Labour, physiology of onset, and stages

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reference textbook
Obstetrics by ten teachers
20th ed(2017): ch 12; p 381-87

Learning objectives

- Understand the physiology of labour
- Understand factors that influencing uterine activity
- Physiological changes preparing to parturition
- Define stages of labour and be able to differentiate normal from abnormal labour (prolonged or precipitous).

Definition of labour

Labor is defined as the onset of a sequence of painful regular uterine contractions that results in progressive effacement and dilatation of the cervix with descent of the presenting part and voluntary maternal bearing-down efforts leading to the expulsion of the products of conception through the vagina.

<u>Average</u> duration of labour:

- **8 hours in primi**
- **5 hours in multiparous**

Onset of labour

- The reason or the mechanism behind the onset of labour is poorly understood
- **How the following events happen??**
- The cervix firm and closed→ soft and stretchable, open and dilated?
- The cervix long & thick→ short and thin (effaced)?
- The uterus quiescent & relaxed → regularly, strongly and frequently contracting?

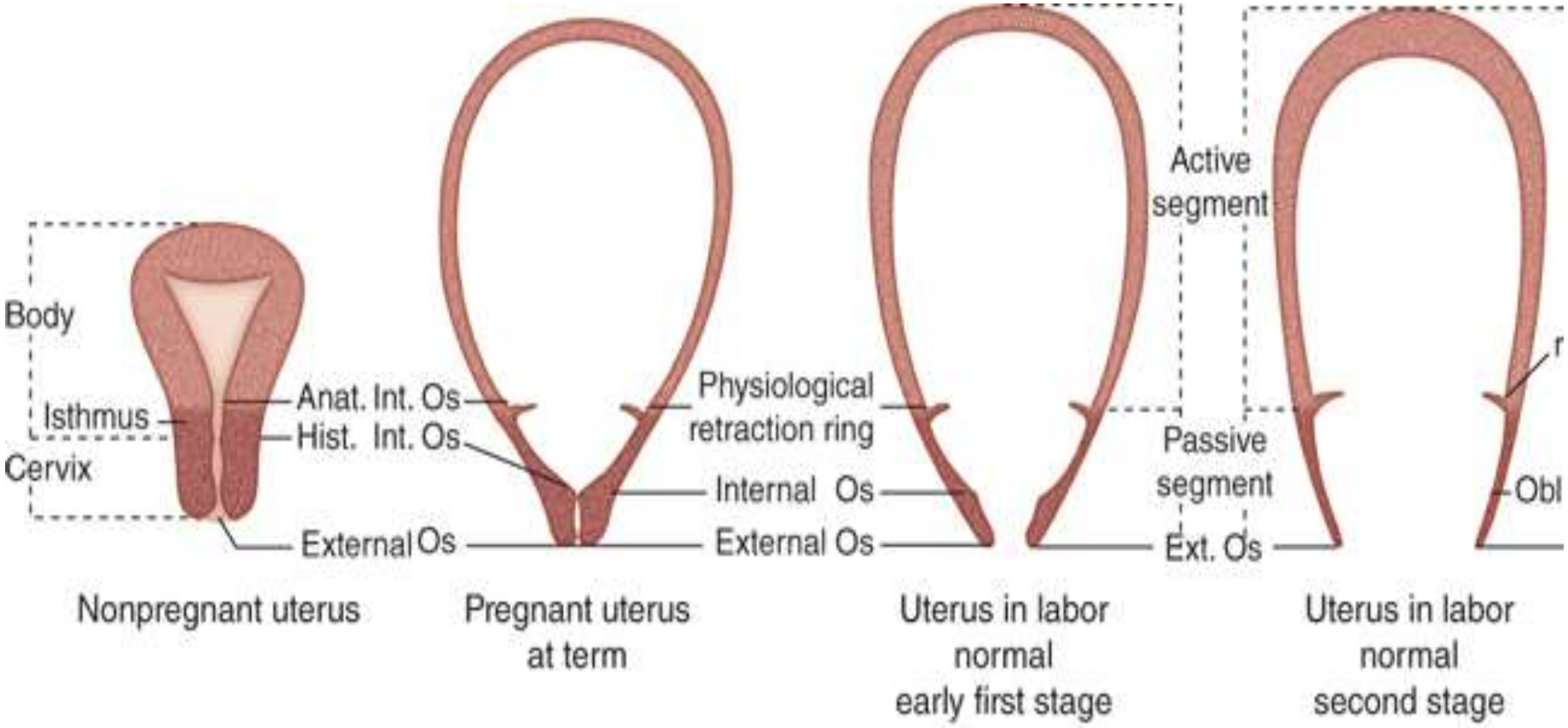
Why labour starts at the end of gestation why not before or after?

