



MECHANISM OF LABOUR

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MECHANISM OF NORMAL LABOUR

- ✓ The series of movements that occur on the head in the process of adaptation during its journey through the pelvis is called mechanism of labor.
- ✓ Is a series of passive movements of the fetus in the passage through the birth canal.

WHY IT IS IMPORTANT TO UNDERSTAND THE MECHANISM OF NORMAL LABOR?

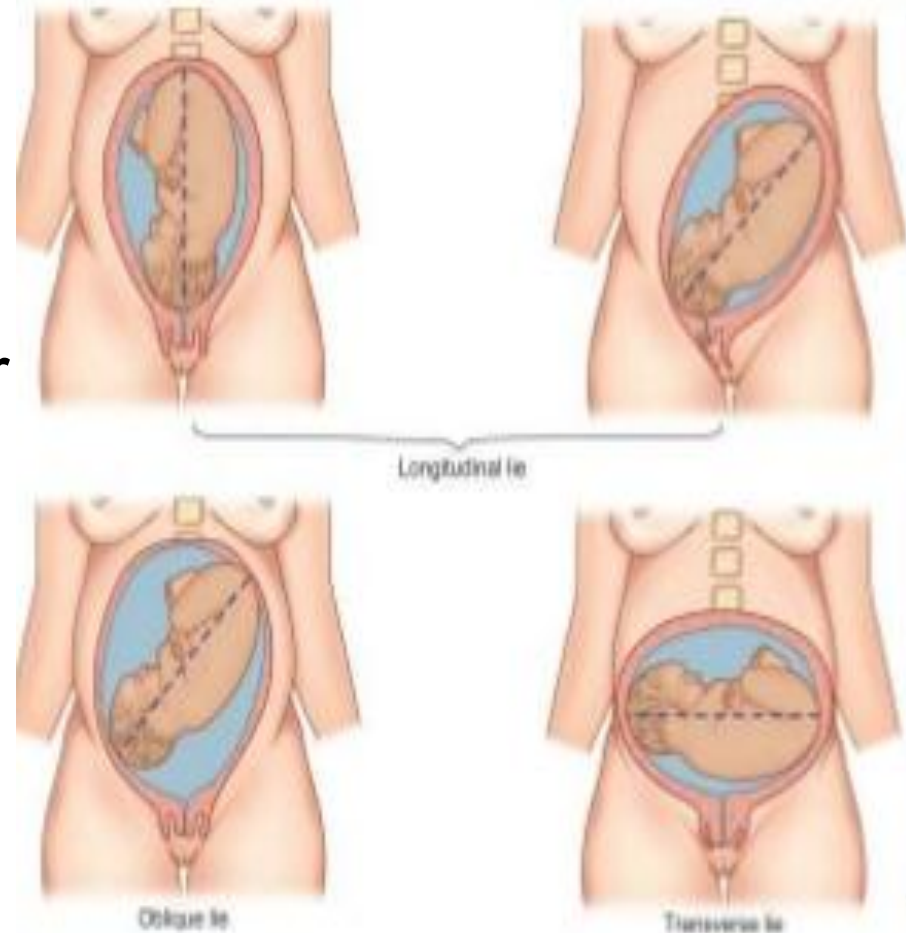
- Knowledge and recognition of the normal mechanism enables caregiver to anticipate next step in the process of descent.
- Helps to ensure that the normal process is recognized,
- That woman gives birth safely and positively or
- Early assistance can be sought if any problem arises.

PRINCIPLES COMMON TO ALL LABOUR

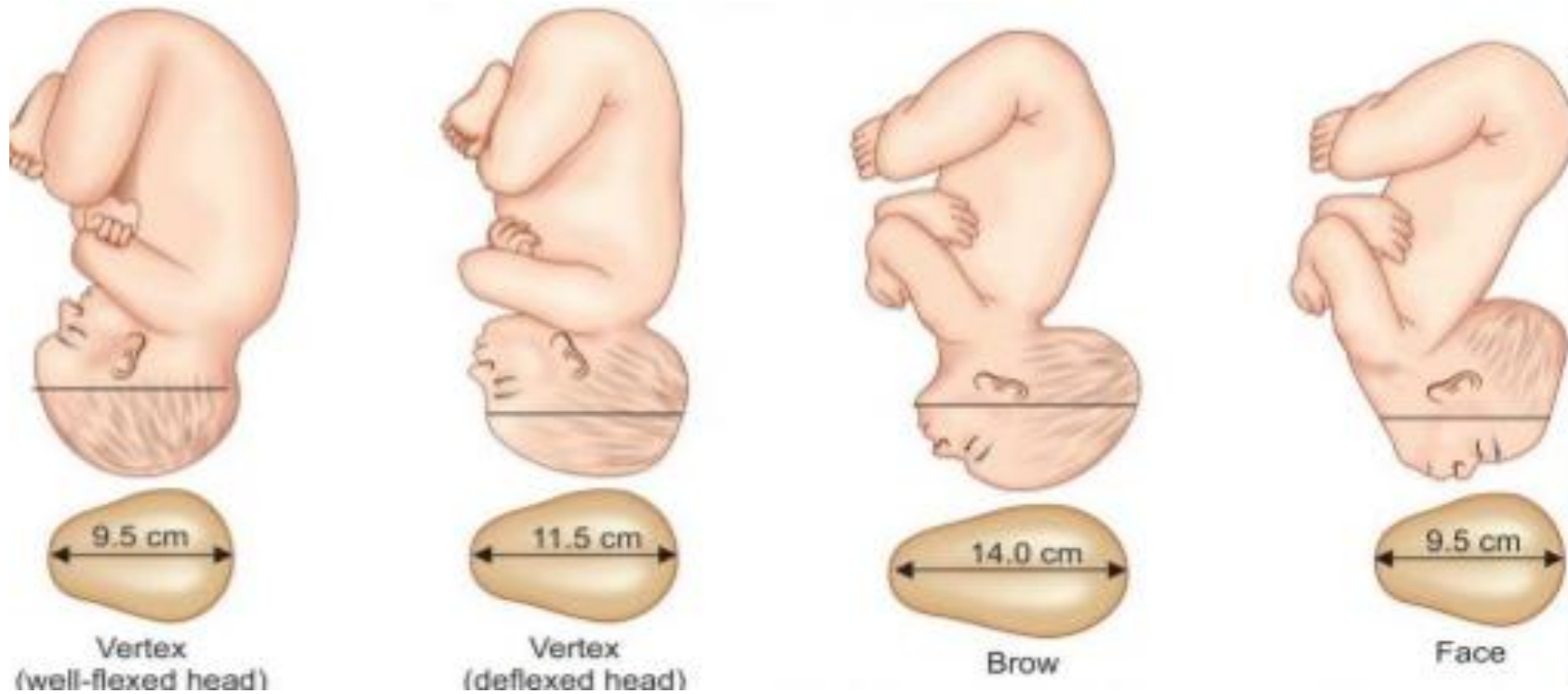
- ✓ Descent takes place.
- ✓ Which ever part leads and first meets the pelvic floor will rotate forwards until it comes under the symphysis pubis.
- ✓ Whatever emerges from the pelvis will pivot around the pubic bone.

