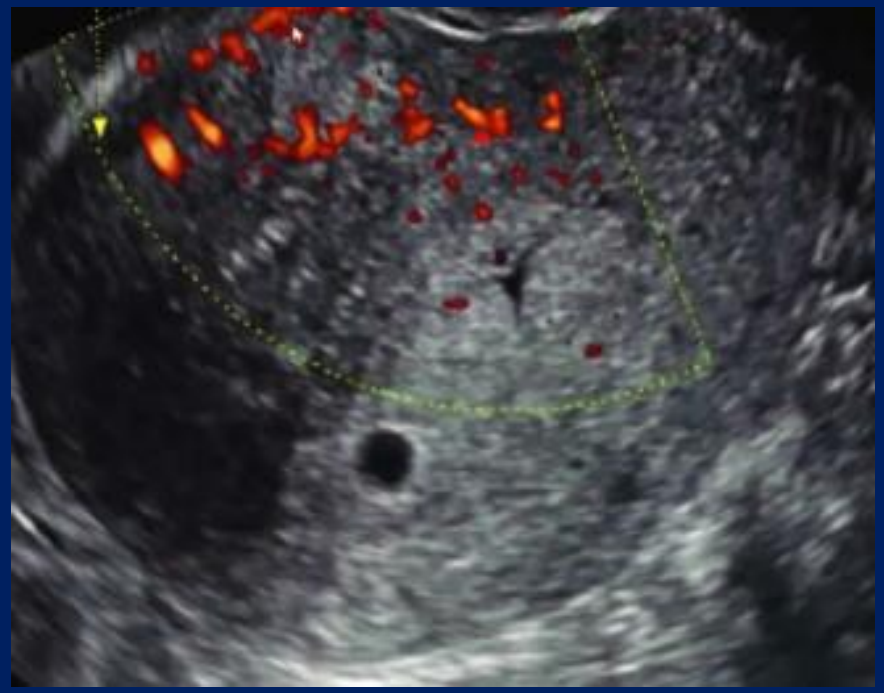
- Most common uterine tumour
- Incidence increases with age during the reproductive years
- Affect >50% of pre-menopausal women age 35-49



