

King Khalid University Hospital
Department of Obstetrics & Gynecology
Course 482

Mechanism Of Labor & Abnormal Presentations



Objectives

To Discuss:

- Anatomy of bony pelvis
- Anatomy of Fetal skull
- Labour : Stages and mechanism of labour.
- Abnormal fetal presentations : breech/Face /Brow

Bony pelvis

- In women the pelvis has special form that adapts to childbearing .
- It is composed of four bones .
- The sacrum, coccyx, and two innominate bones .
- The innominate bone is formed by the fusion of the ilium, ischium, and pubis

Bony pelvis

- The true pelvis is the important portion in childbearing
- Is bounded above by promontory and alae of the sacrum the linea terminalis and the upper margin of the pubic bone , and below by the pelvic outlet .
- Ischial spines (IS) are of great obstetrical importance
- (IS) is the shortest pelvic diameter and has a valuable landmarks in assessing the level of the presenting part of the fetus

Bony pelvis

- The sacrum form the posterior wall of the pelvis and it is curved to accommodate the rotating head .
- The promontory may be felt on vaginal examination and provide a landmark for clinical pelvimetry

Anatomy of the Bony Pelvis

-Bony pelvis is made up of 4 bones; -Sacrum

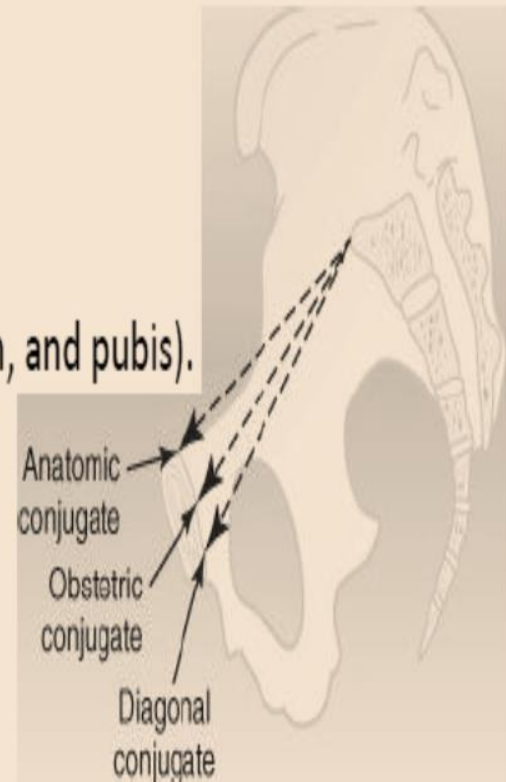
-Coccyx

-Two innominates (composed of the ilium, ischium, and pubis).

-Pelvic inlet diameters; -True conjugate (Anatomic conjugate) [11.5cm].

-Obstetric conjugate [11cm].

-Diagonal conjugate [12.75cm].



-The sacrum: consists of five fused vertebrae. The anterior surface is usually concave.

-The first sacral vertebra is called the **promontory**, which is used as a landmark of clinical pelvimetry.

-Clinical pelvimetry: -Pelvic inlet measured by diagonal conjugate.

-Midpelvis " " bi-ischial diameter.

-Pelvic outlet " " angle of the pubic arch.

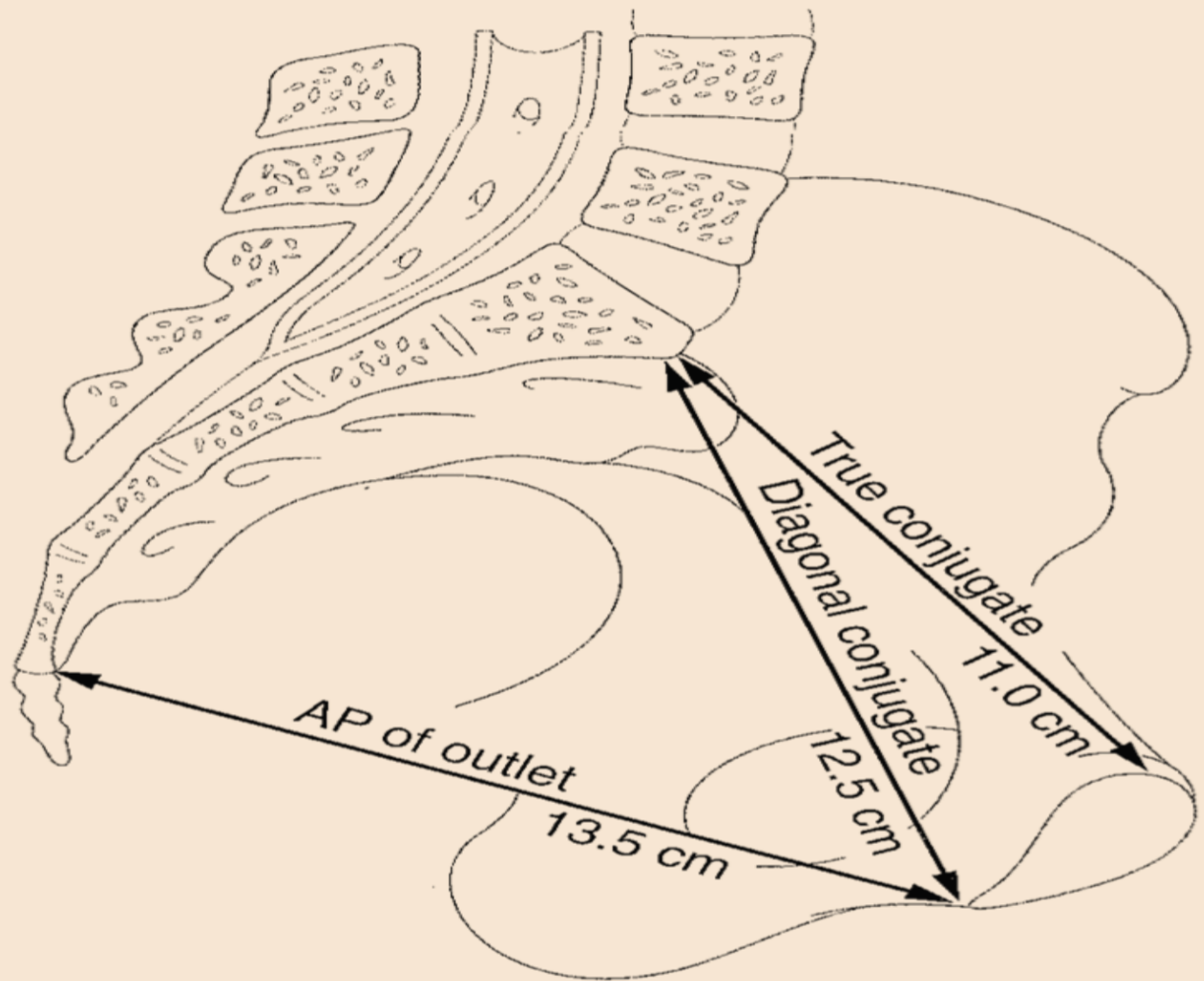
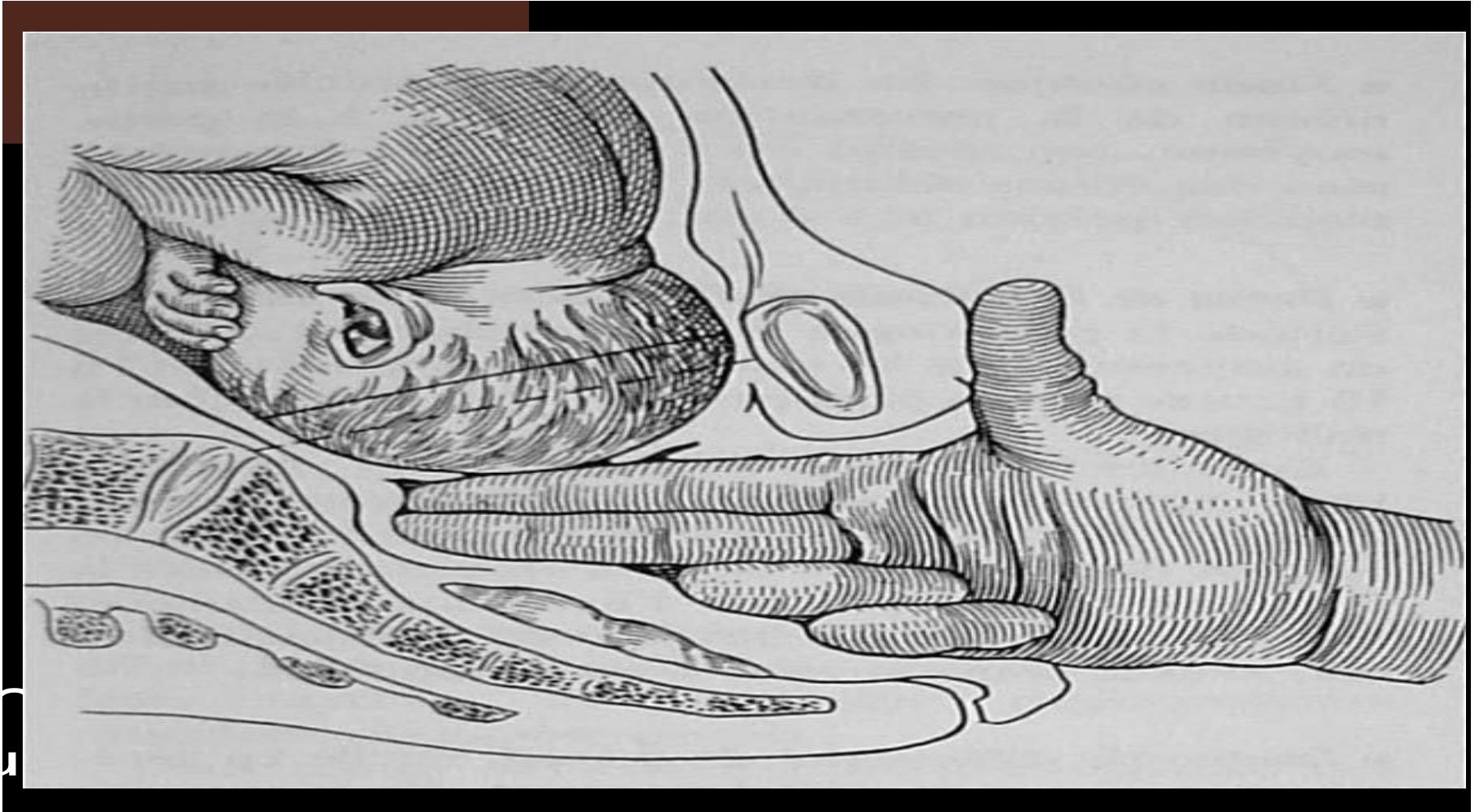


