ABNORMAL MIDWIFERY

SECTION 1: MULTIPLE PREGNANCIES

Introduction

Multiple pregnancy is a term applied when there is more than one foetus in the uterus. The incidence of multiple pregnancies is rare. It is estimated that twin conception occurs spontaneously once in 90 pregnancies, triplets once in 310,000 while quadruplets occur once in 700,000.

Objectives

By the end of this section you will be able to:

- Define multiple pregnancy
- Explain the two different types of twins
- Diagnose twin pregnancy
- Describe the effect of multiple pregnancy on pregnancy
- Describe the management of multiple pregnancies

Multiple Pregnancies

Varieties of Twins

Twins may be binovular or uniovular. Binovular twins are developed from two separate ova, which may or may not come from the same ovary. Uniovular twins are developed from a single fertilised ovum, which undergoes division to form two embryos.
Below is a comparison of the two types of twins.

Uniovular twin (monozygotic)	Binovular twins (dizygotic)
One ovum	Two ova
One spermatozoon	Two spermatozoa
One amnion	Two amnions
One chorion	Two chorions
One placenta	Two placentas (may fuse)
Same sex	Same or different sexes
Identical	May be different in appearance

Diagnosing a Multiple Pregnancy

On Inspection

- The abdomen looks larger than it should at the given date
- Polyhydramnios may increase the abdominal size leading to confusion of the diagnosis

On Palpation

- Abdominal girth will be 101.5 or more centimetres
- Fundal height is larger than dates from twentieth week of gestation
- You will reveal two foetal poles on fundal palpation
- The size of the head is smaller than the size of the uterus
- You will palpate an unusual number of foetal parts

On Auscultation

- Two foetal hearts are recorded simultaneously and there is a difference of 10 to 20 beats

Ultrasound Scan

An ultrasound scan at seventh week can distinguish two separate sacs while from the twelfth week two foetal bodies can be identified. On the fourteenth week, two heads can be detected.

Note: Two skeletons are visible on x-ray at thirty weeks.

Effects of Multiple Pregnancy

The effects of twins on pregnancy include:

- Preeclampsia is three times more common in multiple pregnancies than a single

pregnancy
- Anaemia is more common, due to the increased foetal demand of folic acid and iron dietary requirement
- Polyhydramnios could occur due to more fluid in the two foetal sacs
- Pressure symptoms are more marked, and may include backache, oedema, varicose veins, indigestion, constipation, dyspnoea and bladder irritability
- Minor disorders of pregnancy are more marked, including headache, morning sickness and vomiting
- Premature labour is likely, due to over stretching of the uterus
- Congenital malformation occurs twice as much than in single pregnancy
- Intrauterine growth retardation may occur due to placenta insufficiency

Complications of twins in pregnancy include:

- Malpresentation, where 35% of twins will both present by the head, and another 35% by head and breech. 10% present by breech and/or 20% present by transverse lie or cephalic with transverse lie
- Delay in the birth of the second twin
- Cord prolapse, which occurs especially with the second twin, often when there is malpresentation
- Maternal and foetal distress is common due to prolonged labour
- Locked twins is a rare complication but may prevent spontaneous delivery
- Postpartum haemorrhage due to large placental site

Multiple Pregnancy Management

Management During the Antenatal Period

Intensify the care of the mother of twins by ensuring the following:

- See the patient every two weeks from the 20th week
- Check blood haemoglobin levels at 30, 36, 37 weeks before labour to exclude anaemia
- Relieve any discomfort by advising on remedies for minor disorders of pregnancy
- Advise on diet to prevent anaemia
- Advise on the need for at least two hours rest in the afternoon and six to eight hours rest during the night
- The practice of admitting the patient between 30 to 36 weeks is now uncommon. It was necessary where home conditions were poor. It was intended for improving foetal growth through increased placental blood flow following enough rest in the hospital
- Improve maternal nutritional status
- Never allow the pregnancy to go post mature (post date) due to the danger of

placenta insufficiency

Management During First Stage of Labour

All cases of multiple pregnancy should be delivered in hospitals due to complications that may occur during labour. The following procedure should be followed:

- Take blood for grouping and cross match
- Avoid over sedating the mother during labour
- Prepare your delivery trolley with pairs of instruments for two babies. You should have a resuscitation trolley, baby labels, ergometrine or syntometrine in a syringe
- Put up the oxytocin drip if uterine action is not proving very effective
- Monitor and assess the progress of labour
- Delivery room must be warm
- Time the episiotomy properly
- Check foetal heart beats between each contraction
- Advise on ambulation if membranes are intact
- Encourage the mother to empty her bladder
- Reassure the mother
- Be friendly and display positive attitudes towards the mother and her family members

Management During Second Stage of Labour

Ensure that the following procedure is followed when managing the second stage of labour:

- It is preferable to have an obstetrician, paediatrician and anaesthetist present during the delivery.
- Preparations should be made for resuscitation and special care in case of low birth weight.
- Operating theatres should be ready to receive a mother at a short notice in case of emergency caesarean section.
- Deliver the head of the first twin slowly, clear the airway and hand the baby to the assistants.
- The assistant should label the baby and write ‘first twin’ or ‘twin one’.
- The lie of the second twin is checked (if longitudinal), then the presenting part is checked. If high, the presenting part is pushed down by fundal pressure and the membranes are ruptured.
- The mother is encouraged to push with each contraction and the baby should be born within 45 minutes.
- Oxytocin can be given immediately after delivery of the anterior shoulder of the second twin. It may also be administered after delivery of the placenta.
- As soon as the oxytocin takes effect, the uterus contracts.
- Both cords are taken simultaneously. The placenta and membranes will be delivered using control cord traction.

Complications in the Delivery of Twins

Management of Delayed Twin

Should you be confronted with a case of a delayed twin, the following steps should be taken:

- Ascertain if the lie is longitudinal.
- Assess the contraction and, if poor, ask your assistant to commence syntocinon drip to stimulate contraction.
- Encourage the mother to push during contraction.
- Vacuum extraction may be done when the doctor comes.

Management When Second Twin Lies in Transverse

You must ensure that you follow this procedure should you be confronted with a case where the second twin is lying in transverse:

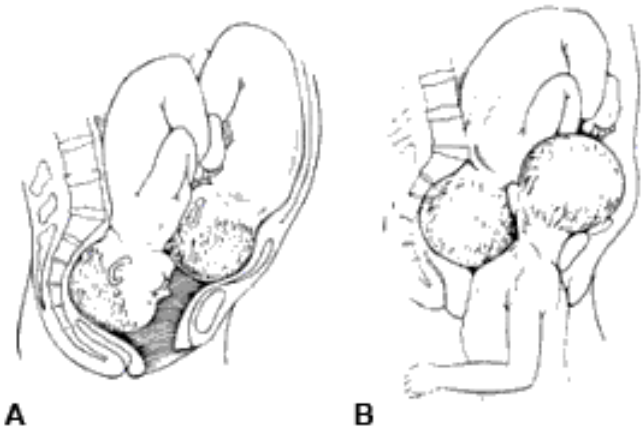
- Send for the doctor.
- Attempt external version when the membranes are intact.
- If you succeed in performing the external version, rupture the membranes and encourage the mother to push the baby.

Remember: In case you do not succeed, the doctor will perform an internal version and deliver the baby in breech.

Expulsion of the Placenta or Bleeding Before Second Twin

If the placenta is expelled soon after the first twin or there is bleeding:

- You should deliver the second twin as soon as possible by using fundal pressure in case of longitudinal lie.
- If this is not possible, inform a doctor as soon as possible and prepare the mother for caesarian section.
- Locked twins are very rare. To facilitate the birth of the second twin, decapitation of the first twin is necessary, but caesarean section for delivery of the second twin is the easiest and safest method.



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Conjoined Twins

A case of conjoined twins usually requires a

cesarean section. At times separation of the conjoined twins is possible.

Version

This is turning the foetus from an undesirable position to a desirable position. The two types of version are external version and pondalic (or internal) version.

External Version

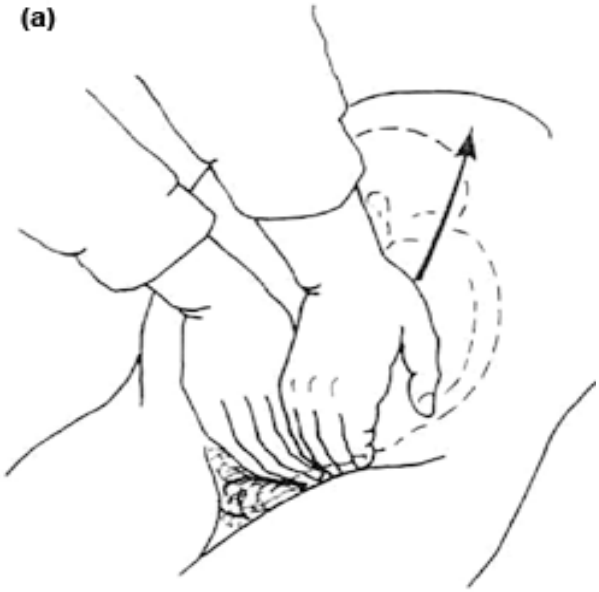
This is the external manipulation of the foetus through the abdomen and the uterine walls, used to correct malpresentation. The procedure is successful when done a month before term. Unfortunately, it is often felt that the foetus returns to its original position after a few hours. This procedure is outdated as caesarean section is recommended in malpresentations. It is now used by a midwife only in the delivery of the second twin in the case of transverse lie.
External version is contraindicated in the case of antepartum haemorrhage, high blood pressure, rhesus negative mother, previous scars and twin pregnancy.

Preparation

- Reassure the mother by explaining the procedure
- Make sure the bladder is empty
- The mother lies with partial flexion of the thighs to relax her abdominal muscles
- Sprinkle powder on her abdomen to prevent friction during the movement
- Engage the mother in conversation during the procedure to divert her attention so as to be relaxed. (Some doctors order valium one to two hours before the procedure)

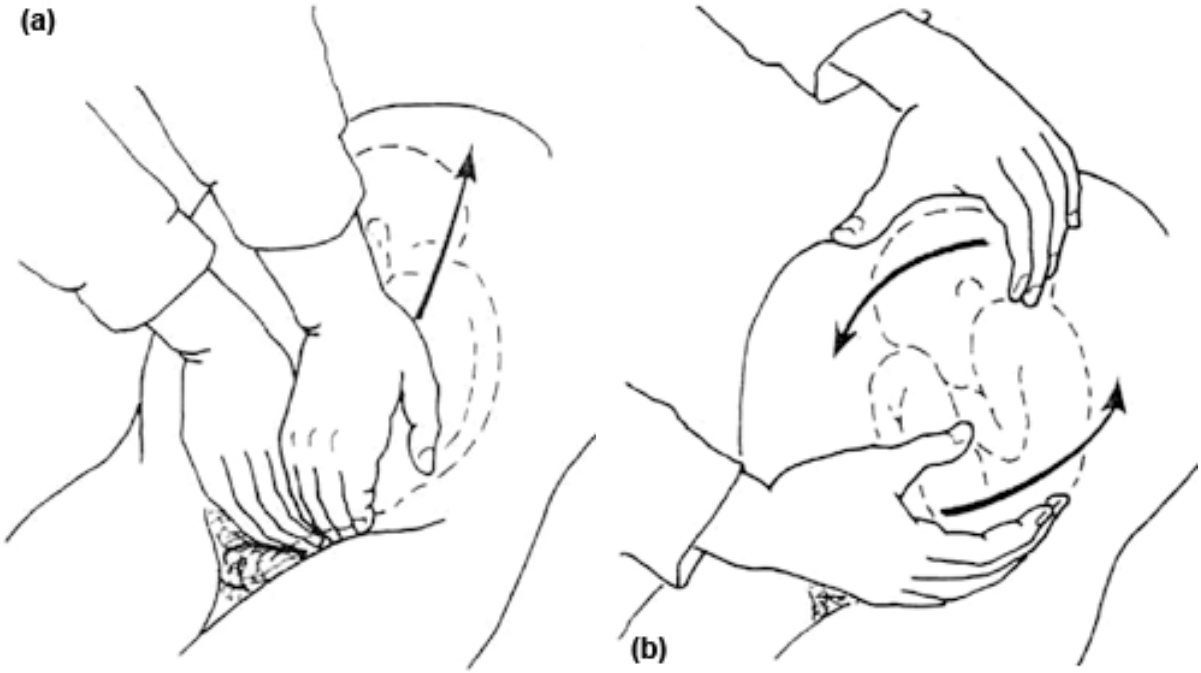
Disengage Breech

The doctor will locate the head and the back and disengage breech by pushing the breech upward with the fingers of both hands. Refer to the diagram on the right.



Make the Foetus do a Forward Somersault

Using steady pressure with one hand press upwards, turn the foetus laterally while the other hand presses on the head displacing it in the direction, which will increase flexion. (Follow the foetus' nose otherwise you will extend the head.)



Post-Version Steps

- Take the foetal heartbeat immediately after the version. For the first few minutes there may be alteration of the heartbeat but it will pick up within a few minutes.

- Observe the mother for three hours.
- If there is no bleeding per vagina, draining of liquor or contraction, advise the mother to report back after one week unless any problem arises.
- If the mother is rhesus negative, anti D should be given within the first 72 hours.

Pondalic Version

This is a manoeuvre designed to change any existing presentation to breech presentation. It is also known as internal version. This manoeuvre is useful in delivery of delayed or transverse second twin. It is now never used in any other circumstances.
While the cervical os is fully dilated, the whole hand is introduced high in the uterus. The baby's feet are grasped and pulled in the direction of the birth canal. The other hand helps to turn the foetus by pushing the head up at the fundus. The version is followed by breech extraction.

Care During Puerperium

For the mother with multiple births, involution is usually slow. The after pain is also often more troublesome. Care of the babies can be a major problem, so the mother should be initially helped with the feeding of the babies. Teach the mother how to feed so that she feels competent when discharged. For more detailed information see the section on Care of Normal Puerperium.

SECTION 2: ABNORMAL UTERINE ACTION

Introduction

Before you begin this section, it is recommended that you review the normal uterine function as you learnt it in the physiology of labour. This section explores abnormalities in uterine action, their causes and management.

Objectives

By the end of this section you will be able to:

- Explain the concept of abnormal uterine action
- Analyse the different types of abnormal uterine action
- Identify causes of various types of abnormal uterine action
- Describe the management of each type of abnormal uterine action

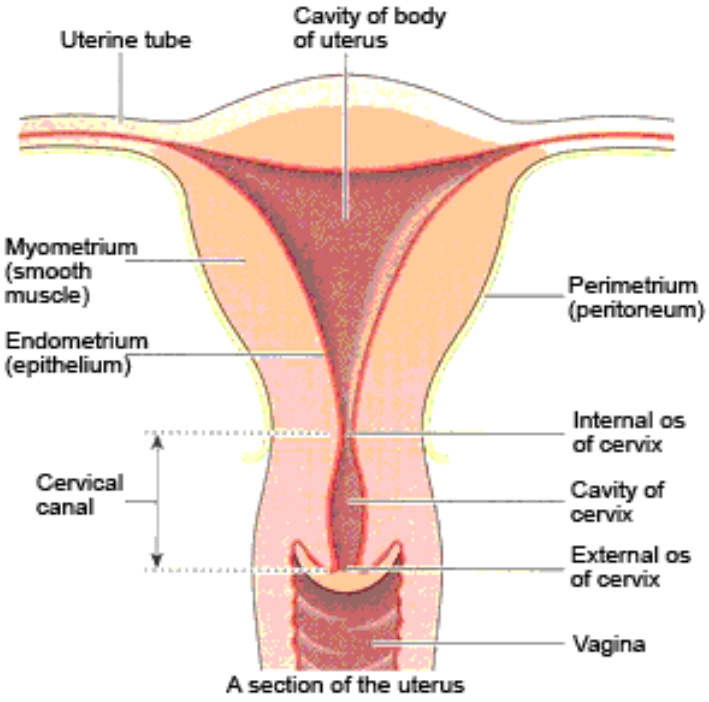
Abnormal Uterine Action

Abnormal uterine action is a dysfunction of uterine muscles due to neuromuscular disharmony. Some types of abnormal uterine action include:

- Hypotonic uterine action

- Incoordinate uterine action, including hypertonic lower uterine segment, constriction ring dystocia, colicky uterus and spurious labour
- Cervical dystocia
- Precipitate labour

You will now explore each of these conditions in more detail.



Hypotonic Uterine Action

This is poor tone in the uterine muscle fibres which results from weak/short contractions. The contractions are infrequent and cause less pain. The uterus may be indented at the height of a contraction. Both mother and baby are affected by the contractions. The effects of weak contractions bring about very slow or no cervical dilatation. This results in prolonged labour.

There are two types of hypotonia; primary and secondary uterine inertia also respectively known as primary and secondary hypotonia. Primary hypotonia starts at the onset of labour. The cause is unknown and it is common in primigravida. Secondary hypotonia occurs when labour has already been established. The uterus is exhausted and contractions slow down, due to:

- Retained second twin
- Cephalopelvic disproportion
- Malpresentation or malposition
- Effect after epidural anaesthesia

Management of Hypotonic Uterine Action

Admit the mother in hospital or transfer to a hospital if she is in a health centre.

Reassure her and then sedate her to reduce anxiety and calm her down to sleep. You should perform an abdominal and pelvic exam to exclude cephalopelvic disproportion. Determine the cause of OPP. If this is present she should be prepared for a caesarean section.
If there are no uterine contractions, these should be stimulated by administering an enema or repeat administration if it had been given previously.
You should check on the following factors:

- Frequency, strength and duration of the contractions
- Vital signs, that is, maternal pulse and BP and general condition
- Foetal heart rates
- Descent of the presenting part

A vaginal examination is done every two to four hours to determine cervical dilatation. The urine is tested every two hours for sugar, acetone and albumin. If there is foetal or maternal distress in the first stage of labour, the mother is prepared for caesarean section. However, if the mother is in the second stage or nearing second stage and contracting and dilating well, the delivery can be assisted by vacuum extraction.
The possibility of post partum haemorrhage should be kept in mind. Hence an intramuscular injection of syntometrin 1ml should be given at the birth of the anterior shoulder or egometrin at the crowning of the head.

Incoordinate Uterine Action

In cases of incoordinate uterine action, there is alteration in the polarity of the uterus with an increase in the resting tone. The uterus is very irritable. The contractions are strong, painful and erratic but in spite of strong contractions, the cervix dilates slowly. Clinically, the patient experiences a lot of pain both before and after contraction. She is exhausted and bears down early due to severe backache. This may lead to retention of urine. Foetal hypoxia occurs due to the hypertonic state of uterus, which interferes with the placental circulation.
On Vaginal Examination (VE) the cervix is noted to dilate slowly despite frequent painful contractions. The cervix is tight, unyielding and oedematous since the mother bears down with each contraction. There are four varieties of Incoordinate uterine action, which will be explored on the next page.
There are four varieties of Incoordinate uterine action described below.

Hypertonic Lower Uterine Segment

In this case, the lower uterine segment is hypertonic. There is loss of polarity and intermittent abdominal pains. The pains occur before and persist long after a uterine contraction. The cervix fails to dilate.

Colicky Uterus

The upper uterine segment contracts strongly and spasmodically. As a result of the different parts of the uterus contracting differently the cervical dilatation is ineffective. There may be reduced placental blood flow leading to
foetal distress.

There is intense clump-like pain, contractions are not effective and the uterus is tender. The mother may not experience severe backache.

Constriction Ring Dystocia

This condition happens one in every thousand labours (Myles, 1999). It is a localised spasm of a ring of muscle fibres. This is a result of disorganised uterine action. It is commonly found near the junction of both the upper and lower uterine segment. It usually embraces a narrow part of the neck of the foetus. It may happen at any stage of labour but if it occurs in the third stage, it is known as an hourglass constriction.

The spasm may be triggered by an early rupture of membranes. The hypertonic uterus is irritated by being moulded round the foetus or by interuterine manipulation.

The condition can be diagnosed vaginally when there is a delay in labour. There is no advance of the presenting part and the upper segment feels tender to the touch. Inhalation of amylnitrate or 10ml of 2% IV magnesium sulphate solution may relieve spasms.

Spurious Labour

Spurious labour is a condition where contractions occur before the onset of labour, which are painful and are accompanied by backache. Giving pethidine or morphine 1ml to relax the uterine contractions can abolish them. This differentiates it with true labour.

