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Obstetrics & Gynecology

Indian College of Obstetricians & Gynaecologists

OSCE in Obstetrics & Gynecology

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Hrishikesh D Pai
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Forewords
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Laxmi Shrikhande

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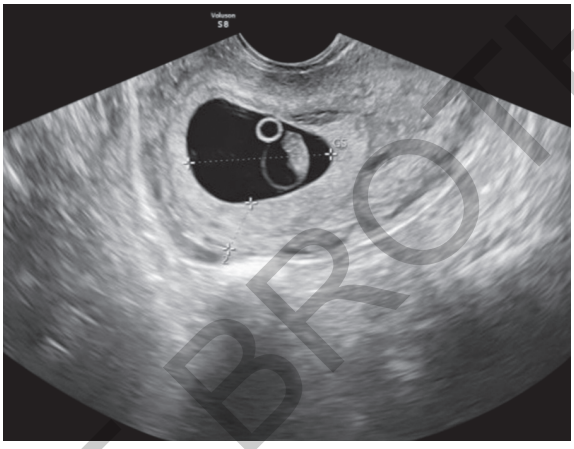
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CHAPTER 3

Ultrasound in First and Second Trimester

Archana Baser

OSCE 1.



1. **Identify the picture. What are the key structures seen?**
2. **What is the aim of an early pregnancy scan?**
3. **Till what gestational age dating can be done and what is the most accurate parameter for dating?**
4. **Discuss the discriminatory zone of β-hCG in TAS and TVS scan.**

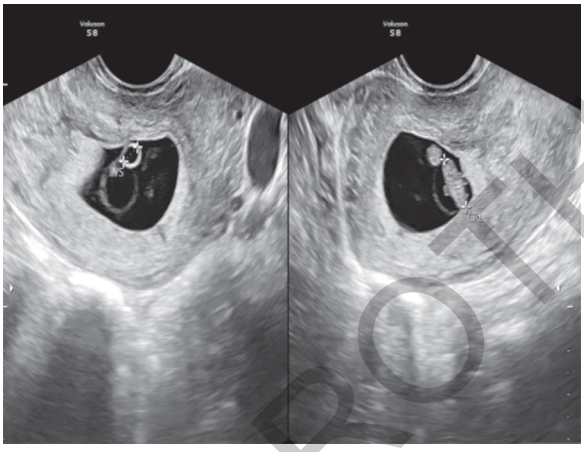
Ans.

1. Early pregnancy scan/viability scan.
   Key structures seen are:
   - Adequate decidual reaction
   - Gestational sac
   - Yolk sac
   - Amnion
   - Embryo
2. *Aims of early pregnancy scan:*
   - Determination of location of pregnancy (intrauterine or extrauterine)
   - Determination of fetal number
   - Presence or absence of cardiac activity
   - Calculation of gestational age.

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3. Dating can be done till the 13 weeks period of gestation and the most accurate parameter for dating is CRL measurement.
4. The discriminatory zone/or critical value of serum β-hCG for detection of intrauterine pregnancy by transabdominal sonography is 6500 mIU/mL and for transvaginal sonography is 1,500 mIU/mL.

OSCE 2.



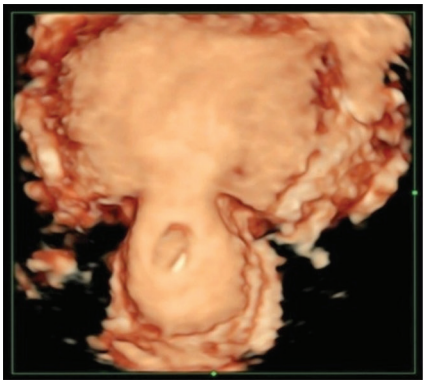
1. **What is a double decidual sign?**
2. **What is the critical landmark for identifying a true gestational sac?**
3. **What is a double bleb sign?**
4. **At what gestational age is a gestational sac, yolk sac, fetal pole, and cardiac activity evident in TVS scan?**
5. **At what MSD (mean sac diameter) is a yolk sac and embryo with cardiac activity evident by TVS scan?**

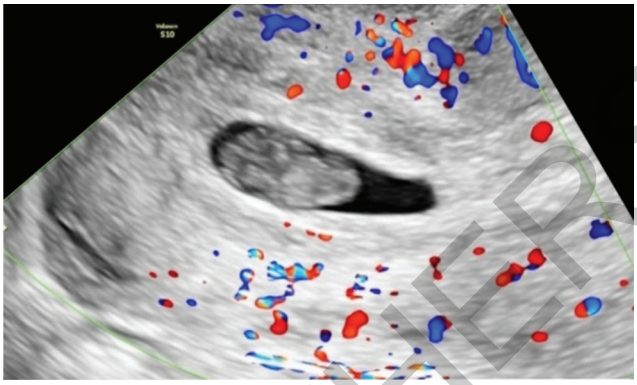
Ans.