CONDITIONS FOR NORMAL MECHANISM IN OCCIPITO ANTERIOR POSITION

- Lie -longitudinal
- Presentation - cephalic
- Position - right or left occipito anterior
- Attitude - flexion



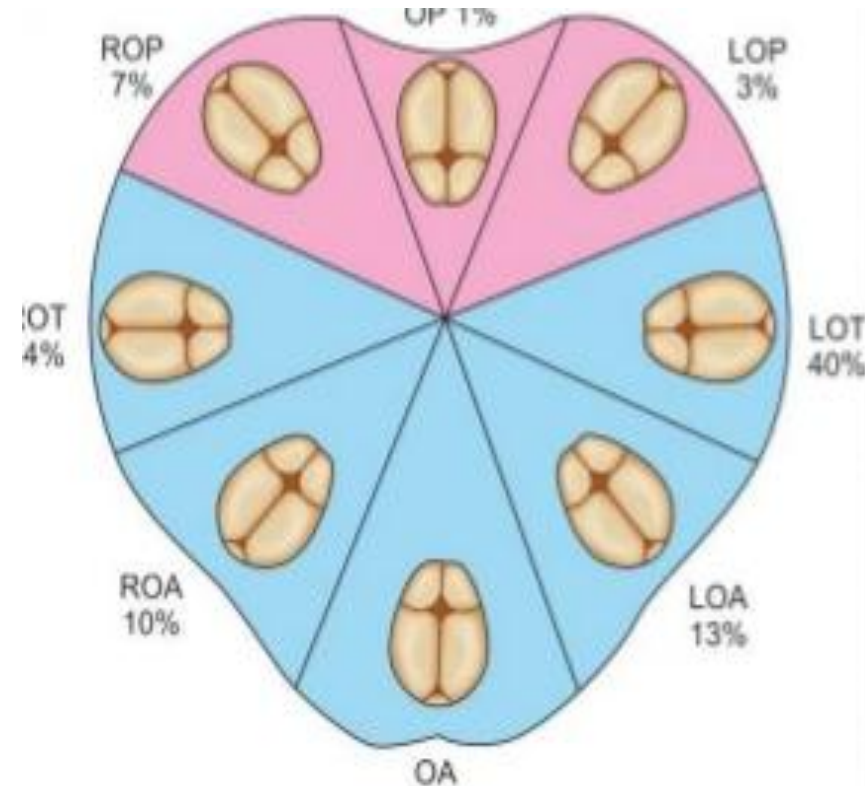
CONDITIONS FOR NORMAL MECHANISM IN OCCIPITO ANTERIOR POSITION



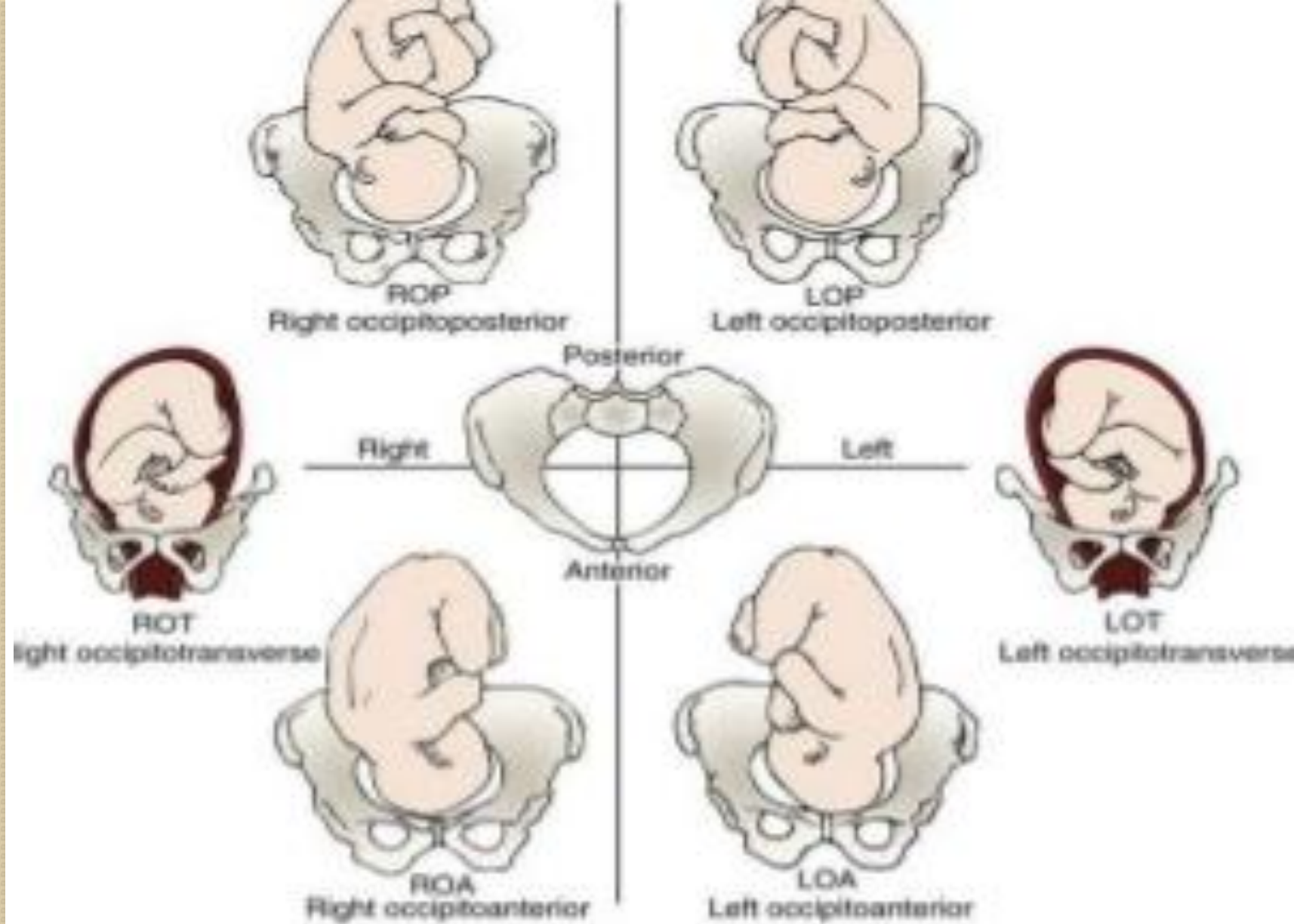
Varieties of cephalic presentations in different attitude

CONDITIONS FOR NORMAL MECHANISM IN OCCIPITO ANTERIOR POSITION

- Denominator - occiput
- Presenting part - posterior part of the right parietal bone or sub-occipital part.