Management of Incoordinate Uterine Action

Cephalopelvic Disproportion (CPD) is usually the underlying cause of this condition. Malpresentation should be ruled out through an abdominal and vaginal examination.

If malpresentation is present, the patient should be prepared for a caesarean section.

If CPD is not present, she may be allowed to continue in labour. Close observation is carried out and a record of observations should be maintained.

Reassure the mother to allay anxiety. Make observations of the foetal heart rate, maternal pulse, and respiratory rate half-hourly. Blood pressure should be taken every four hours and urine testing should be done every two hours. Any signs of maternal/foetal distress; dehydration and ketosis, should be reported promptly and may be corrected by giving intravenously (IV) 5% dextrose alternating with normal saline. You should always maintain an intake and output record.

Sedate the mother to relieve pain, calm her down and enable her to sleep. Epidural analgesia is very effective in prompting normal uterine action (or pethidine if added to the drip). A low dose of 0.5mg syntocinon drip can be given. If, after four to six hours, there is still no progress, the mother should be prepared for a caesarean section.

A small proportion of mothers with Incoordinate uterine action may end up in normal delivery or vacuum extraction. The midwife should be able to make the correct judgement call.

Cervical Dystocia

Cervical dystocia can be divided into two classes; primary and secondary.

Primary Cervical Dystocia

In primary cervical dystocia, the uterine contractions are normal. The presenting part is low down in the pelvis but the cervix fails to dilate. The delay is due to the formation of a cartilaginous ring round the cervix.

This condition occurs mainly in primagravida whereby the first stage is prolonged and there is severe and persistent backache. On vaginal examination the cervix feels thin, tight and unyielding.

Secondary Cervical Dystocia

This type occurs due to previous trauma to the cervix, for example, tears which were repaired, scarring or from infection. The cervix fails to dilate in spite of good uterine contractions.

The management of cervical dystocia is by encouraging the mother to lie on her back, elevation of the bed foot to ease pressure on the cervix and care must be taken to avoid lacerations. Caesarean section should be done to hasten delivery of the baby.

Cervical dystocia can be further divided into one of three types, any of which can occur as primary or secondary cervical distocia.

Rigid cervix

Rigid cervix is a rare condition in which the cervix fails to dilate despite normal uterine contractions. It is characterised by severe persistent backache. On vaginal examination the cervix feels thin, tight and unyielding.

Annular detachment of the cervix

Annular detachement of the cervix is characterised by persistent and prolonged pressure on the rigid cervix, which causes ischemia. The necrosed ring of the cervix is detached and expelled and contributes to a uterine rupture.

Oedematous anterior lip of cervix

Oedematous anterior lip of the cervix involves the anterior lip being nipped between the foetal head and the pelvic brim. It becomes swollen due to pressure. On vaginal examination the oedematous cervix feels like a firm ridge as thick as a finger. It may also be seen at the vulva as a bluish glistering cervix. It delays the first stage of labour, as the cervix does not dilate quickly.

Precipitate Labour

In the case of precipitate labour, the contractions are strong and frequent from the onset of labour. This results in an abnormally rapid progress of labour and delivery may occur within an hour from the onset of labour.

There are several types of complications, which can occur.

Maternal complications include cervical and perenial lacerations. The uterus may fail to contract during the third stage of labour, leading to a retained placenta. Post partum haemorrhage, uterine inversion, shock and collapse may occur due to sudden

relief of pressure.
Foetal complications include foetal hypoxia, which may occur as a result of frequent and strong contractions. Rapid moulding may result in intracranial pressure and, during delivery, this may lead to intracranial haemorrhage. Asphyxia may occur due to rapid expulsion of the baby's unmoulded head.

Remember: Precipitate labour tends to recur. Therefore, with future pregnancies the mother needs to be admitted early into hospital for safe delivery.

Over-Stimulation of the Uterus

This may occur as a result of excessive use of syntocinon or prostaglandin, which may cause tetanic contractions with inadequate periods of relaxation.
Complications of over-stimulation of the uterus include foetal hypoxia. If uterine spasms that reduce the transfer from the placenta of foetal oxygen are not treated, foetal death may occur. Other complications include precipitate labour and rupture of uterus in cases of disproportion.
Methods of management should include the following:

- Stop the administration of syntocinon or prostaglandin at once
- In case of tonic contractions, the patient should be given two puffs of ventolin inhaler
- If there is foetal distress, give dextrose IV and oxygen by mask

Tonic Contractions

This is where the contractions are excessively longer, stronger and more frequent. This results in almost continuous contractions with short periods of relaxation. Tonic contractions are caused by cephalopelvic disproportion. The uterus attempts to overcome the obstruction and so it increases its strength and frequency. The condition is common in primigravidae.
Possible complications of tonic contractions include the rupture of the uterus and foetal death due to prolonged labour.

Management of Tonic Contractions

If the patient is on syntocinon drip, it should be discontinued and the doctor informed. The vital signs, including observations of pulse and blood pressure, should be monitored carefully.
There are several factors, which predispose to abnormal uterine action, these include:

- Age, the elderly primigravida is more likely to have abnormal uterine action
- Parity, the condition is more frequent in primigravida
- Cephalopelvic disproportion or malpresentation OPP, which may either cause hypotonic uterine action or incoordinate uterine action

- Post maturity
- Other factors like over distension of the uterus in multiple pregnancy
- Early rupture of membranes
- Emotional tension of the patient

SECTION 3: TRIAL OF LABOUR, INDUCTION OF LABOUR AND PROLONGED LABOUR

Introduction

This section examines difficulties that can be experienced during labour, how labour can be induced and the conditions of prolonged and obstructed labour.

Objectives

By the end of this section you will be able to:
- Define trial of vaginal delivery
- Explain foetal distress
- Describe the different methods used in induction of labour
- Describe management of prolonged labour
- Explain the complications of prolonged labour
- Describe the preventive measures of prolonged labour
- Explain the concept of obstructed labour
- Identify signs of obstructed labour
- Describe the management of obstructed labour

Trial of Labour

Trial of labour is a test of labour conducted where there is a minor or moderate degree of Cephalopelvic Disproportion (CPD) in which it is difficult to decide whether delivery per vagina is possible.

Factors influencing good prognosis

There are several factors influencing good prognosis. These are:
- Strength of the uterine contractions
- Flexion of the head
- Degree of moulding of the foetal head, that is, reduced engaging diameters
- The giving of pelvic joints. In pregnancy, the joints of the pelvis are relaxed and separate by half to one centimetre
- Maternal courage

Factors influencing poor prognosis

The factors influencing poor prognosis are:
- Early rupture of membrane which may be accompanied by prolapsed cord
- Poor moulding of the head
- Maternal or foetal distress which will necessitate intervention on trial of vaginal

delivery

Remember: Do not hesitate to terminate the trial of labour when there is foetal or maternal distress.

Contraindications for trial of labour

Compare the following list of contraindications for trial of labour with those you learnt in normal labour:

- Grossly contracted pelvis
- Medical or obstetrical complications
- Malpresentations, for example, breech
- Elderly primigravida
- Cases where trial of labour failed before
- Cases of two previous caesarean sections

Remember: Your encouragement and friendly attitude will boost the mother's morale.

Management of Trial of Labour

Explain the situation to the mother and prepare her for possible operative intervention. Assess patient carefully on admission to ascertain the following:

- Whether the mother is in established labour
- Presentation of foetus
- Check for flexion of the head
- State of foetal heart, that is, rate, rhythm and volume
- General condition of mother physically and emotionally
- Confine the mother to bed to prevent early rupture of membranes
- Close observations of temperature and blood pressure every four hours
- Observe foetal heart rate and maternal pulse quarterly to half hourly

You should always observe for signs of foetal and maternal distress. Accurately observe and record for onset, strength, frequency and duration of the contractions. Closely observe the descent of the head every one to two hours per abdominal palpation by the same midwife if possible. Encourage the mother to pass urine every two hours and test for acetone to
exclude acidosis.

Management of Trial of Labour

A vaginal examination should be done every four hours to assess the level of the presenting part, the degree moulding and flexion, the dilation of the cervix (whether progressive or not), the consistency of the cervix and the presence or absence of caput.
You should also check whether the membranes are intact or ruptured. Encourage adequate hydration by giving intravenous 5% dextrose. Sedate the mother with pethidine or morphia in early labour to promote rest, and reduce anxiety.

Undesirable Factors in Trial of Labour

Undesirable occurrences include:

- Rupture of membranes
- Colour of liquor is meconium-stained

- Uterine action is abnormal
- Abnormal presentation, where there is a change from vertex to brow
- When the presenting part fails to descend in spite of good uterine contraction
- When there are signs of foetal or maternal distress

Trial of labour may result in spontaneous vaginal delivery, assisted vaginal delivery by either forceps or vacuum, or caesarean section due to complications.

Trial of Scar: Vaginal Birth After Caesarean Section

Trial of scar is a test of labour for a woman with a previous caesarean section scar, where no recurrent indication is present.
Studies have shown that some 60 – 65% of previous caesarean section mothers (Reedes/Martin, 1987) deliver per vagina, involving same or fewer risks than a repeated section. The trial should be in a facility where, if there is a need for a caesarean section, this can be performed immediately. The midwife should be vigilant in making the necessary observations.

The Main Contraindications to Trial of Scar

The main contraindications include:

- Where the reason for the first scar is likely to be repeated, for example, in cephalopelvic disproportion
- Classical type of caesarean section
- Malpresentation, for example; breech
- Two previous caesarean section scars, regardless of the causes
- Where the previous scar wound did not heal with the first intension
- Where pregnancy occurs within six months of a caesarean section
- Where there is over-distension due to multiple pregnancy or hydromnious
- Multiparty

The management of this mother is as for trial of labour with the addition of these few points below:

- Palpate abdomen gently
- Check for any tenderness over the scar
- Observe for any signs of impending rupture of the uterus
- Report any constant pain in abdomen

Educating the Patient on Avoiding Unnecessary Caesarean Birth

A small percentage of women with conditions that are a threat to the foetal or maternal life need a caesarean section. Many other women have a caesarean section due to a series of events, which leads to an inevitable section seen as necessary at that particular time. For some, if other options had been discussed earlier, a caesarean section may have been avoided.
Some mothers insist on the operation if the month coincides with the previous month of birth of other children, so as to have the same birthdays for their babies. Others prefer not to push and go through the whole process of enlarging the birth canal. If these women were well informed, they might see the sense of preventing a caesarean section.

Additional contributing factors to the decision to have a caesarean section include mismanagement of the syntocinon drip, choice of obstetrician and/or hospital policy.

Maternal Distress

This is a serious and life threatening condition, which should not occur in this era. It happens when the metabolism and the electrolyte balance of the woman in labour is disturbed and this can result into ketoacidosis hypotonic uterine inertia. Maternal and foetal distresses usually occur together after prolonged labour.
In maternal distress, the accumulation of ketoacids and the electrolyte imbalance also affect the metabolism and function of all the other muscles in the body. The intestines stop contracting, which is known as intestinal ileus. The large intestine (colon) distends. Emptying of the stomach is delayed. With large volumes of fluid stagnating uselessly in the stomach, and the small and large bowel, the woman becomes dehydrated. These disturbances in the mother result in a similar disturbance in the foetal metabolism. Often maternal and foetal distress present together in women who have been in labour for a long time at home and are brought to a health centre or hospital in poor condition.
The main symptoms of maternal distress are that the mother is exhausted by severe pain and lack of sleep and she might have severe abdominal pain because of the prolonged and obstructed labour.

- She displays signs of anxiety
- She has a dry and furred tongue
- Her pulse rate is over 120 beats per minute
- Rapid and deep respiration because of acidosis
- She has hot, dry and inelastic skin
- She has a distended abdomen
- There is a reduced output of highly concentrated urine
- Her temperature is 38°C
- She might already have a purulent discharge from an intrauterine infection due to early rupture of the membranes

The main investigation is testing for the presence of acetone in the urine.
The management of Maternal Distress involves giving an infusion of 10% glucose to correct dehydration. A caesarean section is performed when in the first stage of labour. In the second stage, an episiotomy is given and delivery is assisted with vacuum extraction.

Foetal Distress (Fetal compromise)

Foetal distress occurs when the foetus is deprived of oxygen and, as a result, develops hypoxia. The baby may be born as a still birth or develop asphyxia and suffer brain damage.

Causes of Foetal Distress

- Congenital malformation
- Problems with the cord, for example, prolapse, true knot, twisted round the neck
- Obstetric complications

- Mother's condition of preeclampsia/eclampsia
- Severe anaemia, APH

Intra-partum causes include:
- Prolonged labour
- Malpresentation and malposition
- Shoulder dystocia

Foetal tachycardia of more than 160 per minute is an early sign while foetal bradycardia or pulse less than 120 beats per minute is a late sign of foetal distress. Foetal heart acceleration related with uterine contraction is another sign of foetal distress.

Management of Foetal Distress

When foetal distress is anticipated, a blood sample is taken, the normal pH being 7.35. If this falls to 7.2, labour has to be terminated. Below pH 7 the brain cells perish. When there are signs of foetal distress, call the doctor. If the mother is on an oxytocin drip, stop it immediately. Change the mother's position and give oxygen by facemask. If the mother is in the first stage of labour, a caesarean section should be performed.
If she is in the second stage, an episiotomy should be given. Forceps or vacuum hastens the birth. A paediatrician should always be present, if possible.

Post Term Pregnancy

Prolonged pregnancy, or post term pregnancy, refers to a pregnancy that has exceeded 294 days from the first day of the last menstrual period. The difference between this term and post maturity or post mature is that the latter relates to the baby and refers to features or conditions of the neonate.
It has been proven that the duration of pregnancy differs depending on parity and race. Primagravidae have a longer duration of 288 days, compared to multigravidae, who normally have a duration of about 283 days.
To determine prolonged pregnancy is not easy as the mother may give wrong dates. Assessing the gestation period by clinical estimation can be inaccurate because of the biological variation in the size of the mother and the foetus. Quickening cannot be relied on as there is a range of weeks. A primagravida may start feeling quickening between 15-22 weeks while a multigravida may feel quickening at 14-22 weeks. An ultrasound may be relied on in the assessment of maturity. Early scanning can also help to reduce the mistake of diagnosing prolonged pregnancy.

Risks of Post Term Pregnancy

There is low prenatal mortality at 40 weeks, which increases at 42 weeks. The post term period contributes to foetal maturation, with big babies weighing 4,000gm in 10% of cases and 4,500gm in 1% of cases. This can result in cephalopelvic disproportion or shoulder dystocia. There is a reduction of amniotic fluid, which may result in cord compression and reduction of the placental function. There is also a high risk of foetal distress. The management of post term pregnancy usually involves induction of labour

(Myles 1999).

Induction of Labour

Induction of labour involves the initiation of uterine muscle contraction by artificial means.

Remember: Make sure that when labour is induced it will result in a viable baby.

Indications

- When the health or well being of the mother or the foetus would be endangered if the pregnancy continues
- Prolonged pregnancy because after 42 weeks there is danger of placental insufficiency
- Preeclampsia, where both mother and baby are in danger, with the mother in danger of eclampsia and the baby in danger of placental insufficiency
- Signs of intrauterine growth, retardation, which can be detected by abdominal examination or serial ultrasound scan
- Placental insufficiency more common in primigravida aged over 35 years
- Poor obstetric history, for example, history of stillbirth or intra uterine growth retardation in previous pregnancies
- Polyhydramnious, foetal abnormalities
- Spontaneous rupture of membranes. If membranes rupture spontaneously after 36 weeks gestation and labour does not commence within 12 hours, danger of intra uterine infection is very high
- Previous large baby, where weight was over 4kg. Induction is indicated between 38 - 40 weeks. Foetal size tends to increase with successive pregnancies
- Diabetes mellitus, noting that intrauterine death tends to occur near term so induction is indicated between 36 - 38 weeks
- Rhesus iso-immunisation, where rhesus antibodies are present in the maternal serum and the titre is high, labour should be induced to save the life of the baby
- Unstable lie when placenta praevia and pelvic abnormalities have been excluded
- Genital herpes, where labour is usually induced after 38 weeks gestation if disease is in remission
- Previous precipitate labour which tends to recur so induction is indicated at 38 weeks
- Social reasons, which is not common in our community but occurs sometimes
- Intrauterine death

Foetal Maturity and Viability

Where possible amniocentesis may be performed. The lecithin to sphingomyelin ratio in the liquor is calculated in order to estimate the foetal pulmonary maturity. When the ratio is less than two to one, it means that the lungs are not yet mature and induction of labour should be delayed. At times, steroids are given to the mother to stimulate the foetal lungs to produce surfactant to reduce the risk of RDS (Respiratory Distress

Syndrome).

Remember:
You must also make sure you have excluded any contraindications for induction of labour.

Contraindications for the Induction of Labour

- Cephalopelvic disproportion
- Unreliable estimated date of delivery. Confirm estimated date of delivery and maturity by ultrasound
- Malpresentation
- Oblique or transverse lie
- Foetal compromise, that is, if the foetus could not stand the uterine contractions due to prematurity or placenta insufficiency. In such cases caesarean section is preferred
- Psychological factors, for example, if the mother is against induction, her decision should be respected
- Placenta previa

Favourable factors for induction include:

- 38 or more weeks of gestation
- Bishop's score of six or more
- Where 3/5ths of the head or less is palpable above the pelvic brim

here are different methods of induction, which are:

- Medical, where drugs alone are used and the amniotic sac remains intact
- Surgical, where the membranes are artificially ruptured
- A combination of medical and surgical intervention

You will now explore each of these methods in more detail.

Medical Induction

Intravaginal prostaglandin E2 are used in the form of pessaries (2.5mg), vaginal tablets (3-6mg) or gel (2.5-5mg). A nelatone urinary catheter is attached to a syringe containing the gel while membranes are intact in case of intrauterine infection. Introduce the gel to the posterior vaginal phornix.

The dose varies from 2.5mg-5mg. If there is no change overnight, prostaglandin may be added/repeated, but if the cervix ripens overnight, then pessaries of prostaglandin E2 may be introduced to the vagina.

The following steps should be taken to ensure adequate care of the mother during the procedure:

- Maximum of an hour is needed to allow absorption of the prostaglandin, so the mother should be asked to stay in for this period
- Observations are carried out as in normal labour
- After one hour, if foetal heart is normal, the mother should be allowed to walk around

- After four hours, if labour has not been established, a vaginal examination should be done to reassess the cervical dilatation
- If there has been some progress, artificial rupture of the membranes is done and a syntocinon drip is commenced two hours later to prevent sensitivity of the uterus

Oral prostaglandin is usually used to induce labour where the membranes have ruptured. One tablet is swallowed at an hourly interval. A maximum of ten tablets should be administered. Each tablet contains 0.5mg of prostaglandin E2. Should it cause diarrhoea, the administration should be stopped immediately.

You should note, however, that there are several complications associated with prostaglandin. The mother may suffer discomfort due to painful contractions. The induction may be ineffective.
Over-stimulation of the uterus can cause foetal and maternal distress.

Another variety of medical induction is oxytocin administration. The amount and rate of oxytocin must be carefully calculated and administered. Usually 5% dextrose in water of 500mls with five units of syntocinon is commenced after a vaginal examination. The drip is started at 15 drops per minute and increased by ten drops after every half-hour to a maximum of 60 drops. Using two bottles of the same solution is preferred so that in the event of discontinuation of oxytocin, the intravenous line will still be open.

It is crucial to label the amount of syntocinon put in both the bottle and the 2.5ml IV for multiparous and 5ml IV for primigravida chart.

Factors Which Should be Observed and Recorded During Oxytocin Infusion

- Dosage of oxytocin, the name and amount of solution
- Rate of flow
- Vital signs and foetal heart rate every 15-30 minutes
- Vaginal examination findings four hourly
- Maintain intake and output chart
- Record in the chart any other treatment that is given

Possible Complications of Oxytocin Use

- Hypertonic uterine contraction causing foetal distress
- Tetanic and tumultuous contractions, which can result in abruptio placenta
- Birth injury due to rapid expulsion of the baby
- Mother may develop hypertension with frontal headache

Remember:
If any one of the above signs occurs, stop the syntocinon drip immediately and inform the doctor.

Medical Induction

The Bishop Score is an objective method of assessing whether the cervix is favourable for induction of labour. The table below shows how the score is calculated.