Other findings

Uterine pathology

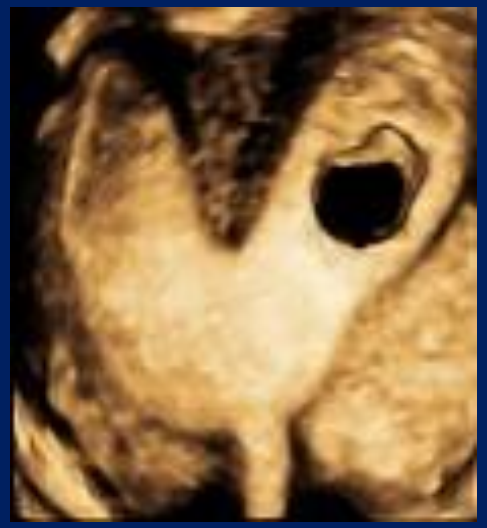
- Adenomyosis

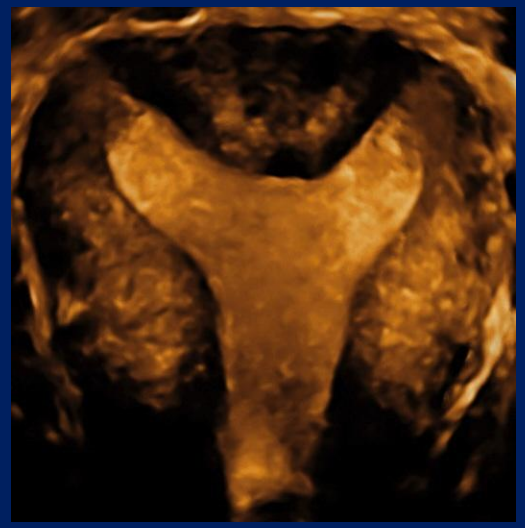


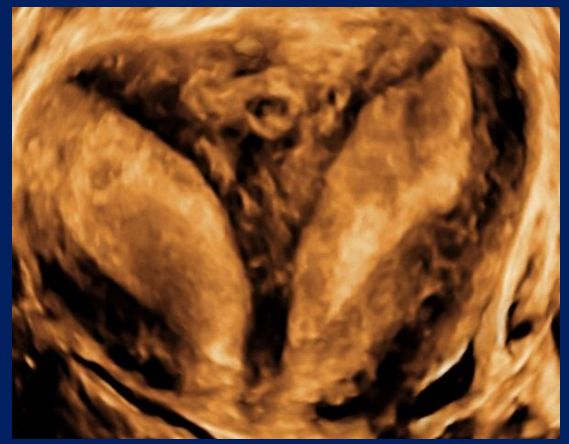
- Characterized by the presence of endometrial glands and stroma within the myometrium, surrounded by smooth muscle hyperplasia.
- Prevalence thought to be ~ 20% (up to 60% of hysterectomy samples)
- Incidence increases with age
- A progressive disease that gets worse
- Thought to be an increased risk of miscarriage

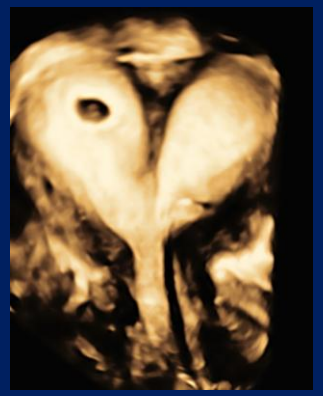
Other findings

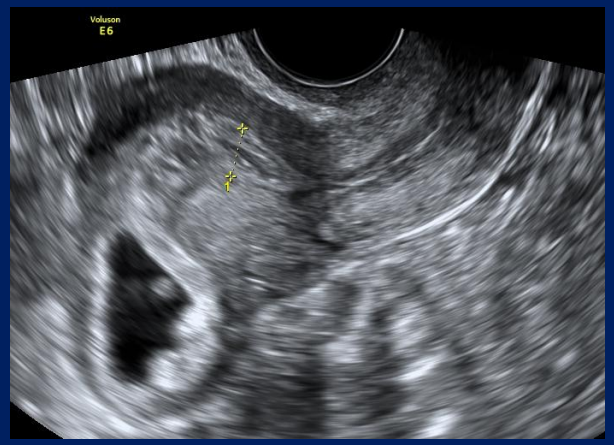
Uterine anomalies

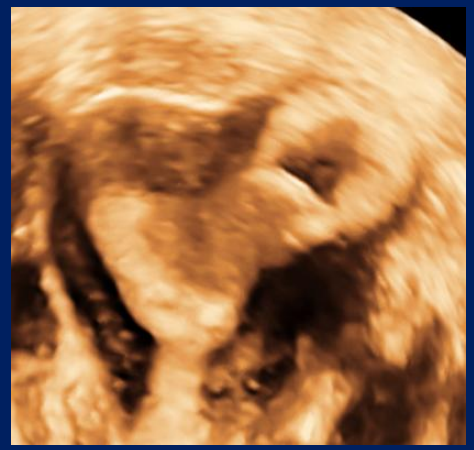












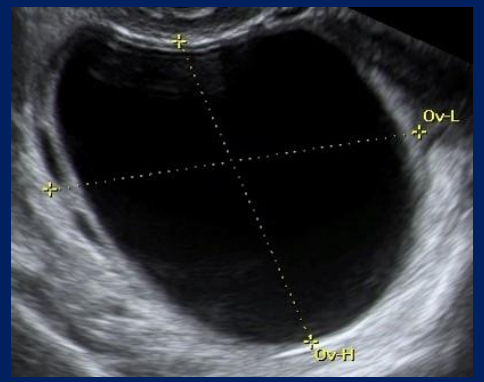
- ~ 5% general population
- ~13% of miscarriage population