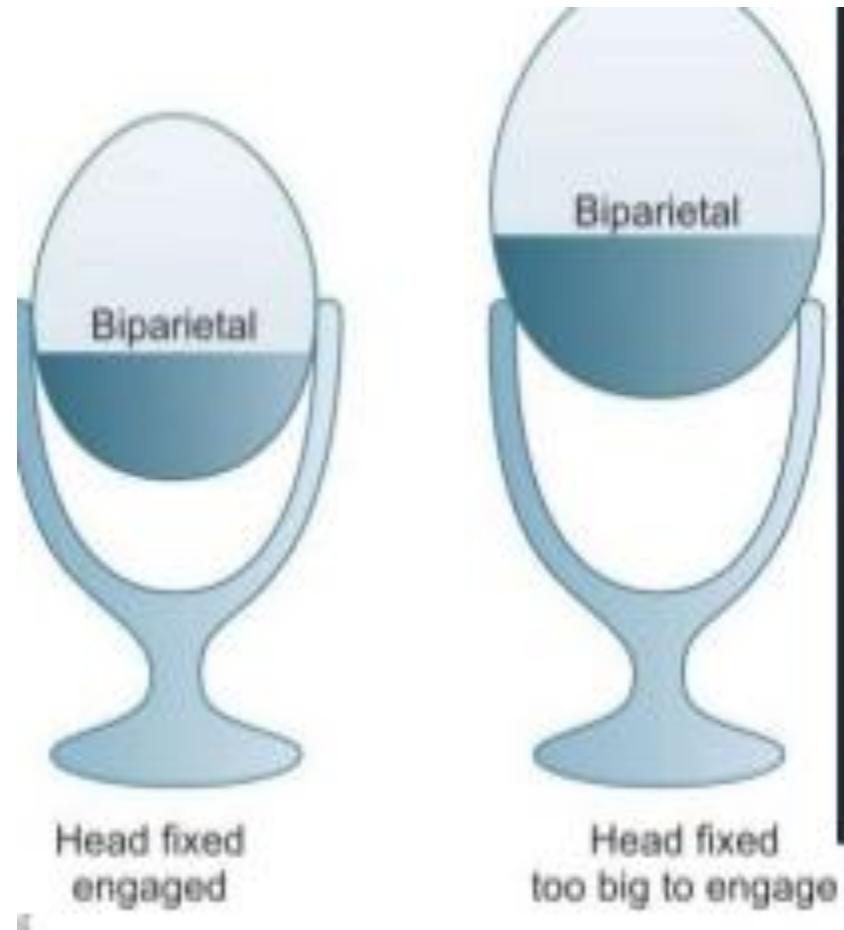
The position and relative frequency of the vertex at the onset of labor



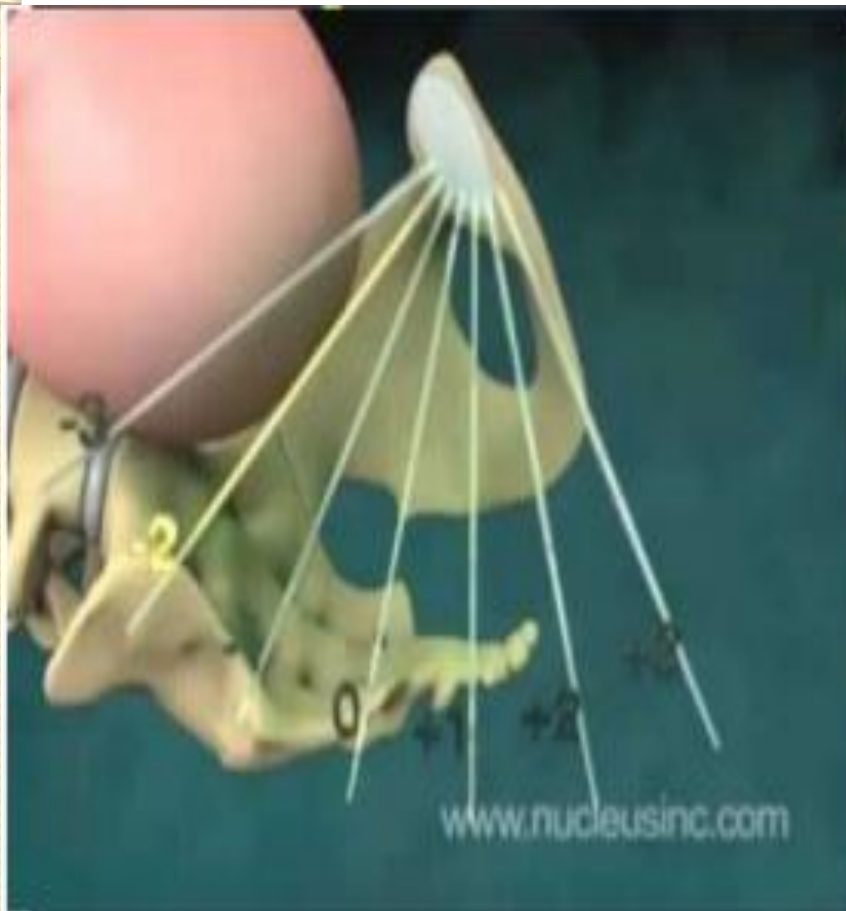
Lie: Longitudinal or vertical
 Presentation: Vertex
 Reference point: Occiput
 Attitude: General flexion

CONDITIONS FOR NORMAL MECHANISM IN OCCIPITO ANTERIOR POSITION CONT...

- Engaging diameter-
biparital 9.5 cm
- Engagement: Head
should be well
engaged in pelvic
brim and cavity.



CONDITIONS FOR NORMAL MECHANISM IN OCCIPITO ANTERIOR POSITION CONT...



Station

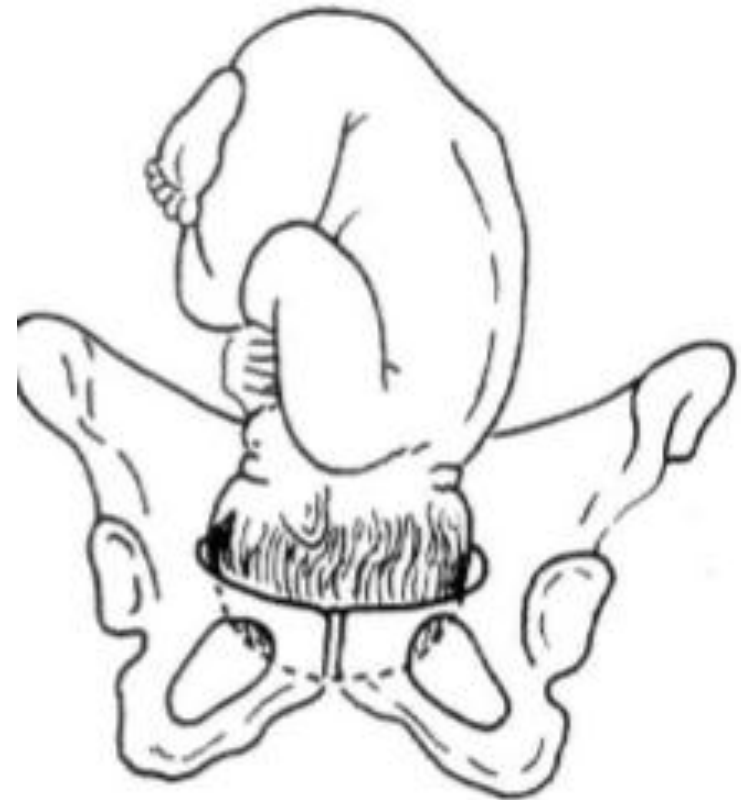
MECHANISM OF LABOUR WITH OCCIPUT ANTERIOR POSITION

- Engagement
- Descent
- Flexion
- Internal rotation of the head
- Crowning of the head
- Extension of the head
- Restitution of the head
- External rotation of the head and internal rotation of the shoulder
- Lateral flexion of the body with expulsion of fetus

ENGAGEMENT

The greatest (horizontal plane) transverse diameter BPD while passes through the pelvic inlet the head is said to be engaged.