Figure 9.4 Sagittal section of the pelvis with conjugate diameters and AP diameter of the outlet shown.

Pelvic examination



Bony pelvis

Pelvic inlet measurement

- Diagonal conjugate it is the distant from the sacral promontory to the lower margin of the symphysis pubis.
- True conjugate from sacral promontory to upper border of symphysis pubis
- Obstetric conjugate from sacral promontory to mid of posterior aspect of symphysis pubis
subtract 1.5-2.0 cm from diagonal conjugate

Bony pelvis

- The mid pelvis at the level of ischial spines the interspinous diameter is 10 cm .
- Pelvic outlet clinically it is the distant between the ischial tuberosities.

TYPES OF PELVISES



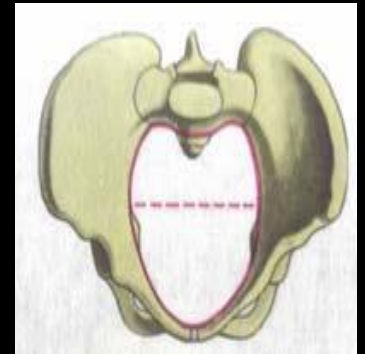
Gynaecoid pelvis (50%)

1. It is the normal female type.
2. Inlet is slightly transverse oval.
3. Sacrum is wide with average concavity and inclination.
4. Side walls are straight with blunt ischial spines.
5. Sacro-sciatic notch is wide.
6. Subpubic angle is 90-100°.



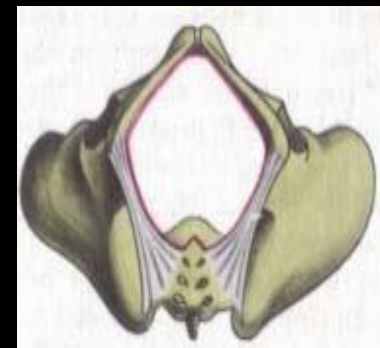
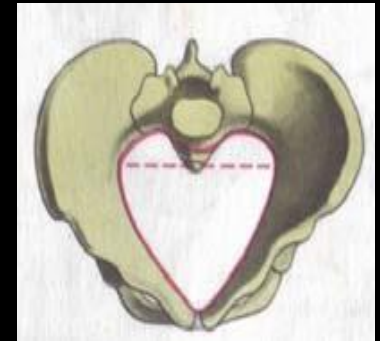
Anthropoid pelvis (25%)

1. It is ape-like type.
2. All anteroposterior diameters are long.
3. All transverse diameters are short.
4. Sacrum is long and narrow.
5. Sacro-sciatic notch is wide.
6. Subpubic angle is narrow.



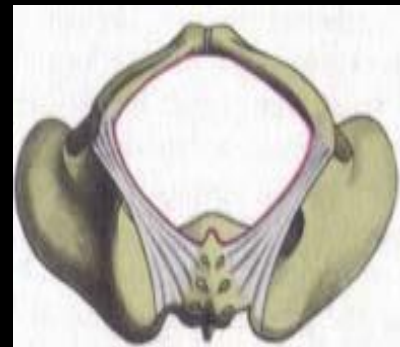
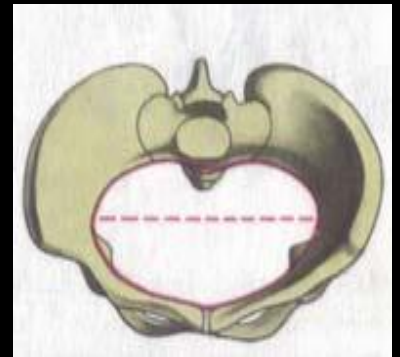
Android pelvis (20%)

1. It is a male type.
2. Inlet is triangular or heart-shaped with anterior narrow apex.
3. Side walls are converging (funnel pelvis) with projecting ischial spines.
4. Sacro-sciatic notch is narrow.
5. Subpubic angle is narrow $<90^{\circ}$.