Bishop Score Table

Scores					
Inducibility features		**0**	**1**	**2**	**3**
1	Consistency of cervix	Firm	Medium	Soft	-
2	Position of cervix	Posterior	Mid	Anterior	-
3	Length of cervix in cm	>2	2	1	<0.5
	(or Effacement)	(0-30%)	(40-50%)	(60-70%)	(80%+)
4	Dilatation of cervix	Closed	1-2cm	3- 4cm	5cm+
5	Station of presenting part 1 cm above or below ischial spines	-3	-2	-1,0	3

Each score is awarded 0 - 3 and the range of scores is 0 - 13. A total score of six or over is favourable. However a score of nine or more will have a safe, successful induction with an estimated length of labour of less than four hours.

Surgical Induction (Amniotomy)

In the case of an uncomplicated pregnancy, a sweep of the membranes is an effective method of inducing labour. After a vaginal examination, the index finger is swept through the cervical os to detach foetal membranes from the deciduas. The action produces prostaglandin.

Amniotomy is an Artificial Rupture of the Membranes (ARM), which is carried out to induce labour when the cervix is favourable. A well fitting presenting part is essential to avoid prolapse of the cord or rupture of the membranes. Allow the descent of the presenting part to the cervical os. This raises the level of prostaglandin which stimulates strong contractions to hasten labour. This method of induction may be combined with oxytocin drip and this is referred to as combined method. This method has likelihood of delivery within 12 hours, requires less analgesia and reduces the risk of Post Partum Haemorrhage (PPH).

Hazards Associated with Artificial Rupture of Membranes (ARM)

- Intrauterine infection due to contaminated instruments
- Cord prolapse
- Early foetal heart deceleration
- Bleeding due to vasa or placenta previa

Remember:
Due to the potential risks of this method, it is now being discouraged in this era of HIV/AIDS.

Prolonged Labour

The term 'prolonged labour' is used when delivery does not take place after 12 hours of established labour (Baird 1952, Myles 1999). Different terms are used for prolonged labour at different times or for different reasons.

Prolonged Latent Stage

The latent phase lasts from the onset of labour to three centimetre dilatation of the cervical os. If this phase takes more than 20 hours in a primigravida and more than 14 hours in a multigravida, it is considered prolonged. In practice diagnosis should be suspected and treatment instituted many hours before this time interval has elapsed.

Primary Dysfunctional Labour

This is when active phase of labour is slow and the cervix dilates at less than one centimetre per hour.

Secondary Arrest

This is when there is slow cervical dilatation in the active phase after normal progress in early labour.
There are numerous causes of prolonged labour at each stage.

Causes of Prolonged First Stage of Labour

- Poor uterine contractions, leading to the cervix dilating slowly or not at all
- Pelvic abnormalities (passage), where contracted pelvis and tumours of the pelvis cause poor progress in labour
- The foetus (passenger) is a large baby, or there is malposition or malpresentation, which prevent the descent of the foetus, for example, occipito-posterior position or shoulder presentation
- Psychological causes, for instance; tension and fear of the unknown tend to prolong labour, most commonly in women who are primigravidae

Casues of Prolonged Second Stage of Labour

- Secondary hypotonic contractions may cause a delay
- Poor maternal effort, which could be due to fear, exhaustion or lack of sensation

due to epidural block, which may inhibit the woman's ability to bear down
- A rigid perineum, which may prevent the advance of the foetus. During the perineal phase, an episiotomy should be performed at the height a contraction
- Reduced pelvic outlet, as in the android pelvis, which narrows at the outlet due to its prominent ischial spines and narrowed sub-pubic arch
- A large foetus, malposition or malpresentation, leading to a large presenting diameter, accounting for the delay

Remember: You should reassure the mother at all times during labour.

Diagnosis of Prolonged Labour

Now that you have seen the possible causes of prolonged labour, you will now focus on the diagnosis of prolonged labour. The following methods may be used to diagnose prolonged labour:

- Proper history of labour including type, duration and frequency of uterine contractions
- Examination of the mother, checking for general appearance, whether distressed or exhausted
- Check the temperature and pulse as an increase of either of them would be significant
- Urinalysis, where concentrated urine suggests fluid imbalance and dehydration. Check for ketones in the urine, the presence of this must be corrected at once
- It is important to identify the cause in order to decide the course of action.

Management of prolonged labour involves management as in normal labour but with some additional steps.

Additional Steps Required in the Management of Prolonged Labour

- When progress of labour is delayed due to poor uterine contractions, syntocinon drip must be put up. If there is no progress in spite of good uterine contraction, labour should be terminated by caesarean section
- Assist the mother to adopt a comfortable position
- Start an intravenous infusion to correct dehydration and ketosis, for example, Ringer's lactate solution or 5% dextrose
- Encourage the mother to empty her bladder every two hours and test the urine for ketones to exclude maternal distress
- Maintain a fluid input and output chart
- Allow sips of water if absolutely necessary even in anticipation of general anaesthesia
- Give oral ranitidine (zantac) 15mg every six hours to reduce gastric secretions
- Give broad-spectrum antibiotic if membranes rupture early (within 24 hours)
- Observe and record every two to four hours temperature, pulse, respiration and blood pressure
- Contractions should be recorded every 15 to 30 minutes and take care of the

bladder every two hours

Foetal Condition in Prolonged Labour

The following steps should be taken to monitor the foetal condition:

- Monitor the foetal heart continuously every quarter to half hour.
- Observe the amniotic fluid for presence of meconium to rule out foetal distress.
- For secondary hypotonic uterine contraction, commence an intravenous infusion of syntocinon with 10% dextrose to stimulate adequate contractions
- Ensure that the presenting part is visible before encouraging the mother to push.
- Perform an episiotomy under local anaesthesia or at the height of a contraction if the perineum is rigid.
- If the cause was obstruction at the outlet as in android pelvis, and the head is arrested mid pelvis resulting to foetal distress, caesarean section is recommended.

Complications of Prolonged Labour

There are a number of complications, which may be experienced by both the mother and the foetus during a prolonged labour.

Maternal complications

- Oedema of the pelvic floor due to the pressure of the presenting part on the pelvic floor and the vaginal walls
- Retention of urine due to continuous compression of the urethra by the presenting part causing bruising which might persist during puerperium
- Ruptured uterus due to overstretching of the lower uterine segment
- Deep perineal tears due to overstretching of the perineum, leading to cystocele or rectocele
- The overstretching of the pelvic floor and uterine ligaments may also cause uterine prolapse
- Stress incontinence

Foetal complications

- Intra cranial damage due to excessive moulding
- Foetal hypoxia, which will lead to asphyxia
- Intra cranial haemorrhage due to prolonged compression of the head, and difficult instrumental delivery

Prevention of Prolonged Labour

Good prenatal care is essential to prevent prolonged labour.
This includes:

- Taking a proper history in relation to cases of previous difficult deliveries
- Detection of malpresentation and malposition

- Any sign of contracted pelvis should be referred to the obstetrician in time to make a timely decision on the mode of delivery

During labour you should take the following steps:

- Maintain proper partograph of the mother in labour and take early decision
- Ensure proper control of the syntocinon drip
- Ensure bladder is emptied every two hours to avoid delay of labour

Obstructed Labour

Labour is obstructed when there is no advance of the presenting part in spite of strong uterine contractions further progress is impossible without assistance. Usually the power (contractions) involves the passage (the birth canal) and the passenger (the foetus). Obstruction usually occurs at the pelvic brim, but may occur at the outlet, for example, in an android pelvis.

Compare the causes of obstructed labour with those of prolonged labour. In obstructed labour, the problem is the passenger and passage (never the power). Usually this is when the passenger has gross abnormalities. This is the opposite of prolonged labour where the 'power' may be the main issue and the passenger or passage have mild or moderate problem.

The Main Causes of Obstructed Labour

- Cephalopelvic disproportion
- Malpresentation, for example; shoulder, brow presentation or persistent mentoposterior position
- Fibroids or tumours located in the lower uterine segment
- Cervical dystocia
- Gross foetal abnormalities e.g. hydrocephalus, locked twins
- Disordered uterine action

Diagnosis of Obstruction of Labour

Early Signs

- The presenting part does not enter the pelvic brim despite good uterine contraction
- The cervix dilates slowly and hangs loosely like an empty sleeve due to poor application of the presenting part
- The membranes tend to rupture early

Later Signs

- Foetal and maternal distress, which occur concurrently
- The contractions are hypertonic and the mother does not relax in between them
- The uterus is moulded around the foetus

- The mother may have pyrexia and tachycardia
- On vaginal examination, there is presence of large caput
- The vagina feels hot and dry and the cervix and vulva are oedematous
- In cephalic presentation, the presenting part becomes wedged and immovable when it descends partly into the pelvis
- It is difficult to pass urine, if catheterised, the urine is bloodstained due to the bruised urethra
- Urinary output is poor
- Uterine exhaustion occurs and contractions cease for a while, only to recommence with renewed vigour, especially in primigravida
- A Bandle's ring is seen abdominally as the lower segment is progressively enlarged and thinned out and the upper segment becomes shorter and thick

Prevention of Obstruction of Labour

Obstructed labour can be prevented through the following measures:

- Good prenatal care to detect mothers at risk
- Clinical and radiological investigations of pelvis adequacy if necessary during the prenatal period
- Careful assessment of the progress throughout labour to detect lack of descent before labour is obstructed
- Taking and interpreting vital observations during labour. This includes foetal heart rate, maternal pulse, temperature and blood pressure, assessment of length, strength and duration of uterine contractions, cervical dilatation four hourly
- Alert an obstetrician immediately, If obstructed labour is suspected
- Commence an intravenous infusion if not already commenced
- Take blood for grouping and cross match in case transfusion is needed. (Keep ready two units of blood) catheterise to empty the urinary bladder
- Maintain asepsis techniques to prevent infection
- In case of early rupture of membranes, give prophylactic antibiotic (as ordered by the doctor)
- Give pre-medication as per doctor's order (Pethidine 100mg IM stat)
- Prepare the mother for emergency caesarean section if in the first stage of labour

In the second stage of labour, failure to progress may be caused by deep transverse arrest. If obstruction cannot be overcome by rotation and assisted birth, a caesarean section should be performed as soon as possible.

The newborn unit should be informed to prepare to receive an asphyxiated baby. Resuscitation equipment should be kept ready and a paediatrician should be present at birth. The surgeon will check carefully for any indication that the uterus has ruptured before taking the patient to theatre for repair of the uterus.

If the labour is obstructed and the foetus has died, the mode of delivery will still be caesarean section, as vaginal birth cannot
be achieved.

The following advice should be given to mothers on the prevention of obstructed labour:

- Mothers should attend antenatal clinic as soon as they realise they are pregnant

- All mothers who have had a previous caesarean section should have a hospital delivery
- Discourage home deliveries, especially of primigravidae and grand multiparous
- Educate traditional birth attendants on early signs of obstructed labour
- Provide health education to the community on the risks of too early or too late pregnancies
- Advise pregnant mothers on the importance of a well balanced diet

Complications Occurring in Obstruction of Labour

There are a number of complications, which may be experienced by both the mother and the foetus during obstructed labour.

Maternal complications

- Rupture of the uterus, due to excessive thinning of the lower uterine segment
- The bladder is traumatised by pressure of the foetal head during labour and delivery. When the bladder or rectum is bruised, this may cause vesico-vaginal fistula or recto-vaginal fistula
- Injury due to a difficult instrumental delivery
- Urinary incontinence due to prolonged compression of tissues causing necrosis of the bladder
- Prolonged rupture of membranes may cause intra uterine infection
- Maternal death occurs when operative delivery is carried out before shock and dehydration is corrected
- Death can also occur in ruptured uterus due to haemorrhage.
  You will discuss this in greater detail in the section on
  Obstetric Emergencies.

Foetal complications

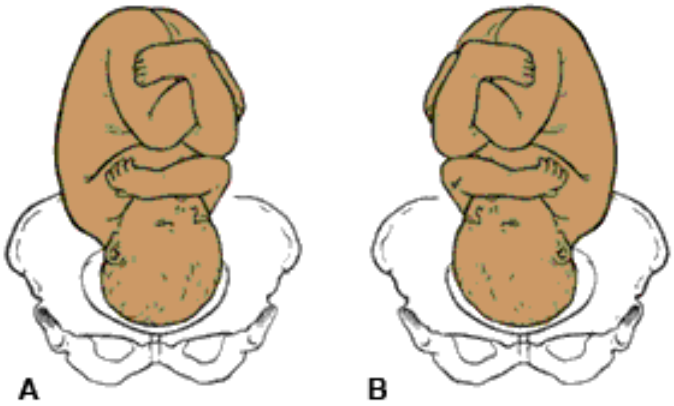
- Intrauterine asphyxia, leading to intracranial damage, that is, permanent brain damage or stillbirth
- Intracranial haemorrhage
- Neonatal pneumonia due to ascending infection resulting from meconium aspiration
- Neonatal death

Malposition of Occiput and Malpresentation

The foetus is not always in the desired position or lie in the uterus. As a result of malposition there is malpresentation of the foetus. The midwife needs to be aware of the various possible malpresentations their complications and how to manage the situation. Several malpositions of the occiput and malpresentations in general are discussed in the following pages.

Occipito Posterior Position

Occipito posterior position is a malposition of the occiput. In this position, the vertex is present but it occupies the posterior position instead of the anterior. The occipito posterior position can be either left or right. The cause is not clear but it is associated with abnormalities of the pelvis.



Right (A) and left (B) occipito posterior position.

Diagnosis of Occipito Posterior Position

On inspection of the abdomen you will notice a saucer shaped depression at or below the umbilicus. The unengaged head will outline the bladder as if it is a full bladder.
On palpation the head is high, as the engaged diameter of 11.5cm cannot enter the brim until flexion takes place. The head feels large and the occiput and sinciput are on the same level. The back is difficult to palpate. Limbs are felt on both sides of the abdomen.
On auscultation the foetal heart is heard on the right flank. It could also be heard at the umbilicus, either at the middle line or slightly to the left.
During labour the mother may complain of severe backache. You may note a slow descent of the presenting part in spite of good contractions. Early rupture of membrane may occur.
On vaginal examination the diagnosis can be confirmed on feeling the anterior fontanelle to the left anterior in ROP. The Sagittal sutures will be in the right oblique of the pelvis, but the findings will depend on the degree of flexion of the head.

Management of Labour in the Occipito Posterior Position

In the occipito posterior position you should expect prolonged, painful labour due to poor fitting of the presenting part, which does not stimulate good contractions.

First Stage of Labour

The mother may experience severe backache. You should give a back massage and encourage the mother to remain mobile as long as she can and to adopt what ever position that is most comfortable to her. Most women find the all-fours position most comfortable, pain relieving and is also believed to aid in the rotation of the foetal head.
Labour is prolonged with incoordinate uterine action. Give intravenous fluid to ensure

that the mother is not dehydrated.
Uterine action should be regulated by the use of syntocinon. Keep accurate records by plotting half-hourly observations of the foetal heart, contractions every four hours, and blood pressure in the partograph. Maintain a strict intake and output chart. The mother may have the urge of early pushing due to the occiput pressing on the rectum. You should discourage her from pushing at this stage as this will cause the cervix to be oedematous and delay the onset of the second stage. Encourage her to change her position and use breathing techniques, as these will control the urge of early pushing.

Second Stage of Labour

The second stage should be confirmed by vaginal examination as the caput may be seen at the vulva with the anterior lip of the cervix. During labour, one of the following may occur:

- Long internal rotation
- Short internal rotation
- Deep transverse arrest

The second stage of labour can present any of three conditions which you will now explore in detail.

Long Internal Rotation

This is where the head turns 3/8 of a circle in 90% of cases and the baby is born as in occiput anterior.

Characteristics of Long Internal Rotation

- The lie is longitudinal
- The attitude is one of deflexion
- The presentation is vertex
- The presenting part is the middle or anterior area of the left parietal bone
- The position is right occipito posterior
- The denominator is the occiput
- The occipito frontal diameter 11.5cm lies in the right oblique diameter of the pelvic brim
- The occiput points at the right sacroiliac joints and the sinciput points at the left iliopectineal eminence
- There is increased flexion and descent takes place in the occiput head and reaches the pelvic floor
- Internal rotation of the head occurs which rotates 3/8 of a circle on the right side of the pelvis while the shoulder rotates 2/8 of a circle on the same side
- The head crowns
- The sinciput, face and chin sweep the perineum, the head is born by extension
- Restitution where the occiput turns 1/8 to the right, undoes the twist at the neck and rights itself with the shoulder
- Internal rotation of the shoulders. The shoulder enters in the same oblique diameter of the pelvis. Anterior shoulder reaches the pelvic floor and rotates 1/8

of a circle forward and lies under the symphysis pubis
- External rotation of the head accompanies the internal rotation of the shoulder
- Anterior shoulder escapes under the symphysis pubis, while the posterior shoulder sweeps the perineum
- The body is born by movement of lateral flexion

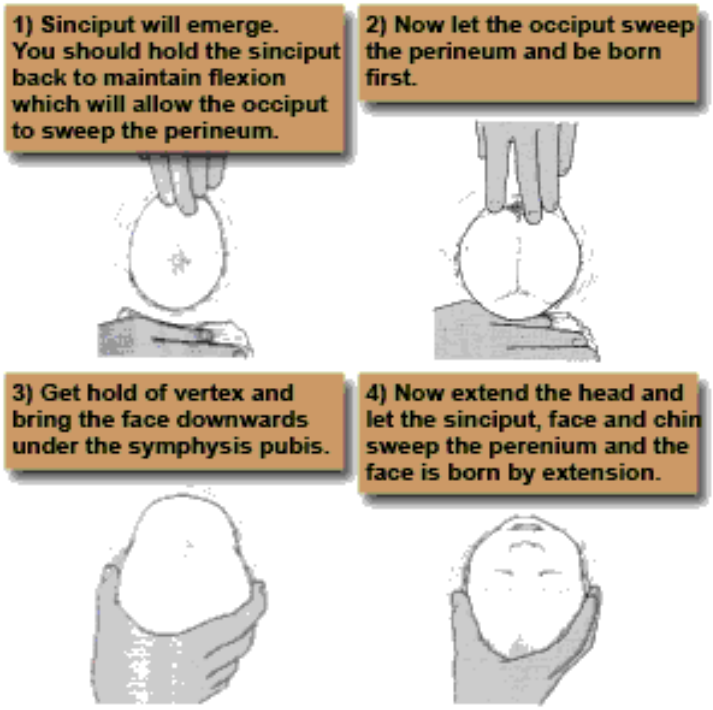
Remember: The above movements do not differ much from the normal mechanism as you may have noticed.

Short Rotation

In cases of short rotation or persistent occiput posterior position, the occiput fails to rotate forward. It persists with the same position. The sinciput reaches the pelvic floor and rotates forwards, while the occiput sinks in the hollow of the sacrum.
The baby is born face to pubis.

Management of Face to Pubis Delivery

Give an episiotomy when necessary:
You should watch for signs of buttonhole tear due to the large presenting diameter.
A buttonhole tear is a rupture at the centre of the perineum.
If you failed to diagnose this earlier you may be extending the head thinking it is a vertex delivery, until you see the hairless forehead escaping under the pubis arch. You should then flex the head towards the symphysis pubis.



Deep Transverse Arrest

This is where the occiput fails to rotate forward. This forces the sinciput to reach the pelvic floor first and rotate forwards. The occiput then goes into the hollow of the sacrum, which results in the face to pubis delivery. At first there is good flexion. The occipit reaches the pelvic floor and begins to rotate but flexion is not maintained. The occipito frontal diameter is caught by the bispinious diameter of the outlet. This arrest may be due to poor contractions, a straight sacrum or prominent ischial spines.

On vaginal examination the sagittal suture is on the transverse diameter of the pelvis and both anterior and posterior fontanels are palpable. The head is caught at the ischial spines.

Management of Deep Transverse Arrest

Reassure the mother while explaining the position of her labour. Take her consent for the operative procedures which will be necessary. Inform the doctor of her situation. Encourage her to breathe slowly and change her position to discourage pushing. When the doctor arrives, administer analgesics. A vacuum extraction may be performed or the head may be rotated with forceps and the baby delivered.

Aftercare is the same as in operative manipulation.

Conversion to Face or Brow

At the onset of labour with a deflexed head, an extension may occur instead of flexion. When there is complete extension, the baby will be born as face presentation but when there is incomplete extension (this is refered to as 'military attitude'), the presenting part turns to brow. A delivery by caesarean section is recommended.

You have seen that labour is not smooth with this type of malposition.