Other findings

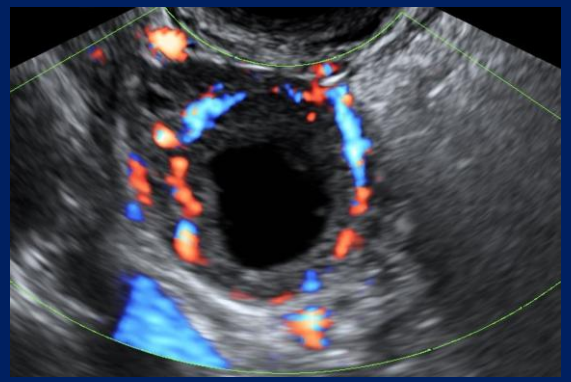
Ovarian pathology

- Adnexal masses occur in ~ 2% of pregnancies.

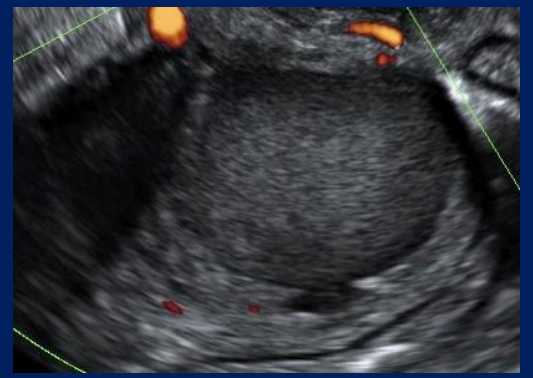
- Simple Cyst



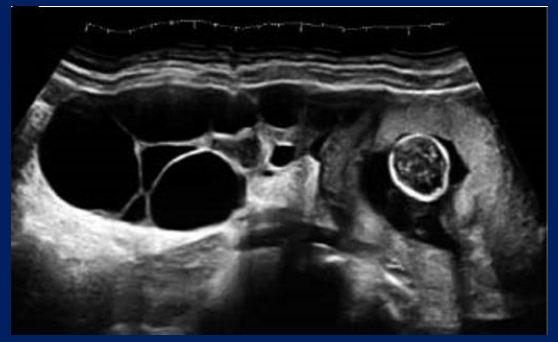
- Corpus Luteum



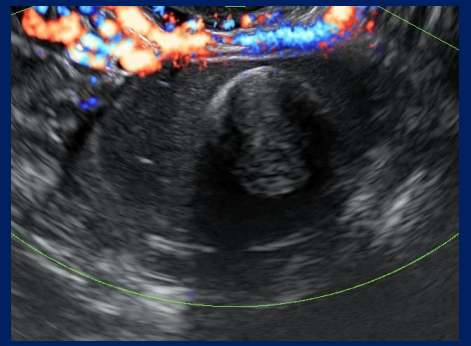
- Endometrioma



