

Transvaginal sonography

Contents :

- Scanning techniques
- Advantage & Disadvantage
- First trimester
- Ectopic pregnancy

Target :

- to understand the orientation of screen
- to know when to use TVS
- to know the key events in early pregnancy
- to discriminate the ectopic pregnancy

.ENDOVAGINAL SCANNING

- get verbal consent, presence of a female chaperone.
- transabdominal scanning first.
- should be performed after complete voiding.
- insert probe slightly posterior
- then tilt the probe anterior
- contact of the probe with the cervix or vaginal fornix is not necessary for routine exams.
- longitudinal view of the uterus and endometrium.
- evaluate adnexa
- transverse view of the uterus (rotate 90 degree from longitudinal view)
- PCDS (posterior angulation if anteverted)

.ADVANTAGE AND DISADVANTAGE

A. Advantage

- to image pelvic structures with better detail
- do not need filling bladder
- abdominal scar or obesity
- cul de sac area or deep mass
- cyclic change of endometrium and ovary
- early pregnancy diagnosis
- during 2nd, 3rd trimester:
 - .cervix

- .placenta previa
- .presenting fetal part

B. Disadvantage

- difficult orientation
- limited field of view(maximum 8 cm)
- discomfort in elderly patients

.TVS OF FIRST TRIMESTER

A.Goals of first trimester sonography

- Site of implantation
- Viability at time of scan
- Prediction of future viability
- Gestational age
- Multiple embryos-chorionicity
- Anomalies
- Uterine/Adnexal masses

B.Site of implantation:

- decidual thickening at implantation site(?)
- high velocity of trophoblastic flow

C.Gestational sac

- chorionic cavity, within endometrium
- at 4⁺² weeks 1-2mm.
- grows about 1-1.2 mm/day, by 7 week larger than Yolk sac.
- mean sac diameter(accuracy \pm 1 week)
- abnormal appearance
 - irregular contour
 - thin decidual reaction(<2 mm)
 - absent double decidual sac
 - low position

D.Yolk sac

- function-transfer of nutrients, hematopoiesis, formation of gut
- connected to midgut by vitelline duct
- visualized when MSD of 8 mm(5-6 wks)
- persisting to about 11-12 wks.

sized 3-7 mm

larger than 7 mm-abnormal gestation

smaller than 3 mm-chromosomal aberration and spontaneous abortion<Holzgreve,1992>

evidence of intrauterine pregnancy

situated between amnion and chorion

E.CRL

most accurate measurement of GA($\pm 0.7w$ at 9 weeks)

should be visualized if gestational sac is 16mm

F.Cardiac activity

begins to beat 6th week(CRL 1.5-3 mm)

absence may be normal in embryos 4 mm

should be seen in embryos 5mm

4 chamber view-12 weeks.

mean embryonic heart rate at 6 weeks is 90-113 bpm

increase until 9 weeks to 144- 170bpm

-cardiac activity with poor outcome

under 90 - poor prognosis in first trimester

under 70 - all demise

subchorionic collection

oligohydramnios

G.Amniotic cavity

amniotic fluid clearer than chorionic fluid

double bleb sign

abnormal amniotic sac:

enlarged amniotic cavity relative to CRL correlates with early embryonic death

increased AF volume may be related to congestive heart failure.<Bimhotx,JUM

1995>

H.Sonographic landmark in Embryo

-G. sac: 4.5 weeks

-Y. sac: 5 weeks

-Embryo: 6 weeks

-Heart beat: 6 weeks

-Spine: 7 weeks

-Limbs: 7 weeks

-Body movements: 8 weeks

-Midgut herniation: 8-12 weeks

- Falx cerebri: 9 weeks
- Ossification of mandible: 9-10 weeks

I. Signs for early pregnancy

- intradecidual sign:
 - gestational sac completely embedded within decidua and not large enough to protrude into the uterine cavity
 - adjacent uterine cavity remains straight
- DDSS(Double decidual sac sign):
 - two concentric echogenic rings surrounding an intrauterine fluid collection
 - inner ring= chorion and trophoblast
 - outer ring= decidua vera
- Double bleb sign

J. Pregnancy failure rates after sonographic detection of cardiac activity

<i>Weeks</i>	<i>Bleeding</i>	<i>no bleeding</i>	<i>overall</i>
5.5-6	33%	16%	20.4%
7-9	10%	5%	7.6%
9-11	4%	1-2%	4.5%

K. Subchorionic fluid collection

- present in up to 50% of first trimester, not necessarily with clinical bleeding
- may not all be blood
- increased incidence of embryonic death onll in presence of clinical bleeding(9.3%)
- bed rest did not affect incidence of embryonic death.

L. Nuchal translucency

- abnormal 3 mm
- increased risk of aneuploidy with increased NT, septation
- in euploid fetus:
 - omphalocele, duodenal atresia, polycystic kidney, sirenomelia
 - without anomaly, usually resolve by 16 weeks.
 - ass. with spontaneous abortion, premature delivery