- In LOA, fetal head enters pelvic brim with occiput (denominator) lying in relation to left iliopectineal eminence, sinciput at right sacroiliac joint and sagittal suture lying on the right oblique diameter of maternal pelvis.



ENGAGEMENT CONT...

- The engaging transverse diameter of fetal head is biparietal 9.5 cm and the sub-occiput bregmatic 9.5 cm. Both the diameter remain on the same plane.
- In primigravida- 38-42 weeks
- In multigravida- late first stage or after rupture of membrane.


ASYNCLITISM AND SYNCLITISM

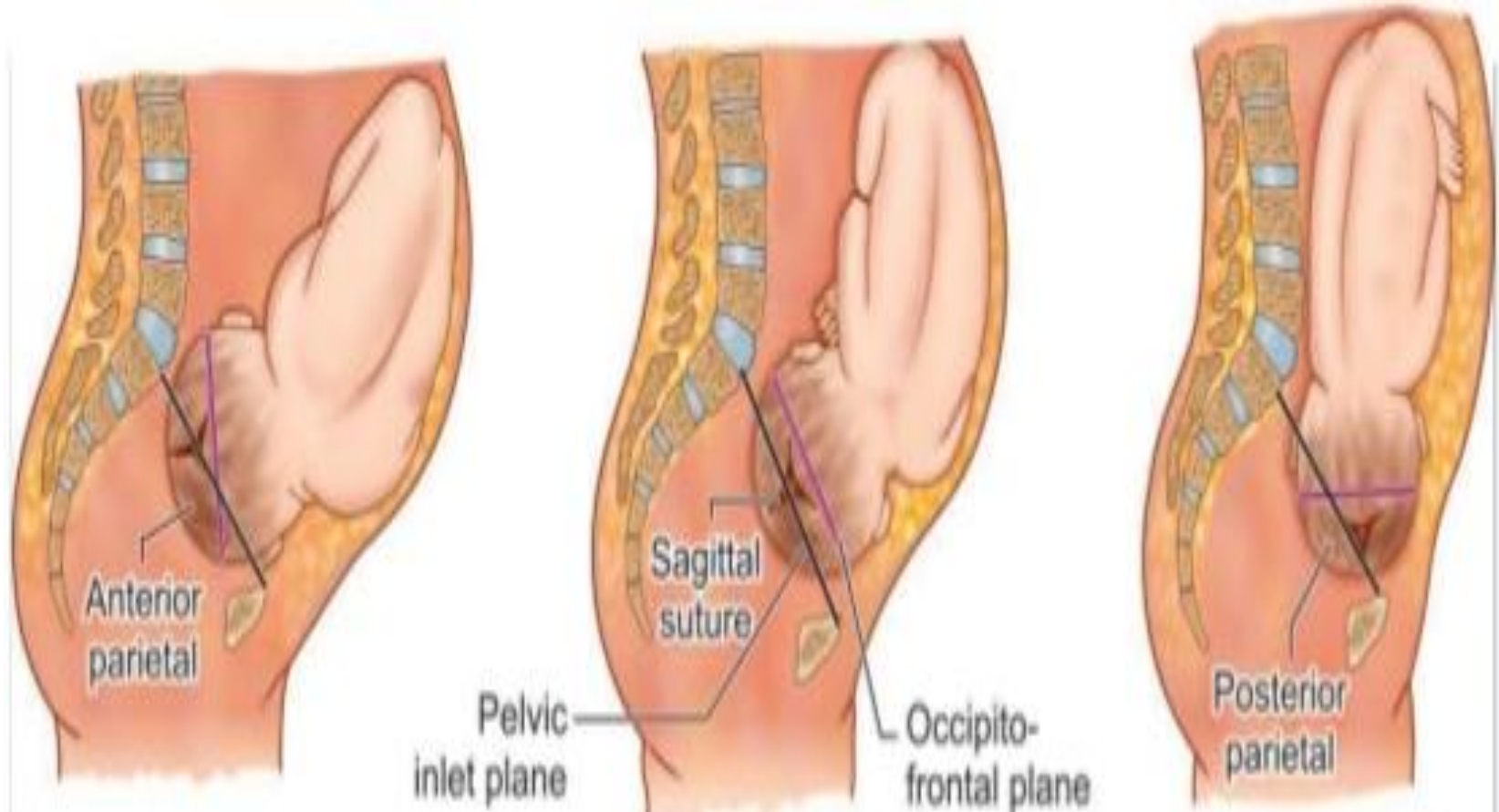
- Asynclitic refers to a fetal head that is not parallel to the anteroposterior plane of the pelvis.
- The head is synclitic when the sagittal suture lies midway between the symphysis pubis and the sacral promontory.

ENGAGEMENT CONT...

Asynclitism


- Due to lateral inclination of the head, the sagittal suture does not strictly correspond with the available transverse diameter of the inlet.
- Either deflected anteriorly toward the symphysis pubis or posteriorly toward the sacral promontory.
- Such deflection of the head in relation to the pelvis is called asynclitism..

- 
- When the sagittal suture lies anteriorly, the posterior parietal bone becomes the leading presenting part and is called **posterior asynclitism** or **posterior parietal presentation**.
 - This is more frequently found in primigravidae because of good uterine tone and a tight abdominal wall.
 - Mild degrees of asynclitism are common but severe degrees indicate cephalopelvic disproportion.



Head brim relation prior to engagement:

- (A) Anterior parietal presentation;
- (B) Head in synclitism;
- (C) Posterior parietal presentation



✓ When the sagittal suture lies more posteriorly with the result that the anterior parietal bone becomes the leading presenting part and is then called **anterior parietal presentation or anterior asynclitism**

▪

✓ It is more commonly found in multiparae

2. DESCENT

- ✓ Provided that there is no undue bony or soft tissue obstruction, descent is a continuous process.
- ✓ Often begins before the onset of labour.
- ✓ Slow or insignificant in first stage but pronounced in second stage.
- ✓ Completed with the expulsion of the fetus.