The mother and her baby play a role in this process.

the uterus:

- Myometrial cells (myocytes) are interlacing, synchronized in action
- PG
- Gap junctions
- Myocytes contract and retract→ progressively shorten
- **Upper** (active and dominant) and **lower** (passive) segments

Upper (active) & lower (passive) segments of the uterus



Uterine contractions of labour are characterized:

- Involuntary
- Irregular in the beginning then become regular
- Frequency→ 2 /10 minutes in early labour
- Frequency→ 4-5 /10 minutes in advanced labour
- Duration→ 30 – 60 seconds

Cervix: contains myocytes and fibroblast.

- Collagen
- Fibronectin
- dermatan sulphate (a proteoglycan)

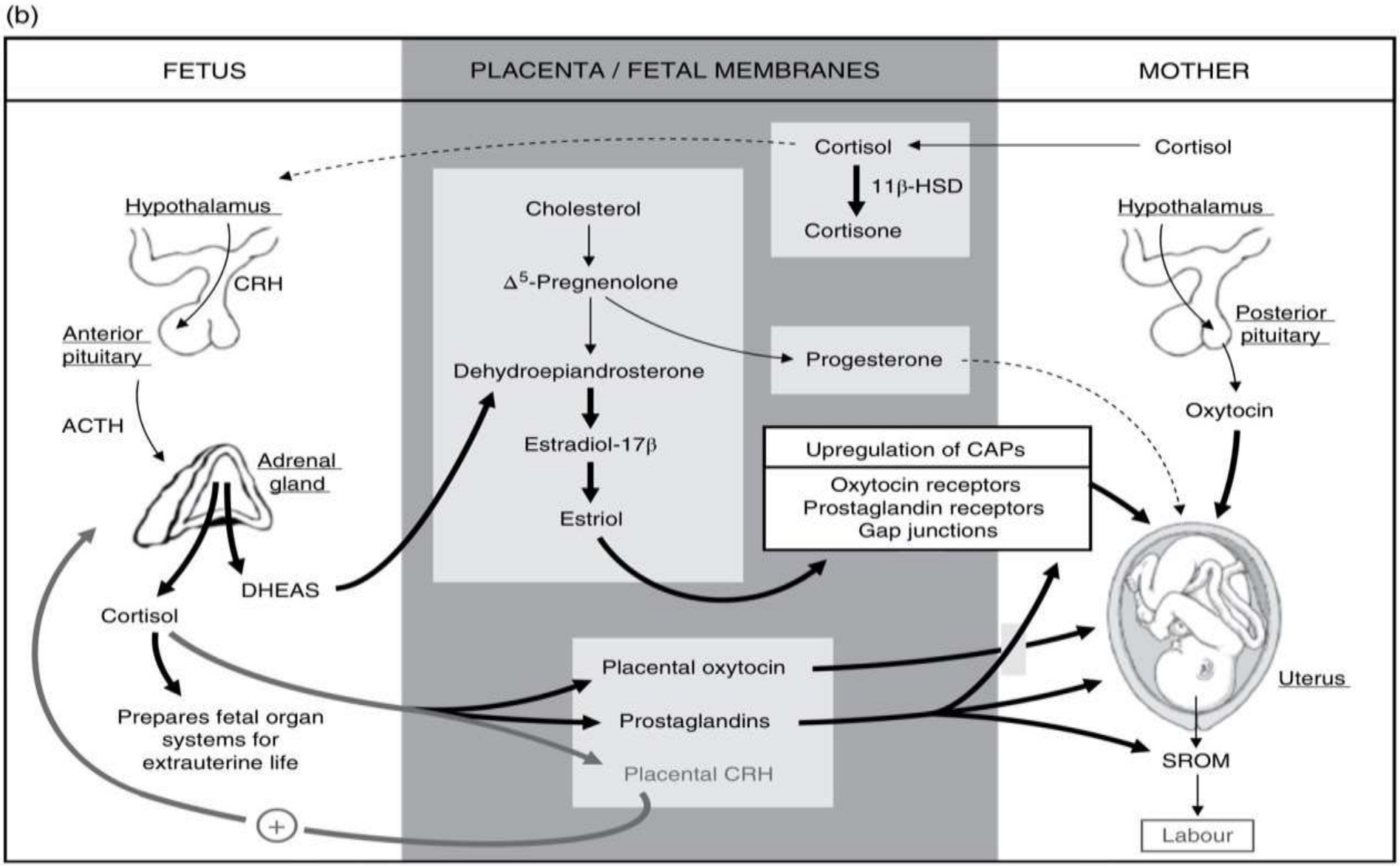
Early in pregnancy: remain closed, firm and not dilate in response to contractions.