Complications of Conversion to Face or Brow

- Obstructed labour, as a result of deflexed or partially extended head that is impacted in the pelvis
- Maternal trauma, as a result of prolonged labour, or instrumental delivery causing perineum tears. In undiagnosed OPP, instrumental delivery may cause third degree tears
- Neonatal trauma to the baby, if forceps or ventous vacuum extraction are used
- Cord prolapse which may cause hypoxia, that may result in stillbirth
- Cerebral haemorrhage, due to the compression of a large presenting part
- Asphyxia, leading to brain damage

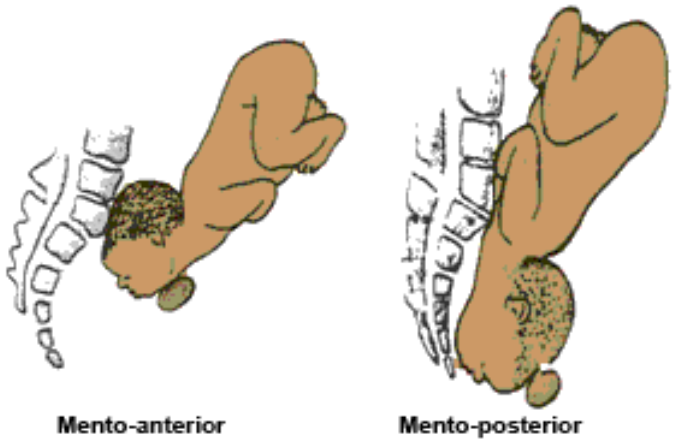
You will now look at face presentation as it is one of the potential OPP outcomes. Note the delivery of face in comparison with face
to pubis.

Face Presentation

Face presentation occurs when the head has complete extension, and the occiput is in contact with its spine. It happens in about one in every five hundred labours. Primary face presentation is when the face presents before labour. The term secondary face presentation is used when the face presents during labour. There are six positions in a face presentation, namely:

- Right mento-posterior
- Left mento-posterior
- Right mento-lateral
- Left mento-lateral
- Right mento-anterior
- Left mento-anterior

The denominator is the mento, the presenting diameters are the submento bregmatic (9.5cm) and the bi-temporal (8.2cm).



Mento-anterior Mento-posterior

Causes of Face Presentation

You will now look at some of the causes of face presentation in detail.

Anterior Obliquity of the Uterus

The pendulous abdomen of a multiparous woman leans forward resulting in the alteration of the direction of the uterine axis. This causes the foetal buttocks to also lean forward and the force of the contractions to be directed in a line towards the chin, rather than occiput, which usually results in extension of the head.

Contracted Pelvis

Face presentation develops as the head enters in the transverse diameter of the brim. The obstetric conjugate is bound to be withheld which will result in the extended head in an android pelvis. Face presentation results when vertex presentation is in the posterior position and remains deflexed. The parietal eminences are caught in the reduced sacro-

cotyloid dimension, the occiput does not descend and the head becomes extended.

Polyhydramnios
In polyhydramnios, when the spontaneous rupture of membranes occurs, the resulting rush of fluids may cause the head to extend as it sinks into the lower uterine segment.

Congenital Abnormality
The absence of vertex in the encephally thrusts the face forwards. A tumour on the foetal neck can also cause extension of the head although this is rare.

Abdominal and Per Vaginal Diagnosis of a Face Presentation
The diagnosis is usually made in labour. During an abdominal examination check for the following features:

- The shape of the foetal spine is an s-shape.
- The round occiput is prominent and may be ballottable when the position is mento-posterior and a deep groove can be felt between it and the back.

The diagnosis is not always easy and clear. During a vaginal examination you may notice that you can diagnose face presentation with confidence if you have mastered vaginal examination skills. You will differentiate face from brow presentation when you feel the orbital ridges, the brow itself and the anterior sutures. You should look for the following characteristics:

- The presenting part is usually high, soft and irregular
- In a sufficiently dilated cervix you may feel orbital ridges, eyes, nose and mouth
- The mouth may be open with hard gums
- The foetus may suck the examining finger
- In progressive labour, the face becomes oedematous and is difficult to distinguish it from a breech presentation
- To determine the mentum, you must locate it, and if it is posterior, you should decide whether it is lower than the sinciput in order to rotate forward and advance
- The orbit ridges determine the position either on the left or right oblique of the pelvis brim

Mechanism of Left Mento-Anterior Position
In face presentation, you will be substituting occiput with the chin. Instead of flexion you will maintain deflexion and instead of extension you will maintain flexion. Now look at the secret formula:

- Lie is longitudinal
- Attitude is one of extension of the head and the back
- The presentation is face
- The position is left mento anterior. In a left mento anterior position the orbital ridges will be in the left oblique diameter of the pelvis
- The denominator is the mentum
- The presenting part is the left molar bone

Extension
Descent takes place throughout and with increasing extension and thus the mentum

becomes the leading part

Internal Rotation of the Head
This occurs when the chin reaches the pelvis floor and rotates forwards 1/8 of a circle. The chin escapes under the symphysis pubis. When this takes place and the sinciput, vertex and occiput sweep the perineum, the head is born.

Restitution
This occurs when the chin turns 1/8 of a circle to the mother's left.

Internal Rotation of Shoulders
The shoulders enter the pelvis in the left oblique diameter and the anterior shoulder reaches the pelvis floor first and rotates forward 1/8 of a circle along the right side of the pelvis.

External Rotation of the Head
This occurs simultaneously and the chin moves a further 1/8 of a circle to the left.

Lateral Flexion
The anterior shoulder escapes under the symphysis pubis, the posterior shoulder sweeps the perineum and the body is born by a movement of lateral flexion.

Prolonged Labour
Labour is often prolonged due to ineffective uterine contraction caused by an ill-fitting presenting part. The facial bones do not mould and in order to enable the mentum reach the pelvic floor and rotate forwards, the shoulders must enter the pelvic cavity at the same time as the head.
With good uterine contractions, descent and rotation of the head occurs and labour progresses through to a spontaneous delivery.

Mento-Posterior Position
When the head is completely extended with an effective contraction, the mentum reaches the pelvic floor first and will rotate forwards an the position becomes anterior.

Persistent Mento-Posterior Position
The head is incompletely extended, the sinciput reaches the pelvic floor first and rotates forwards 1/8 of a circle, which brings the chin into the hollow of the sacrum. Further mechanism is prohibited, which results in impacted face. In order for further descent, both head and chest have to be accommodated in the pelvis.

Management of Labour in Face Presentation
Upon diagnosing the condition the first action you must take is to inform the doctor about the face presentation. Routine maternal and foetal condition observations are done as in normal labour (maternal pulse, foetal heart rate and contraction) half hourly. Blood pressure and temperature is done two hourly. Empty the urinary bladder every two hours.

Vaginal examination to determine cervical dilation and descent of the head, is done every four hours to monitor progress of labour. Take care not to injure the foetal eyes. In mento-posterior positions, the midwife should note whether the mentum is lower than the sinciput since rotation and descent depends on this. If the head remains high despite good uterine contractions, the mother is prepared for caesarean section.

Management of Labour in Face Presentation

Face extends to the Perineum

When the face extends to the perineum, give episiotomy to prevent extensive perineum tear.

Face appears at the Vulva

When the face appears at the vulva, maintain extension by holding back the sinciput until the chin is delivered.

The baby's face appears at the vulva

Chin has been delivered

Once the chin has been delivered allow the occiput to sweep the perineum. In this way the submento-vertical diameter (11.5cm) distends the vaginal orifice, instead of the mento vertical diameter (13.5cm).

The baby's face
appears at the vulva

The baby's chin
has been delivered

Occiput rides over Perineum

The baby's face
appears at the vulva

The baby's chin
has been delivered

The occiput is allowed to
ride over the perineum

Head is flexed completely

The head is flexed completely and it is delivered.
Inform the doctor if the head does not descend in the second stage. In a mento-anterior position, it may be possible to deliver the baby using forceps.
If the head becomes impacted, or there is any suspicion of disproportion, a caesarean section will be necessary.

The baby's face appears at the vulva

The baby's chin has been delivered

The occiput is allowed to ride over the perineum

The head delivered

There are several possible complications during labour with a face presentation.

Obstructed Labour

A minor degree of contracted pelvis may result in obstructed labour as facial bones do not mould. Caesarean section is necessary in persistent mento posterior position.

Cord Prolapse

A prolapsed cord is more common when the membranes rupture because the face is an ill-fitting presenting part. Always perform a vaginal examination following rupture of membranes to rule out cord prolapse.

Facial Bruising

The baby's head is elongated with a swollen bruised
face, oedematous eyelids and lips at birth. You should take great care while performing vaginal examination to avoid injury.

Cerebral Haemorrhage

The lack of moulding of facial bones can lead to intra-cranial haemorrhage caused by excessive compression
of the foetal skull or by upward compression in the
typical moulding of the foetal skull found in this type
of presentation.

Maternal Trauma

Extensive perineal laceration may occur at delivery due to the large submento vertical and bi-parental diameters distending the vagina and perineum. This increases the incidence of caesarean section, which can increase chances of maternal morbidity and mortality.

Breech Presentation

Breech presentation occurs in about three percent of labour (Campbell & Lees, 2000). Due to the high risks to both the mother and the baby, the present practice is to book all mothers with breech presentation for caesarean section.
In breech presentation, the foetus lies with the buttocks in the lower pole of the uterus, after 34 weeks of pregnancy. There is no obvious reason as to why the foetus presents as breech at term but the following points are contributing factors:

- Maternal causes include contracted pelvis, polyhydramnios and multiple pregnancy
- Foetal causes include pre-term labour, hydrocephalus, extended legs

Breech presentations are classified as follows:

- Complete breech; the buttocks presents with the feet and legs flexed on the thighs and the thighs flexed on the abdomen.
- Frank breech; the buttocks present with the hips flexed and the legs extended against the abdomen and chest; this is the most common type of breech presentation.
- Incomplete breech; one or both feet or the knees extend below the buttocks. This is also known as single or double footling presentation.
- Compound breech; the buttocks present with another part such as a hand. This type of presentation is rare.

The condition can be diagnosed in the following manner:

- Previous history of breech, though this is not conclusive
- On palpation at the fundus, a round, hard, ballotable mass is palpated
- On auscultation, the foetal heart is heard above the level of the umbilicus

Antenatal Management of Breech Presentation

The midwife refers the mother to a doctor at thirty two weeks if the breech presentation persists. An x-ray may be done should there be any doubts in diagnosis. It may reveal the following:

- Shape and size of the pelvis
- Size of foetus
- Foetal abnormalities, for example; hydrocephally
- Whether the legs are extended or flexed

High risk conditions for breech pregnancies include:

- Multiple pregnancy
- Previous scar
- Rhesus –ve mother
- High blood pressure

Breech labour may be as easy as normal labour. You will now look at the dangers of breech delivery and how you may prevent them.

Prenatal mortality rate is 10%, while 50% of stillbirths in breech presentation are pre-term. The danger is great, except in the hands of experts. When nearing the second stage of delivery you should:

- Prepare the equipment for delivery
- Prepare resuscitation trolley and drugs in case of an asphyxiated baby
- Inform the obstetrician and paediatrician

Risks to the skull

The soft skull bones are damaged easily. A large skull may be trapped by the partially dilated cervix, which had allowed the other part of the baby to pass through. It is important to make sure the patient does not push prematurely. Use of sedatives can help to keep the mother calm.

Intracranial haemorrhage

This may occur due to rapid compression of the unmoulded skull. Venous congestion, which is caused by hypoxia, might occur. It may also result
from the upward force of foetal blood into the intracranial venous sinuses,the sudden release of the head from the cervix and/or the quick extraction process.

This is why it is important to inform the mother as soon as the condition is diagnosed that there may come a time when she will feel that the head is pushing out and she has the urge of pushing but she should plan to release the head slowly to prevent damage to the baby's head.

Hypoxia
This is caused by interference with the utero-placental circulation. You should not use fundal pressure if there is placental separation while the head is still in the vagina.

Cord compression
This is inevitable with a big baby, but you can assist by pulling a loop of cord after the baby is born up to the umbilical and try to position it so that it is not nipped. When the cord is compressed, the foetus will be stimulated to prematurely breathe and inhale mucous or liquor which will cause asphyxia at birth and subsequent pneumonia.

Injuries
It is very easy for the baby to sustain fractures of the lower and upper limbs but you can prevent this by being competent in the delivery of extended legs. You can flex the knee and gradually pull it out. You may also use Lovset's manoeuvre and should know how to splint the upper arm and flex the elbow.
Prevent rupture of the liver and spleen by holding the baby at the iliac crest with the thumbs at the sacrum. Avoid holding the baby at the kidney level to prevent damage to adrenals. Paralysis can occur due to crushing of the spinal cord. To prevent crushing the spinal cord you, should always check that the sub occipital area appears before you carry an upward traction.

Mechanism of Labour in a Left Sacro Anterior (LSA) Position
The bitrochanteric diameter (10cm) enters in the left oblique diameter of the pelvic brim. The sacrum points to the left ilio-pectineal eminence.

Summary of LSA Position	
Position	Left – Left Sacro-Anterior, LSA
Lie	Longitudinal
Attitude	Complete flexion
Presentation	Breech
Denominator	Sacrum
Presenting part	Anterior buttock

Descent
This takes place with increasing compaction due to increased flexion of limbs.

Internal Rotation of the Buttocks
The anterior buttock reaches the pelvic floor first and rotates one eighth of a circle forwards along the right side of pelvis. The bitrochanteric diameter is now in the antero-posterior diameter of the outlet.

Lateral Flexion of the Body

The anterior buttock escapes under the symphysis pubis. The posterior buttock sweeps the perineum and the buttocks are born by a movement of lateral flexion.

Restitution of the Buttock

The anterior buttock turns slightly to the patient's
right side.

Internal Rotation of the Shoulders

The shoulders enter in the same oblique diameter of the brim as the buttocks. The anterior shoulder rotates forwards one eighth of a circle along the right side of the pelvis and escapes under the symphysis pubis. The posterior shoulder sweeps the perineum and the shoulders are born.

Internal Rotation of the Head

The head enters in the transverse diameter of the pelvic brim. The occiput rotates along the left or right side of the pelvis. The sub-occipital region (nape of the neck) impinges under surface of the symphysis pubis.

External Rotation of the Body

The body turns so that the back is uppermost, a movement which accompanies internal rotation
of the head.

Birth of the Head

The chin, face and sinciput sweep the perineum and the head is born in flexed attitude.

Second Stage of Labour

At this stage you should reassure the mother and confirm fully dilation of the cervix by performing vaginal examination.

Note:

You should not be overly concerned by seeing the buttocks at the vulva as they are soft and can pass through a 6cm dilated os.

Delivery of Complete Breech

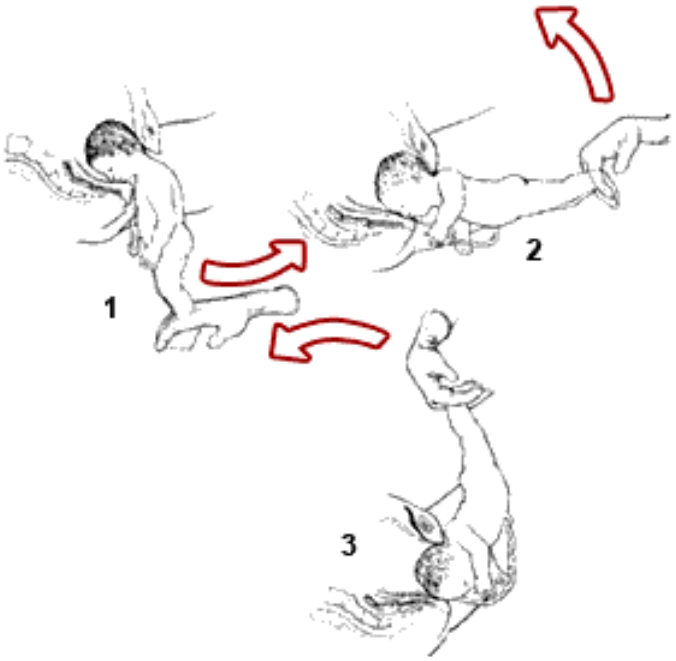
The following procedure should be followed when delivering the complete breech:

- Mother's buttocks are positioned at the edge of the bed to allow the baby to hang and apply supra-pubic pressure to the head if required
- Give episiotomy when the buttocks extend the perineum, to avoid compression of a moulded head
- The buttocks should be expelled by an aided bearing down effort of the mother
- With the same contraction the baby is born up to the umbilicus
- Pull a loop of cord to prevent traction of the cord. The cord should be handled

gently to avoid inducing spasm and should be nipped under the pubic arch to avoid anoxia
- Check if elbows are on the chest as is the case with complete breech
- The midwife can assist the expulsion of the shoulder by wrapping a small towel around the baby's hips as it is slippery and loses heat
- Hold the baby by the iliac crest to avoid crushing of liver and spleen

The key point to remember is:
'Hands off the breech! Let nature take its course!'

The procedure continues:
- While the uterus is contracting and the woman pushing, the anterior shoulder escapes under the symphysis pubis
- Elevate the buttocks to allow the posterior shoulder to sweep the perineum
- The back should be in the uppermost position until the shoulders are born
- As soon as the shoulders are born, let the baby hang by its weight for one or two minutes
- When the hairline appears, grasp the baby by the feet and hold the stretch, applying sufficient traction to prevent fracture of the neck
- Move the feet through an arch of 180° until the mouth and nose are free at the vulva
- You are now holding the baby upside down and mechanical suction can be used to clear the airway to avoid asphyxia
- At this stage, ask the mother to pant through an open mouth, 'breathing out the head'. One or two minutes should elapse to allow slow delivery of the vault of the head to prevent a tentorial tear



Delivery of the head
(The Burns Marshall method)

The previous pages describe a routine complete breech delivery where the apgar score is usually about seven to eight. The breech delivery, however, may not always be this simple. This is supposed to be a doctor's procedure but many times you may have to perform it and perform it efficiently. Should you be called upon to assist in the management of extended legs, you should follow this procedure:

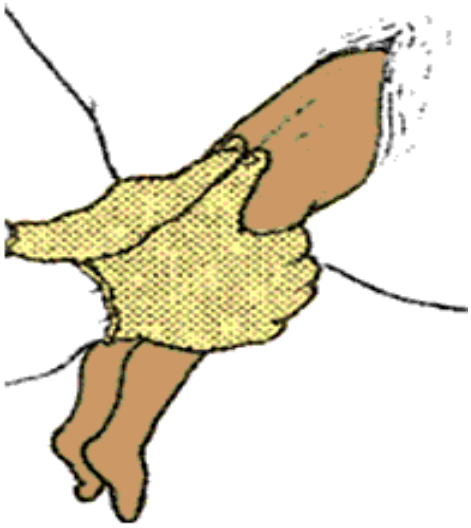
- Apply downward traction until popliteal fossae appear at the vulva
- An episiotomy is made when the buttocks extend the perineum
- Pressure is applied at the popliteal fossae with abduction of the thigh
- The knee will flex and this will aid extraction of the feet and avoid fractures of lower limbs
- The foot will be swept over the baby's abdomen and the feet are born
- You should now wait until the baby is delivered up to the umbilicus, pull a loop of cord
- Feel for the elbow at the chest, which should not be felt with extended hands

Management of the extended legs

In a situation where you are called upon to aid with the delivery of the extended hands, you should apply the Lovset manoeuvre. This is a combination of rotation and downward traction to deliver the arms whatever position they are in. The direction of rotation must always bring the back uppermost. When the baby's umbilicus is born and shoulders are in antero-posterior diameter, grasp the baby by the iliac crest applying downward traction until the axilla is visible. Rotate the baby through half a circle 180° anticlockwise. One arm which is now anterior is delivered. Rotate the baby back 180° clockwise and the second shoulder is delivered in a similar manner. Please refer to Myles, Margaret Text book of Midwives for a complete demonstration of this process.