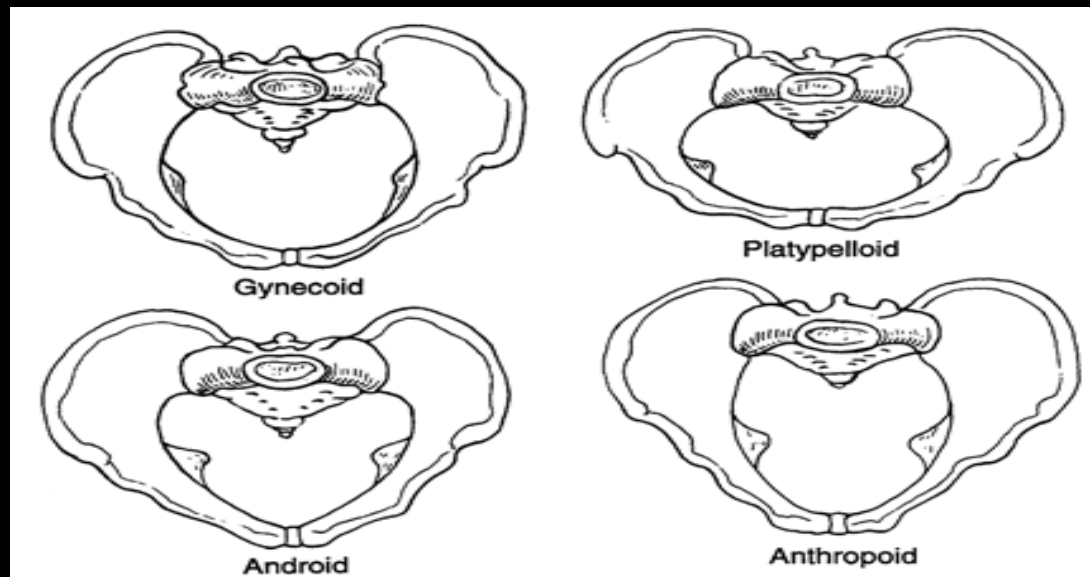
Platypelloid pelvis (5%)

1. It is a flat female type.
2. All anteroposterior diameters are short.
3. All transverse diameters are long.
4. Sacro-sciatic notch is narrow.
5. Subpubic angle is wide.



| Type | Shape | Posterior sagittal diameter | Prognosis |
|--------------|--------------|-----------------------------|-----------|
| Gynecoid | Round | Average | Good |
| Anthropoid | Long, oval | Long | Good |
| Android | Heart shaped | Short | Poor |
| Platypelloid | Flat, oval | Short | Poor |

From Gabbe SG, Niebyl JK, Simpson JL. *Obstetrics: normal and problem pregnancies*, 3rd ed. New York: Churchill Livingstone, 1996:433, with permission.



FETAL SKULL



Fetal Skull

BONES

- Two frontal bones separated by frontal suture.
- Two parietal bones separated by sagittal suture .
- Two coronal sutures between frontal and parietal bones .
- Two lambdoid sutures between parietal and and occipital bone .

Fetal Skull

- Sutures meet at an irregular space forms which is enclosed by a membrane called fontanel .
- Anterior fontanel is a lozenge shape between the two frontal and two parietal bones usually it is opened .
- Posterior fontanel at the junction of the two parietal bones and occipital bone .
- It gives an important information concerning presentation and position of the fetus.

Fetal Skull

Fetal head diameters

- Subocipitobregmatic 9.5 cm vertex presentation.
- Submentobregmatic 9.5 cm face presentation.
- Mentoverical 12.5 cm brow presentation .
- Biparietal diameter 9.5cm .
- Occipitofrontal 10.5 cm

