Revised Reprint

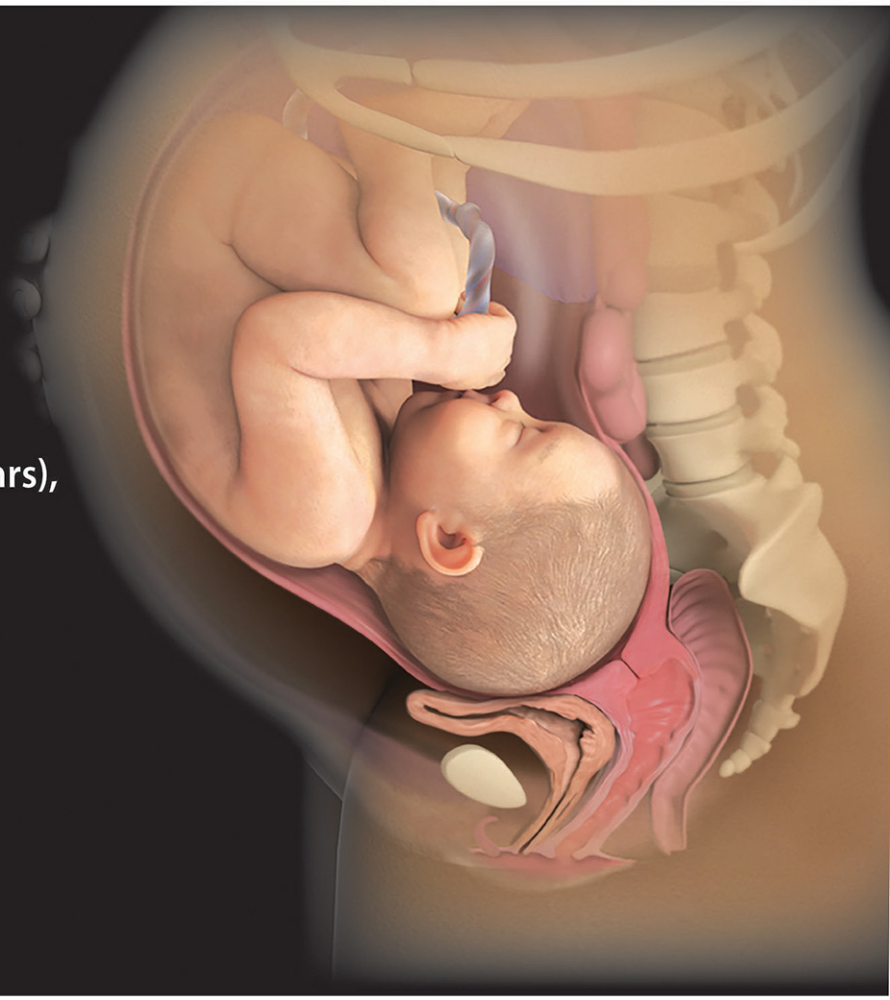
DC Dutta's Textbook of OBSTETRICS

10th Edition

Including Perinatology & Contraception

As per the Competency-based Medical Education Curriculum (NMC)

Hiralal Konar



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Normal Labor

Intrapartum Care for a Positive Child Birth Experience (WHO)

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LABOR

DEFINITION: Series of events that take place in the genital organs in an effort to expel the viable products of conception (fetus, placenta and the membranes) out of the womb through the vagina into the outer world is called 'labor'. It may occur prior to 37 completed weeks, when it is called the preterm labor. Labor is characterized by the presence of regular uterine contractions with effacement and dilatation of the cervix with fetal descent. A parturient is a patient in labor and parturition is the process of giving birth. **Delivery** is the expulsion or extraction of a viable fetus out of the womb. It is not synonymous with labor; delivery can take place without labor as in elective cesarean section. Delivery may be vaginal, either spontaneous or aided, or it may be abdominal.

NORMAL LABOR (EUTOCIA): Labor is called normal if it fulfils the following criteria:

1. Spontaneous in onset and at term
2. With vertex presentation
3. Without undue prolongation
4. Natural termination with minimal aids
5. Without having any complications affecting the health of the mother and/or the baby.

ABNORMAL LABOR (DYSTOCIA): Any deviation from the definition of normal labor is called abnormal labor. Thus, labor in a case with presentation other than vertex or having some complications even with vertex presentation affecting the course of labor or modifying the nature of termination or adversely affecting the maternal and/or fetal prognosis is called abnormal labor.

DATE OF ONSET OF LABOR: It is very much unpredictable to foretell precisely the exact date of onset of labor. It is not only varies from case to case but even in different pregnancies of the same individual. Calculation based on Naegele's formula can only give a rough guide. **Based on the formula, labor starts approximately on the expected date in 4%, 1 week on either side in 50%, 2 weeks earlier and 1 week later in 80%, at 42 weeks in 10%, and at 43 weeks plus in 4%.**

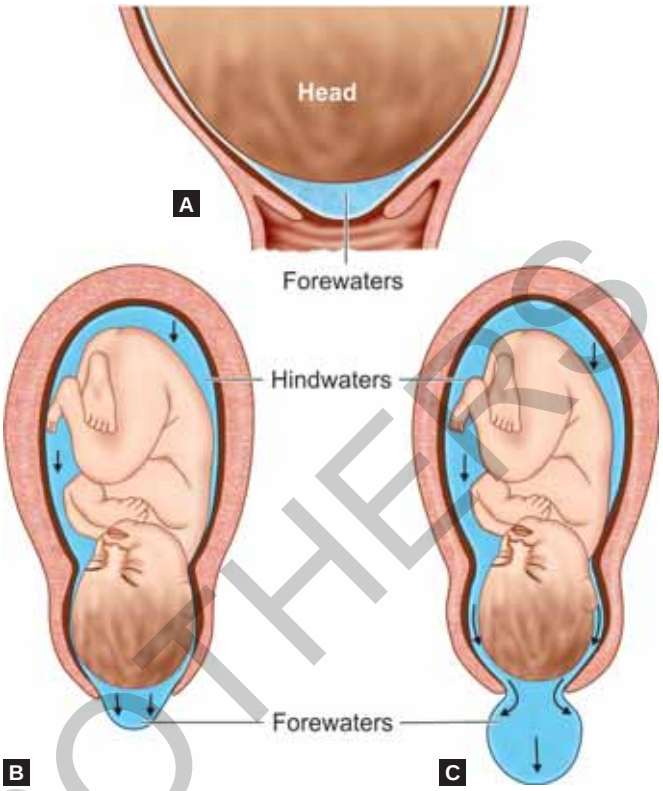
CAUSES OF ONSET OF LABOR

The precise mechanism of initiation of human labor is still obscure. Endocrine, biochemical and mechanical stretch pathways as obtained from animal experiments, however, put forth the following hypotheses.