Later (toward term):

Proteolytic activity→ soften and ripen and easily dilate in response to uterine contractions.

- (increased water content) By effect of PG and other humoral factors

Factors initiating labour



Hormonal factors:

- Progesterone and its receptor
- Estrogen and its receptor
- Progesterone/ Estrogen → ↓ ratio
- Cortisol (fetal adrenal)
- CRH (placental)
- Oxytocin (maternal and fetal)
- Fergusson reflex

Mechanical factors:

- Uterine stretching at full term
- Over stretch in multiple pregnancy and polyhydramniose → premature labour

physiologic Preparation for Labor

- **Lightening:** settling of the fetal head into the brim of the pelvis.
- **Braxton Hicks contractions:** increase in frequency.
- **Cervical ripening:** the cervix begins to soften and become stretchable.

- **Lightening:** occurs 2 or more weeks before labor in first pregnancies.

  it does not occur until early labor in multiparous women.
- Clinically, the mother may notice a flattening of the upper abdomen and increased pressure in the pelvis.

- **Braxton Hicks contractions:** may occur more frequently, sometimes every 10–20 minutes, and with greater intensity during the last weeks of pregnancy. When these contractions occur early in the third trimester, they must be distinguished from true preterm labor.
- These are a common cause of false labour.

DIAGNOSIS OF LABOUR

symptoms & signs of labour:

1- abdominal and back pain

2- increased vaginal discharge which may be bloody stained discharge or watery (show).

- **(the Show:** it means the passage of a small amount of blood-tinged mucus from the vagina).

3- there may be nausea and vomiting due to pain

4- in advanced stage of labour (late 1st and 2nd stage) there is increased pain and urge to (push) bearing down

5- increased frequency of micturition, and urge for bowel evacuation when the baby's head press on the bladder and rectum

6- uterine tightening (contractions) by abdominal palpation on regular intervals 2-4/10 minutes

7- cervical dilatation and effacement by serial vaginal exam

Duration of labour

- There is no ideal length for normal labour
- In nulliparous if > than 12 hrs→ prolonged
- In multiparous if > than 8 hrs→ prolonged

- **Precipitous labour:** expulsion of the fetus within < than 3 hours of the onset of regular contractions.

STAGES OF LABOUR

Stages of labour:

- **First stage:** from the time of the beginning of labour until 10 cm cervical dilatation.
- **Second stage:** the period between full cervical dilatation to delivery of the baby.
- **third stage:** the period from the delivery of the baby to the complete delivery of the placenta and membranes.

1st stage

- subdivided into two phases, the latent phase and the active phase.