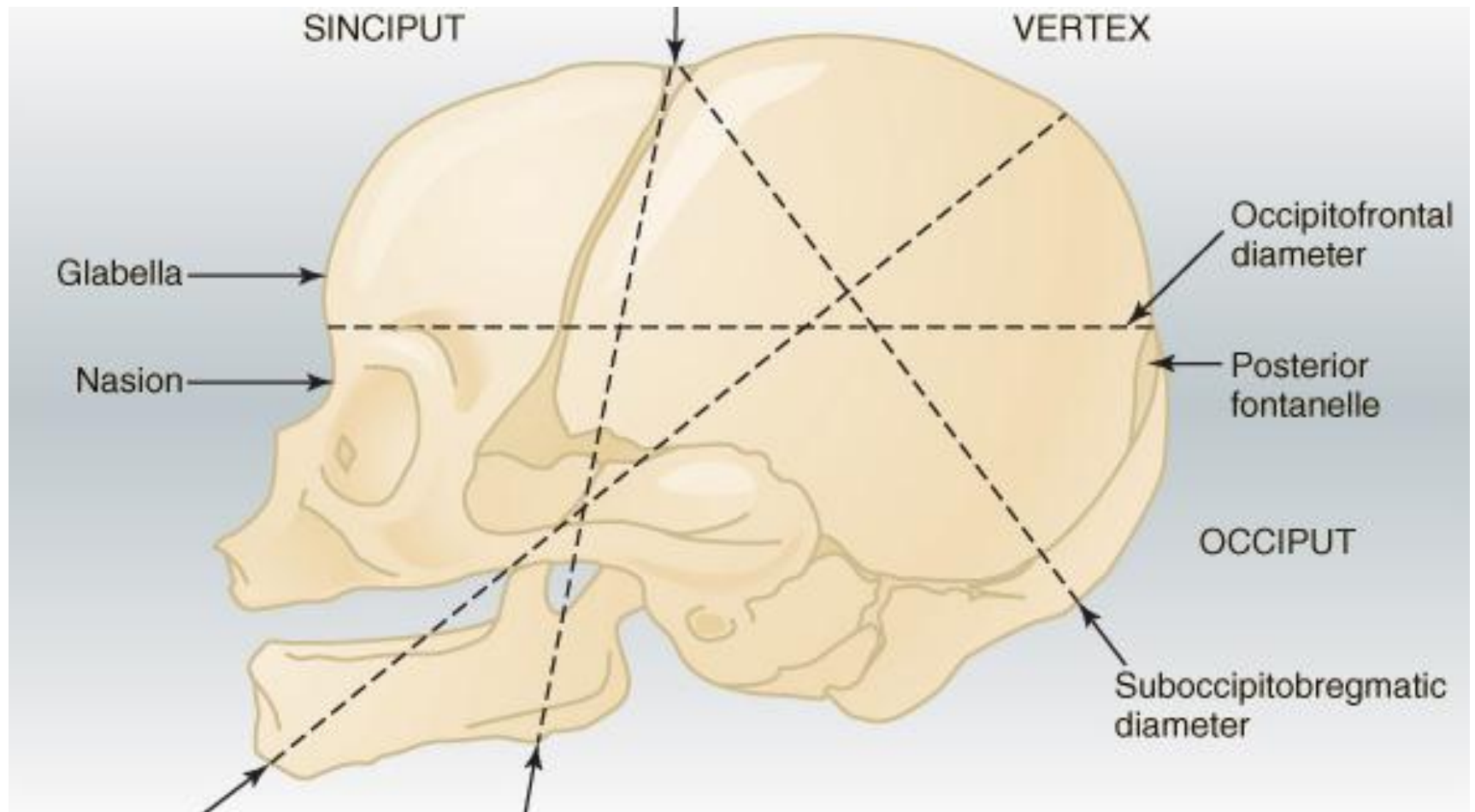
Fetal Skull

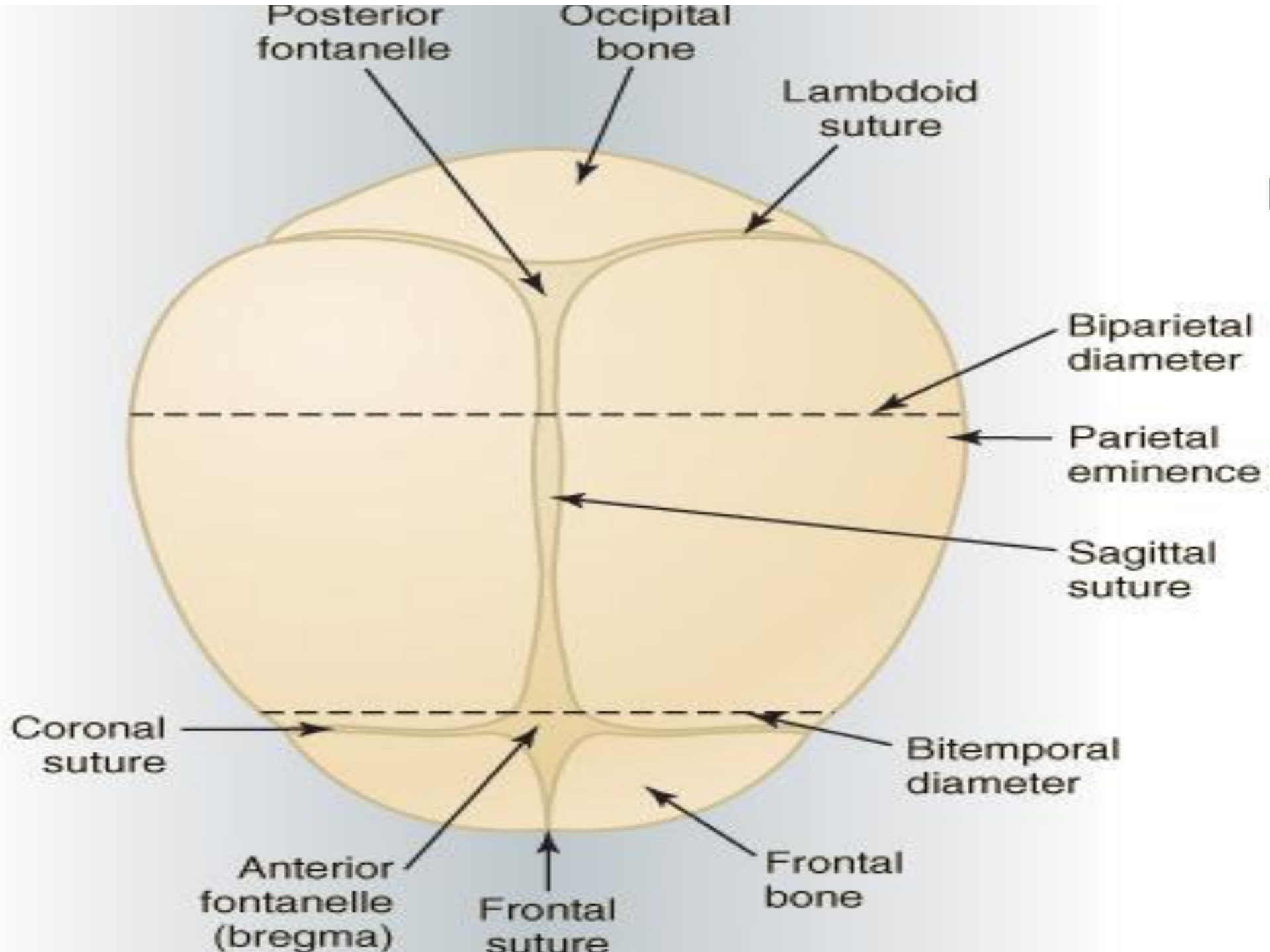
- ❑ Largest & least compressible part of the fetus & the most important part.
- ❑ The fetal skull consists of a base & a cranium (vault)
- ❑ The cranium consists of the occipital bone, parietal bones, temporal, and frontal bones.
- ❑ At birth, the cranial bones overlap under pressure.

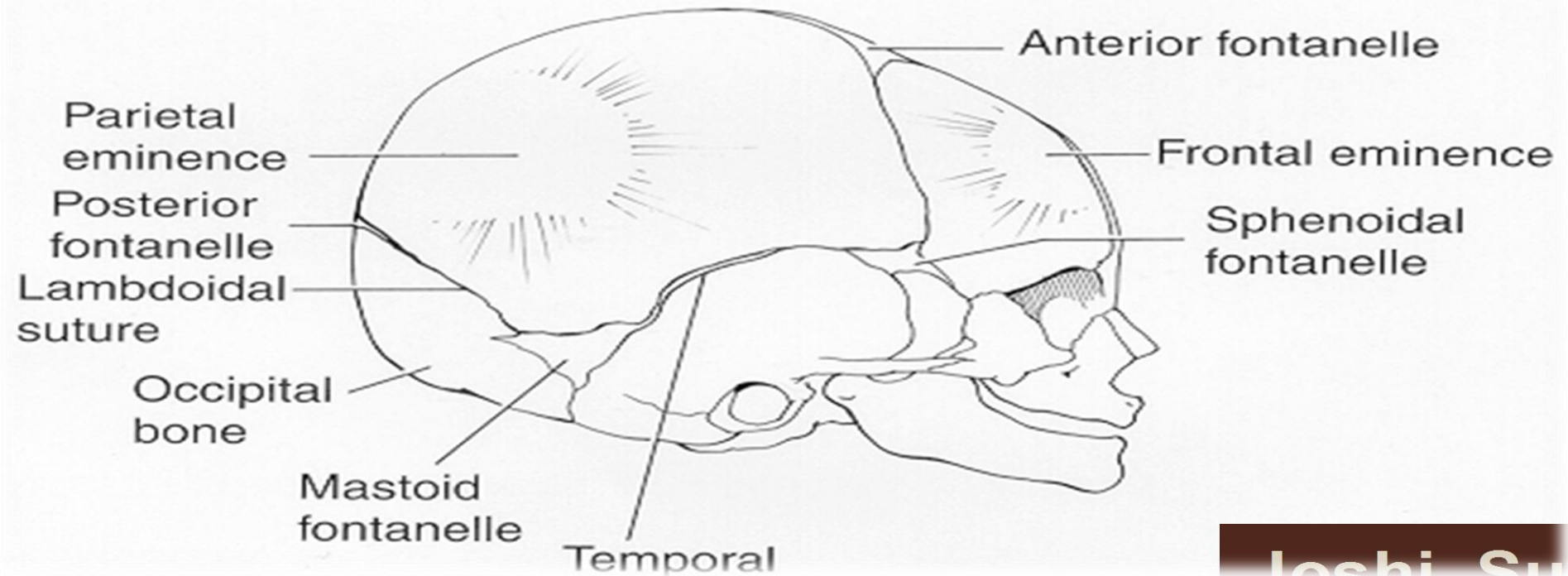
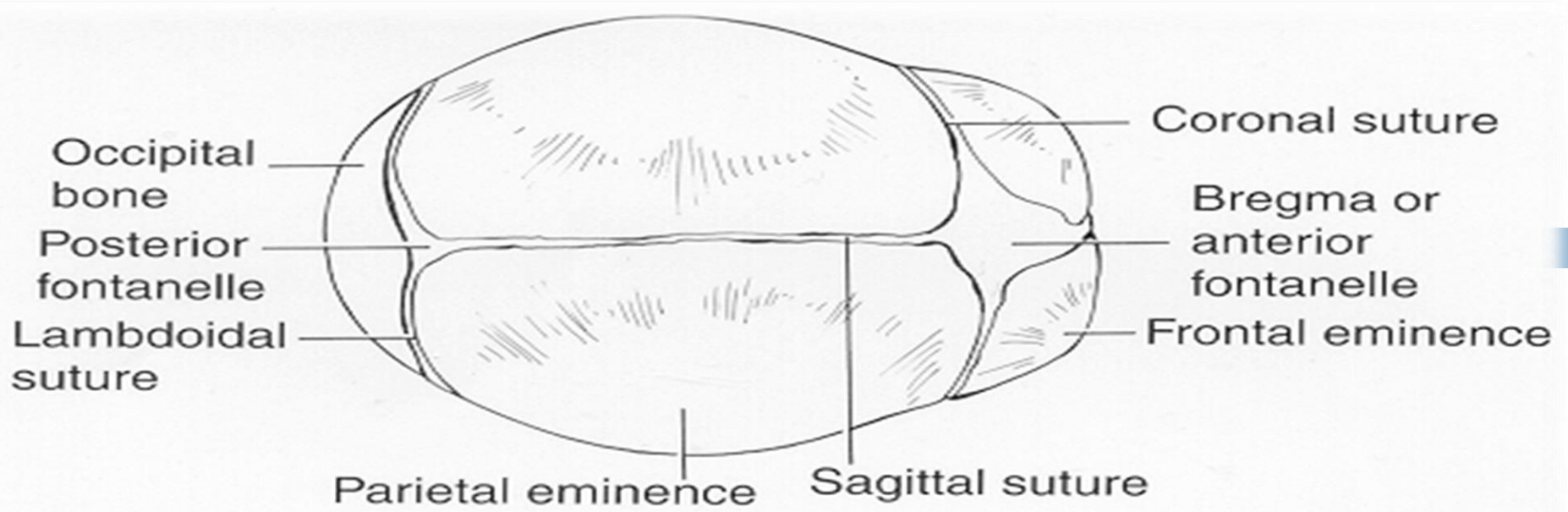
Fetal Skull

