Amniotic fluid and its abnormality

By

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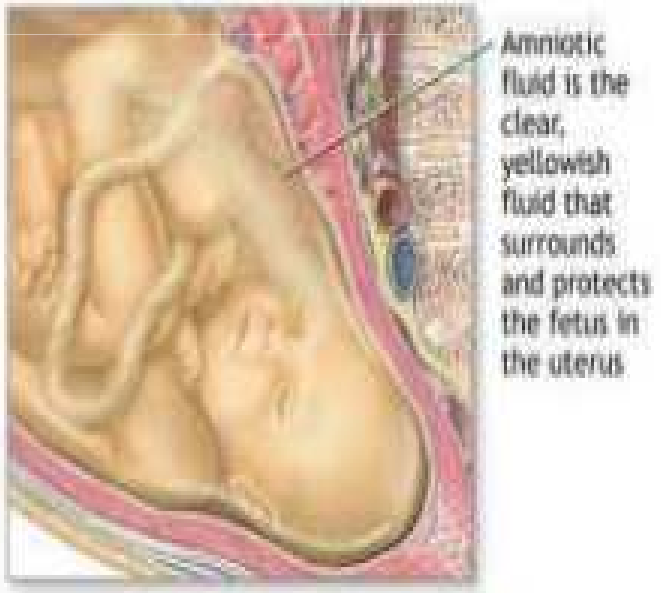
Definition:

- Amniotic fluid is a clear, yellowish liquid that surrounds and protects the unborn baby (fetus) during pregnancy. It is contained in the amniotic sac.



Amniotic Fluid

- Sources: Early stages: Skin & placenta

  12 - 14 W: lung & kidney

  20 W: kidney

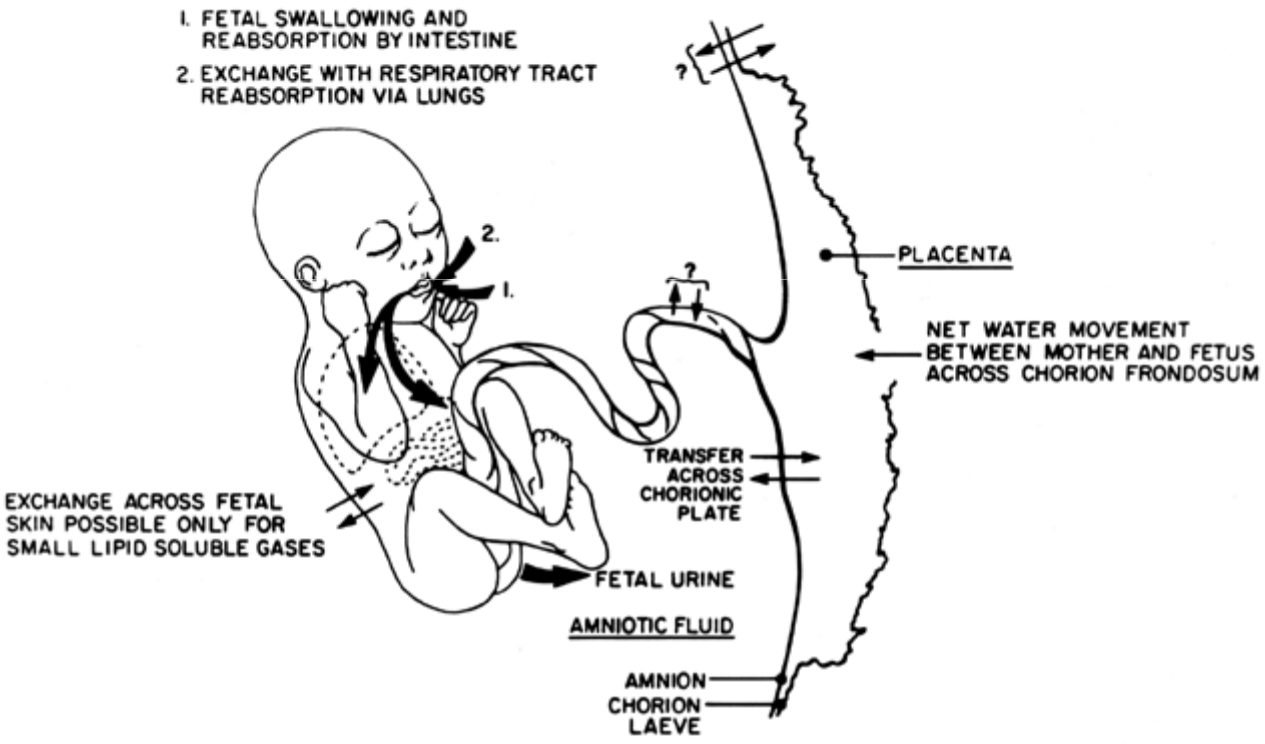
- Amount: 33 - 34 W: 800-1000 ml

  At term: 600 ml

- U/S parameters: I. AFV

  II. FFP

Source of amniotic fluid



Amniotic fluid contd...