- **Uterine distension:** Stretching effect on the myometrium by the growing fetus and liquor amnii can explain the onset of labor at least in twins or polyhydramnios. **Uterine stretch** increases gap junction proteins, receptors for oxytocin and specific Contraction Associated Proteins (CAPs).
- **Fetoplacental contribution:** Cascade of events activate **fetal hypothalamic-pituitary-adrenal axis** prior to onset of labor → increased CRH → increased release of ACTH → fetal adrenals → increased cortisol secretion → accelerated production of estrogen and prostaglandins from the placenta **(Fig. 13.1)**.
- **Estrogen:** The probable mechanisms are:
  - **Increases** the release of oxytocin from maternal pituitary.
  - **Promotes** the synthesis of myometrial receptors for oxytocin (by 100–200 folds), prostaglandins and increase in gap junctions in myometrial cells.
  - **Accelerates** lysosomal disintegration in the decidual and amnion cells resulting in increased prostaglandin ($PGF2\alpha$) synthesis.

contact with the pelvic brim) being spherical, may well fit with the wall of the lower uterine segment. Thus, the amniotic cavity is divided into two compartments **(Figs. 13.5A to C)**. The part above the girdle of contact contains the fetus with bulk of the liquor called **hindwaters**, and the one below it containing small amount of liquor called **forewaters**. With the onset of labor, the membranes attached to the lower uterine segment are detached and with the rise of intrauterine pressure during contractions there is herniation of the membranes through the cervical canal. **There is ball-valve like action** by the well-flexed head. Uterine contractions generate hydrostatic pressure in the forewaters that in turn dilate the cervical canal like a wedge. When the bag of forewaters is absent (PROM) the pressure of the presenting part pushes the cervix centrifugally.

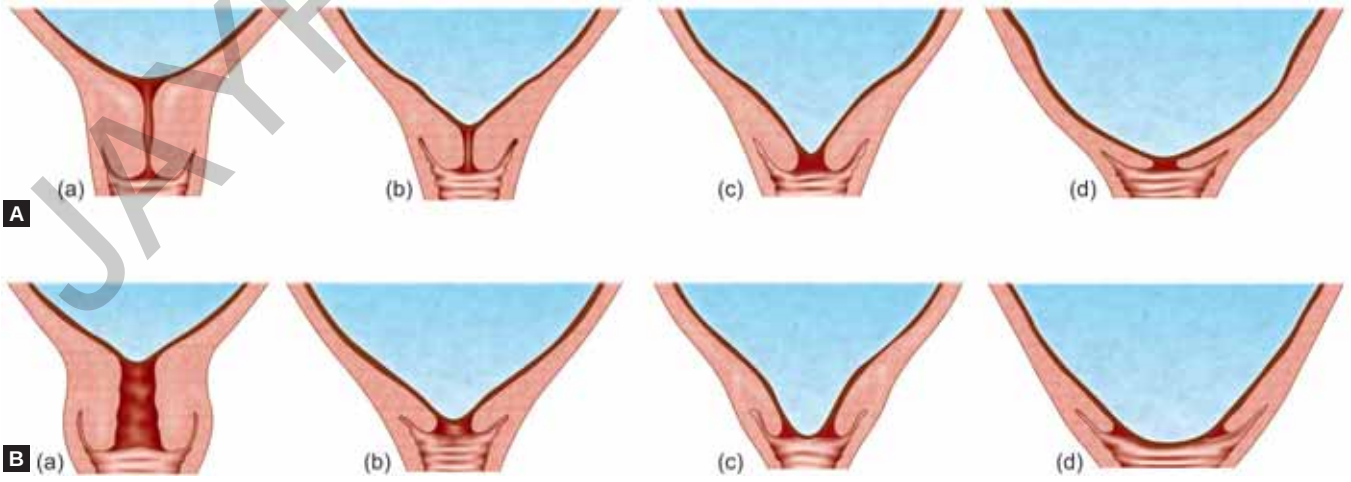
- ***Vis-a-tergo*:** The final phase of dilatation and retraction of the cervix is achieved by downward thrust of the presenting part of the fetus and upward pull of the cervix over the lower segment. This phenomenon is lacking in transverse lie where a thin cervical rim fails to disappear.



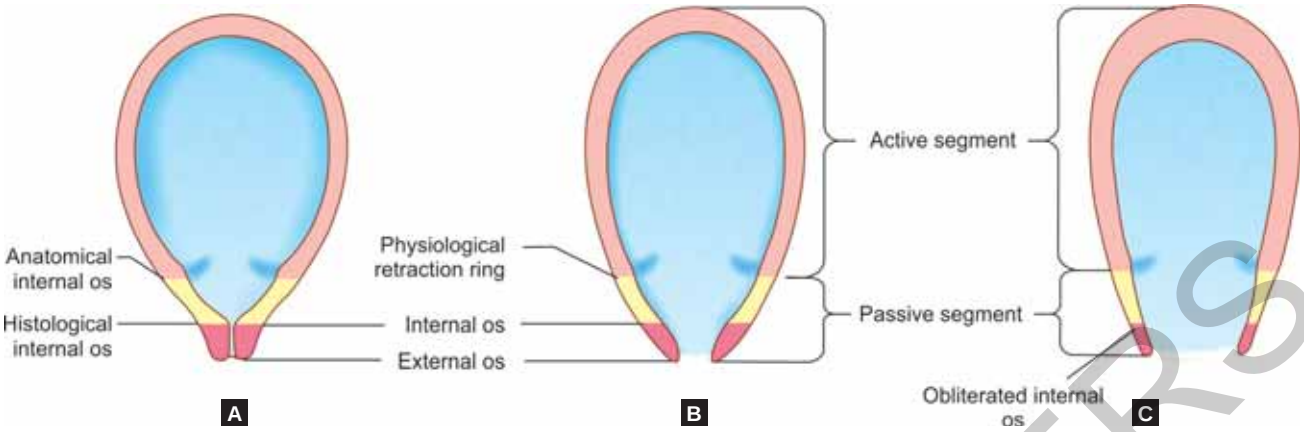
Figs. 13.5A to C: (A) Formation of bag of membranes and forewaters; **(B)** Well-fitting presenting part dividing the forewaters from hindwater; **(C)** Ill-fitting presenting part allows the hindwaters to force into the bag of membranes during contraction which may lead to its early rupture.

EFFACEMENT OR TAKING UP OF CERVIX: Effacement is the process by which the muscular fibers of the cervix are pulled upward and merges with the fibers of the lower uterine segment. The cervix becomes thin during first stage of labor or even before that in primigravidae. **In primigravidae**, effacement precedes dilatation of the cervix, **whereas in multiparae**, both occur simultaneously **(Figs. 13.6A and B)**. Expulsion of mucus plug is caused by effacement.

LOWER UTERINE SEGMENT: Before the onset of labor, there is no complete anatomical or functional division of the uterus. During labor the demarcation of an active upper segment and a relatively passive lower segment is more pronounced. The wall of the upper segment becomes progressively thickened with progressive thinning of the lower segment **(Figs. 13.7A to C)**. This is pronounced in late first stage, especially after rupture of the membranes and attains its maximum in second stage. A distinct ridge is produced at the junction of the two, called **physiological retraction ring** which should not be



Figs. 13.6A and B: Diagrammatic representation of the dilatation and 'taking up' of the cervix in—**(A)** Primigravida; **(B)** Multipara: **(A)**—(a) cervix before labor; (b and c) progressive `taking up' of the cervix without much dilatation; (d) cervix completely taken up with external os still remaining undilated; **(B)**—(a) cervix before labor, to note the patulous cervix; (b and c) progressive and simultaneous dilatation and `taking up' of the cervix; (d) taking up and dilatation of the external os occur simultaneously.



Figs. 13.7A to C: Sequence of development of the active and passive segments of the uterus: **(A)** Uterus at term; **(B)** In early labor; **(C)** Late second stage.

Table 13.1: Lower Segment (LS) of uterus and the clinical significance.