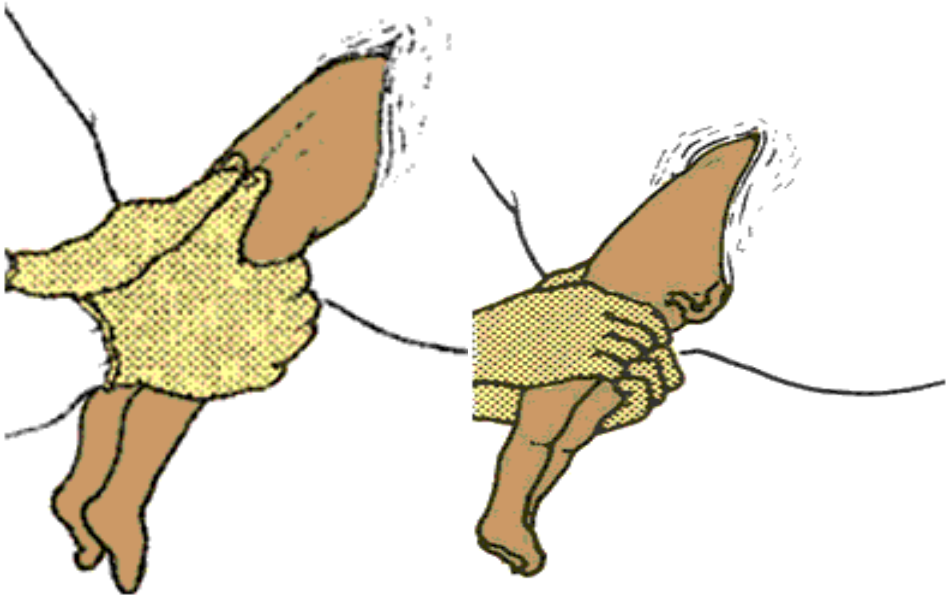
Take hold of the baby

The position of the baby is Left Sacro-Anterior. During a contraction when the umbilicus is born and the shoulders are in the anteroposterior diameter, grasp the baby at the illiac crest with the thumbs over the sacrum. A small towel should be wrapped around the baby's waist to prevent it from being slippery.



Rotate the baby

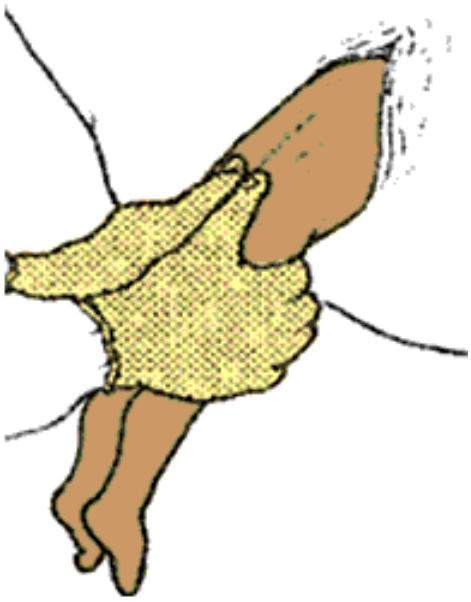
Rotate the baby through half a circle, 180° anti-clockwise, (starting by turning the back upper most) while applying downwards traction until the axillar is visible. The hand that was posterior now becomes anterior, this movement sweeps the arm infront of the face and also allows the shoulders to enter the pelvis in the transverse diameter.

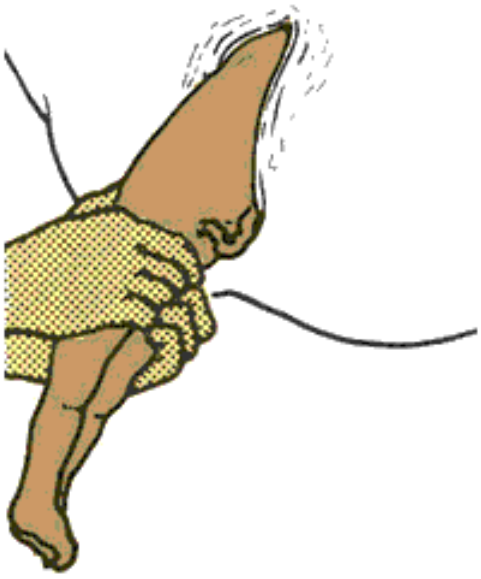


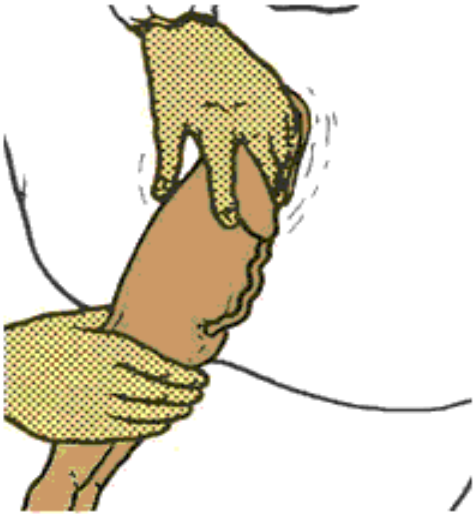
Deliver the anterior arm

The arm that was previously posterior is now anterior. With the two first fingers of your left hand (which is at the baby's back) splint the baby's humerous to avoid breaking it.

The elbow is drawn downwards and delivered under the pubic arch. Wait for the next contraction.

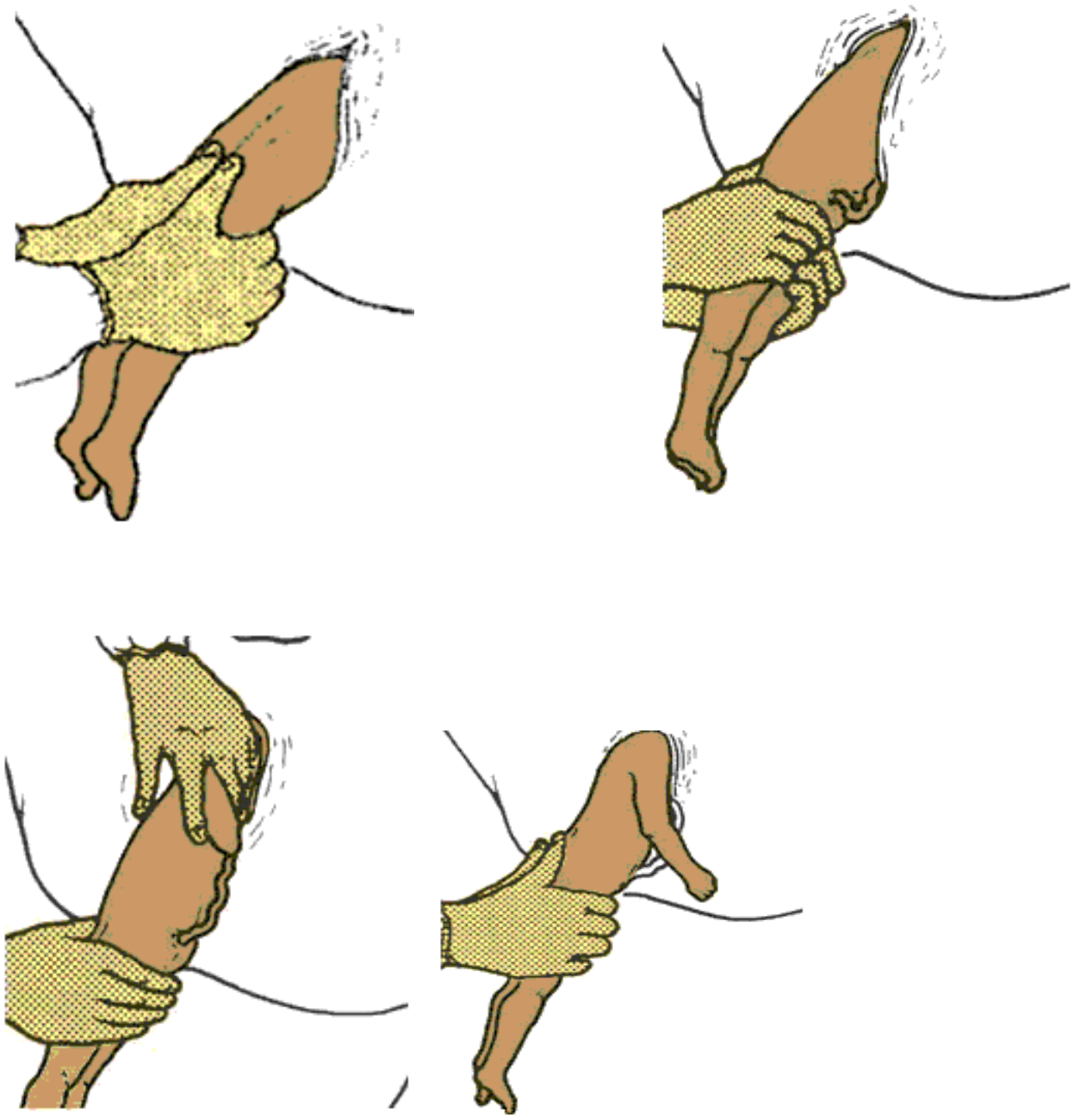






Rotate the baby again

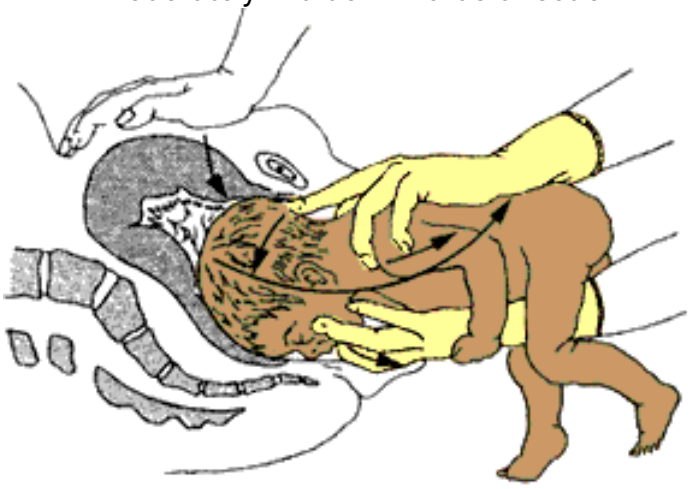
Rotating the body half circle clockwise, make anterior arm posterior. Using the right hand, splint the humerous, draw it downwards and deliver it under the pubic arch.
Repeat the next side and deliver the other hand.



It sounds easy, but you will agree that at times applying tractions can be a very arduous task. Now look at the diagram of how you will position your hands and fingers when performing the
Mauriceau-Smellie-Veit Manoeuvre (jaw flexion and shoulder traction).
The following procedure should be followed when delivering the extended head:

- Position hands and fingers to extract extended head

- Put the baby astride your left arm with the palm supporting the chest
- First and third finger of left hand should
  be placed on the malar bones to flex the head, middle finger in the mouth well back
  to aid flexion
- First and second right hand fingers should be hooked over the shoulders pulling moderately in a downwards direction



Delivery of the extended head
(Mauriceau-Smellie-Veit Manoeuvre)

The procedure continues:

- Controlled traction is exerted in a downwards direction as the head descends in the curved birth canal. Traction continues until the sub occiput area appears before the appearance of the nape of the neck. Upward traction at this level will inflict fracture of the neck
- Instruct the mother to pant
- Exert traction in upward direction to allow for the birth of the head. Nose and mouth are free. Your intervention will clear the airway
- The Vault is delivered slowly

Causes of Delayed Breech

The following are some of the causes of delayed breech:

- Delay in the first stage is rare, though it may be caused by impaction due to a large baby, a small pelvis or weak contractions in which case a caesarean section is done
- Delay during the second stage is usually caused by extended legs

In terms of management, nothing should be done until the buttocks extend the perineum. At this point you should perform a medio-lateral episiotomy.

Delay in the Birth of the Head

If an insufficiently dilated cervix holds up the head, the baby will make gasping movements. You should mop the vaginal wall in contact with the baby's face and

inserting two fingers make a channel through which you can meet the baby.
If the head is arrested high in the cavity, disproportion may exist. Suprapubic pressure may help, but application of forceps is necessary.
The doctor will use forceps for the delivery of the coming head.

SECTION 4: ABNORMAL PUERPERIUM

Introduction

You are now going to look at abnormal purperium. First you need to reflect on the meaning of the puerperium or postpartum period.
The puerperium or postpartum period starts about one hour after delivery and continues for the next six weeks. During the postpartum period, the mother goes through physical and psychological transition caused by what she has gone through her pregnancy with all the adjustments of hormones, not to mention the stress and fatigue of labour. Her body is vulnerable to many complications due to blood loss, laceration and injury of the birth canal.
Complications during this period are associated with trauma sustained during childbirth, disorders of the circulatory system or psychological disorders. Postpartum nursing starts from early pregnancy. At that time it is important to prevent the occurrence of complications by treating all infections and controlling chronic diseases from getting worse. Give health education to maintain cleanliness and physical status by encouraging balanced diet to prevent anaemia. During labour, aseptic techniques and vigilant observation should be used to enable early detections of complications that are likely to arise. This will allow you to take appropriate action in good time. During the postpartum period, provide appropriate care and counselling to prevent anxiety, and ensure that the new mother has enough rest and sleep. Try keeping the stressed mother calm. Observe her closely to detect any early signs of complications and treat them promptly.

Objectives

By the end of this section you will be able to:

- Define puerperal pyrexia
- Describe the management of puerperal pyrexia
- Define various breast conditions
- Explain the management of breast complications during puerperium

Puerperal Pyrexia

Puerperal pyrexia is a febrile condition, which presents with a temperature of 38°C and above within 14 - 21 days following childbirth or abortion.
Causes of puerperal pyrexia include:

- Genital tract infection

- Urinary tract infection
- Breast disorders, for example, mastitis, breast engorgement or breast abscess
- Thrombophlebitis
- Respiratory tract infection
- Other causes of pyrexia such as malaria
- Vesico-vaginal fistula
- Recto-vaginal fistula
- Pyrexia of unknown origin

After separation of the placenta, a superficial wound is left on the uterine wall. Other wounds may be present on the birth canal, depending on the type of delivery. These wounds may be minor bruises or deep tears of the cervix, vagina or perineum. If not appropriately managed, puerperal pyrexia ensues.

Bacteriology

Bacterial organisms are classified in two groups: Endogenous and Exogenous.

Endogenous Organisms

These are harmless organisms, which are present in the lower intestinal tract, on the perineum and in the vagina. They have a role to play in the ecology of the body. Escherichia coli inhabit the bowel and the vagina. Streptococcus faecalis reside in the lower intestine and the anus. Anaerobic streptococci and Clostridium welchii are found in the vagina.

Exogenous Organisms

These are imported into the birth canal from other sources such as the hands of birth attendants or airborne infections from other patients or visitors. The organisms are harboured in dust and in the throat.

Staphylococcus aureus is the main cause of breast infection found in dust and has developed resistance to antibiotics in recent years.

Pathology

When the organisms enter the tissues, the whole process depends on:

- The virulence of the organisms
- The body's ability to resist invasion (strength of immune system)
- The trauma inflicted to tissues
- The effectiveness of the antibiotic and the time of commencement

The first sign of genital tract infection is pyrexia with a rising pulse rate 24 hours or more after delivery.

Puerperal Sepsis

This is an infection of the genital tract occurring any time between rupture of membranes or labour and six weeks after delivery or abortion. Two or more of the following will be present; pelvic pain, fever, abnormal vaginal discharge, abnormal smell, foul odorous discharge and delay to uteral restitution. There are three types of puerperal sepsis: mild, moderate and severe.

Mild infection
The infection is usually localised to the specific tissues of the area, for example, the vagina, cervix or uterus. The temperature is gradually stepped up but rarely goes beyond 38°C. The mother may have no other complications or symptoms. With prompt appropriate antibiotic use, the condition should be cured within three to four days.

Moderate infection
When endometritis develops, it manifests in about 48 to 72 hours after delivery. The mother complains of loss of appetite, headache, backache and general discomfort. The pulse rate ranges from 100 - 120mmHg. The temperature is rarely above 38.8°C. The uterus is bulky and tender to the touch. Lochia discharge may decrease in amount. It is a red brownish colour and has a foul smell.

In cases of Haemolytic streptococcus, the lochia may be odourless initially. If the infection is contained in the endometrium, it clears within seven to ten days of treatment.

Severe infection
The virulent strain of haemolytic streptococcus rapidly infects the entire peritoneal cavity and causes septicaemia and haemolytic anaemia by gaining access to the circulatory system through the placental site. The mother will have a persistent fever of over 39°C, which may be continuous or remittent. Rigours are common and the pulse usually ranges from 140 - 160mmHg.

The uterus is sub-involuted and tender to the touch. Pallor is marked due to anaemia. There is persistent vomiting and sometimes diarrhoea. The mother appears very sick, restless and complains of insomnia.

Diagnostic Physical Examination
The following procedure should be followed when conducting a diagnostic examination:

- Head to toe examination should be done.
- Check on mucous membranes for pallor, throat for infection, breast for engorgement or swollen glands and abdomen for tenderness.
- Check the uterus for sub involution, and the perineum for any signs of infection from tears and episiotomy.
- Inspect the legs for any inflammation.

When carrying out investigations, the following steps should be taken:

- Take a high vaginal swab. The use of a speculum may be difficult, and no antiseptic solution or cream should be used to lubricate the speculum.
  Use aseptic technique.
- Sample blood for haemogram, WBC total and differential.
- In very serious cases blood culture is done.
- High vaginal swab for culture and sensitivity.
- Sample mid-stream urine for culture and sensitivity.

Medical Treatment
The following methods may be used to treat the condition:

- A broad spectrum antibiotic is given soon after the collection of vaginal and urine specimen to be changed when the result of high vaginal swab

is ready.
- An analgesic in case of pain, and a sedative to ensure good sleep, is commenced.
- The mother should be placed on iron supplements if not on them already.
- If haemoglobin is below 7.4dl packed cell transfusion is recommended.
- Fluid and electrolytes balances should be ensured on a daily basis. In case of imbalance, 5% glucose infusion with added vitamins and potassium chloride is given.
- In case of infected perineal wound, the stitch should be clipped to allow drainage of pus.
- Localised infection is treated, with hydrogen peroxide and antibiotic spray.
- It may be necessary at times to incise and drain a pelvic abscess made through posterior vaginal fornix or rectum.

Nursing Care

You will now look at what kind of care should be provided to the mother. Isolate her until the cause has been identified, antibiotics started and the temperature has settled. Unless the mother is severely ill, the baby stays with her and the midwife will help her take care of the baby. Try to keep the mother free of stress and exhaustion.

You should nurse the mother in a propped up position with a pillow to encourage uterine drainage of lochia. Adoption of prone position for half an hour will also serve the same. Encourage the mother to eat a light nutritious diet, ensuring she takes plenty of fluids. You should reserve a bathtub for her use only if she is able to go to the bathroom.

She should have vulva swabs every four hours and change of beddings frequently. You should also check her pulse rate and blood pressure every four hours and carry out a daily head to toe examination to assess her condition.

Prevention of Post Partum Infection

The mother should be advised to eat a well balanced diet before and during pregnancy to prevent anaemia. She should receive early and regular prenatal care and exercise moderately, which will promote good health during pregnancy.

In the hospital, ensure proper infection control and monitoring, for example, cultures in the ward and nasal pharyngeal cultures from the personnel. Maintain the use of the aseptic technique. You will be able to minimise the risk of haemorrhage by proper management of the three stages of labour. Finally, you should try to prevent caesarean section whenever possible.

Breast Disorders During the Puerperal Period

Breast disorders may affect the whole breast or the nipples.

Engorgement of the Breast

On the third day postpartum secretion of milk begins. If the baby does not empty the

breast it becomes over distended. The breast becomes enlarged and covered with distended veins, which are tender, hard and knotty. The mother may also have palpable nodules in the axilla and will experience sleepless nights due to pain.

Treatment of Engorged Breasts

In the early stages of engorgement, the breast may be emptied by manual expressing to relieve congestion. In the latter stage, the congestion and pressure of the ducts prevents the flow of milk. Manual expression of the breast should be done to promote flow of breast milk before the baby is fixed on the breast. When the mother cannot tolerate manual expression, electrical or manual breast pump should be used. You should administer an analgesic and ensure that the mother's breasts are effectively supported by a well-fitting, lactating bra.

Cracked Nipple

Sore nipples are caused by either the loss of the epithelium cover on a big area of the nipple or a deep, small, painful crack at either the tip or base of the nipple. The two conditions may also exist simultaneously. There are several reasons why cracked nipples may occur. These include:

- A flat nipple (try to pull it at 37 weeks to prevent infection and premature labour)
- Wet and unhygienic nipple
- Badly fixed baby on the breast covering the baby's nostrils
- Leaving the baby too long on the breast
- Untoughened breast during pregnancy

Certain complications may arise from this condition. There is a risk of formation of abscess as the ducts are not emptied and as a result of the raw area which allows access for micro-organisms.