1. Double decidual sac sign is a sonographic feature seen in normal intrauterine pregnancy depicting appearance of two concentric echogenic rims of which outer ring is *decidua parietalis* and inner ring is *decidua capsularis*.
2. The critical landmark for identifying a true gestational sac is the presence of Yolk sac.
3. Double bleb sign is a sonographic feature showing a Yolk sac and Amniotic sac in the gestational sac giving an appearance of two bubbles. The embryonic disk is located in between the two.
4. G sac (gestational sac) seen at 4.5–5 weeks
   - Yolk sac at 5–5.5 weeks
   - Fetal pole at 6 weeks
5. a. Yolk sac at MSD 6 mm
   b. Embryo with CA (cardiac activity) at MSD 12 mm
   c. CA is present in CRL ≥4 mm

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OSCE 3.





1. **Identify the image and comment on it. Enumerate four differential diagnosis of early pregnancy hemorrhage.**
2. **Enumerate four different types of abortions.**
3. **How is early pregnancy failure different from missed abortion and an anembryonic pregnancy?**
4. **What is a sliding sign?**

Ans.

1. The above image is suggestive of abortion in progress.

   The differential diagnosis of early pregnancy hemorrhage are:

Obstetrics	***Nonobstetric***
Implantation bleeding	Cervical polyps
Miscarriages	Cervical erosion
Ectopic pregnancy	Carcinoma cervix
Hydatidiform mole	Anovulatory bleeding

2. The types of abortions are:

Spontaneous	***Induced***
Threatened abortion	MTP
Inevitable abortion	Septic abortions
Incomplete abortion	
Complete abortion	
Missed abortion	

3. *Early pregnancy failure* is when the pregnancy ends spontaneously such that either the embryo does not appear at all or the cardiac activity does not appear, or there is loss of previously viable embryo.

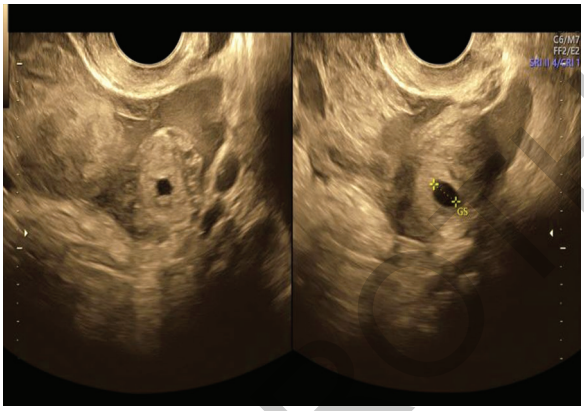
   Missed abortion is when the cardiac activity in a previous viable embryo/fetus does not appear even when the CRL is greater than 7 mm.

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Anembryonic pregnancy or blighted ovum refers to the one in which the gestational sac is seen without the embryo. If on TVS scan, a gestational sac of MSD >25 mm is seen with no identifiable yolk sac or embryo, then it is termed as anembryonic pregnancy.

4. *Sliding sign* is a sonographic feature, that differentiates spontaneous abortions in progress from a cervical ectopic pregnancy. It involves the sliding of products of conception when a slight pressure is applied by the sonographer during TVS. It is absent in cervical pregnancy.

OSCE 4.



1. **What is the image suggestive of?**
2. **What is Bagel's or Donut sign?**
3. **Enumerate four sites of ectopic pregnancy.**
4. **Enumerate four ultrasound features of ectopic pregnancy.**
5. **Enumerate two criteria for expectant management.**

Ans.