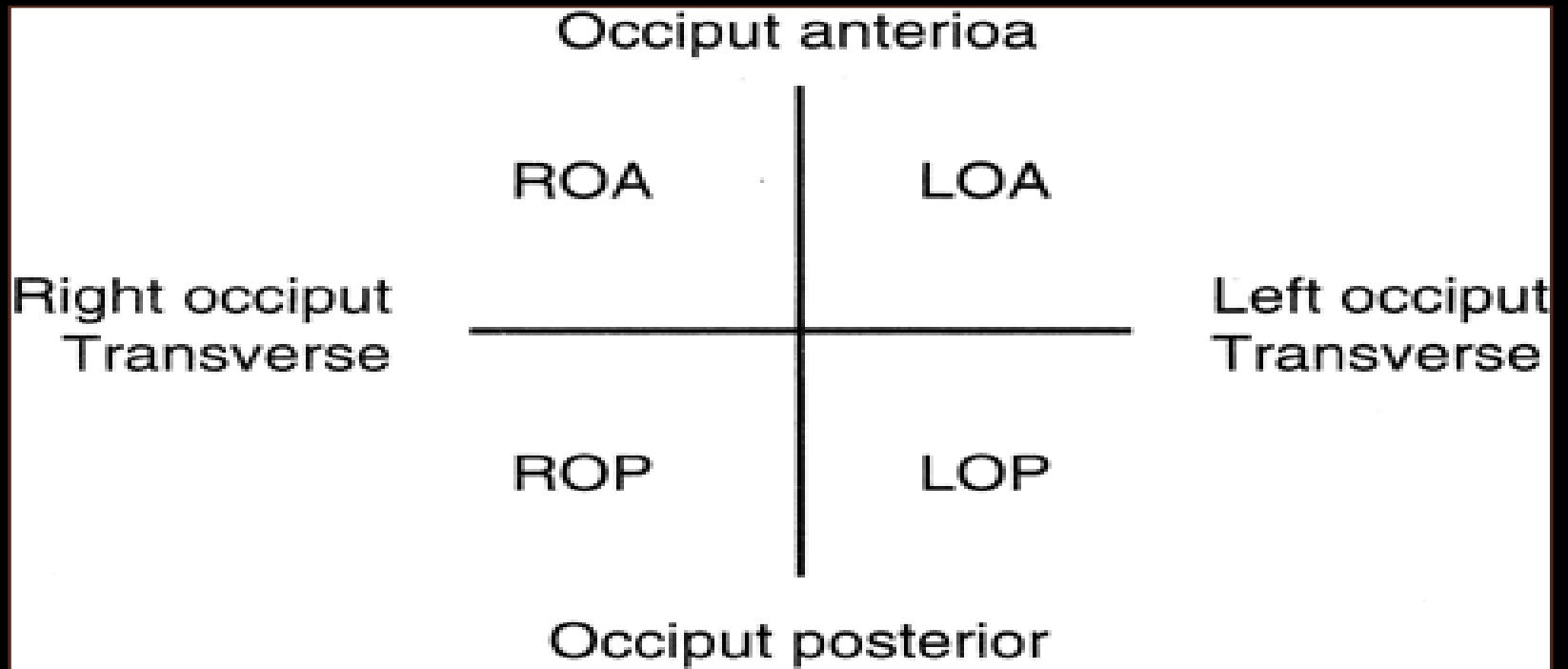
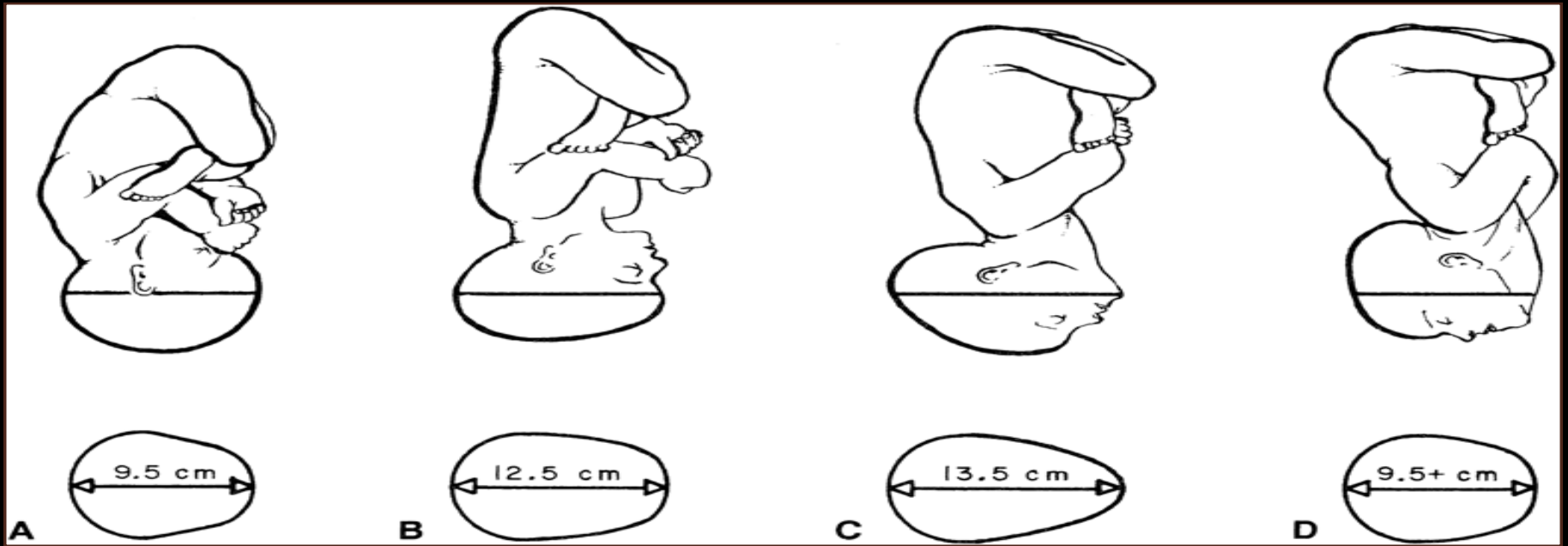
- conform maternal pelvis, a process known as "molding" -Sutures: - 4 sutures .
- Fontanelles:-Membrane-filled spaces.
- They are helpful in diagnosing head position.
- Anterior Fontanelle closes at 6-8 weeks of life (Y shaped).
- Posterior Fontanelle closes at 18 months (Diamond shape).