Anatomical features	*Clinical significance*
▪ **LS is developed from the isthmus** of the (nonpregnant) uterus, which is bounded above anatomical and below by histological internal os. ▪ **In labor, LS is bounded** above by the physiological retraction ring and below by the fibromuscular junction of cervix and uterus. ▪ This segment is formed **maximally during labor** and the **peritoneum is loosely attached anteriorly.** ▪ **It measures 7.5–10 cm** when fully formed and becomes cylindrical during the second stage of labor **(Figs. 13.7B and C)**. ▪ **The wall becomes gradually thin** due to: (i) Relaxation of the muscle fibers to allow elongation, (ii) the muscle fibers are drawn up by the muscle fibers of the upper uterine segment by contraction and retraction during labor and (iii) descent of the presenting part causes further stretching and thinning out of wall. ▪ **This segment has got poor retractile property** compared to the upper segment.	▪ The phenomenon of receptive relaxation enables expulsion of the fetus by **formation of complete birth canal** along with the fully dilated cervix **(Fig. 13.17)**. ▪ **Implantation of placenta** in lower segment is known as **placenta previa**. ▪ **It is through this segment** that **cesarean section** is performed. ▪ Poor decidual reaction in this segment facilitates **morbid adherent placenta**, once the placenta is implanted here. ▪ **In obstructed labor,** the lower segment is very much stretched and thinned out and ultimately **gives way (ruptures)** especially in multiparae. ▪ **It is entirely the passive segment** of the uterus. Because of poor retractile property, there is chance of postpartum hemorrhage if placenta is implanted over the area.

confused with the **pathological retraction ring**—a feature of obstructed labor (p. 344). Lower segment of uterus is characterized by following features **(Table 13.1)**.

EVENTS IN SECOND STAGE OF LABOR

The second stage begins with the complete dilatation of the cervix and ends with the expulsion of the fetus. **This stage is concerned with the descent and delivery of the fetus through the birth canal.**

Second stage has two phases:

1. **Propulsive**—from full dilatation until head touches the pelvic floor.
2. **Expulsive**—since the time mother has irresistible desire to *'bear down'* and push until the baby is delivered.

With the full dilatation of the cervix, the membranes usually rupture and there is escape of good amount of liquor amnii. The volume of the uterine cavity is thereby reduced. Simultaneously, uterine contraction and retraction become stronger. The uterus becomes elongated during contraction, while the anteroposterior and transverse diameters are reduced. **The elongation is partly due to the contractions of the circular muscle fibers of the uterus to keep the fetal axis straight**.

Delivery of the fetus is accomplished by the downward thrust offered by uterine contractions supplemented by voluntary contraction of abdominal muscles **(Fig. 13.8)** against the resistance offered by bony and soft tissues of the birth canal. There is always a tendency to push the fetus back into the uterine cavity by the elastic recoil of the tissue of the vagina and the pelvic floor. **This is effectively counterbalanced by the power of retraction**. Thus, with increasing contraction and retraction, the upper segment becomes more and more thicker with corresponding thinning of lower segment. **Endowed with power of retraction, the fetus is gradually expelled from the uterus against the resistance offered by the pelvic floor**. After the expulsion of the fetus, the uterine cavity is permanently reduced in size only to accommodate the afterbirths.

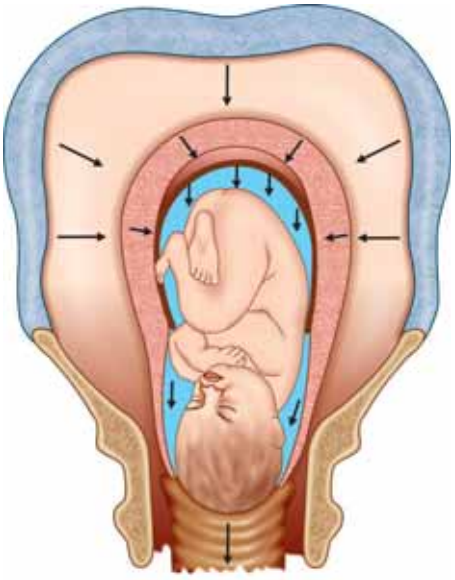


Fig. 13.8: Diagram showing the expulsive forces in the second stage. Increased intra-abdominal pressure augments the downward expulsive force of uterine contraction.

The expulsive force of uterine contractions is added by voluntary contraction of the abdominal muscles called '**bearing down**' **efforts**. For details, p. 124.

EVENTS IN THIRD STAGE OF LABOR

The third stage of labor comprises the phase of **placental separation**; its descent to the lower segment and finally its **expulsion** with the membranes.

PLACENTAL SEPARATION: **At the beginning of labor, the placental attachment roughly corresponds to an area of 20 cm (8") in diameter**. There is no appreciable diminution of the surface area of the placental attachment during first stage. During the second stage, there is slight but progressive diminution of the area following successive retractions, which attains its peak immediately following the birth of the baby.

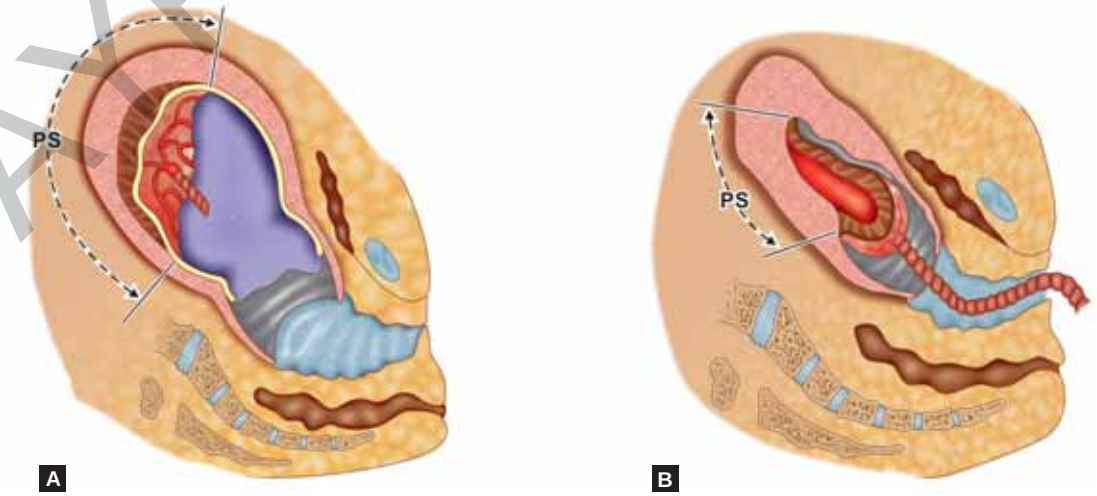
After the birth of the baby, the uterus measures about 20 cm (8") vertically and 10 cm (4") antero-posteriorly, the shape becomes discoid. The wall of the upper segment is much thickened while thin and flabby lower segment is thrown into folds. The cavity is much reduced to accommodate only the afterbirths.

Mechanism of separation: Marked retraction reduces effectively the surface area at the placental site to about its half. But as the placenta is inelastic, it cannot keep pace with such an extent of diminution resulting in its buckling **(Figs. 13.9A and B)**. A shearing force is instituted between the placenta and the placental site which brings about its ultimate separation. **The plane of separation runs through deep spongy layer of decidua basalis** so that a variable thickness of decidua covers the maternal surface of the separated placenta. **There are two ways of separation of placenta (Figs. 13.10A and B).**

(1) **Central separation (Schultze):** Detachment of placenta from its uterine attachment starts at the center resulting in opening up of few uterine sinuses and accumulation of blood behind the placenta (retroplacental hematoma). With increasing contraction, more and more detachment occurs facilitated by weight of the placenta and retroplacental blood until whole of the placenta gets detached.