Composition:

- first half of pregnancy, the composition of fluid is almost identical to a transudate of plasma.
- late pregnancy, the composition is altered mainly due to contamination of fetal urinary metabolites.
- The composition includes- water (98-99%) and solid (1-2%).
- The following are the solid constituents:

Organic-

Protein- 0.3 mg%
Glucose- 20 mg%
Urea- 30 mg%
NPN- 30 mg%

Uric acid- 4 mg%
Creatinine- 2 mg%
Total lipids- 50 mg%
Hormones (Prolactin, insulin and renin)

Amniotic fluid function:

1. Allow room for fetal growth, movement and development.
2. Ingestion into GIT→ growth and maturation.
3. Fetal pulmonary development (20 weeks).
4. Protects the fetus from trauma.
5. Maintains temperature.
6. Contains antibacterial activity.
7. Aids dilatation of the cervix during labour.

NORMAL VOLUMES OF AMNIOTIC FLUID

Varies with the duration of pregnancy.

Average of amniotic fluid volume

- **12 weeks**: 50 ml;
- **24 weeks**: 500 ml;
- **36 weeks**: 1000 ml & decreases thereafter.

At term: The normal range in a singleton pregnancy is large: 500-2000 ml

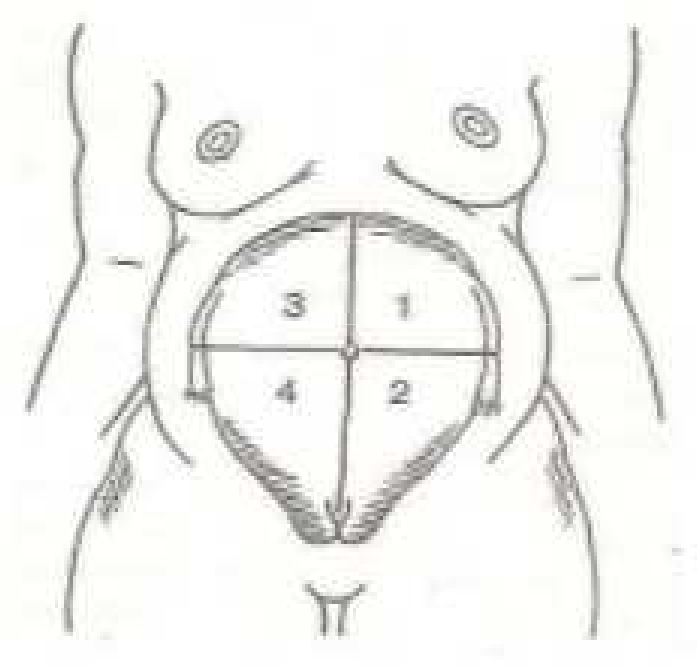
Clinical importance of AF:

- **Screening for fetal malformation** (serum α-fetoprotien).
- **Assessment of fetal well-being** (amniotic fluid index).
- **Assessment of fetal lung maturity** (L/S ratio).
- **Diagnosis and follow up of labour.**
- **Diagnosis of PROM** (ferning test).

Measurment of AF

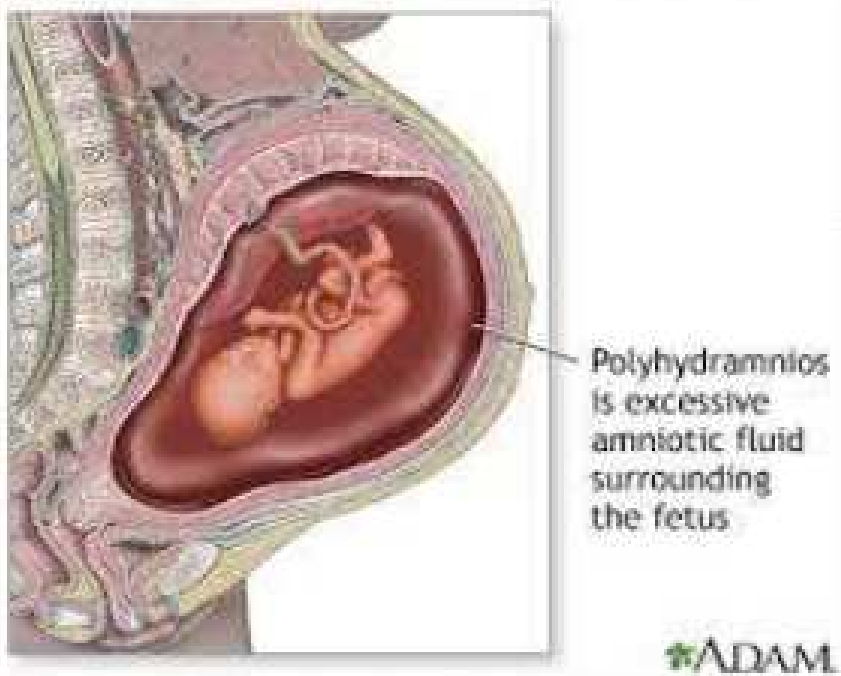
- Measurement of AFI- quantitative method of measurement of amniotic fluid by usg. Single largest pocket is measured in four quadrants and added.