Fetal Skull











A

Vertex



B

Sinciput



C

Brow



D

Face

Fetal Skull

Anteroposterior diameters;

- Supraoccipitomenal (13.5 cm)
- Occipitofrontal (11 cm)
- Suboccipitobregmatic (9.5 cm)
- Submentobregmatic (9.5 cm)

Transverse diameters;

- Biparietal (9.5 cm): the largest transverse diameter.
- Bitemporal (8 cm): the shortest transverse diameter.

Lie, presentation, attitude, & position

FETAL LIE

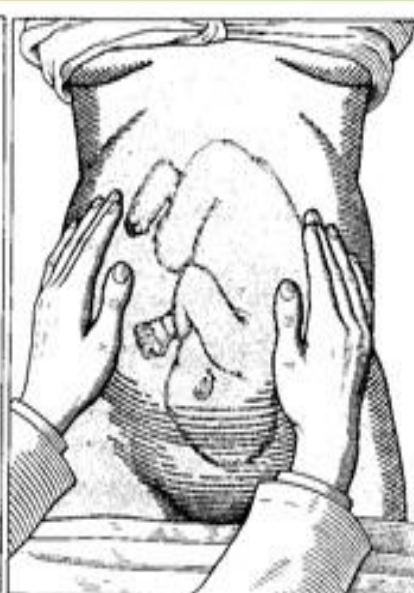
- The relation of the long axis of the fetus to that of the mother
- Longitudinal lie is found in 99% of labours at term
- Predisposing factors for transverse lie/oblique lie ➔ multiparity, placenta previa, hydramnious, & uterine anomalies

FETAL PRESENTATION

- The presenting part is the portion of the body of the fetus that is foremost in the birth canal
- The presenting part can be felt through the Cx on vaginal examination
- Longitudinal lie ➔ cephalic presentation
 - ➔ breech presentation
- Transvrse lie ➔ shoulder presentation



First maneuver



Second maneuver





(A) vertex



(B) sinciput



(C) brow



(D) face

POSITION

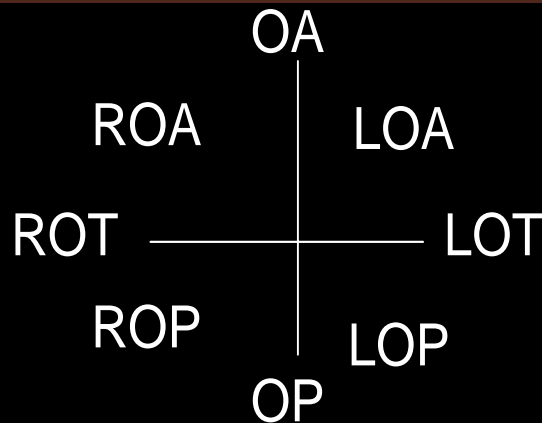
The relation of an arbitrary chosen point of the fetal presenting part to the Rt or Lt side of the maternal birth canal

The chosen point**denominator**

- Vertex presentation ➔ Occiput
- Face presentation ➔ Mentum
- Breech presentation ➔ Sacrum

Each presentation has two positions Rt or Lt

Each position has 3 varieties : Anterior, transverse, posterior



MECHANISM OF LABOUR



Labour



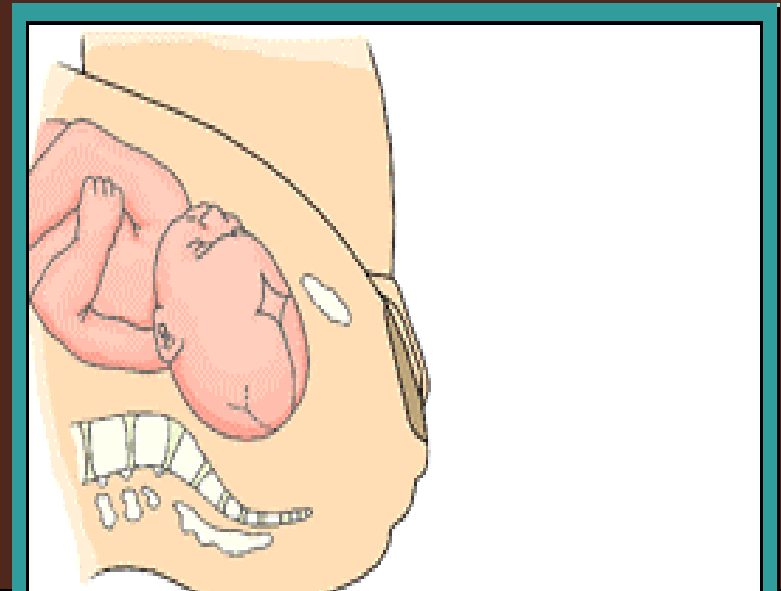
Onset of painful, regular, contractions, more than one every ten minutes. With progressive cervical effacement and dilatation accompanied by descend of the fetal presenting part.

Uterine contractions have two major goals:

- To dilate cervix
- To push the fetus through the birth canal

Success will depend on the three P's:

- Powers
- Passenger
- Passage



Stages of labor



Labor is divided into three stages.

1st stage from diagnosis of labor till full dilatation of the cervix.

2nd stage of labor from full dilatation of the cervix till delivery of the fetus.

3rd stage from delivery of the fetus until delivery of the placenta.

The duration of labor

- Primigravida about 12 hours .
- Multigravida 8.0 hours
- The moral of most women deteriorate if labor is prolonged .
- There is greater incidence of fetal hypoxia after long labor.
- Greater incidence of operative vaginal delivery.

Mechanism of labor

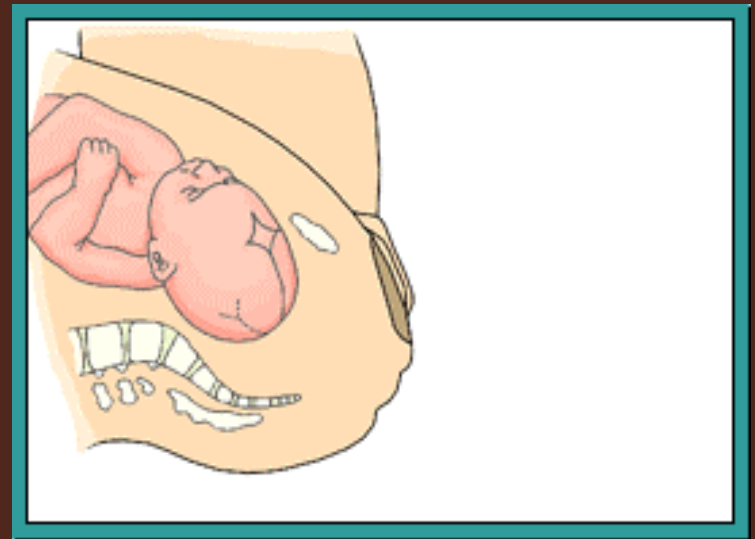
It is a series of changes in position and attitude that the fetus undergoes during its passage through the birth canal.