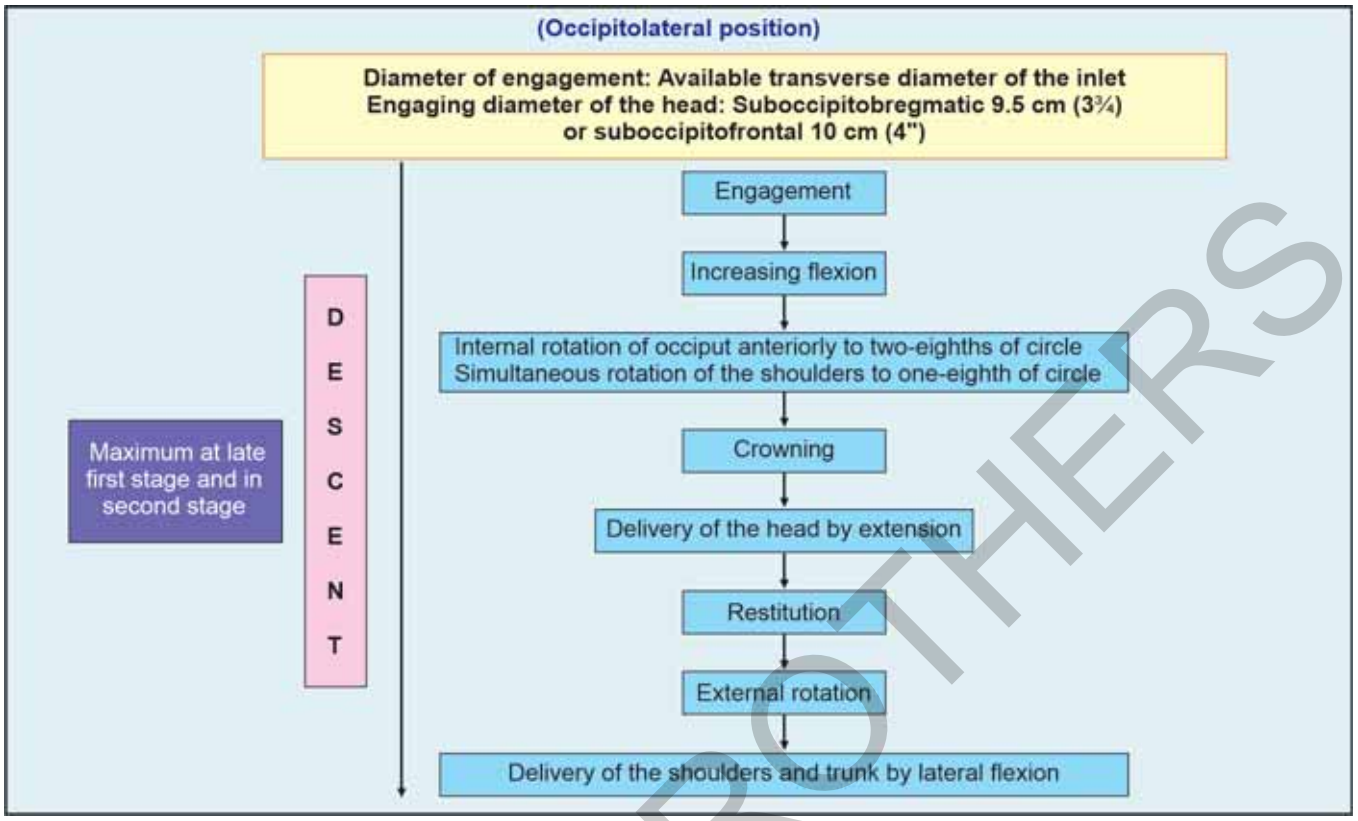
(2) **Marginal separation (Mathews-Duncan):** Separation starts at the margin as it is mostly unsupported. With progressive uterine contraction, more and more areas of the placenta get separated. Marginal separation is found more frequently.

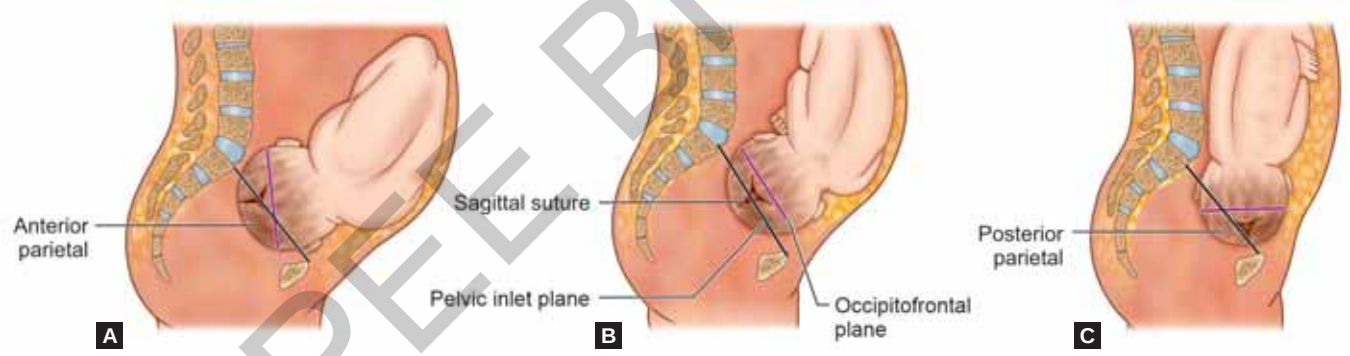
SEPARATION OF THE MEMBRANES: The membranes, which are attached loosely in the active part, are thrown into multiple folds. Those attached to the lower segment are already separated during its stretching. **The separation is facilitated partly** by uterine contraction and



Figs. 13.9A and B: Diagram showing area of placental site: **(A)** Before the delivery of the baby; **(B)** After the delivery of the baby. ***Note:*** The reduction of the surface area of the placental site resulting in buckling of the placenta.
(PS: Placental Surface)

Flowchart 13.2: Summary of mechanism of labor.





Figs. 13.12A to C: Head brim relation prior to engagement: **(A)** Anterior parietal presentation; **(B)** Head in synclitism; **(C)** Posterior parietal presentation.

Box 13.1: Advantages of asynclitism.