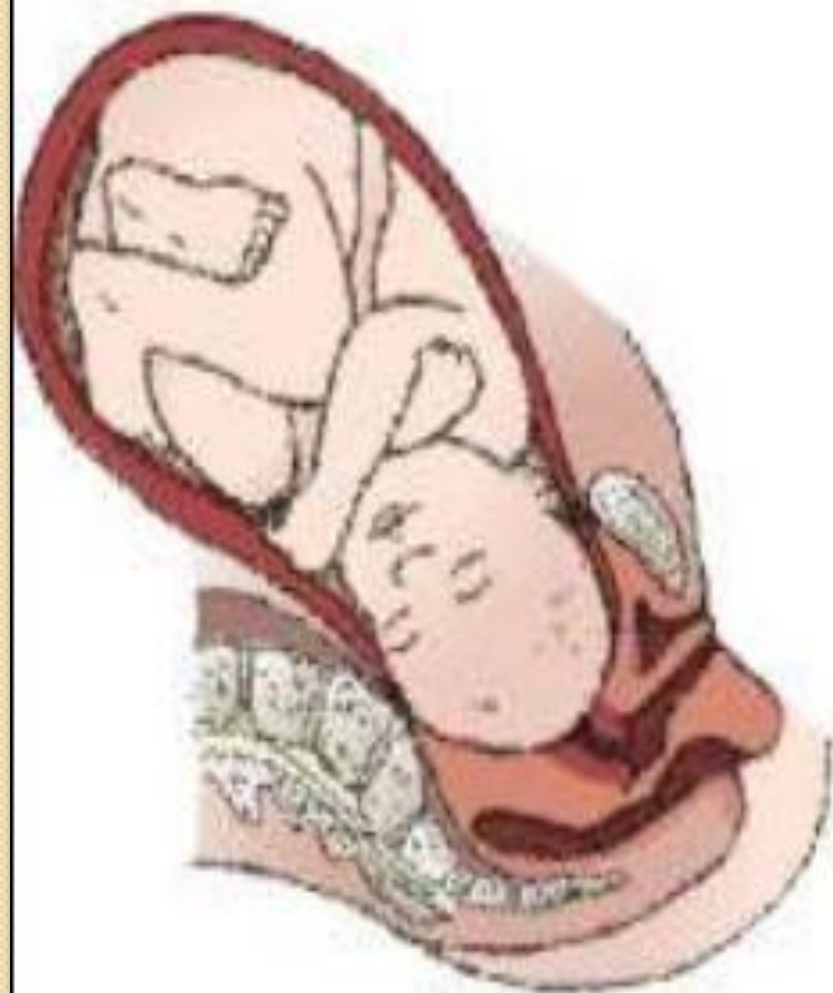
2. DESCENT

- In primigravidae, it occurs during the later weeks of pregnancy when engagement of the head provides confirmation that vaginal delivery is probable.
- In multigravid women, muscle tone is often more lax and therefore, descent and engagement of the fetal head may not occur until labour actually begins.

FACTORS AFFECTING THE DESCENT

- ✓ Uterine contraction and retraction
- ✓ Bearing down efforts by woman
- ✓ Direct pressure from the fetal head specially after rupture of the membrane and full dilatation of the cervix
- ✓ Pressure exerted by the amniotic fluid
- ✓ Extension and straightening of the fetal head.

A



Posterior
fontanel

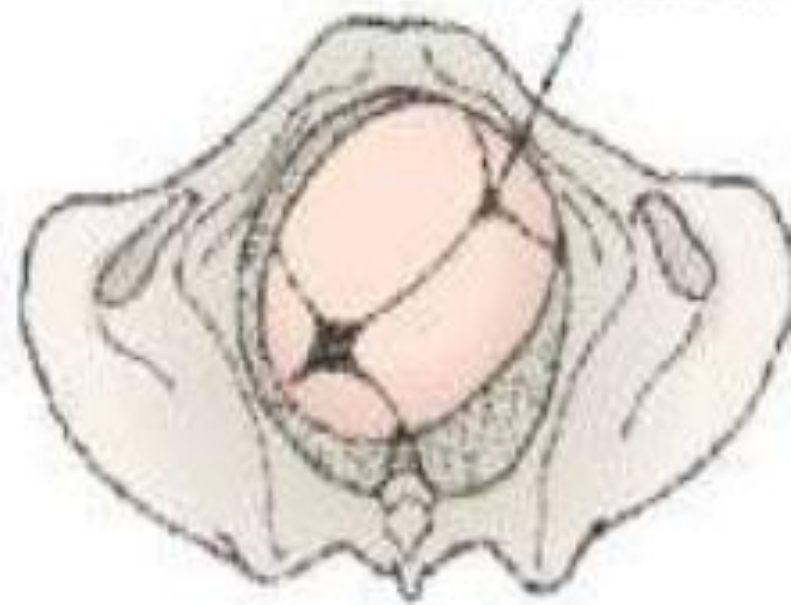


Fig. 18-13A Cardinal movements of the mechanism of labor. Engagement and descent.

FLEXION


- Some degree of flexion of the head - noticeable at the beginning of labor but complete flexion uncommon.
- As the head meets the resistance of the birth canal during descent, full flexion is achieved.
- If pelvis is adequate, flexion is achieved due to the resistance offered by the cervix, walls of the pelvis or by the pelvic floor.

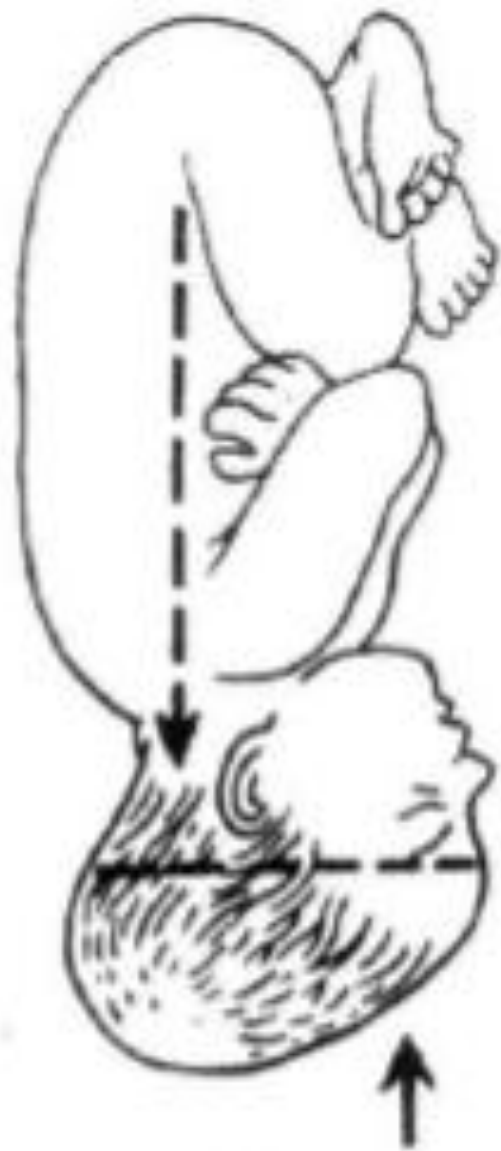
FLEXION CONT...