Cardinal movements

Cardinal movements

- Refers to changes in the fetal head position during its passage through the canal.
- Seven distinct movements:

- Engagement
- Descent
- **Flexion**
- **Internal rotation**
- **Extension**
- **External rotation/restitution**
- **Expulsion**



OCCIPUT PRESENTATIONS

THE CARDINAL MOVEMENTS OF LABOUR

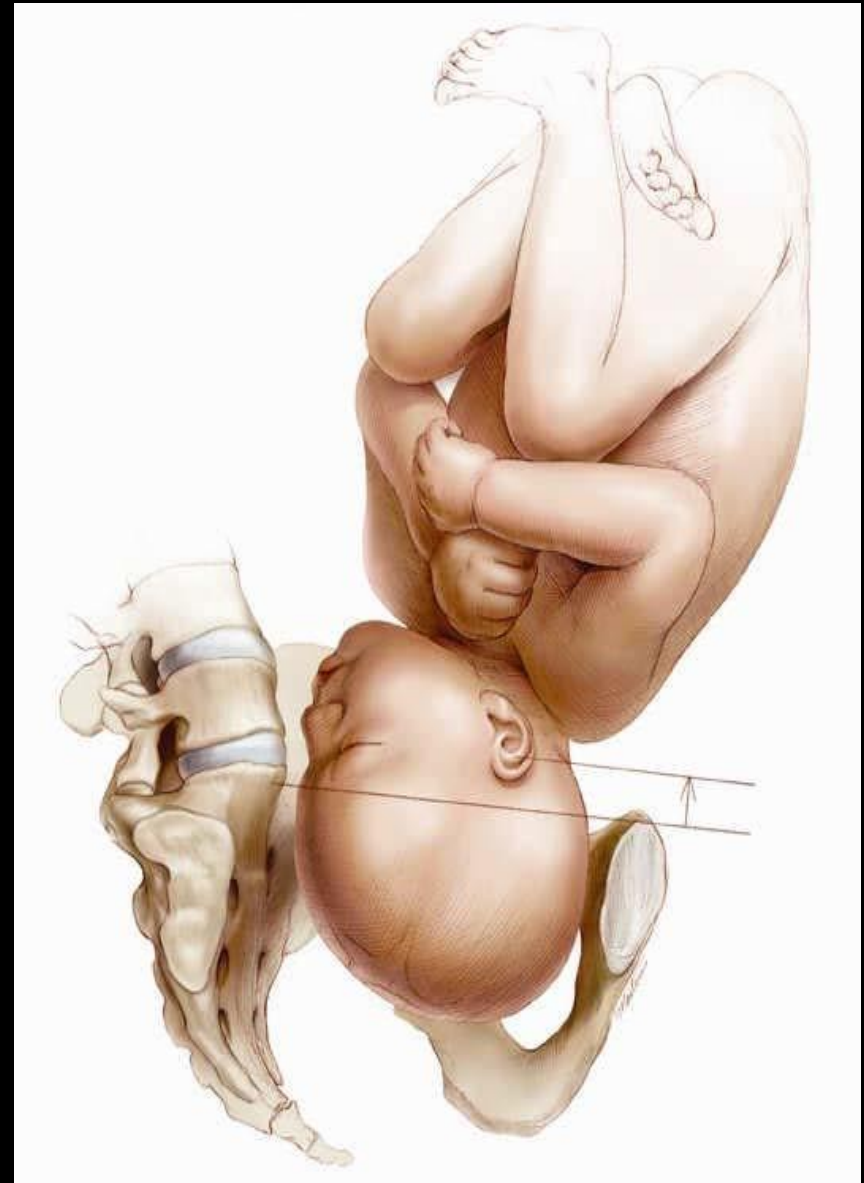
ENGAGEMENT

The greatest transverse diameter BPD passes through the pelvic inlet

It may occur in the last few weeks of pregnancy or only in labour especially in multipara

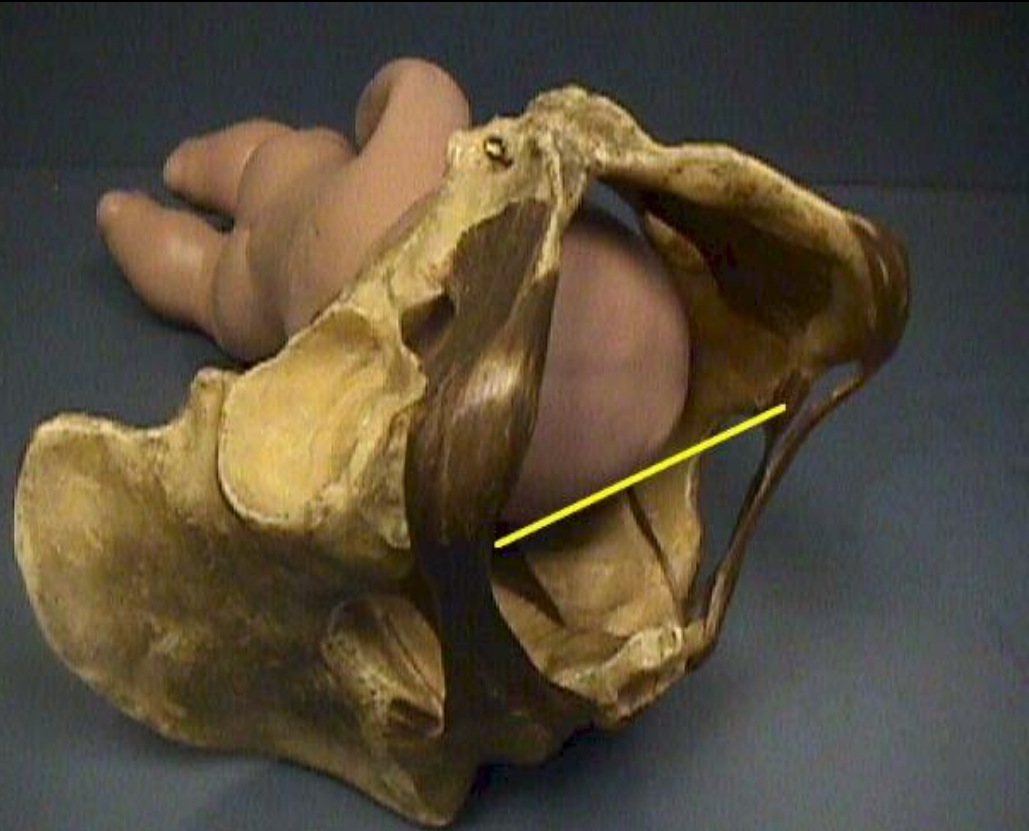
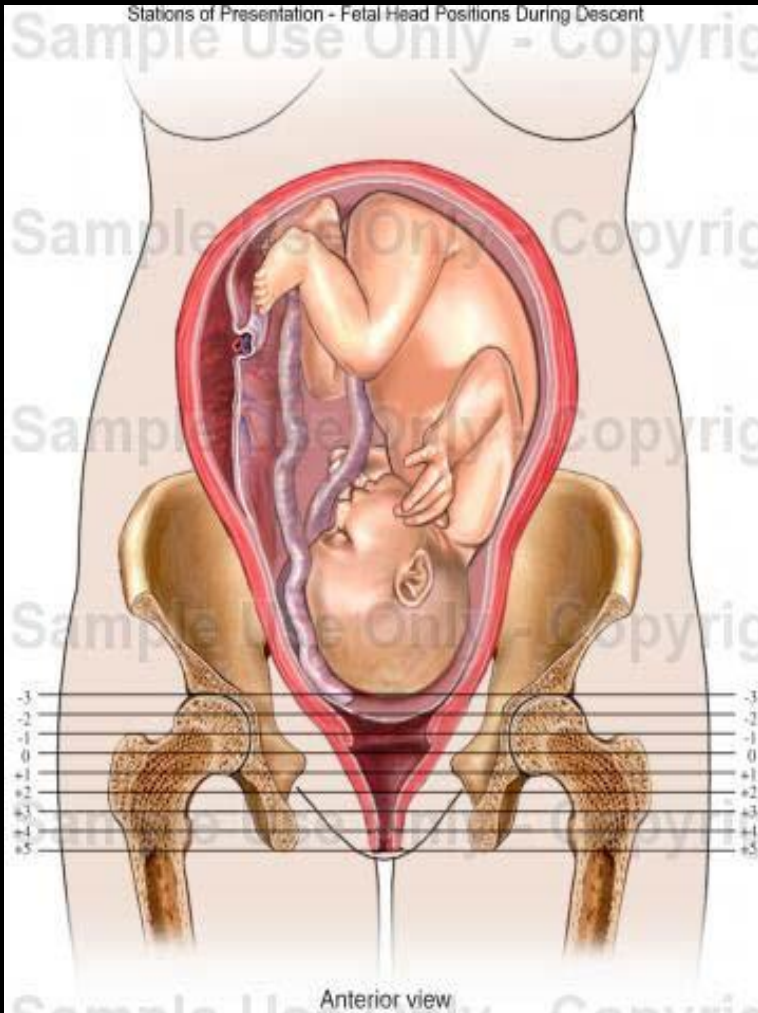
The fetus enters the pelvis in transverse or oblique diameter

- LOT → 40%
- ROT → 20%
- OP → 20% ROP > LOP
- ROA / LOA → 20%



ENGAGEMENT

Stations of Presentation - Fetal Head Positions During Descent



Fetal head at -1 station, 1 cm above the level of the ischial spines.