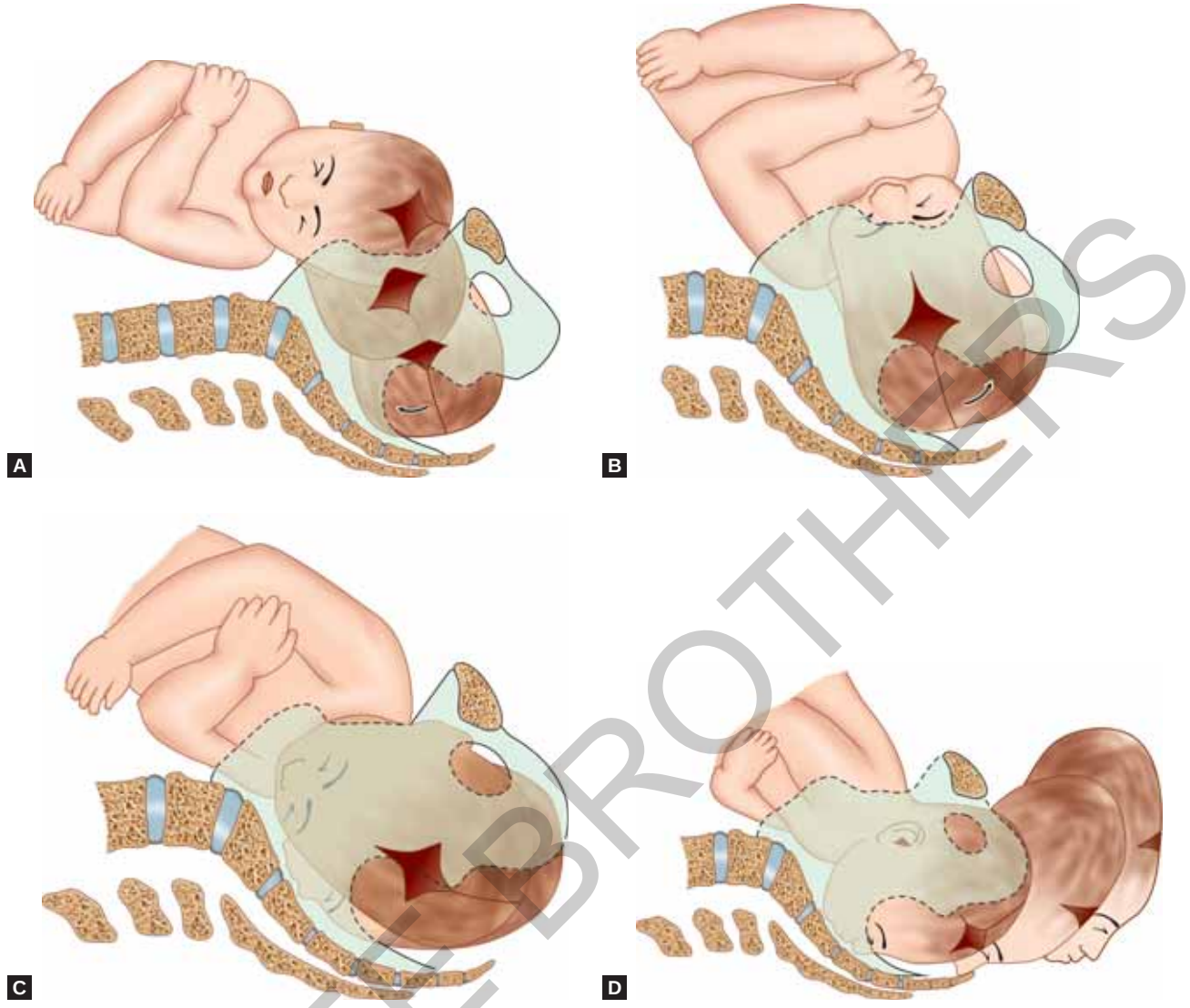
- Engagement of head with asynclitism, the two parietal eminences cross the brim one at a time. This helps lesser diameter (super subparietal: 8.5 cm), to cross the pelvic brim instead of larger biparietal diameter (9.5 cm) for engagement in synclitism.
- Asynclitism is beneficial in the mechanism of engagement of head.
- Marked and persistent asynclitism is abnormal and indicates cephalopelvic disproportion.

When the sagittal suture lies anteriorly, the posterior parietal bone becomes the leading presenting part and is called **posterior asynclitism or posterior parietal presentation (Lizman obliquity)**. This is more frequently found in primigravidae because of good uterine tone and a tight abdominal wall.

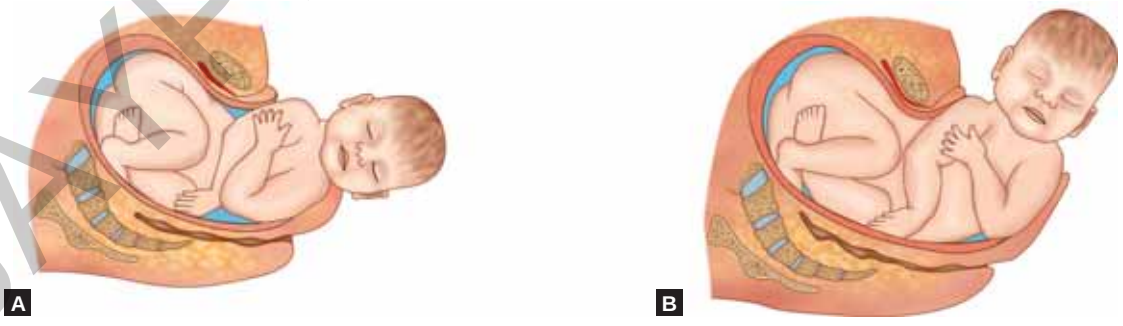
In others, the sagittal suture lies more posteriorly with the result that the anterior parietal bone becomes the leading presenting part and is then called **anterior parietal presentation or anterior asynclitism (Negele's obliquity)**. It is more commonly found in multiparae.

Mild degrees of asynclitism are common but severe degrees indicate cephalopelvic disproportion (Box 13.1).

Posterior lateral flexion of the head occurs to glide the anterior parietal bone past the symphysis pubis in posterior parietal presentation. Lateral flexion in the reverse direction occurs to glide the posterior parietal



Figs. 13.15A to D: Lateral view showing mechanism of labor in left occipitolateral position: (A and B) Posterior parietal presentation, posterior lateral flexion of the head and engagement; (C and D) Internal rotation of the head with movement of the shoulders; descent and delivery of the head by extension.

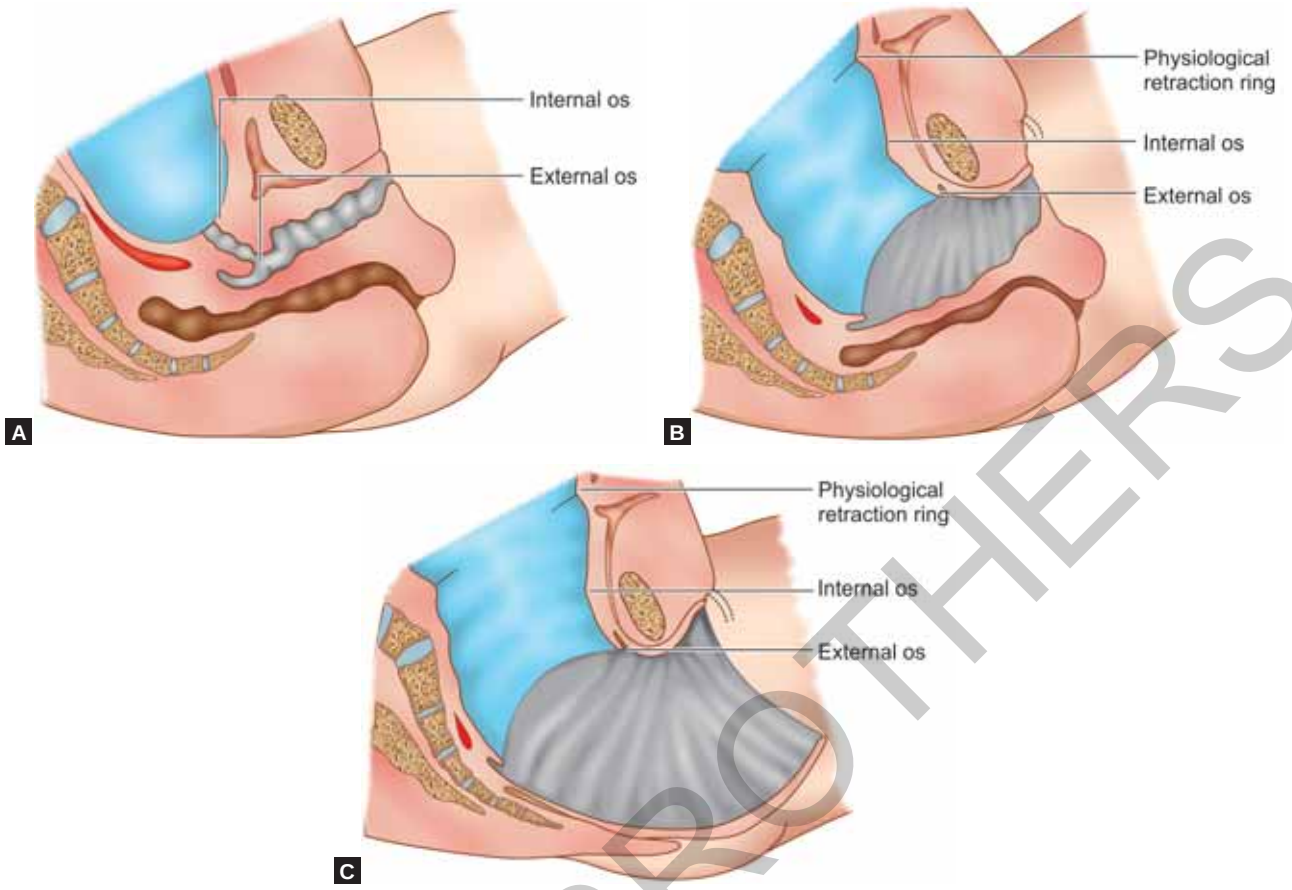


Figs. 13.16A and B: Delivery of the shoulders by lateral flexion: **(A)** Anterior shoulder; **(B)** Posterior shoulder.