- Flexion is essential for descent, since it reduces the shape and size of the plane of the advancing diameter of the head.
- The fetal spine is attached nearer the posterior part of the skull; pressure exerted down the fetal axis will be more forcibly transmitted to the occiput than the sinciput.

FLEXION CONT...

- The effect is to increase flexion which results in smaller presenting diameters which will negotiate the pelvis more easily.
- At the onset of labour, the sub-occiput-frontal diameter 10 cm is presenting part.
- With greater flexion the suboccipito-bregmatic diameter 9.5 cm and occiput becomes the leading part

- 
- It is a movement of great importance without which there will be no further descent. • Internal rotation brings the anteroposterior diameter of the fetal head into the alignment with the maternal pelvis. 4. Internal rotation of the head



(1)



(2)

INTERNAL ROTATION OF THE HEAD

- ✓ It is a movement of great importance without which there will be no further descent.
- ✓ Internal rotation brings the anteroposterior diameter of the fetal head into the alignment with the maternal pelvis.

INTERNAL ROTATION OF THE HEAD

- ✓ Internal rotation is a turning forwards of whatever part of the fetus reaches the gutter shaped pelvic floor first.
- ✓ During contraction the leading part is driven downwards onto the pelvic floor.
- ✓ The resistance of this muscular diaphragm brings about rotation.

THEORIES WHICH EXPLAIN THE ANTERIOR ROTATION OF THE OCCIPUT ARE:

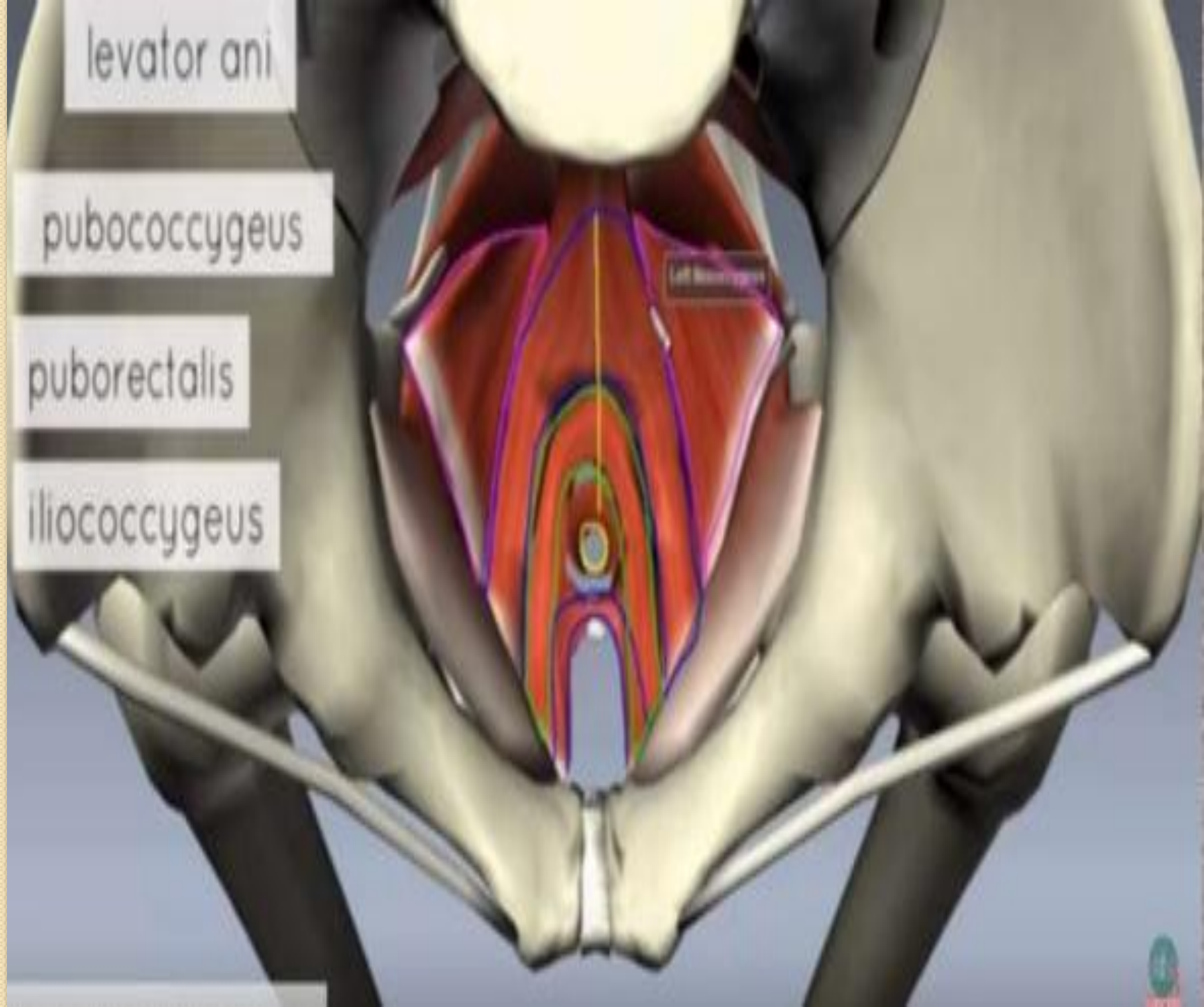
- ✓ **Slope of pelvic floor:** The gutter like pelvic floor helps rotation. Levator ani muscles, pelvic body
- ✓ **Also called the rotation by law of pelvic floor (Hart's rule).**
- ✓ **Resistance** - an important determinant of rotation. (Rotation often delayed following epidural anaesthesia)

levator ani

pubococcygeus

puborectalis

iliococcygeus



THEORIES WHICH EXPLAIN THE ANTERIOR ROTATION OF THE OCCIPUT ARE:

- The muscles are gutter shaped and slope down anteriorly so whichever part of the fetus first meets the lateral half of this slope, will be directed forwards and towards the center.

THEORIES WHICH EXPLAIN THE ANTERIOR ROTATION OF THE OCCIPUT ARE:

Pelvic shape:

- ✓ Forward inclination of the side walls of the cavity,
- ✓ narrow bispinous diameter and
- ✓ Long anteroposterior diameter of the outlet


Results in long axis of the head to accommodate in the maximum available diameter, i.e. anteroposterior diameter of the outlet leaving behind the smallest bispinous diameter.


THEORIES WHICH EXPLAIN THE ANTERIOR ROTATION OF THE OCCIPUT ARE:


Law of unequal flexibility (Sellheim and Moir): The internal rotation is primarily due to inequalities in the flexibility of the component parts of the fetus.