Latent: from onset of labour → 3-4 cm
duration 3-8 hours but shorter in multiparous

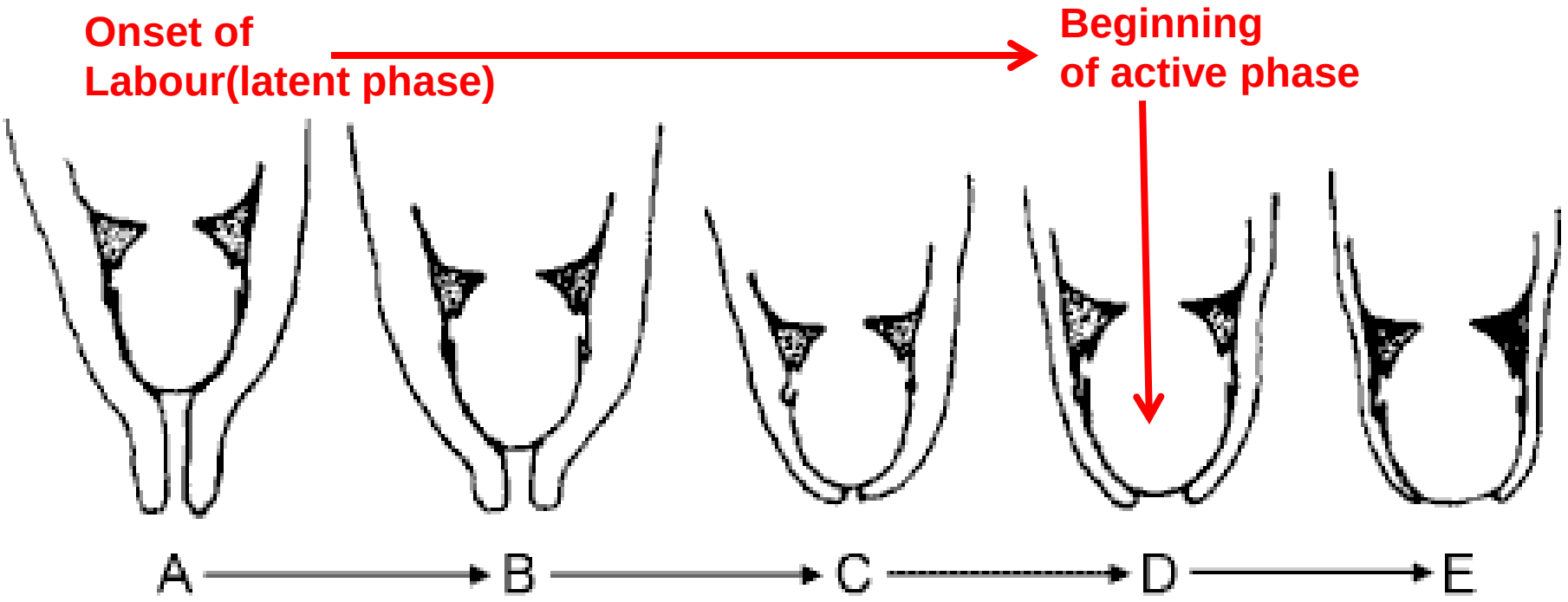
Active: from 3-4 cm up to 10 cm
duration 2-6 hours being shorter in multiparous

Rate of cervical dilatation is 1 cm/hour is normal

Being faster in multiparous

If < 1cm / 2hours is considered abnormal

Effacement & dilatation in latent phase



2nd stage

2nd stage is further subdivided into 2phases: passive and active 2nd stage

Passive: the time between full dilatation and the onset of involuntary expulsive contractions

duration 1-2 hrs (for desc. and rotation)

Active 2nd stage: there is maternal urge to push and the fetal head is visible at the perineum

duration 2 hr in primi, 1 hr in multi

Epidural usually cause prolongation of duration

3rd stage:

- duration of the third stage is 0–30 minutes for all pregnancies.
- Separation of the placenta generally occurs within 2–10 minutes of the end of the second stage
- If 3rd stage managed physiologically without oxytocic interference the duration is up to 60 minutes

features of normal labour?

1. Spontaneous onset at 37–42 weeks' gestation.
2. Singleton pregnancy.
3. Cephalic vertex presentation.
4. No artificial interventions.
5. Cervical dilatation of at least 1 cm/ 2 hours in the active phase of first stage.
6. Active second stage no more than 2 hours in primiparous and 60 minutes in multiparous woman.
7. Spontaneous vaginal delivery.
8. Third stage lasting no more than 30 minutes with active management.
9. Healthy mother and baby