- Normal range is 5-24 cm
- Single deepest pocket
- Normal range is 2-8 cm



Polyhydramnios

- Definition- Liquor amnii >2000 ml
- AFI >25 cm
- Single vertical pocket > 8 cm



Causes of polyhydramnios

Idiopathic

Maternal

Diabetes , preeclampsia , Rh isoimmunisation ,generalized odema

Placental

more than one placenta (multiple pregnancy)

large placenta (infection , macrosomia)

chorioangioma

Fetal

congenital anomaly (GIT ,CVS, CNS ,Chromosomal anomaly)

Fetal hydrops (immune and non immune)

Diagnosis of polyhydramnios

- Symptoms:
  - dyspnea.
  - edema.
  - abdominal distention
  - preterm labour.
- Abdominal examination:
  - ↑uterus than expected.
  - difficult to palpate fetal parts.
  - difficult to hear fetal heart sound.
  - ballotable fetus.

- Ultrasound:
  - excessive amniotic fluid.
  - fetal abnormalities.
  - assess fetal wellbeing: BPP & Doppler
- Fetal karyotyping.

Complications

Maternal

Antepartum

- symptomatic , Pressure effect (varicosities)
- miscarriage
- preterm labour and PROM
- Antepartum hemmorrhage (AP)
- preeclampsia
- malpresentation

Intrapartum

, - difficult labour , bleeding
- increase incidence of operative delivery

postpartum

- PPH

Fetal

- Fetal distress and death during labour due to cord prolaps

Management

- According to the cause and severity .
- **Mild cases** of polyhydramnios rarely require treatment.
- Treatment for an underlying condition ,such as diabetes ,may help resolve polyhydramnios.

Amniocentesis

- 500 ml/h
- 1500-2000 ml/d
- carries a small risk of complications, including preterm labor, placental abruption and premature rupture of the membranes

Indomethacin

- Decreases lung liquid production
- Decreases fetal urine production
- Increases fluid movement across fetal membranes

Oligohydramnios

Definition :

Diminished amniotic fluid less than 500 ml. By ultrasound the vertical diameter of the largest pocket of amniotic fluid measures 2 cm or less, or the amniotic fluid index is 5 cm or less.

Incidence : about **0.5**% of all pregnancies.

Time of onset may be :

1- Midgestation (poor prognosis).

2- Third trimester.

Causes of oligohydramnios

- Ruptured membranes
- Congenital abnormalities
  - Bilateral renal agenesis or cystic dyplasia
  - Obstruction of the urinary tract
  - Meckel-Gruber syndrome
  - VACTERL (vertebral, anal, cardiac, tracheo-esophageal, renal, limb) association
  - Sirenomelia
  - Sacral agenesis
- Growth restriction (placental insufficiency)
- Postterm pregnancy
- Drugs:Angiotensin-converting enzyme inhibitors
  - Prostaglandin synthase inhibitors
- Twin- to -twin transfusion
- TRAP (twin reverse arterial perfusion sequence)

Diagnosis

Diagnosis :

1- The fundal level is lower than the period of amenorrhea.

2- Breech presentation is common.

3- The fetal parts are easily felt and the fetus is almost immobile.

4- The FHS are clearly heard.

Investigation :

1- Ultrasound : Values :

· Confirm diagnosis : DVP ≤2 cm or AFI ≤5 cm.

· Detect a cause : - Fetal growth restriction. - Congenital anomalies.

· Malpresentation.

· Assess fetal wellbeing : BPP and Doppler.

2- Evaluation of fetal wellbeing (serial) : DFMC – NST – BPP - Doppler.

3- Fetal karyotyping.

COMPLICATIONS

FETAL

Abortion

Prematurity

IUFD

Deformities - contractures,amputation

Potters syndrome- pulmonary hypoplasia

Malpresentations

Fetal distress

Low APGAR

MATERNAL

Increased morbidity

Prolonged labour: uterine inertia

Increased operative intervention

Oligohydramnios

- Prophylaxis and treatment:

  - preconception care: hypertension, nephropathy, systemic disease, diabetes with microangiopathy
  - prenatal care:
    - treatment above mentioned diseases, detection of malformations, treatment of infections and ionic disorders;
    - conservative therapy (diet, rest);
    - operative therapy (amnioinfusion)
  - during labour: CTG, intranatal amnioinfusion- in case of green amniotic fluid

Colour abnormality of amniotic fluid

Red colour

Indicate bleeding as in abruptio placenta , vasa previa …..)

Brown

Intrauterine death

Green

Meconium (grade I ,II ,III)

Indicate fetal distress

Yellow

Hyperbilirubineamia

Thank you