PREREQUISITES OF ANTERIOR INTERNAL ROTATION OF THE HEAD •

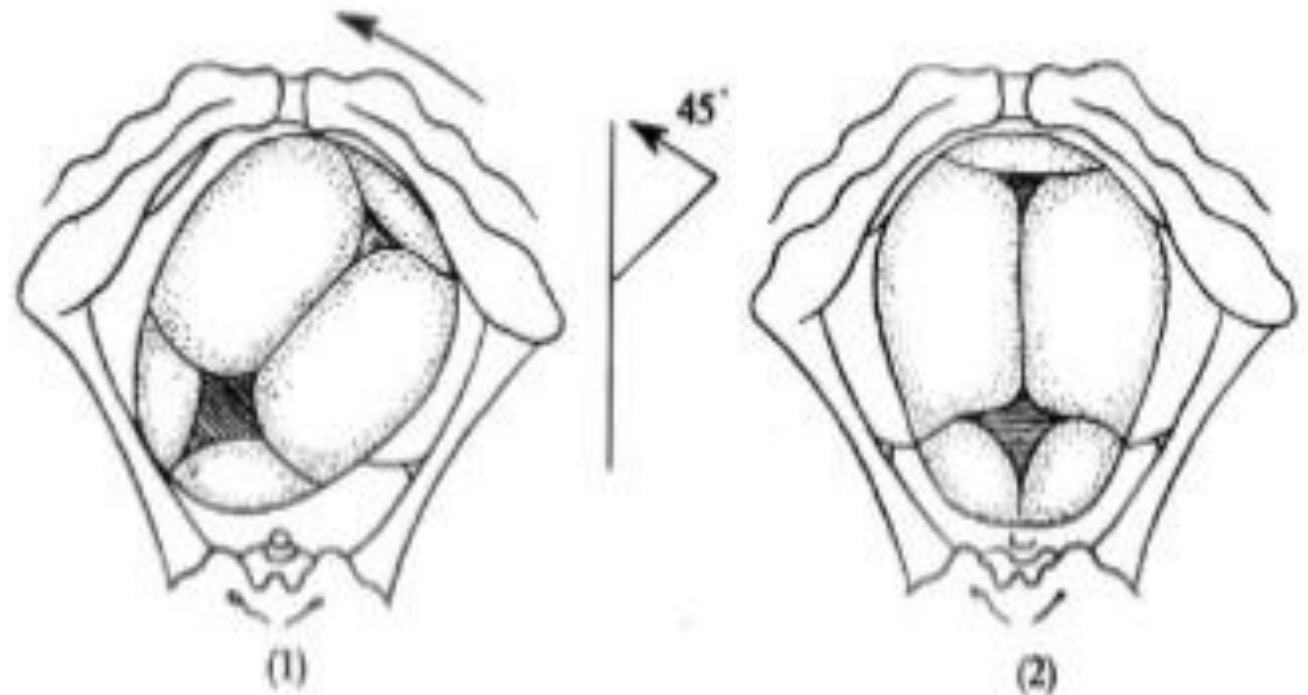
- ✓ well-flexed head,
- ✓ efficient uterine contraction,
- ✓ favorable shape at the midpelvic plane,
and
- ✓ tone of the levator ani muscles.

- 
- ✓ In well flexed vertex presentation, the occiput leads and meets the pelvic floor first and rotates anteriorly through 1/8th of a circle.
 - ✓ In LOA position, occiput rotates 45° (1/8th) from the left towards midline (from the left iliopecineal eminence to the symphysis pubis), where it can escape under the pubic arch and allow the sub-occipital region to pivot on the lower border of the symphysis pubis.

- 
- ✓ This causes a slight twist on the neck of the fetus as the head is no longer in direct alignment with the shoulder.
 - ✓ The antero-posterior diameter of the head now lies in the widest (antero-posterior) diameter of the pelvic outlet, facilitating an easy escape.

- 
- ✓ The occiput slope beneath the sub-pubic arch and crowning occurs.
 - ✓ When the head no longer recedes between contractions and the widest transverse diameter (biparietal) is born.

Torsion (twisting of the neck) : Torsion of the neck is an inevitable phenomenon during internal rotation of the head.



5. CROWNING OF THE HEAD

- After internal rotation of the head, further descent occurs until the sub-occiput lies underneath the pubic arch.
- At this stage, the maximum diameters of the head (biparietal diameter 9.5 cm) stretches the vulval outlet without any recession of the head even after the contraction is over called 'crowning of the head'.





6. EXTENSION OF THE HEAD

- Delivery of the head takes place by extension through 'couple of force' theory.
- Head in a downward direction, pelvic floor offers a resistance in the upward and forward direction,
- downward and upward forces neutralize and remaining forward thrust helping in extension.

6. EXTENSION OF THE HEAD...

- Vertex, brow, face and chin which sweep the perineum.
- Immediately following the release of the chin through the anterior margin of the stretched perineum, the head drops down, bringing the chin in close proximity to the maternal anal opening.
- The subocciputo-frontal diameter 10 cm distends the vaginal outlet.

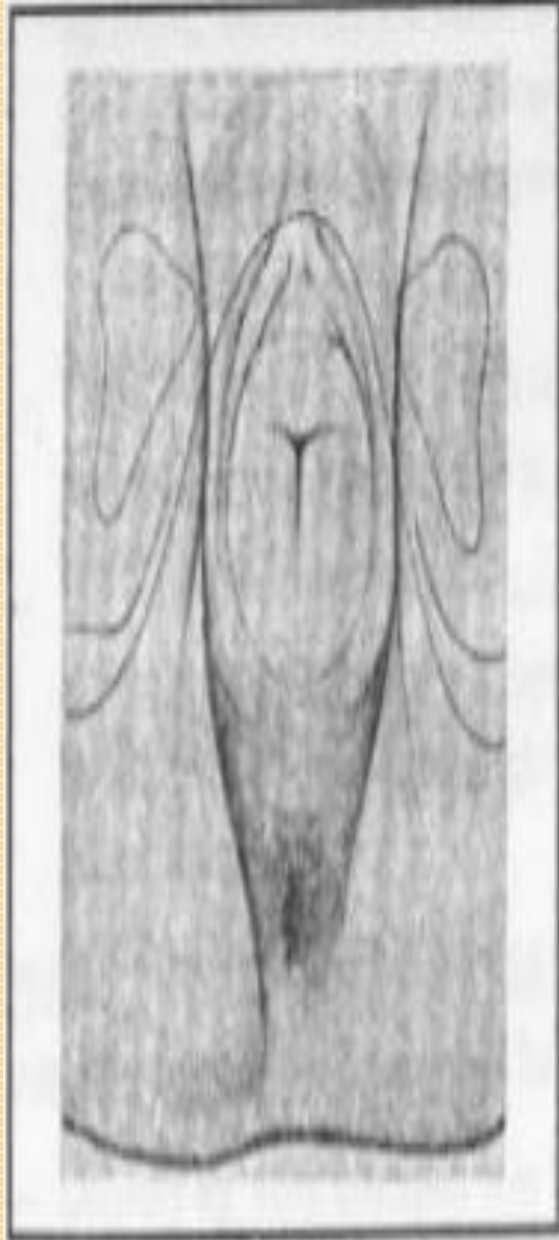


Fig.12.22: Crowning of the head



Fig.12.23 Sub-occipito frontal diameter distending the vulval outlet



7. RESTITUTION OF THE HEAD

- The twist in the neck of the fetus that resulted from internal rotation is now corrected by a slight-untwisting movement.
- Visible passive movements of the head to undo the twist in the neck, that took place during internal rotation of the head.
- In a vertex, LOA, the occiput restitutes $\frac{1}{8}$ th of a circle to the left, back to where it was before internal rotation took place. 7. Restitution of the head

7.RESTITUTION OF THE HEAD

CONT...