CLINICAL COURSE OF FIRST STAGE OF LABOR

The first symptom to appear is intermittent painful uterine contractions followed by expulsion of blood-stained mucus (show) per vaginam. Only few drops of blood mixed with mucus is expelled and any excess should be considered abnormal.

PAIN: Pains are felt more anteriorly with simultaneous hardening of the uterus. Initially, pains are not strong enough to cause discomfort and come at varying intervals of 15–30 minutes with duration of about 30 seconds. But gradually the interval becomes shortened with increasing intensity and duration so that in late first stage the contraction comes at intervals of 3–5 minutes and lasts



Figs. 13.17A to C: (A) The relative position of the bladder, urethra and the genital organs at the beginning of labor; **(B)** Formation of birth canal with the cervix fully dilated. **Note the forward displacement of the urethra and bladder neck behind the pubis**; **(C)** Marked stretching with downward and backward displacement of the posterior wall of the canal as the head descends down.

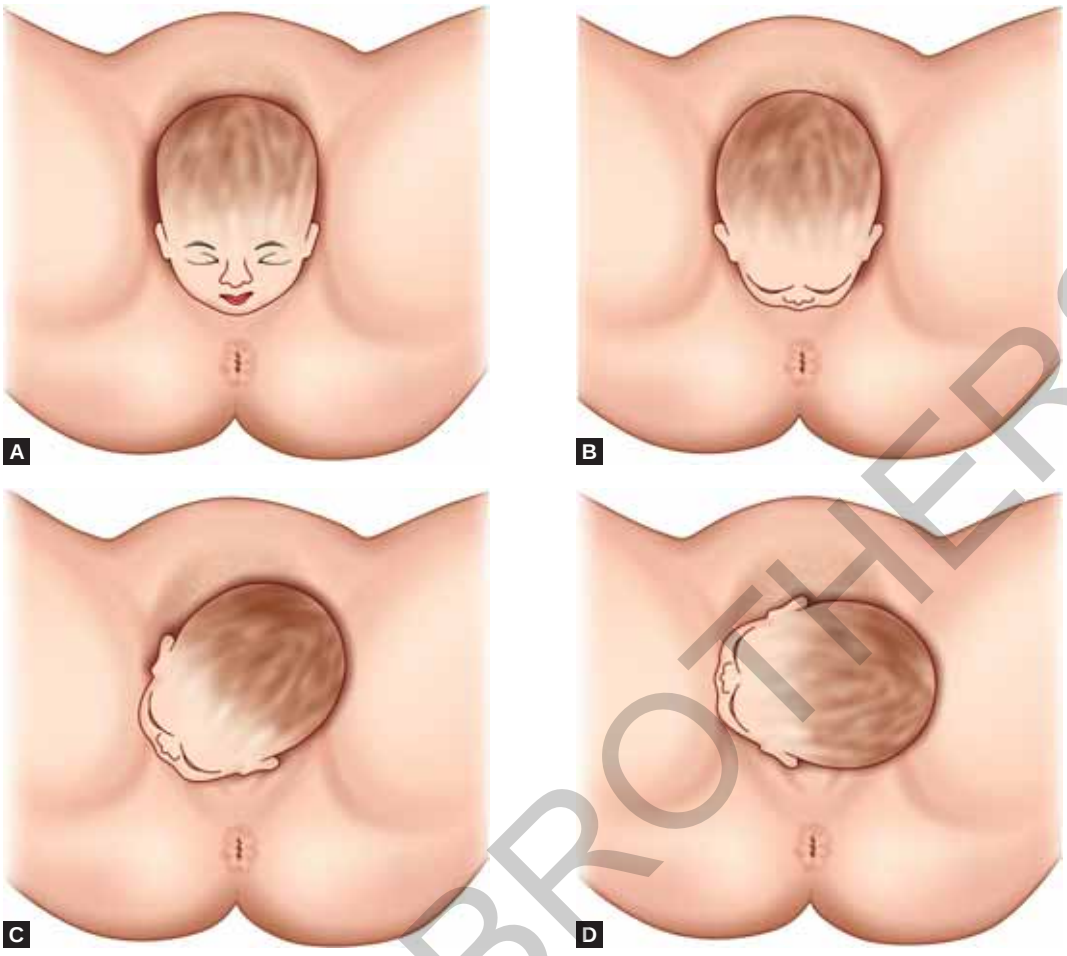
for about 45 seconds. The relation of pain with uterine contraction is of great clinical significance. **In normal labor,** pains are usually felt shortly after the uterine contractions begin and pass off before complete relaxation of the uterus. **Clinically pains are said to be good** if they come at intervals of 3–5 minutes and at the height of contraction the uterine wall cannot be indented by the fingers.

DILATATION AND EFFACEMENT OF THE CERVIX: Progressive anatomical changes in the cervix, such as dilatation and effacement, are recorded following each vaginal examination. **Cervical dilatation relates** with dilatation of the external os and **effacement is determined by** the length of the cervical canal in the vagina. In primigravidae, the cervix may be completely effaced, feeling like a paper although not dilated enough to admit a fingertip. It may be mistaken for one that is fully dilated. While in multiparae, dilatation and taking up occur simultaneously which are more abrupt following rupture of the membranes. **The anterior lip of the cervix is the last to be effaced**. The first stage is said to be completed only when the cervix is completely retracted over the presenting part during contractions.

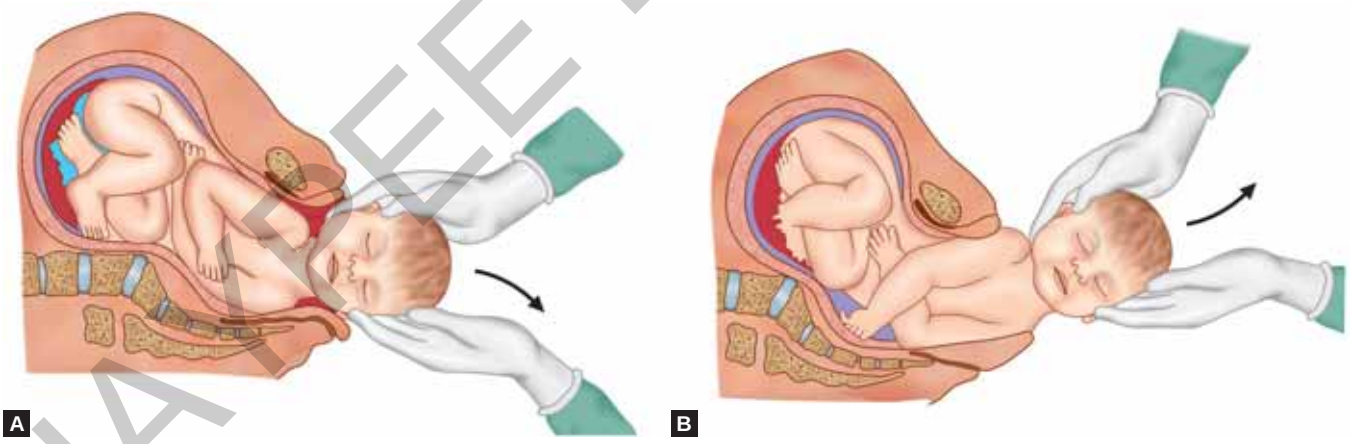
Cervical dilatation is expressed either in terms of fingers—1, 2, 3 or fully dilated or better in terms of centimeters (10 cm when fully dilated). It is usually measured with fingers but recorded in centimeters. One finger equals to 1.6 cm on average. Simultaneously, effacement of the cervix is expressed in terms of percentage, i.e., 25%, 50% or 100% (cervix less than 0.25 cm thick). **The term 'rim' is used** when the depth of the cervical tissue surrounding the os is about 0.5–1 cm.