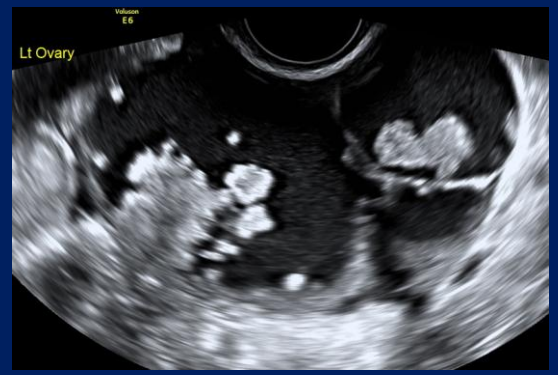
- Theca Lutein Cyst



- Dermoid

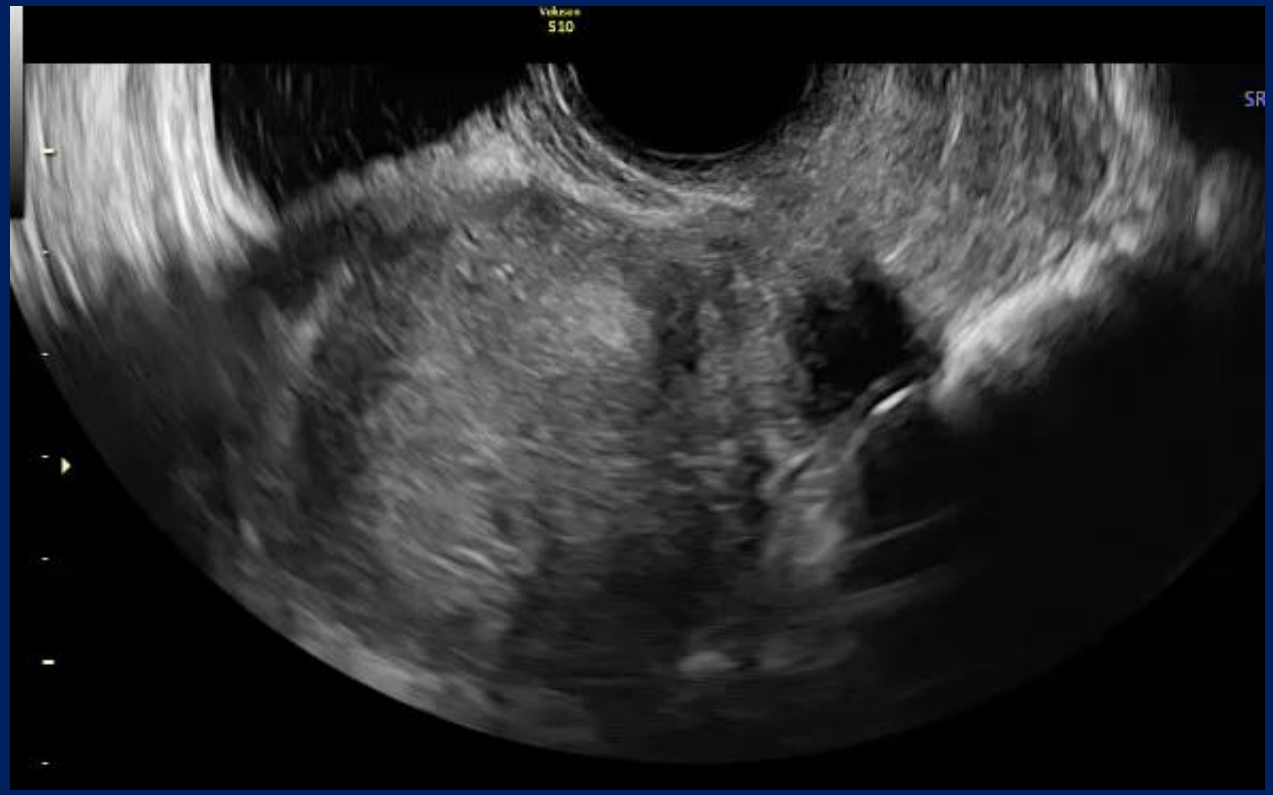


- Borderline Tumour



Other findings

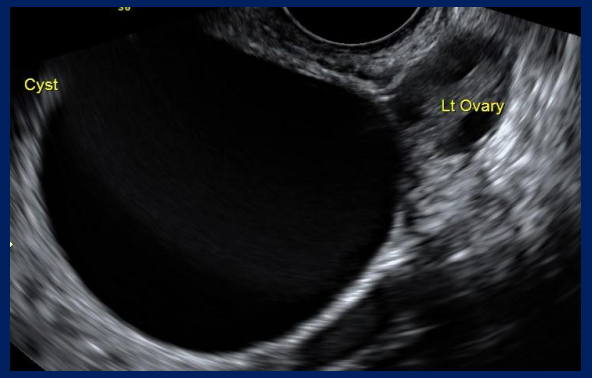
IUCD



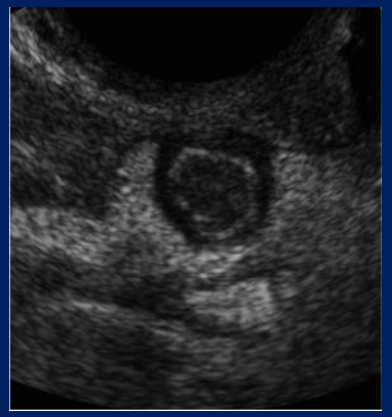
Other findings

Other pathology

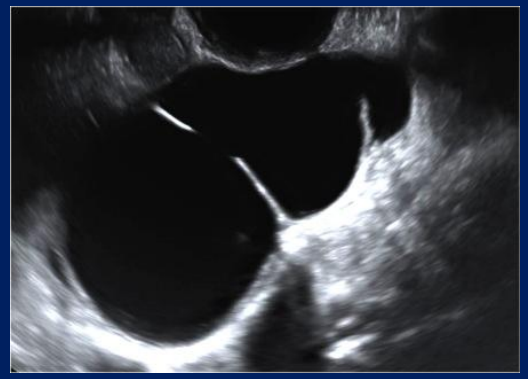