- The occiput thus points to the maternal thigh of the corresponding side to which it originally lay.
- Whether the position is right or left and the midwife knows whether she is delivering an LOA or an ROA .

§. INTERNAL ROTATION OF THE SHOULDERS

- Similar to internal rotation of the head.
- In LOA – Shoulders are in the left oblique diameter of the pelvic cavity.
- Anterior shoulder rotates forwards bringing the shoulders into the antero-posterior diameter of the outlet.
- Occurs with uterine contraction after the head is born.

9. EXTERNAL ROTATION OF THE HEAD

- Movement of rotation of the head visible externally due to internal rotation of the shoulders.
- As the anterior shoulder rotates towards the symphysis pubis from the oblique diameter,

Carries the head in a movement of external rotation through the $\frac{1}{8}$ th of a circle in the same direction as restitution.

9. EXTERNAL ROTATION OF THE HEAD

- Anterior shoulder slips beneath the subpubic arch and the posterior shoulder passes over the perineum.



D. Extension.

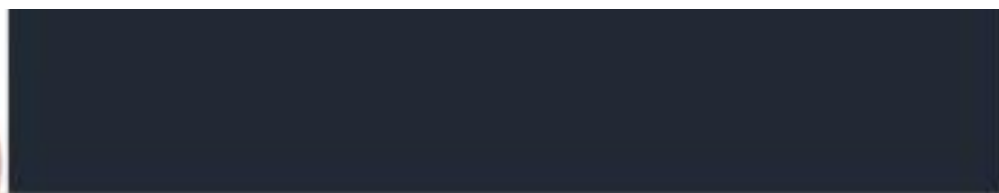


E. Rotation: OA to LOA.



F. External rotation: LOA to LOT.

Source: G. D. Pomeroy, Jessica DY, A. Black, G. D. Jones: Human Labor & Birth, 6th Edition
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10. LATERAL FLEXION OF THE BODY WITH EXPULSION OF FETUS

- ✓ Remainder of the body born by lateral flexion as the spine bends side way through the curved birth canal.
- ✓ Anterior shoulder first.
- ✓ The anterior shoulder slips beneath the sub-pubic arch and the posterior shoulder passes over the perineum.



(a)



(b)

Fig. 12.26 : Assisted delivery of the shoulders — (a) Anterior shoulder
(b) Posterior shoulder





A Before engagement



B Engagement, flexion, descent



C Descent, rotation



D Complete rotation, early extension



E Complete extension



F Restitution



G Anterior shoulder delivery



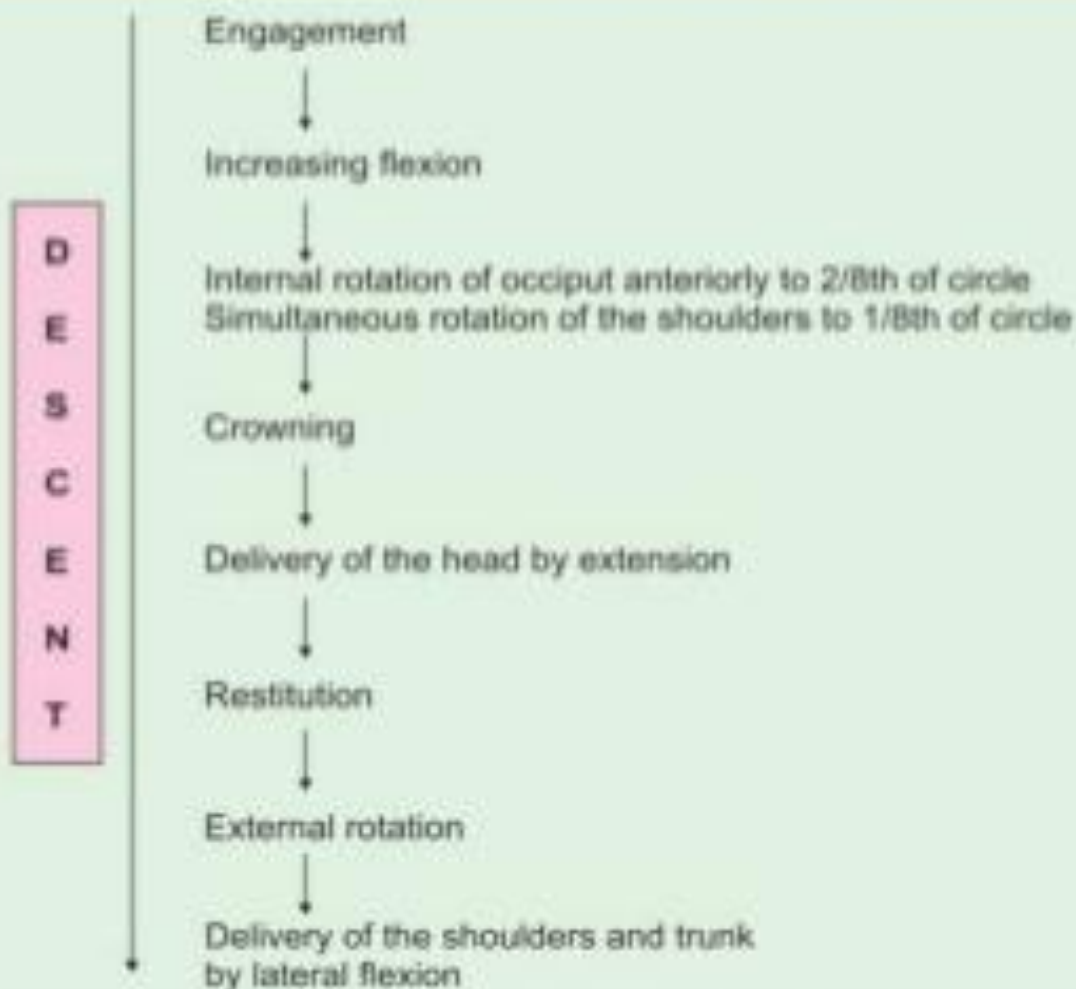
H Posterior shoulder delivery

SUMMARY OF MECHANISM OF LABOR

(Occipito-lateral Position)

Diameter of engagement : Available transverse diameter of the inlet

Engaging diameter of the head : Suboccipitobregmatic 9.5 cm (3 ¾")
or
Suboccipitofrontal 10 cm (4")





THANK YOU!!!