Recommended Methods of Treatment for Cracked Nipples

- Rest the breast for 24 hours or until the crack is healed
- Meanwhile express the milk manually
- Expose the breast to the air for 20 minutes six hourly or to an electric lamp 30cm distance to promote healing
- Apply lanoline or massage cream ointment for soothing the nipple

Acute Puerperal Mastitis

Mastitis is the inflammation of the breast. If the condition is not treated, it may proceed to abscess formation. The term 'flushed breast' is applied in mild cases where the infection is superficial and localised. The condition rarely occurs prior to the eighth day of puerperium. It commonly arises during the second or third week. Mastitis may arise in two different ways. Cellulitis infection occurs when the infectious micro-organism enters through the cracked nipple and spreads through the interlobular tissue. Adenitis is a result of the multiplication of organisms which are already present in the breast itself due to engorgement, static of milk or bruising through careless handling.

Primary Causative Organisms of Mastitis

The primary causative organisms are streptococcus i.e. haemolytic streptococcus

organisms and staphylococcus aureus. The usual route for transmission of organisms to the mother's breast is from the:

- Nasopharynx of her infant
- The patient's hands
- Nursery personnel in contact with the infant
- Skin infection of the baby
- The umbilical cord

The main signs and symptoms of the condition are:

- The mother complains of acute pain and tenderness in the breast
- General malaise characterised by a chilly sensation, followed by rise of temperature to 40°C with increased pulse rate
- On inspection, the breast appears reddened and hard
- The inflammation may be generalised, confined to a lobe or a local area
- There are indurations, tenderness and erythema of the involved area
- Mastitis is usually unilateral, in advanced cases there maybe local abscess formation

Management of Mastitis

A sample of breast milk should be taken for bacteriological examination. Broad spectrum antibiotics should be administered immediately while awaiting the culture result. Depending upon virulence and resistance, cephalosporin or vancomycin drugs that are particularly effective against staphylococcal infections should be administered to prevent formation of breast abscess.

As soon as mastitis occurs, breast feeding on the affected area should be suspended. Empty the breast by gentle expression or with an electric breast pump. Support the breast with a firm breast binder or a well fitted brassiere. Heat application may be ordered to hasten the localisation of the abscess.

Abscess of the Breast

Acute mastitis may lead to a mammary abscess. Part of the breast becomes painful, tender, and oedematous with redness of the overlying skin. The axillary's glands become tender and enlarged. The abscess may form near the surface or in the substance of the breast. If untreated, a deep abscess may burrow in several directions affecting the whole breast.

Treatments for Abscesses of the Breast

Treatments include:

- Lactation is suppressed with Bromocriptine (2.5mg) twice for 14 days
- A radical incision is made externally from near the areola margin towards the perineal of the breast
- Avoid cutting the lactiferous ducts. Insert gauze drainage after you evacuate the pus
- Post-operative care is the same as for any surgical patient

In the case of breast abscess, there is need for urgent suppression of lactation.

Bromocriptine (2.5mg BD) is given for 14 days, although it should be noted that this treatment is expensive. However, it is preferred to oestrogen due to the risk of varicose thrombosis with the latter. In many cases all that is needed is supporting the breasts firmly and limiting fluid intake.

Prevention of Breast Complications

Encourage breastfeeding by providing information on the advantage of breastfeeding. Educate the mother during prenatal care on the prevention of breast complications. Help her to fix the baby properly on the breast. Stress the importance of emptying the breast by manual expression in case of excess milk, to avoid engorgement. You should also emphasise the importance of infection prevention, including prompt treatment of any members of the family with boils, burns or any skin lesions.

Extra Genital Infection

Urinary Tract Infection

Pyelonephritis occurs in a number of cases during the puerperium. Proper treatment during pregnancy will prevent recurrence of the condition. For more information regarding urinary tract infections, refer to unit five.

Respiratory Infection

A respiratory infection may cause puerperal pyrexia. The possibility of sepsis must be ruled out; otherwise both conditions may be present at the same time. For more information on respiratory management, see unit five.

Venous Thrombosis

This refers to the formation of clots in the veins, usually in the lower limbs. Puerperal mothers are prone to venous thrombosis. Puerperal mothers who have had a caesarean section often haemorrhage and after a difficult delivery it may take a longer time for her to move around. Another possible cause of the condition is varicosity, which may occur during delivery due to injury or inflammation. Mothers over 35 years and those with high parity are also at high risk.

Prophylaxis

During pregnancy you should ensure that pregnant mothers with thrombo-embolic disorders are not given oestrogen preparations and are encouraged to do exercise. Pregnant women with marked varicose veins should wear embolic stockings or crepe bandage. Mothers at a high risk of developing thrombosis or pulmonary embolism should be given a low dose of heparin 5,000 units subcutaneous.

SECTION 5: OBSTETRIC ANAESTHESIA, OPERATIONS AND EMERGENCIES

Introduction

You are now in the fifth section of this unit on labour. In the previous section you learnt that abnormal labour presents special challenges and carries many risks. This is why you should refer such women to the doctor in the prenatal clinic during their third trimester. They should also be advised to deliver in the hospital, as they may need a caesarean section.
In this section, you will study obstetric anaesthesia, operations and emergencies.

Objectives

By the end of this section you will be able to:

- Describe obstetric anaesthesia
- Describe the management of obstetric operations
- Describe the management of obstetric emergencies

Obstetric Anaesthesia

By the end of this topic you will be able to:

- Differentiate between anaesthesia and analgesia
- Describe the risks associated with anaesthesia with particular emphasis on how to prevent these risks
- Describe the role of a midwife in the administration of anaesthesia

Anaesthesia means absence of sensation and freedom from pain. General anaesthesia is the induction of unconsciousness, which may also involve the giving of some analgesia.

Regional anaesthesia is when a group of nerves is made free of sensation. Local anaesthesia is when a specific area of the body is anaesthetised e.g. the perineal area when repairing an episiotomy perineal or vaginal tear.
Each of these three categories of anaesthesia will be covered in this topic.
Remember: General anaesthesia for a pregnant woman in her second and third trimesters, or for a mother who has just delivered, is dangerous due to the effect of progesterone.

General Anaesthesia

It is essential that only trained anaesthesia personnel administer general anaesthesia to patients. Moreover, it is essential to place an endotracheal tube in all pregnant patients undergoing general anaesthesia, since the risk of aspiration pneumonitis, secondary to

the inhalation of gastric content, is a significant one.

Until the baby is born, the mother should receive 100% oxygen and a low concentration of an inhalation agent such as isoflurane 0.5%.
After delivery anaesthesia can be deepened by supplementing the anaesthetic with higher concentrations of potent volatile inhalation agents.
Factors connected with anaesthesia have been a significant cause of maternal deaths until very recently. It is essential for the midwife to be aware of the risks associated with anaesthesia and why they occur, so as to give intelligent help to assist the operating team and the patient.

Problems in Obstetrics Anaesthesia

In obstetrics the anaesthetic problems are due to:

- Effects of progesterone on the mother
- The pressure from the gravid uterus
- The presence of two patients rather than one patient

Some of the problems include; Mendelson's syndrome, failed intubation, aortalcaval occlusion and maternal awareness.

Mendelson’s Syndrome

It is believed that in pregnancy and especially in advanced labour there is a delay in gastric emptying time, due to the effect of progesterone on the gastro-intestinal tract.
Narcotic analgesics like pethidine that are given in labour, cause significant delay in gastric emptying. The static stomach content raises the pH. Fasting also gives similar reactions. The pressure from the gravid uterus results in the reflux of the contents in the stomach when the mother is in recumbent position. When she is under general anaesthetic unnoticed regurgitation may occur. In cases where the acid stomach contents are aspirated into the lungs, a condition known as Mendelson’s Syndrome result. The alveoli are damaged which causes the impairment of gaseous exchange. It is impossible to oxygenate the mother and in severe cases death may ensue.

Prevention of Mendelson’s Syndrome

The main method of prevention is the administration of antacid therapy while in labour to high risk patients.

Rapid Sequence Induction

Rapid sequence induction is used for unprepared patients. Prepared obstetric patients are also liable to have acid contents in the stomach and the same technique is used. The method always includes endo-tracheal intubation with the use of cricoid pressure, which protects the lungs even when silent regurgitation occurs.

Cricoid Pressure

The cricoid cartilage is pressurised to close the oesophagus, preventing acid reflux. This pressure is essential in preventing the death of the mother. Proper application of cricoid pressure is essential. When intubation fails and the anaesthetist is able to maintain a clear airway, a facemask should be used while the assistant maintains cricoid pressure. Another option is spinal anaesthesia, after waking the mother.

Failed Intubation

This usually occurs in pregnant women with laryngeal oedema due to pregnancy and induced hypertension. The anaesthetist has difficulties visualising the vocal cords and introducing the tracheal tube. Other factors include poor opening of the mouth and a stiff or fat neck.

Prevention

Use a pre-oxygenation technique, which involves giving facemask oxygen for four minutes uninterrupted. This will prevent cyanosis significantly when attempting to intubate.

Aortocaval occlusion

You will now look at aortocaval occlusion and its prevention. The cause of aortocaval occlusion is the weight of the gravid uterus, which partially blocks the inferior vena cava. The venous return is then reduced, which in turn leads to a fall of cardiac output. This occurs when a pregnant woman lies supine in late pregnancy for a long period in labour. If an emergency caesarean section is being performed due to foetal distress, aortocaval occlusion increases the foetal distress and causes further foetal hypoxia.

Do you know how this might be prevented?

This condition can be prevented by encouraging the mother in labour to remain in an upright position for as long as possible. During labour, when the woman needs to lie flat, the midwife should ensure she is tilted to the left, either with a small rubber wedge under the mattress or a folded blanket under the left buttock at an angle of 15°. Modern delivery beds, chairs and operation tables have this facility incorporated.

Maternal Awareness

While giving general anaesthesia most of the drugs, except muscle relaxants, will pass the placental barrier and result in a sleepy baby. To prevent this, a light anaesthetic agent is given. The woman retains a high level of consciousness and she is able to recall events that occurred during the operation. However, she is unable to give any indication of sensation since she is paralysed. A woman who has retained awareness cannot recall pain but recalls the whole conversation during the operation. This can be a terrifying experience, since she may not want to know what was happening.
Awareness often occurs when nitrous oxide is used alone.
The addition of an opiate intravenously as soon as the baby is delivered is known to reduce maternal awareness significantly. In order to prevent maternal awareness you

should maintain neither too deep nor too light a level of anaesthesia for the mother. In this manner, you will also be able to prevent Mendelson's Syndrome, aortocaval occlusion and foetal hypoxia.

Regional Anaesthesia

The operational region is made free from pain by infiltrating an anaesthetic drug into the nerves supplying the region. This can be achieved in several ways i.e. epidural block, spinal anaesthesia, pudendal block and para
cervical block.

Epidural Block

Epidural analgesia is described as lumbar or caudal, depending on the site used when approaching the epidural space. This is achieved by infiltrating anaesthetic into the epidural space so that it surrounds the fibres of the specific spinal nerves and anaesthetises them, thereby achieving a selective block. This can be done in two ways:

Lumbar Epidural Block

This is the most common approach and there are three different techniques which may be used. The anaesthetic is introduced between lumbar vertebrae two and three, or three and four.
First technique: A single shot epidural refers to the process whereby local anaesthesia is introduced using a Touhy needle, but no catheter is inserted for topping up purposes.

Second technique: Intermittent technique is when a polyethylene or nylon catheter is inserted into the epidural space so that further doses of local anaesthetic may be given when required.
Third technique: The continuous technique is where anaesthetic solution is infused via epidural catheter using an intravenous infusion line attached to an electronic drip counter.

Caudal Epidural Block

This is an uncommon technique. The epidural needle is introduced between the sacral vertebra and cocyxiatus through the sacral hiatus.

Contraindications for caudal epidural block include:

- Maternal reluctance
- Bleeding disorders
- Systemic or site infection
- Existing disease, for example, multiple blood vessels sclerosis

Regional Anaesthesia

You will now look at some of the indications of epidural analgesia. These include:

- Request of the mother
- Malposition where long, exhausting labour is anticipated
- Malpresentation, particularly breech presentation, where an obstetrician requires a well relaxed mother to perform an assisted breech delivery
- Multiple pregnancy where an epidural analgesia is advantageous because it allows for the possibility of manipulative delivery
- When the mother is not obtaining adequate pain relief from other analgesic methods and is tense and distressed

There are several complications, which may arise from the use of anaesthetics. You will now study each of these in turn.

Complications of Regional Anaesthesia

Hypotension

This occurs as a result of the effect of vasodilatation of the blood vessels. Rapid intravenous infusion can prevent the condition. This is commonly known as a preload and commonly consists of between 500ml and 1000ml of Hartman's solution. A functional intravenous infusion is essential before epidural analgesia is commenced in order to prevent hypotension.

Dural Tap

This is the accidental puncture of the durameter. This is recognised when a few drops of Cerebrospinal Fluid (CSF) seep through the Tuohy needle. In order to prevent this condition, the anaesthetist normally re-sites the epidural catheter in an adjacent space. The obstetrician is informed and a forceps delivery will be planned in order to prevent the woman from pushing and possibly forcing more CSF through the
dural puncture.
A reduction of CSF volume usually results in severe headache, which resolves spontaneously within a week. Another measure to minimise leakage of CSF is to leave the epidural catheter in position and infuse normal saline with the help of an infusion pump. This is normally continued for 24 hours while the woman is lying flat.

For quick relief of the headache, the anaesthetist may decide to perform a 'blood patch', that is under strict asepsis taking between 10ml – 20ml of venous blood from the woman's antecubital vein and introducing it into the epidural space via the intervertebral space nearest the dural puncture. This results in immediate cure of the headache.
The woman is left to rest for an hour or two to avoid disturbing the clot, which has sealed the dural puncture. It carries risks of infection but the success rate is 90% on the first occasion and 98% if the procedure is repeated.

Total Spinal Block

This is a rare complication. It occurs when by mistake there is a dural puncture that fails to be recognised and the anaesthetist injects the local anaesthetic solution. This results in rapid motor and sensory block with a drastic fall of blood pressure. The mother collapses and cardiac arrest may follow. If this happens, immediate

resuscitation is essential and ventilator support is required.
Occasionally, this effect is seen following a later top up and not during the initial stages of epidural analgesics. The reason for this is unclear but, in some cases, the epidural catheter is thought to have migrated. The midwife who tops up an epidural must be aware of these possible complications and their immediate treatment.

Bloody Tap

This happens when the anaesthetist punctures one of the epidural veins. Blood is seen in the catheter. In this case the epidural catheter is re-sited in order to prevent intravenous injection of local anaesthetic solution. If local anaesthetic is injected in the vein, toxicity will result and the woman will complain of tingling or numbness of the mouth and tongue, and dizziness. Her speech may be slurred and she may finally have convulsions.

Patchy Block

This is when an epidural block is sometimes more effective on one side of the body or is completely unilateral for no obvious reason. If this occurs the anaesthetist should be informed to adjust the epidural catheter.

Disadvantages of Local Anaesthesia

There are several disadvantages of local anaesthetics. These include:

- Unpleasant experience to the woman who may lose sensation and motor function in her legs
- Being unable to pass urine due to unawareness of a full bladder

The epidural block may also contribute to the following symptoms in the postnatal period:

- Impaired bladder function
- Marked perineal pain
- Backache due to trauma by the Tuohy needle during the epidural procedure

Drugs Used in Epidural Analgesia

There are several drugs used in epidural analgesia. These are:

Bupivacaine

This is administered in strengths of 0.25% and 0.5% and these concentrations are modified as required by diluting with normal saline. It is effective within 10 - 20 minutes of administration and lasts for about two hours during labour. The total dose given is not excessive unless labour is prolonged and toxicity is not common.

Ropivacain (Naropin)

This analgesic is good in low concentration with minimal and non-progressive motor block. Its long acting action makes it suitable for use in labour.

Opiates

Drugs in this group include:

- Diamorphine
- Morphine
- Pethidine

These are good post operative analgesics and neither cause hypotension, nor cause motor or sympathetic block. They are not as effective as might be expected in relieving labour pains but are commonly used in our hospitals following caesarean sections due to the pleasant feeling of wellbeing they induce. There is some risk of respiratory depression, although this risk is minimal.

Lignocaine

This is usually administered in the strength of 0.5 - 1% and is one of the more effective local anaesthetics available for epidural administration. The short acting span makes it unsuitable for use through out labour since a large dose may be needed and toxicity is therefore a risk. If the woman is very distressed it may be used for the initial dose and Bupivacaine can be used thereafter.

Spinal Anaesthesia

Although spinal anaesthesia provides for pain relief at the time of delivery, it is not suitable for use during labour as it decreases the strength of the labour contractions. It is suitable for caesarean section provided the operation is not prolonged beyond the effective time of the anaesthetic solution in use.
A spinal block is performed in a manner similar to an epidural block but in this case a local anaesthestic solution is injected into the sub-arachnoid space, i.e. in to the cerebrospinal fluid.The woman will have total motor control and sensory block over and below the anaesthetised areas.
There is a greater risk of hypotension with spinal than with epidural block. Blood pressure should be monitored carefully as should the the bladder contents.

Pudendal Block

Thjs is a technique that is used to anaesthetise areas that are supplied by pudendal nerve, namely lower vargina, perineum and vulva. This method is very unreliable and does not give
adequate analgesia.

Para Cervical Block

In this technique the para cervical plexus is blocked, this gives pain relief for the first

stage of labour but each injection is only effective for about three hours.
The technique is not favourable since the uterine artery passes close to the nerve plexus and inadvertent intra-arterial injection of even a small amount of anaesthesia would lead to foetal bradycardia or intrauterine death.

Local Anaesthesia

Perineal infiltration is very common among midwives who perform it before repairing episiotomies, perineal tears or vaginal tears. Lignocain is commonly used, but there is need for caution as levels above 200ml of 1% solution leads to risk of toxicity.

The midwife should really minimise the risk of intravenous injection, by being observant of the presence of blood in the solution after withdrawing the piston prior to injection.

Inhalation Anaesthesia

This is a process by which you administer volatile agents using a facemask in pain relief.
It is indicated in the late first stage and during the second stage
of labour.
Explain the procedure to the mother to ensure her cooperation. You should let her know that it will relieve the pain. Tell her to breathe in during a contraction and rest during the time the contraction wears off. She has to breathe in for at least 15 to 35 seconds at the beginning of a contraction.
It is contra-indicated under the following circumstances:

- Antepartum haemorrhage
- Preeclampsia
- Anaemia
- Congestive cardiac failure
- In all cases with placental insufficiency
- Maternal and foetal distress
- Intra uterine growth retardation

What are the main advantages of inhalation anaesthesia?

· It is easy to use
· It can be used by any competent midwife without supervision so long as she knows how to regulate
the flow
· Inhalation anaesthesia has shortlived effect on pain relief with no complications to the baby
There are two types of inhalation anaesthesia.
These are called:

- Tritene or trichoboroethylene
- Entonox

Tritene

This has a composition of upto 0.5% of tritene in air. It is blue in colour and a volatile

agent. One of the main side effects of this drug is that it accumulates in the maternal blood stream causing sleep but also, at times, disorientation. When this happens you must stop the inhalation. It also accumulates in the foetus, causing drowsiness at birth. It should not be administered for more than four hours. Once the drug is stopped the effect is short lived.

Entonox

This drug is composed of 50% nitrous oxide and 50% oxygen. When used in high concentration it is suitable for anaesthesia.
It has no side effects.

Responsibilities of the Midwife

The main responsibilities of the midwife include:

- Preparing equipment and ensuring it is in good working order
- Staying with the patient so as to instruct her on how to use the inhalation apparatus
- The midwife should know how the apparatus is used

Obstetric Operations

You will now study obstetric operations. The easiest and most important operation is the episiotomy. This is a technique each midwife should master while in the labour ward. This competence is achieved through observing an experienced midwife conducting the procedure. It is an aseptic procedure.

Episiotomy is invasion through the perineal tissues, which is designed to enlarge the vulva outlet during delivery.

Remember:
Give an episiotomy only when indicated.