- Paraovarian Cyst



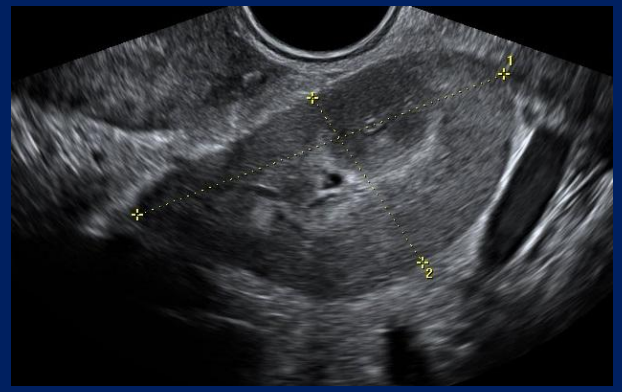
- Appendicitis



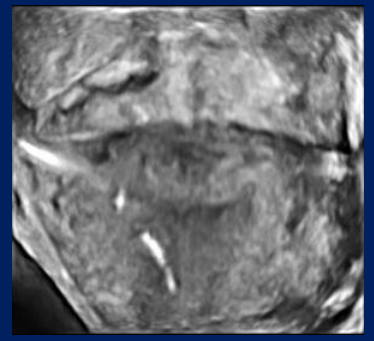
- Hydrosalpinx



- Pelvic Kidney

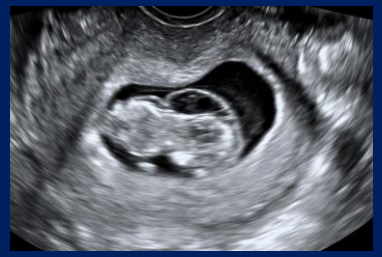
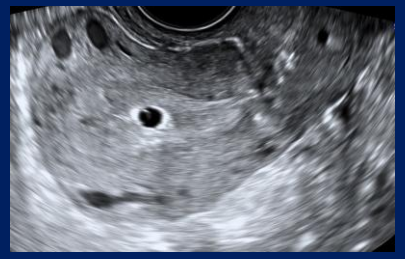
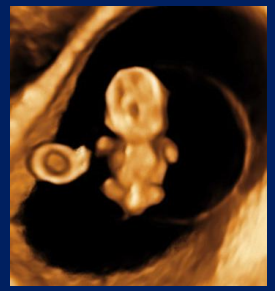