1. The image is suggestive of an ectopic pregnancy, with gestational sac seen in the adnexa.
2. Bagel's or Donut sign or Blob sign is a sonographic feature of intact tubal ectopic pregnancy in which a gestational sac is seen in the adnexa surrounded by a hyperechoic ring.
3. The different sites of ectopic pregnancy are:

Tubal (98.3)	***Extra tubal site (1.7%)***
Ampulla (most common)	Rudimentary horn
Isthmus	Cornual
Infundibulum (fimbrial)	Abdominal
Interstitial	Ovarian
	Cervical
	Cesarean Scar

4. The sonographic features of ectopic pregnancy are:
   - Empty uterine cavity
   - Thickened endometrium

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- Pseudogestational sac
- Decidual cast
- Gestational sac in the adnexa with or without cardiac activity
- Ring of fire appearance of the sac, showing increased vascularity in color Doppler
- Blood in the peritoneal cavity

5. Expectant management for Ectopic pregnancy should be done in:
   - Clinically stable patient.
   - Serum β-hCG <1,000 mIU and fall on further tests
   - Only tubal ectopic
   - Diameter of tubal mass not greater than 3.5 cm
   - No signs and symptoms of tubal rupture or hemoperitoneum seen on clinical examination and on TVS.

OSCE 5.



1. **Identify the image. What is the optimal time to determine chorionicity?**
2. **What is Lambda sign and T-sign?**
3. **Enumerate four important aspects of assessment of multiple pregnancy on an ultrasound.**
4. **Discuss the types of chorionicity and zygosity in twin gestation.**
5. **What is the role of ultrasound in appearing twins and vanishing twins?**

Ans.

1. Twin gestation—the optimal time to determine chorionicity is 11–14 weeks.
2. *Lambda sign or twin peak* sign refers to the triangular projection of trophoblastic tissue isoechoic with placenta into the intervening membranes from the placental surface corresponding to dichorionic placenta.

   T-sign is when there is absence of Lambda sign. It refers to a thin dividing membrane between two amniotic sacs when there is only one placenta for two gestations. It corresponds to monochorionic placenta.
3. The important and practical aspects on ultrasound are:
   - Total number of gestational sacs

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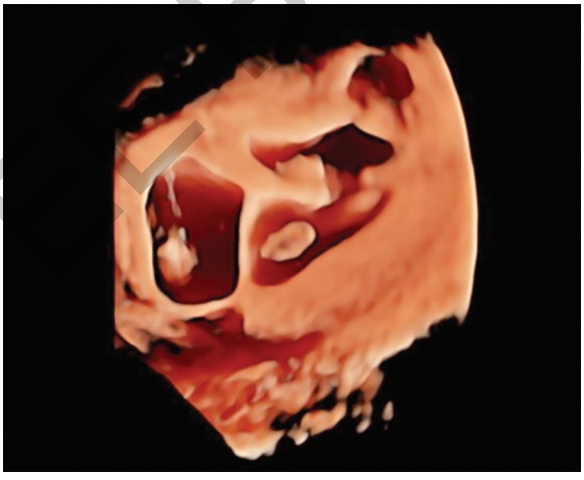
- Total number of amniotic sacs in chorionic cavity
- Total number of Yolk sacs, to diagnose the amnionicity
- Number of placenta
- Chorionic peak sign/Lambda sign, indicative of dichorionicity
- The thickness of intertwin membrane

4. *Chorionicity* refers to placentation
   Zygosity refers to a type of conception.
   The chorion differentiates on day 4 and the Amnion on day 8 after fertilization.
   Dizygotic twins always have dichorionic placenta. Monozygotic depends on the time of division of zygote

Division within 72 hours	Dichorionic diamniotic
Between 4–8 days	Monochorionic diamniotic
Between 8–12 days	Monochorionic monoamniotic
After 13 days	Conjoined twin

5 A diagnostic pitfall in first trimester screening of twins is the appearing twin which is common with monochorionic twins. Ultrasound plays an important role here. Repeat scan should be done for patients with monochorionic twins.

OSCE 6.



1. **What is the order of pregnancy in the above picture?**
2. **What is Epsilon sign?**
3. **What sonographic findings determine chorionicity?**
4. **Enumerate four maternal and four fetal complications associated with multiple gestation.**
5. **What is the role of ultrasound in multiple pregnancy in second trimester?**
6. **When and how is embryo reduction done?**

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Ans.