DESCENT

- In nullipara engagement takes place before the onset of labour & further descent may not occur till the 2nd stage
- In multipara descent begins with engagement
- It is gradually progressive till the fetus is delivered
- It is affected by the uterine contractions & thinning of the lower segment



Descent

- Refers to the downward passage of the presenting part through the bony pelvis
- Not steady process
- Greatest at deceleration phase of first stage and during 2nd stage of labor

Flexion

- Occurs passively as the head descends due to the shape of the bony pelvis.
- Partial flexion occurs naturally but complete flexion usually occurs only in the labor process
- Complete flexion places the fetal head in optimal smallest diameter to fit through the pelvis

Internal Rotation

- Rotation of the fetal head from occiput transverse to occiput either in anterior or posterior position
- Occurs passively due to the shape of the bony pelvis

EXTENSION

- When the flexed head reaches the vulva it undergoes extension ➡ the base of the occiput will be in direct contact with the inferior margin of the symphysis pubis
- Crowning ➡ the largest diameter of the fetal head is encircled by the vulvar ring
- The head is born by further extension as the occiput, bregma, forehead, nose, mouth & chin pass successively over the perineum

External Rotation/Restitution

- As the head is delivered, it rotates back to its original position prior to internal rotation
- It aligns anatomically with the fetal torso
- The release of the passive forces on the fetal head allows it to return to appropriate position

Expulsion

- Delivery of the fetus
- After delivery of the fetal head, descent and intraabdominal pressure by mother brings shoulder to the level of the symphysis
- Downward traction allows release of the shoulder and the fetus is delivered.

Abnormal Presentations



Malpresentation

Fetal lie:

- This is the relationship of the longitudinal axis of the fetus to longitudinal axis of the mother.
- There are three lies longitudinal , oblique , and transverse lie .

Fetal attitude:

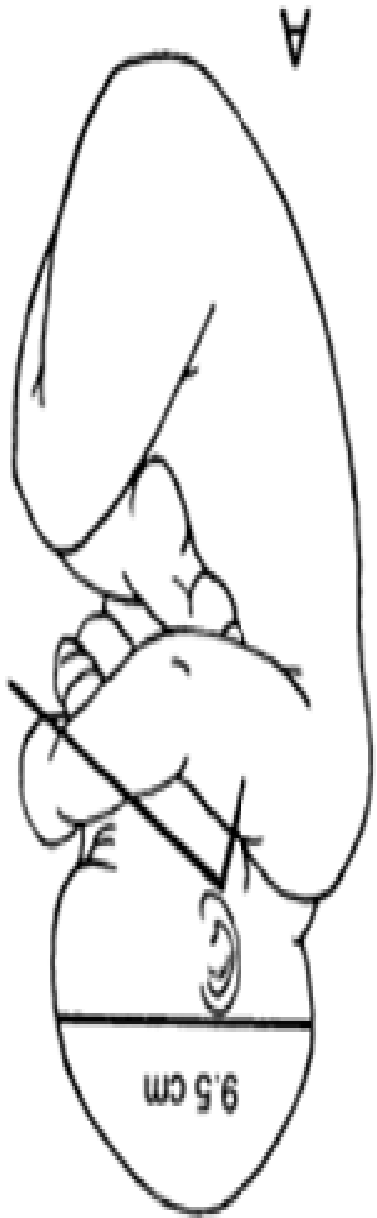
The relationship of the different parts of the baby to each others , usually flexion attitude .

Malpresentation

- The part of the fetus occupies the pelvis eg ,cephalic , breech , shoulder presentation .

Position:

- The relationship of the presenting part to the four pelvic quadrants .eg left occipito anterior , right mento posterior .



Breech presentation

- incidence is 3% at term .
- Baby is presenting with buttocks and legs

Types:

- Complete breech where the leg are flexed at hip joint and knee joint ,
- Frank breech flexed hip but extended knee joint .
- Footling breech with extended hip and knee joints and high buttocks .

Variations of Breech presentation



Complete
breech



Incomplete
breech



Frank
breech

Breech presentation

Fetal causes:

- Hydrocephalus , polyhydramnios oligohydramnios , placenta previa , short umbilical cord .

Maternal causes:

- Uterine anomalies, fibroid uterus, small pelvis
- The most important cause is preterm labor

Management

- The patient can be offered the option of either vaginal breech delivery , caesarian section or external cephalic version (ECV) .

External cephalic version

- Done after 37 weeks.

Contra indications:

- Contracted pelvis , scar uterus, placenta previa , hypertensive patient .

Management

- Complications:
- Membrane rupture , uterine rupture, abruptio placenta , cord prolapse
- It should be done in the theater with setup ready four c - section .

Breech delivery

- Patient in lithotomy position ,
- Cervix should be fully dilated .
- When buttocks protrudes through the vulva an episiotomy can be performed .
- Legs are delivered easily unless it is an extended that need to be flexed .
- With delivery of the umbilicus small loop of cord is pulled down to feel the pulsations .

Breech delivery

- Then delivery of both arms first the anterior then the posterior .
- Delivery of the head .
- Keep the baby hanging to promote head flexion (Burns-Marshall) manoeuvre .
- Jaw flexion shoulder traction .
- Obstetrical forceps for the after coming head as needed.

Complications

- Cord prolaps , lower limb fracture , abdominal organs injuries , brachial plexus nerve injuries,
- Difficulties in delivering the head (Entrapment of after coming head) and intracranial bleeding .

Face presentation

- Incidence 1-500 .
- Occurs as the result of complete extension of the head .
- In majority of case the cause is unknown but is frequently attributed to excessive tone of the extensor muscles of the fetal neck.
- Rare causes like tumor of the neck , thyroid , thymus gland and cord around the neck

Face presentation

- The presenting diameter of the face is the submento –bregmatic , which measures 9.5cm .
- Diagnosed in labor by palpating the nose, mouth ,or eyes on vaginal examination.
- In case of mento-anterior vaginal delivery is possible and the head is delivered by flexion.
- If the face is mento posterior the delivery by c - section.

Brow presentation

- Incidence is 1-2000.
- It occurs when there is less extension of the fetal head than that seen in face presentation, midway between face and vertex presentation .
- The presenting diameter is mento-vertical 13.5 cm.
- Is diagnosed in labor by palpating the anterior fontanelle , supra orbital ridges, and nose on vaginal examination .
- Delivery is by c - section section.

Shoulder presentation

- Due to oblique or transverse lie in labor .
- Common in women with high parity .
- Can occur with uterine anomalies , pelvic tumor.
- In case of rupture membranes exclude cord prolaps .
- Delivery of shoulder presentation in labor with rupture membrane is by c - section.