Partograph (Fig. 35.6): Friedman (1954) first devised it. Partograph is a composite graphical record of cervical dilatation and descent of head against duration of labor in hours. It also gives information about fetal and maternal condition, which are all recorded on a single sheet of paper (for details, p. 494). **Cervical dilatation is a sigmoid curve and the first stage of labor has got two phases—(1) latent phase and (2) active phase (Fig. 13.18)**.

First stage of labor (Friedman 1971) is divided into a relatively flat latent phase and a rapidly progressive active phase **(Fig. 13.18)**. The active phase has three compartments. **Presently active phase is refined to start with 5 cm (WHO) or 6 cm (ACOG, SFMM).**



Figs. 13.26A to D: (A) Head is born by extension; **(B)** Head drops down with the face close to the anus; **(C)** Restitution; **(D)** External rotation.

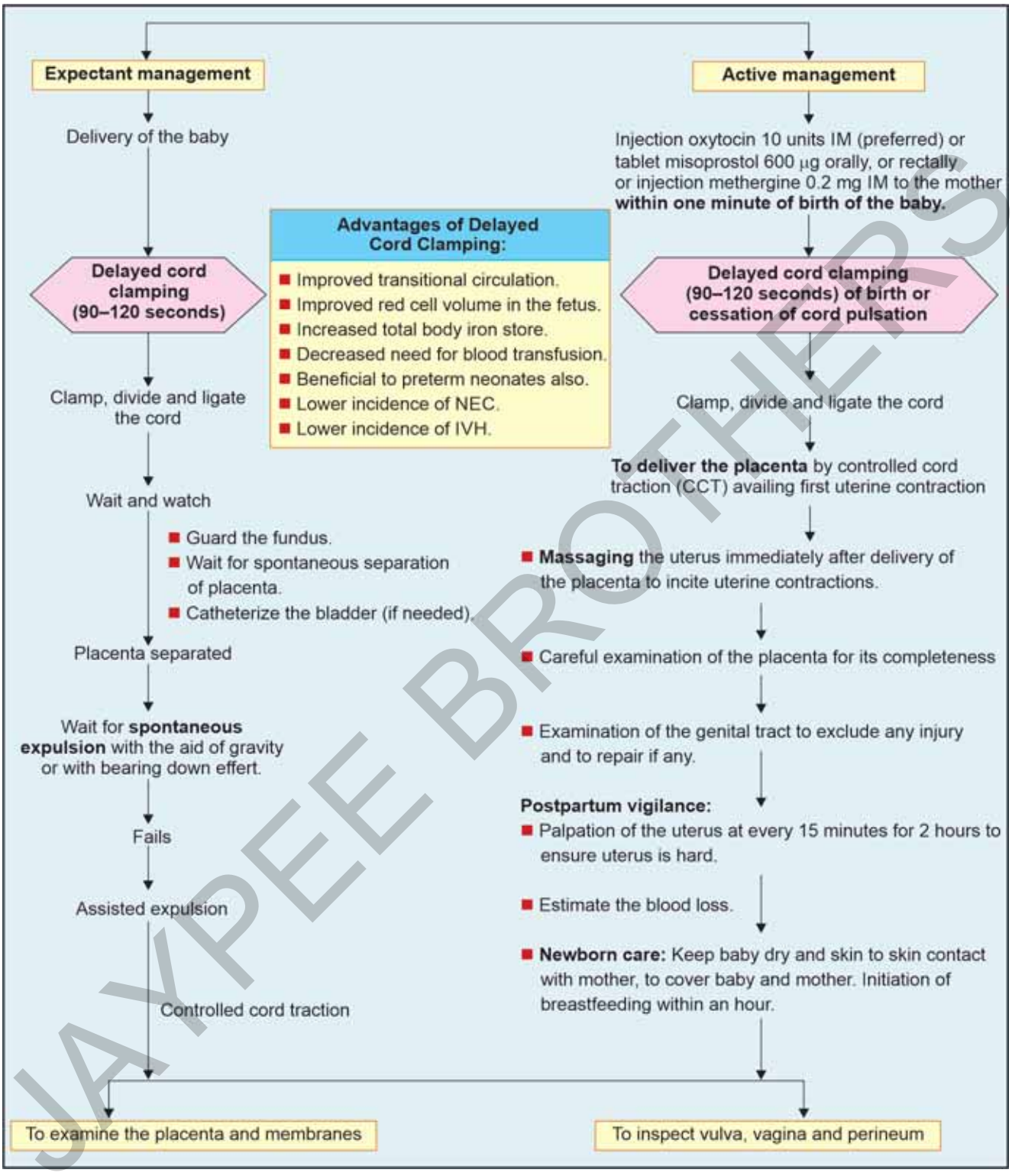


Figs. 13.27A and B: Assisted delivery of the shoulders: **(A)** Anterior shoulder; **(B)** Posterior shoulder.

IMMEDIATE CARE OF THE NEWBORN

- **Soon after the delivery of the baby,** it should be placed on a tray covered with clean dry linen with the head slightly downward (15°). It facilitates drainage of the mucus accumulated in the tracheobronchial tree by gravity. The tray is placed between the legs of the mother and **should be at a lower level than the uterus** to facilitate gravitation of blood from the placenta to the infant.
- **Air passage (oropharynx) may be cleared** of mucus and liquor. Bulb syringe or suction catheter aspiration may be used.
- **Apgar rating** at 1 minute and at 5 minutes is to be recorded.
- **Clamping and ligature of the cord:** The cord is clamped by two Kocher's forceps, the near one is placed 6–10 cm away from the umbilicus and is cut in between. Two separate cord ligatures are applied with sterile cotton threads 1 cm apart using reef-knot,

Flowchart 13.3: Scheme of management of third stage of labor.



fundus and the thumb in front using the uterus as a sort of piston **(Fig. 13.29)**. **Pressure must be given only when the uterus becomes hard.** If it is not, then make it hard by gentle rubbing. The pressure is to be withdrawn as soon as the placenta passes through the introitus. **If the baby is macerated or premature, this method is preferable to cord traction** as the tensile strength of the cord is much reduced in both the instances.

The cord may be accidentally torn which is not likely to cause any problem. The sterile gloved hand should be introduced, and the placenta is to be grasped and extracted.

— **The uterus is massaged** to stimulate uterine contractions and to make it hard. This also facilitates expulsion of retained clots if any.