1. The order of pregnancy in above picture is Quadruplet.
2. Epsilon sign is seen in higher order pregnancy, where three separate gestational sacs meet at a junction of three interfetal membranes (trichorionic triplets)
3. Sonographic findings determining chorionicity are:
   - Total number of gestational sacs
   - Total number of amniotic sacs in chorionic cavity
   - Total number of yolk sacs for diagnosing amnionicity
   - Number of placenta
   - Chorionic peak sign/twin peak sign indicative of dichorionicity
   - The thickness of intertwin membrane
4. *The maternal and fetal complications are:*
   Maternal:
   - Hyperemesis
   - Pre-eclampsia
   - HELLP syndrome
   - Placental abruption
   - Polyhydramnios
   - Placenta previa
   - Gestational diabetes

   Fetal:
   - Vanishing twins
   - Congenital malformations
   - Fetal aneuploidies
   - Single fetal demise
   - Conjoined twins
   - Acardiac twins
   - Twin-to-twin transfusion syndrome
   - Discordant twin
5. *USG importance in second trimester:*
   - To determine chorionicity, if not done in first trimester
   - To assess cervical length to prevent preterm birth
   - To detect congenital malformations which are more common in multiple pregnancy.
   - To detect complications associated with monochorionic placentation.
   - For serial growth assessment, Doppler waveforms, and growth discrepancy.
6. Embryo reduction is done in between 7 and 11 weeks. It can be done transabdominally or transvaginally, with or without anesthesia. It involves injection of potassium chloride (KCl) directly or near the heart under sonographic guidance.

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OSCE 7.



1. **What is the timing of first trimester scan and enumerate its advantages?**
2. **How is first trimester screening for chromosomal abnormalities carried out?**
3. **What should be the position of fetus while measuring NT?**
4. **What are the criteria for optimization of NT scan?**
5. **Enumerate four etiologies of congenital anomalies.**

Ans.

1. The timing of the first trimester scan is 11–13.6 weeks.
2. The screening for chromosomal abnormalities is carried out.
3. The position should be a neutral position.
4. *Criteria for NT optimization (AIUM guidelines):*
   - CRL
   - Head
   - Profile face
   - Spine
   - Abdominal transverse view
   - Orbital view and Premaxillary triangle view
   - Visualization of three segments of all 4 limbs, 12 long bones
5. *Etiology of congenital anomalies:*
   - Idiopathic etiology (up to 60%)
   - *Multifactorial (20%):*
     - Neural tube defects—spina bifida, anencephaly
     - Congenital cardiac defects
     - Cleft lip cleft palate
     - Club foot
   - *Genetic (11%):*
     - *Chromosomal disorders (6%):* Trisomy 21, 18, 13
     - *Single gene disorders (5%):*
       - Achondroplasia
       - Neurofibromatosis

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  - Retinoblastoma
  - Marfan's syndrome
  - Cystic fibrosis
  - Sickle cell disease
  - Hemophilia
  - DMD
  - Fragile X syndrome
- *Maternal diseases (5%):*
  - Diabetes
  - Epilepsy
- Infections (2%)
- Environmental factors (rare 1%)

- *Drugs (rare 1%):*
  - Isotretinoin
  - Alcohol
  - Warfarin
  - Phenytoin
  - Lithium

OSCE 8.



1. **What is the ultrasound image suggestive of?**
2. **What are the advantages of a first trimester scan?**
3. **What is the significance of raising NT?**
4. **Enumerate four common anomalies detected in the first trimester scan.**
5. **What are prenatal tests and enumerate four indications for prenatal diagnosis?**

Ans.

1. The image is suggestive of a first trimester scan showing raised nuchal translucency.
2. *Advantages of first trimester scan are:*
   - Timely termination
   - Relatively less complications in termination

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- Genetic and chromosomal testing
- Couples with nonlethal and corrected malformations can be offered timely counseling and treatment.
- Less physical and mental trauma to couples
- Cases in which no chromosomal defect is found, proper follow-up and timely delivery with pediatric multispecialty care can be done.