The main indications of an episiotomy are:

- Rigid perineum, mostly in primigravidae
- Poor maternal effort or maternal distress in second stage
- In case of foetal distress in second stage to hasten delivery
- When the perineum threatens to tear, for example, in persistent occipito posterior
- Prior to assisted delivery such as in low forceps or vacuum delivery
- Preeclamptic mother
- In mothers who have medical conditions such as cardiac disease or diabetes mellitus
- In premature labour to minimise the risks of intracranial injury to the baby
- In case the mother has had previous third degree tears which had been repaired
- In malpresentation like breech delivery to prevent risks of intracranial injury to the

baby

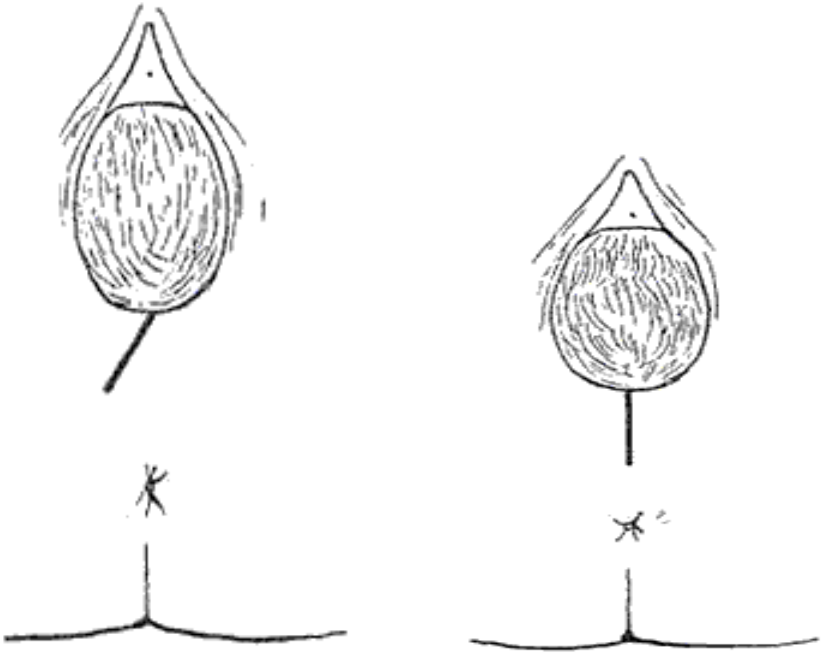
There are several types of episiotomy incisions.

Mediolateral Episiotomy

This is the most commonly performed episiotomy due to its safety record. However, it is difficult to repair. It begins at the centre of the fourchette, directed posteriorly and laterally the incision is not more than 3cm at 45° to the midline. Move towards a point midway between ischio-tuberosity and the anus. This is to avoid damaging the anal sphincter and the
Bartholin's glands.

Median Episiotomy

This begins at the fourchette, is directed posteriorly for approximately 2.5cms and stops just before the anal sphincter. It follows the insertion of perennial muscles and has minimal bleeding due to few blood vessels in this area. It is easy to repair, less painful and rarely causes dypareunia. However there is the danger of the incision extending to the anal sphincter.

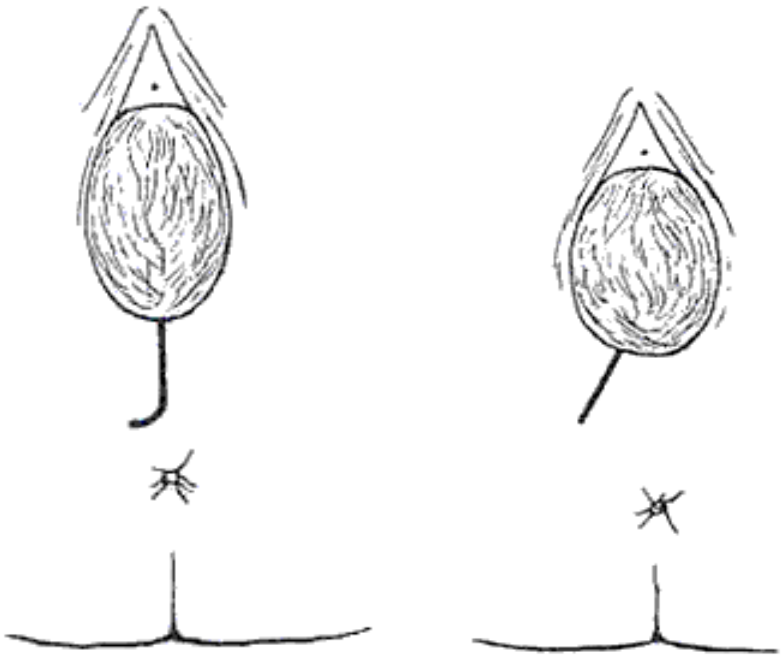


J Shaped Episiotomy

The incision begins at the centre of the fourchette, is directed posterior for about 2cm and then it is extended latero-posteriorly to avoid damage to the anal sphincter. Suturing of this episiotomy is very difficult.

Lateral

Not used now. Unlike in all the other types, the incision does not begin at the centre of the fouchette but on the side of the vaginal opening. The incision may extend leading to a severe vaginal tear and excessive bleeding.

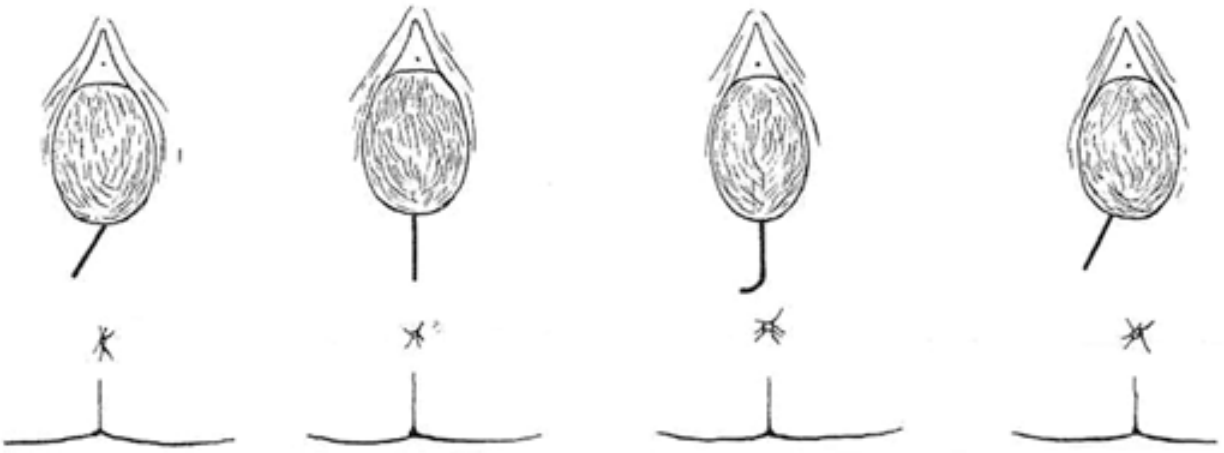


Remember: Episiotomy can comfortably be given without local anaesthesia at the height of a contraction. The first and the second types are more preferred.

Performing an Episiotomy

The timing of the incision is very important. It is best timed when the presenting part is directly applied to the perineum. If the episiotomy is performed too early, it exposes the mother to a lot of bleeding. If performed too late, there will not be enough time to infiltrate the local anaesthesia. A tear may already have developed before the midwife gives an episiotomy.
The main requirement for the procedure is a trolley with:

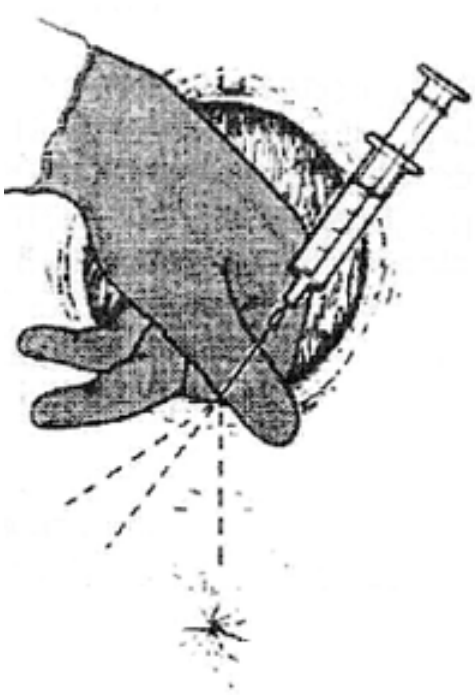
- Suture pack
- 10mls syringes and needles
  Lignocaine (0.5% 10ml or 1% 5mls)
- Chromic catgut
- Needle holder
- Suturing scissors
- Artery forceps
- Toothed dissecting forceps.
- Mayo scissors



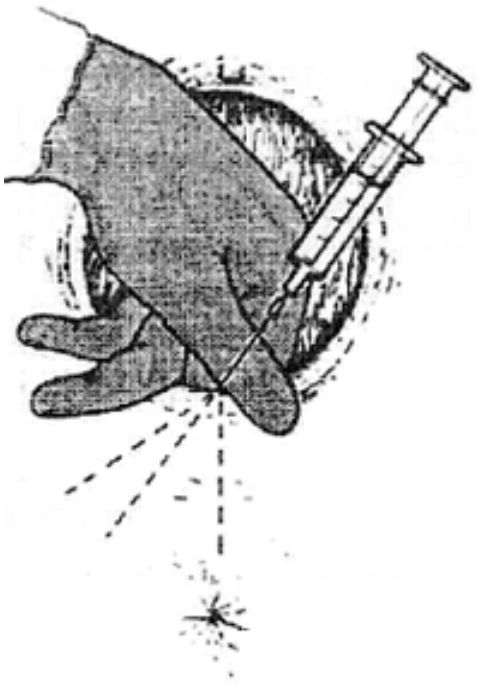
Procedure

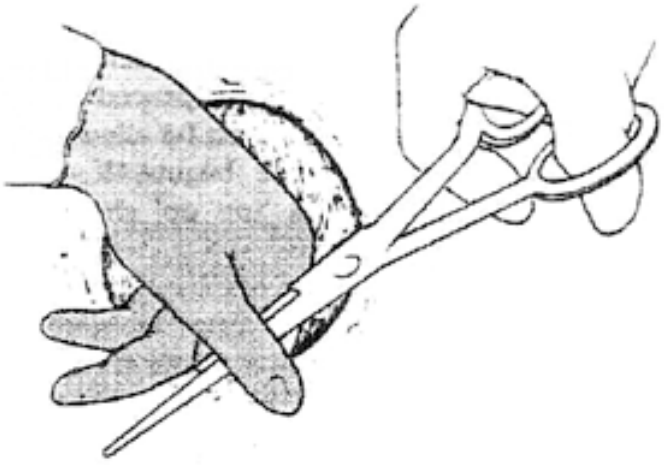
When the head reaches the pelvic floor, two fingers of the left hand are inserted between the perineum and the foetal head. Lignocaine, 0.5%, is infiltrated into the area where the incision has to be made. Using the right hand, the midwife places the tip of the opened scissors and makes an incision at the height of a contraction.

Infiltrating the Perineum



Performing an Episiotomy





Delivery of the head should follow immediately and it should be controlled to avoid extension of the episiotomy. If there is delay before the head emerges, apply pressure at the episiotomy site between contractions to minimise bleeding.
Use aseptic techniques.

The Method Used and the Toxic Signs of Local Anaesthesia

The following method should be used:

- Direct your needle 4.5cm beneath the skin of the proposed site of injection
- Ensure the needle is not in the blood vessel by drawing back the piston
- If you withdraw blood, redirect the needle
- Inject the lignocaine as you withdraw the needle
- Distribute the anaesthesia by changing direction of the needle to two or more areas on the proposed injection site

The following are toxic signs of local anaesthesia that you should be aware of:

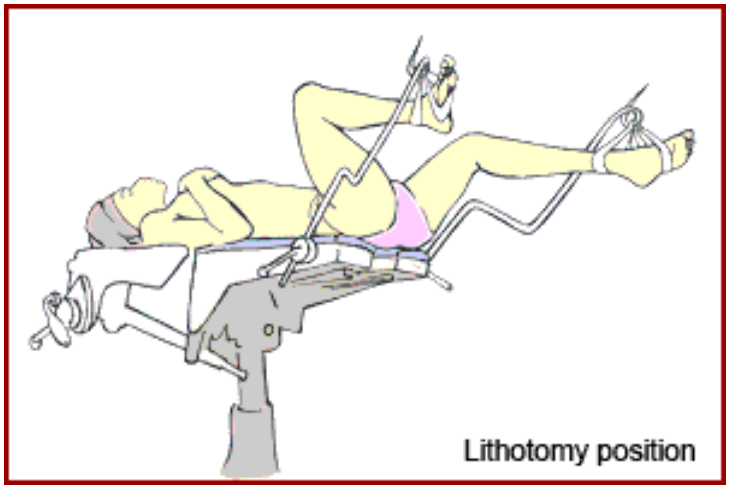
- Drowsiness
- Twitching of the face/lips
- Tingling in the area of the mouth
- Convulsion
- Circulatory collapse
- Respiratory collapse

If the above signs are noted, call for medical help (anaesthetist) and resuscitate.

Repair of the Episiotomy

The episiotomy should be repaired as soon as possible (immediately after the third stage) before oedema sets in and while tissues are still anaesthetised. You will need a good source of direct light. The patient is placed in the lithotomy position. The midwife should be seated comfortably during the procedure.

An aseptic technique must be maintained throughout the procedure. The vagina and the episiotomy site are cleaned with antiseptic lotion and the midwife should have a sterile gown and gloves on. Sterile gauze is inserted into the vagina to absorb blood and keep the operation site dry. Absorbable sutures are used. The repair begins at the apex of the vaginal wound. A continuous or interrupted stitch is used, started from the apex to the fourchette bringing the two edges of the wound together. The perineal muscles are then sutured and finally the skin is sutured.



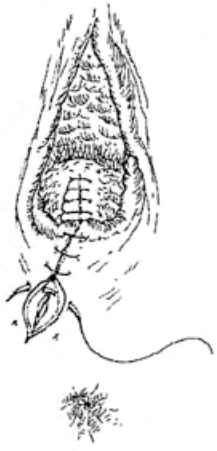
The stitches should just be firm enough. If they are too loose, they may cause oedema

and if they are too tight, the mother will be very uncomfortable. After suturing, remove the pack from the vagina and note on the mother's card that the pack has been removed. Insert the little finger into the anal orifice to make sure the two orifices have not been stitched together and the vaginal orifice isstill patent.

The repair from the apex of the vagina

The fascia and muscle of perineum are repaired with three or four interrupted sutures

Skin suture



Care of the Episiotomy

Advise the mother on how to take care of the episiotomy site.

This includes:

- Four hourly seat baths
- Change the perineal pad whenever it is soiled
- Avoid coitus until the episiotomy wound is healed
- Take a balanced diet to promote healing
- Maintain good hygiene
- Avoid constipation by taking plenty of fluids and roughage, constipation would

cause stretching of the sutures
during defecation

Possible complications to be on the look out for include:

- Infections leading to broken episiotomy
- Haematoma formation at the site of the episiotomy haemorrhage

Vacuum Extraction (Ventouse) Delivery

Younge invented the basic idea for the vacuum extractor in 1706 when he used a glass suction cup. In 1849, Simpson designed the instrument, but at the time it was hardly used. In 1774 Mostron introduced the modern vacuum extractor. There are opinions about the value in assisting delivery by this method and it is rarely used these days. However, it is still useful in remote areas.

Indications for vaccum delivery:

- Mild foetal distress
- Delay in second stage of labour
- Malposition; occipital lateral and occipital posterior positions
- Maternal exhaustion

The Procedure

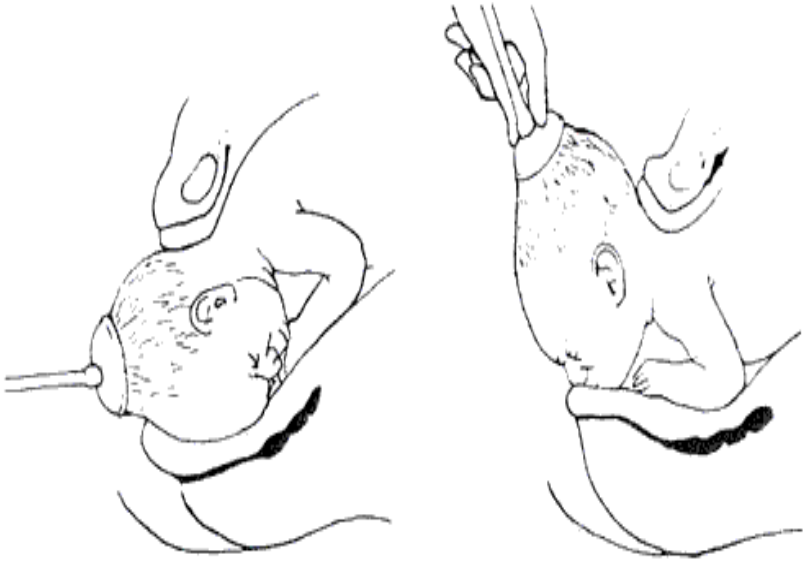
The following steps should be followed when conducting this procedure:

- Reassure the mother and explain the necessity of this procedure
- The paediatrician should be present
- Explain to the mother that the baby will have chignon (an area of oedema and bruising where the cup is applied) but this will disappear after some hours
- Equipment as for normal delivery with the addition of vacuum equipment
- The mother should be placed in the lithotomy position
- The doctor should assemble the cup and tubing
- The nurse attaches the distal end to the suction
- The doctor should then swab and prepare the mother
- Catheterisation is done to empty the bladder
- The perineum should be infiltrated with 1% lignocaine
- The cup should be dipped in sterile water then introduced sideways into the vagina by pressing backwards against the perineum
- It is placed on the scalp as near as possible to the posterior fontanelle
- Care should be taken not to trap the cervix or the vaginal wall under the cup

While the doctor holds the cup in the correct position:

- The pressure causes an artificial caput succedaneum or chignon, when vacuum reaches 0.8kg/cm the cup is completely filled with scalp
- Traction on the handle should be made as nearly vertically to the cup as possible as oblique direction may pull the cup off
- The nurse uses the hand pump to create vacuum gradually
- Increase negative pressure by 0.2kg/cm at one minute interval until 0.8kg/cm

is attained



he procedure continues as follows:

- Intermittent traction is applied with uterine contraction
- Direction of pull changes as the head descends through the birth canal
- When crowning takes place episiotomy is performed if necessary
- The use of ventouse should be reconsidered if there is no obvious descent after three to four contractions
- To prevent damage to the scalp, the vacuum is reduced as slowly as it was created after delivery of the head by opening the screw release valve
- The cup is then detached
- Should the cup detach itself, it is probably due to pulling in the wrong direction or using too much force
- A vacuum should be created again and if the chignon is large, then another area on the scalp is used

Remember:
Never use the cup actively to rotate the baby's head during the procedure. Do not continue this procedure for more than 30 minutes.

What complications should you watch out for during and after the procedure?

· Failure of the procedure
· Trauma to the foetal scalp
· Chignon, that is, oedema and bruising where the cup had been applied, which can occasionally get infected
· Some babies develop cephallohaematoma
· Intracranial haemorrhage
· Necrosis of the scalp
· Aponeurotic haematoma

· These complications occur mainly due to some degree of disproportion where the cup has been applied for long period and forceful traction used

Caesarean Section

Caeserian section is the delivery of the foetus through an incision made on the abdominal wall and uterus. It is considered a major abdominal surgery. The diminished danger of caesarean section has made it widely used and even abused at times.

Indications

The following are indications of caesarean section:

- Maternal or foetal distress during labour
- Pelvic tumour
- Diabetes mellitus
- Cephalopelvic disproportion
- Severe high blood pressure
- Abnormal uterine action
- Haemolytic diseases
- Failed induction
- Placenta previa
- Antepartum haemorrhage
- Gross disproportions
- Cervical or vaginal stenosis
- Fault in birth canal
- Double uterus
- Impacted mentoposterior
- Foetal malpresentation
- Shoulder presentation
- Breech presentation

Types of Caesarean Section

You should note that the forceps delivery poses several dangers both to the mother and baby.

What are the different types of caesarean section called?

· Lower segment section, which is the operation of choice
· Classical section
· Extraperitonial caesarean section
· Caesarean hysterectomy

Can you think why a lower segment section procedure would be the operation of choice?