— **Examination of the placenta membranes and cord:** The placenta is placed on a tray and is washed

MANAGEMENT OF FOURTH STAGE: Pulse, blood pressure, tone of the uterus (well retracted) and any abnormal vaginal bleeding are to be watched at least for 1 hour after delivery. When fully satisfied that the general condition is good, pulse and blood pressure are steady, the uterus is well retracted and there is no abnormal vaginal bleeding, the patient is sent to the ward.

SUMMARY

First Stage of Labor

First stage of labor starts from the onset of true labor pain and **ends with** full dilatation of the cervix. **Its average duration** is about 12 hours in primigravidae and 6 hours (WHO-10 hours) in multiparae. **First stage consists** of *latent phase* (up to 5 cm of cervical dilatation) and *active phase* (up to 10 cm). The stage is chiefly concerned with dilatation and effacement of the cervix.

This stage is clinically manifested by progressive uterine contraction, dilatation and 'effacement' of the cervix and ultimate rupture of the membranes. **Maternal and fetal conditions** remain unaffected except during uterine contraction. **Management consists of: (1)** Noninterference with watchful expectancy. **(2)** Women is given **encouragement, emotional support and adequate pain relief** during the entire course of labor. **(3)** To monitor carefully the progress of labor, maternal condition and fetal behavior so as to detect any deviation from the normal. **(4) Partograph is maintained**.

Second Stage of Labor

The **second stage of labor starts** from full dilatation of the cervix and **ends with** expulsion of the fetus. **Its average duration** is 2 hours (WHO-3 hours) in primigravidae and 30 minutes (WHO-2 hours) in multiparae. **This stage concerns** with the descent and delivery of the fetus through the birth canal. **This stage is** clinically manifested by increased frequency and intensity of uterine contractions with appearance of 'bearing-down' efforts which result in expulsion of the fetus. The mother may show features of exhaustion. The **principles in management are: (1)** To assist the natural expulsion of the fetus slowly and steadily. **(2)** To prevent perineal injuries. **During conduction of delivery,** head is delivered slowly in between contractions. Flexion is maintained so that smaller diameter of the head stretches the perineum. Thus, timely performed episiotomy (selective), prevents perineal laceration. Shoulders are delivered slowly with next contraction. **Immediate care of the newborn** includes clearing of the air passage and eyes, delayed clamping and ligaturing of the umbilical cord and Apgar scoring.

Third Stage of Labor

The third stage begins after the expulsion of the fetus and ends with expulsion of the placenta and membranes. Its **average duration is 15 minutes**. This stage concerns with placental separation and its expulsion. **The separation is** achieved by marked reduction in the uterine surface area of the placental site following delivery due to retraction. **The placenta being** inelastic, shears off its attachment through the deep spongy decidual layer. There are **two ways of separation**—central (Schultze) and marginal (Mathews-Duncan). **The bleeding is** controlled by effective myometrial contraction and retraction (living ligature) and by thrombosis. **The expulsion may occur** through 'bearing-down' efforts or more commonly with assistance. **The management is** either by employing watchful expectancy or **by active management (WHO)** in cases where oxytocin 10 units IV (slowly) or IM/methergine 0.2 mg IV is administered within 1 minute following the delivery of the baby.

Tablet misoprostol 600 μg, can be given orally or rectally in cases with home delivery. It can be given by a community health worker. Placenta is delivered by CCT soon following delivery of the baby. Uterine massage may be given to make it hard. The placenta and the membranes should be examined following their expulsion.

Fourth Stage of Labor

It is the stage of observation for at least 1 hour after the delivery of the baby, placenta and the membranes to ensure that both the mother and the baby are well.

POINTS

- **Labor** involves a series of changes in the genital organs associated with regular painful uterine contractions with effacement and dilatation of the cervix. **Delivery** is not synonymous with labor as it can take place without labor. Normal labor should fulfil some defined criteria.
- **Onset of labor** is difficult to understand. Role of estrogen, progesterone, prostaglandins, oxytocin, and the fetus have been explained.
- **Active phase of labor** begins when the cervix is 5 cm dilated. Management of latent phase (observation) and active phase of labor are different.
- **Labor events** are conventionally divided into two phases (latent phase and active phase) and three stages.
- **Main events in the first stage of labor** are: (a) **dilatation** and (b) **effacement** of the cervix. **Second stage** events are: (a) **descent** and (b) **delivery** of the fetus. **Second stage** is characterized by two phases: **(a) propulsive and (b) expulsive (bear down)** to deliver the fetus. **Third stage events** are **separation** of placenta and **expulsion** of placenta.
- **Lower uterine segment** is formed mainly during the first stage of labor. Clinical importance of lower uterine segment is very much.
- **Mechanism of normal labor** involves a series of movements on the head in the process of adaptation during its passage through the pelvis.

Contd…

DC Dutta's Textbook of OBSTETRICS

Salient Features

- This tenth edition reflects the authoritative resource on comprehensive obstetric and perinatal care.
- The language throughout the text is crisp, lucid and unambiguous.
- Information is consistent and uniform across all the chapters.
- Enriched with numerous colored boxes, tables, flowcharts, illustrations, line drawings, MR images, ultrasonograms, skiagrams and key points for quick revision and fast learning without going through the text.
- All the chapters have been thoroughly updated and restructured to reflect the contemporary obstetric care with quality.
- Focuses on evidence-based knowledge. Core knowledge (must-know area) has been highlighted.
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- **Guidelines and recommendations of professional and academic organizations have been highlighted. These highlighted matters are the must know for the individual topics discussed. They are the answers to the questions which the students are frequently tested on.**
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- **The QR codes used in several topics in the book highlight the extra reading matters for advanced learning. This is an approach to encourage and prepare the postgraduate students for their various examinations.**
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- Equally informative to nursing students, midwives, homeopathic and ayurvedic students, as well as general practitioners and practicing obstetricians.

Reviews

Every chapter of this comprehensive text is easy to navigate and read with its standardized headings, subheadings, tables, boxes, flowcharts and key points. This is an excellent textbook superbly written. It should be in each and every library and in the possession of all the medical students, midwives and practicing clinicians.
—***Sir Sabaratnam Arulkumaran*** *DSc PhD FRCOG FRCS*
Professor Emeritus, St George's University, London, Past President–FIGO, RCOG, BMA

All the editions of Dutta's Obstetrics, since 1983 till date, have strongly supported the progress of knowledge and understanding in the field of obstetrics. The tenth edition is a remarkable one in all aspects. This book has always been the Bible to all the medical and nursing students as well as the clinicians.
—***Himadri Bal*** *MD Professor, Dr DY Patil Medical College, Pune, Maharashtra, India*

The presentation of Dutta's Obstetrics is simple, readable and easy to understand. The book has always been up-to-date with the progress of science. Guidelines of different international bodies are highlighted. It is an excellent educational resource to all the medical students, practicing obstetricians and the midwives.
—The Journal of Obstetrics and Gynecology of India. August 2016; 66(4):303-4.

Dutta's Textbook is indeed a formidable work. It is beautifully illustrated with the comprehensive and concise text matter. It is an immensely useful study resource for all.
—***Colm O' Herlihy*** *MD*
Professor, National Maternity Hospital, Dublin, Ireland

I consider this textbook as the *Bhagavad Gita* for all the medical students, practicing obstetricians and the midwives. It is my companion since the MBBS days. All the editions of Dutta's adorn a place of pride in the library of my clinic.
—***Jyoti Gupta*** *MD President–BOGS*

The text is superbly illustrated with diagrams, graphs, images, sketches and beautiful photographs. The presentation is lucid and easy to read and understand. It is of immense benefit to the students—both the medical and midwifery.
—***Michael P O'Connel*** *MD*
Consultant, Coombe Women and Infants University Hospital, Dublin, Ireland

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