3. Increased NT is a useful marker of chromosomal abnormalities, fetal malformations and genetic syndromes.
4. The common anomalies are:
   - Acrania and Anencephaly
   - Encephalocele
   - Dandy–Walker malformation
   - Open spina bifida
   - Omphalocele
   - Gastroschisis
   - Body stalk anomaly
   - Megacystis
   - Congenital diaphragmatic hernia
   - Congenital heart defects
   - Hydrops fetalis
5. Prenatal tests are performed to diagnose and guide management of the pregnancy, delivery, and neonatal period.
   - *Prenatal methods*

     Noninvasive tests:
     - Ultrasound/dual and quadruple tests
     - Fetal MRI
     - Free-fetal DNA

     Invasive tests:
     - Amniocentesis
     - Chorionic villus sampling
     - Fetal blood sampling
     - Fetal biopsy
     - Fetal surgery

     Indications for prenatal diagnosis:
     - Women at high risk for chromosomal abnormalities, advanced maternal age, previous affected pregnancy, either of the couple is a known carrier of balanced translocation.
     - Family history of a known genetic condition
     - Congenital heart defects
     - Family history of congenital defects like CHD, NTD, renal and CNS anomalies
     - Maternal medical conditions like DM, HTN, autoimmune diseases, hypothyroidism.
     - Abnormal serum screen

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- Abnormal or borderline USG findings
- Congenital infections like rubella, CMV, chickenpox, syphilis
- Exposure to smoking, Alcohol, teratogenic drugs like anticonvulsants, oral anti-coagulants, chemotherapeutic drugs
- Multiple gestation.

OSCE 9.



1. **What is a TIFFA scan, and at what gestation is it done?**
2. **What are the factors to be checked during the fetal anomaly scan?**
3. **Enumerate four second trimester markers for Trisomy 21.**
4. **Enumerate four common congenital anomalies seen in second trimester scan.**
5. **Who should be offered mid-trimester anomaly scan?**

Ans.

1. TIFFA scan is targeted Imaging for fetal anomalies. It is done around 18–22 weeks.
2. Standard views for the examination of the fetus at mid-trimester anomaly scan are:
   - Skull
   - Brain
   - Face
   - Neck
   - Spine
   - Heart
   - Limbs
   - Abdomen
   - Umbilical cord
   - Thorax
   - Placenta
   - Cervical length
3. Second trimester markers for Trisomy 21 are:
   - Ventriculomegaly
   - Absent or hypoplastic nasal bone
   - Increased nuchal fold thickness

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- Intracardiac echogenic focus
- Aberrant right subclavian artery
- Hyperechogenic bowel
- Mild hydronephrosis
- Shortening of Femur or humerus.

4. The common congenital anomalies seen in second trimester are:
   - *NTDs:*
     - Anencephaly
     - Spina bifida
     - Encephalocele
     - Sacrococcygeal teratoma
   - *CNS malformations:*
     - Hydrocephalus
     - Holoprosencephaly
     - Agenesis of corpus callous
     - Septal agenesis
     - Septo optic dysplasia
     - Dandy–Walker malformation
     - Vermian hypoplasia
     - Blake's pouch
     - Arachnoid cyst
   - *Face and Neck:*
     - Cleft lip and palate
     - Macrognathia
     - Microphthalmia
     - Aphasia
     - Hypertelorism
     - Cystic hygroma
     - Hemangioma
     - Lymphangioma
     - Teratoma
   - *Cardiac:*
     - Conotruncal malformations
     - TOF
     - Double outlet right ventricle
     - Truncus arteriosus
     - Transposition of great vessels
   - *GIT:*
     - Tracheoesophageal fistula
     - Duodenal atresia
     - Small bowel obstruction
     - Omphalocele
     - Gastroschisis

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OSCE in Obstetrics & Gynecology

Salient Features

- This is a one-of-a-kind textbook based purely on the format of OSCE, i.e., Objectively Structured Clinical Examination stations, covering the fields of Obstetrics as well as Gynecology exhaustively
- Liberal use of pictures and illustrations will not only aid the students in their preparation but also make the process of reading enjoyable
- An exhaustive collection of chapters ranging from the basics of Obstetrics and Gynecology to recent advances like Endoscopy in Gynecology, Reproductive Medicine, and Imaging in Obstetrics
- Topics like Fetal Ultrasound in First and Second Trimester, Screening and Congenital Malformations have been extensively covered with the help of images and illustrations making the topics simple and easy to understand
- Liberty has been taken to provide detailed answers of some topics as well as pertinent references for further reading
- The book is mainly designed for undergraduate and postgraduate students. However, this book will be a handy asset for all clinical practitioners, the seekers of knowledge in the various stages of their career as well.



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