- Essure Device

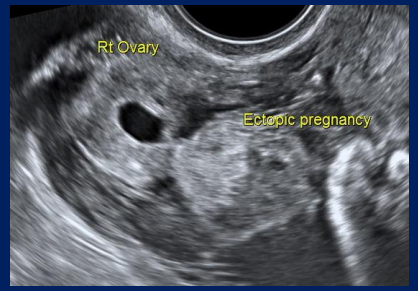


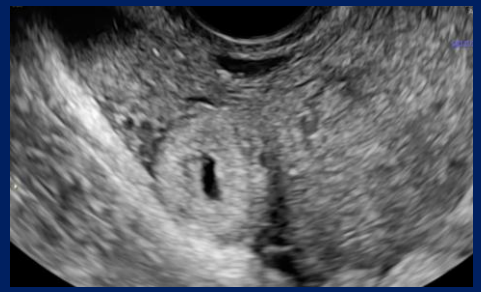
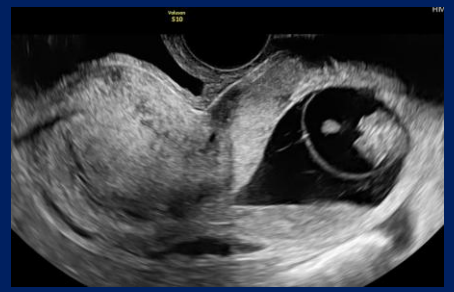
Summary

1. Normally sited pregnancy – live, early or miscarriage

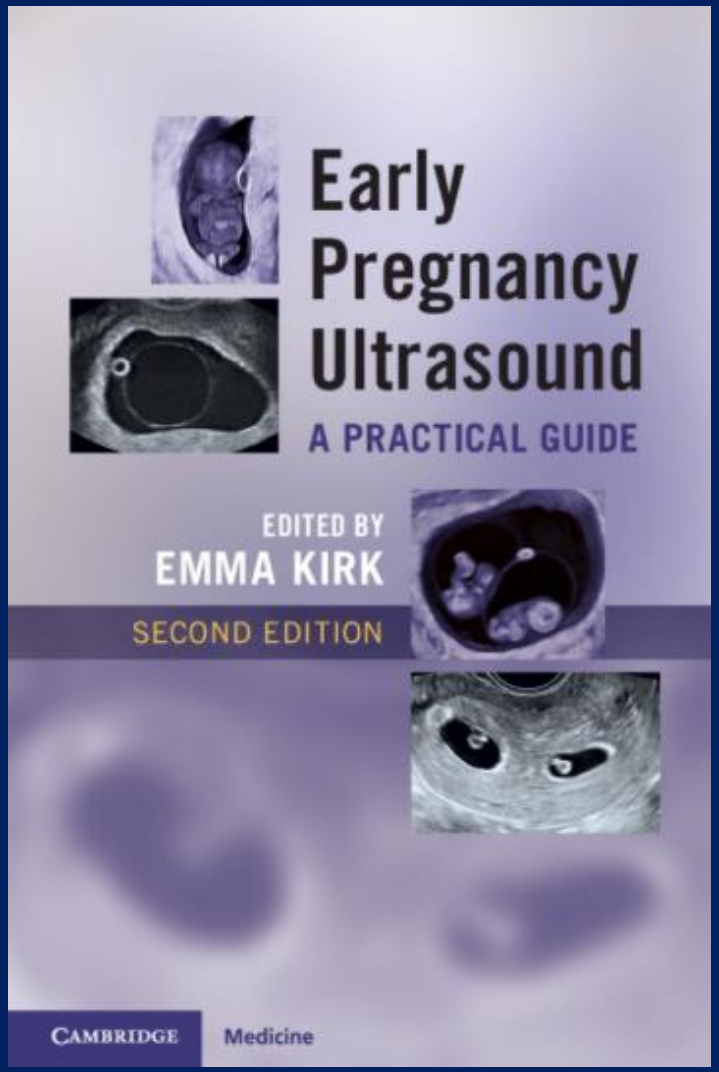




2. Ectopic pregnancy – extra-uterine or uterine (partial/complete)



Thank you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