The main advantages of lower segment section are:

- Blood loss is minimal
- Incision is easy to repair
- The risk of rupture during labour is lessened as the lower uterine segment has less uterine activity
- The operation is associated with lower incidence of postoperative infection

Lower Segment Caesarean Section

The following steps make up the procedure to be followed in the lower segment section:

- The bladder is emptied by catheterisation.
- Intravenous glucose saline is started (kept ready).
- The operation table is tilted to prevent compression of inferior vena cava.
- A transverse or vertical incision is made out of the lower subumbilical to open the peritoneal cavity.
- At the end of the wound a wide retractor is inserted.
- To push the bladder off from the lower segment, the uterovesical pouch is divided transversely for about 10cm.
- A transverse incision about 2cm long is made in the middle of the lower segment.
- Deepen until the membranes bulge.
- If possible the amnion sack should be kept intact.
- The incision is extended to 10cm by exerting traction using two index fingers at the incision.
- The membranes are ruptured.
- The hand is then slipped beside the head and the first blade of Wringley's forceps is applied, and the other follows.
- As the head is delivered gently with the forceps, the anaesthetist injects ten units of syntocinon intravenously.
- The shoulders are eased out carefully to avoid lateral splitting of the uterine wound.
- The delivered foetus is held upside down, the air passage cleared by suctioning.
- The cord is clamped and cut and the baby is handed to the assistant for further care.
- The placenta separates immediately and is delivered through the wound.
- The uterine incision is sutured with two layers with catgut or dexon.
- Any blood, liquor, vernix is removed from the peritoneal cavity and the wound closed.

Classical Caesarean Section

The incision is made directly into the wall of the body of the uterus. The procedure is rarely performed, its indications are:

- Gestation of less than 32 weeks (i.e before the lower segment has formed)
- Placenta previa which is anteriorly situated
- An hour glass contraction (constriction ring)

It is always performed through a midline incision.

Extra Peritoneal Caesarean Section
Procedure

Access to the lower uterine segment is secured by appropriate dissection of tissues around the bladder to by pass the peritoneal cavity and the baby is extracted. As the peritoneal cavity is not disturbed there is no risk of introducing infection from infected liquor or infection from the uterus. This was a popular procedure in the pre-antibiotic era but is now outdated.

Caesarean Section Hysterectomy

This is also known as Porro's Operation. The removal of the uterus follows after caesarean section, due to other conditions of the uterus; such as placenta accreta, multiple fibroid tumours of the uterus and so on. On rare occasions and in conjuction with other gynaecological disorders this operation may be used for sterilisation purposes.

Elective Caesarean Section

The decision to deliver by caesarean section is made during pregnancy before the onset of labour. Some reasons for this decision are absolute while others depend on combination of factors and the opinion of the obstetrician.

Emergency Caesarean Section

This operation is performed when adverse conditions develop during labour. The psychological preparation of the mother for the operation is of paramount importance. You should be prepared to deal with the different feelings of different mothers. An opportunity should be given to mothers to explore and express their feelings, be they fear, disappointment or frustration. This can be done in a group or individual counselling setting, where uncertainties and misunderstandings can be clarified. The nurse can be of great help acting as a mediator, fostering acceptance and sense of readiness to both the apprehensive mother and her partner

Pre-Operative Care For Elective

Caesarean Section

The following are characteristic of pre-operative care during an elective caesarean section:

- The doctor explains the procedure to the mother and her partner and consent is obtained.
- Physical examination is carried out to make sure the mother is fit for general anaesthesia
- Blood for haemoglobin, cross match and two pints of blood are kept ready.
- Mother is admitted and not fed overnight. Sodium amytal (200mg) is given to ensure a good night's sleep.
- The abdomen is cleaned in the morning.
- A bath is taken in the morning.
- A retention catheter is inserted to ensure an empty bladder through the operation.
- An intravenous infusion is started as per prescription.
- Valuables are kept safely.
- Nail polish, dentures, glasses or contact lenses are removed.
- Theatre gown, leggings and scarf are put on the mother.
- Pre-operative medication is usually administered half an hour before the operation (1m atropine and analgesic).
- Foetal heart, foetal position, and presentation are determined.
- Maternal observations are recorded: pulse, respiration, blood pressure and temperature.
- A urinalysis is carried out for albumin sugar.

Unanticipated Caesarean Section

In such a situation, the mother's anxiety will be high. Reassure the mother and explain the reasons for surgery. The procedure is the same as outlined for elective Caesarean but if food has been consumed, gastric lavage should be performed.

Remember: In some countries midwives are trained to perform caesarean sections.

Post Operative Care

This is the same care given to any woman who has undergone a major abdominal operation. For more details, refer to module one, unit four.

Additional care steps are also recommended. The mother should breast feed as soon as her condition permits. If for any reason she cannot breast feed, the breast should manually be expressed from the third day to prevent engorgement of the breasts. Four hourly vulva swabbing should be taken if the patient is confined to bed.

Remember that maternal mortality is four times greater than in normal labour. Elective sections usually have lower mortality rates but emergency cases are usually at high risk,

especially due to the use of anaesthesia. Mothers who were in labour for a prolonged period are especially at risk of serious infection; so prophylactic antibiotics should always be used. A ruptured uterus is more rare here than in the lower segment section. All mothers with a caesarean section scar should be delivered in the hospital under vigilant observation.
The foetus is also at risk, given that respiratory problems may occur due to the anaesthesia. Intracranial damage may occur as a result of improper care during the delivery of the foetal head, which has to be brought up from the pelvis or through the small uterine incision.
Obstetric emergencies may occur suddenly or may be due to poor management or negligence on the part of the skilled medical personnel. You should always be vigilant in your observations in an effort to avoid such emergencies. When they do happen, you should be ready to respond in order to save lives and reduce morbidity and mortality.

Obstetric Emergencies

Obstetric Emergencies

You will now look at some obstetric emergencies and how you can prevent them and systematically deal with them.

Vasa Praevia

This condition occurs when there is a velamentous insertion and the blood vessel from the cord lies over the os, in front of the presenting part. This endangers the life of the foetus. Vasa praevia can be felt on virginal examination when the membranes are still intact. The condition can be visualised on ultrasound. A speculum examination should be undertaken if this is suspected. When the membranes rupture, the foetal vessel may also rupture. The rupture of vessels should be suspected when there is fresh bleeding after the rupture of the membranes following foetal distress.

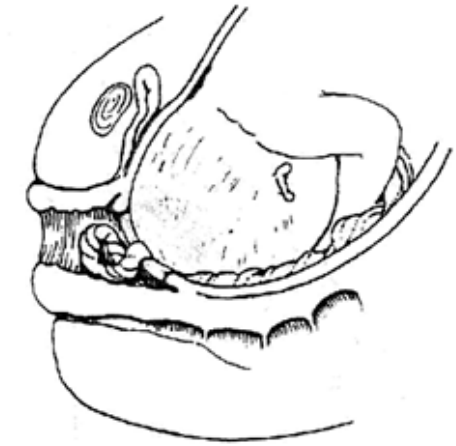
Management of Vasa Praevia

You should inform the doctor immediately. Take the foetal heartbeat and, if the foetus is alive, administer oxygen and prepare the mother for caesarean section.
A paediatrician should be present at the time of delivery of the baby. The baby's haemoglobin should be estimated and transfused as necessary. There is high mortality associated with this condition.

Presentation of the Cord

This is a condition where the cord lies in front of the presenting part and the membranes are intact.
Cord prolapse is a term used when the umbilical cord lies in front of the presenting part and the membranes

are ruptured.
Occult prolapse describes the condition that occurs when the cord lies alongside, but not in front of, the presenting part.



Causes of Cord Prolapse

Any condition in which the presenting part does not fit well into the lower uterine segment will permit the umbilical cord to slip down in front of the presenting part, for example, malpresentation and malposition, breech presentation, face and brow presentation, shoulder presentation resulting from transverse lie and occipito posterior position.
Malpresentation, polyhydramnious and prematurity are conditions that are more common in multiple pregnancies, all of which can cause cord prolapse.

- Contracted pelvis: because the membranes may rupture before the head has engaged.
- Certain placental and cord conditions like low implantation of the placenta, marginal insertion of the cord and a long cord.
- High head: the membranes rupture spontaneously when the foetal head is still high. Also artificial rupture of the membranes is contraindicated
  in high head.
- Prematurity: there is more room between the small foetal head and the maternal pelvis.
- Polyhydramnios: the cord is likely to be swept down in a gush of liquor when the membranes
  rupture spontaneously.

How would you diagnose cord presentation or cord prolapse?

During labour cord presentation or prolapse can be diagnosed as follows:

- On vaginal examination a soft pulsating mass can be felt in front of the presenting part with the membranes intact.
- A cord may be felt in the vagina or seen at the vulva either pulsating or not

pulsating.
- Whenever the membranes rupture a vaginal examination should be done to rule out cord prolapse.

Management of Cord Presentation

As soon as you get cord presentation, which is rare, you should remove your fingers, taking care not to rupture the membranes. Explain to the mother the situation at hand. Ask your assistant to inform the doctor and theatre staff to prepare for emergency caesarean section while you prepare the mother for the section. Take the mother to theatre as soon as possible as the membranes may rupture at any minute.

Management of Cord Prolapse

If you diagnose prolapse of the cord while performing a vaginal examination, check for the following factors that determine the method of management. Check whether the pulsation of the cord cervical dilatation is in the first or second stage. Determine the adequacy of the pelvis. If the cord is pulsating you must act very fast in order to save the baby.

Pulsating Cord with Mother in First Stage

Explain to the mother the situation at hand while you push up the presenting part so as not to compress the cord. If the cord is outside the vagina, gently replace it in the vagina to prevent spasm and keep warm. Instruct your assistant to inform the obstetrician and the theatre staff, and keep the mother in knee chest position without removing your fingers. Continue elevating the presenting part until the patient is
in theatre.
Your assistant should give the mother oxygen by facemask while someone else draws blood for grouping and cross matching. At this point you should commence an intravenous line and keep the vein open. The mother should be asked when she last had a meal and gastric aspiration should be commenced if necessary.
Once consent has been taken, the mother should be rushed to the theatre as soon as possible. If the cervical os is fully dilated and the pelvis is adequate, you should encourage the mother to push. Tell the assistant to inform the doctor and prepare for vacuum extraction. Continue encouraging the mother to push and give a generous episiotomy to hasten the delivery of the baby. Should the doctor arrive before the baby is out, he may perform vacuum extraction. If there is malpresentation, the patient should be quickly prepared for caesarean section as per steps above.

If the Cord is not Pulsating

The procedure to be followed varies from institution to institution. In some institutions you may be able to personally inform the patient of the situation. Otherwise, you may have to wait until the doctor comes to tell the patient about her dead foetus. If the patient is in first stage of labour and the pelvis is adequate, let nature take its course and deliver a fresh stillbirth. If the patient is in the second stage, she is encouraged to

push and she will deliver a stillbirth. In case there is a contracted pelvis, a caesarean section should be performed in spite of the death of the foetus.

Post Partum Haemorrhage (PPH)

PPH can be defined as excessive bleeding of more than 500mls of blood from the genital tract after the birth of a baby or any amount that may lead to deterioration in the mother's condition. This is also known as Primary PPH. If the condition occurs after 24 hours of, and within six weeks after, delivery it is known as Secondary PPH.

There are several predisposing factors associated with PPH.

Can you think what theses are?

- Grand multipara, that is, high parity of more than five children and advanced age
- Precipitate labour, that is, rapidly progressing labour
- Over distension of the uterus resulting from polyhydramnios, multiple pregnancy or overly large infant
- Previous history of PPH
- Blood clotting/coagulation disorders and disseminated intravascular coagulation
- Preeclampsia and eclampsia
- Heavy sedative medication during labour or general anaesthesia

Primary Post Partum Haemorrhage

Bleeding occurs in the third stage of labour and within 24 hours after delivery. The main sources of the haemorrhage include:

- Placental site
- Lacerations of the genital tract
- Blood coagulation disorders

Haemorrhage from the Placental Site

Bleeding can also result from the mismanagement of the third stage of labour. If ergometrine or syntocinon is not given at the end of the second stage, it remains quiescent for a few minutes. While the placenta is still attached, no bleeding occurs. However, if there are any attempts to manipulate the uterus such as massaging, kneading, squeezing and pushing, this will over-stimulate the uterus and cause uncoordinated uterine contractions, hence bleeding will begin.

Injudicious attempts to expel the placenta before complete separation will cause PPH as well as inversion of the uterus. Additionally, a full/distended bladder during the third stage inhibits proper placental separation leading to haemorrhage.
An abnormally adherent placenta can also be problematic. In placenta acreta chorionic villi penetrate the myometrium to the peritoneal surface of the uterus. In placental praevia, the placenta has a wider area of attachment than normal and the lower uterine segment may fail to contract strongly enough to control bleeding.
Disseminated Intravascular Coagulation (DIC) and other clotting disorders are rare but can cause slow but persistent and dangerous haemorrhage. DIC is especially associated with concealed placenta, abrupt, amniotic embolism and dead foetus. Finally, fibroids can interfere with good muscular action and prevent the closure of the blood sinuses.

What are the Signs of Possible PPH?

· There is an escape of blood through the vagina.
· There is an abnormally high fundus and the uterus feels larger and softer than normal.
· The patient becomes shocked especially with
concealed haemorrhage.
· With excessive haemorrhage the blood pressure falls, the pulse rate rises, pallor and air hunger may occur.
· Post partum necrosis of the anterior lobe of the pituitary gland is rare and occurs with low level blood pressure.

Prevention of Primary Post Partum Haemorrhage

You should be able to identify risk factors during the antenatal period through accurate history taking. Anaemia must be corrected during pregnancy. You should encourage hospital delivery, especially for women with a history of PPH, grand multipara or a history of APH.

For the mothers at risk of PPH infusion of syntocinon during labour until two hours after third stage is effective and safe for the mother. In case of prolonged labour induction can be done by use of syntocinon drip.
Ergomentrine or syntocinon should be given at crowning of the head or after delivery of the anterior shoulder of the foetus. The bladder should be emptied at the end of the first stage of labour. In anticipation of blood coagulation disorders, you should have ready two units of blood for women at risk.

Management of Primary Postpartum Haemorrhage

The main principles of treatment involve arresting the bleeding, restoration of the blood volume and treatment of circulatory
failure (shock).
You should ascertain whether the uterus is contracted, if it is not, you should rub it to cause a contraction. Ask your assistant to repeat syntometrine if you administered this at the end of the second stage. If you had not, they can begin to administer syntometrine, put up an IV infusion of normal saline and call the doctor.

When you feel a contraction, deliver the placenta by using control cord transition. When the placenta is out you should continue to rub until the final contractions expel the clots and the bleeding stops.
However, if the mother is still bleeding and the placenta is out, the uterus is not well contracted. Quickly check for the completeness of the placenta. If the placenta is complete, perform a bimanual compression whereby the right hand is inserted into the vagina in the anterior fornix above the cervix, and the left hand is placed on the abdomen and pressed downwards onto the posterior wall of the uterus so that it is compressed between the two hands. The doctor will order syntocinon drip 40 units at 40 drops per minute.

Maintain firm pressure till the uterus is felt to contract; bleeding will stop.

Management of Primary Postpartum Haemorrhage

If the placenta is not complete, do a bimanual compression IV with 40 units of syntocinon. Ask your assistant to inform theatre staff to prepare for exploration under general anaesthesia. Prepare the patient for theatre, ready to be transferred when the doctor arrives.
If the placenta has not separated and remains in the upper uterine segment, manual removal of the placenta under general anaesthesia is performed. If bleeding still continues (and is not due to a clotting defect) tying of the internal iliac arteries or even hysterectomy may be considered.
However, you should check the haemoglobin level and determine the need for haematinics or transfusion with blood. If the placenta is delivered and is complete and the uterus is well contracted but the mother is still bleeding, check the birth canal for any tear, which may be the cause of bleeding.
If the placenta is delivered, the uterus is well contracted and there is no tear of the perineum, which is bleeding, then you should suspect coagulation disorders. The doctor will commence the mother on fibrogen while preparation is made to transfuse fresh blood.

Haemorrhage from Lacerations

Bleeding resulting from lacerations may occur from the cervix, the wall of the vagina, at the apex of an episiotomy wound, and/or
a tear.
This usually occurs during the Spontaneous Vaginal Delivery (SVD) of a large (macrosonic) baby or when a large diameter presents in face, extraction of the after coming head in breech presentation, or due to difficult instrumental delivery.
The main signs of SVD are that the bleeding starts immediately the baby is born, the blood flow is continuous and/or the uterus is
firmly contracted.

Can you think of the management of lacerations?

The Management of Lacerations

In a lithotomy position examine the patient's birth canal to determine the location and extent of the tear. Apply pressure to the tears till they are sutured. Use aseptic technique to suture the tears. Remember that proper retractors and instruments are needed to suture a high cervical tear.
Profuse haemorrhage from a cervical tear involving a branch of the uterine artery can be temporarily controlled by clamping the artery with an artery forceps till the patient is taken to theatre. A seat bath after the suturing helps to clean the area. Antibiotics should be prescribed to prevent infection. You should also determine the level of bleeding to determine the need for transfusion or haematinics.

Blood Coagulation Disorders

In the event that the patient has a coagulation disorder, she may bleed profusely. You can diagnose this by doing a bedside clotting time to rule out DIC. Clotting time that is more than seven minutes is suggestive of DIC. In this case start management as follows:

- Keep the patient warm
- Give fresh whole blood
- Give fresh frozen plasma
- Give platelets concentrates

This type of care may not be available in small health institutions hence the need for referral.
If bleeding persists utero-ovarian artery ligation or subtotal hysterectomy should be considered.

Secondary Post Partum Haemorrhage

This usually occurs 24 hours after delivery or up to six weeks post delivery. The mother may present with retention of a placenta piece/products of conception, blood clots or puerperal sepsis, especially due to caesarean section. There may be low grade fever, lochia is usually heavier than normal and bright red in colour. Sub involution
is present.

Can you think how to manage a secondary post haemorrhage?

The Management of a Secondary Post Haemorrhage

Mothers are usually readmitted during the puerperal period. Call for the doctor. If the uterus still palpates, stimulate it to induce a contraction and expel blood clots. Give ergometrine 1ml. Keep all pads and linen to assess blood volume. The doctor may order an ultrasound to rule out any retained products of conception. The result will determine whether the mother will be prepared for exploration under general anaesthetic or treated conservatively with antibiotic and oral ergometrine.
Haemoglobin is estimated before discharge. If it is below 9g/dl, the option of iron

replacement is discussed with the mother. The severity of anaemia determines the appropriate care with foods rich in iron or iron supplements. In severe cases the mother is transfused.

Ruptured Uterus

This is a serious complication, which should not occur in today's obstetric care where there is good prenatal and intra partum care.
The rupture of the uterus is a tear in the wall of the uterus. This tear is divided into two categories.

Complete or Intra Peritoneal

This is a tear in the wall of the uterus, which involves the endometrium, myometrium and perimetrium/peritoneum.

Incomplete or Extra Peritoneal

This is the tearing of the uterus, which involves the endometrium and myometrium. Tears can occur parentally, during labour or delivery and may endanger the lives of both mother and foetus.

Can you think of the predisposing factors that may lead to ruptured uterus?

The factors that may lead to ruptured uterus

Predisposing factors include those that contribute to over distension of the uterus such as:

- Polyhydramnious and multiple pregnancy
- Pregnancy occurring within six months post Caesarean section with the placenta situated on the scar
- Obstetric manipulation or operations such as during internal cephalic version
- Previous operation of the uterus
- Foetal pelvic disproportion
- Myomectomy

Signs of ruptured uterus include:

- Rupture may be gradual with bleeding
- Pain and tenderness at the central region are present when the rupture is incomplete
- Diagnosis is difficult; therefore close monitoring is very important.

The Causes of Ruptured Uterus

Prenatally, a ruptured uterus may occur due to a weak scar. During labour and delivery or when not in labour a ruptured uterus may occur as a result of:

- Obstructed labour, for example in malpresentation, cephalopelvic disproportion, contracted pelvis
- Excessive or injudicious use of oxytocin

- Intrauterine manipulation, for example, internal cephalic version of second twin
- Forceps delivery and vacuum extraction
- Shirodkar stitch in labour
- Rigid cervix
- Breech delivery
- Multiparity, due to the degeneration of the uterine muscle
- Previous scar
- Manual removal of placenta
- Perforation of uterus

During labour a classical scar is more likely to rupture than the lower segment scar.

Early Signs of Scar Rupture

Early signs of scar rupture include a constant lower abnormal pain. This pain worsens during a contraction. There is fresh bleeding, which may be mistaken for show. Contractions may continue but the cervical os fails to dilate. Pulse rate is raised due to shock and tends to increase slowly.

Vigilant observation is required for a mother with a uterine scar showing the above signs so that she can be sectioned before rupture occurs.

Epidural analgesia masks the early signs, and is therefore contraindicated in the mother with a caesarean scar. In the advanced stage, the mother complains of severe and drastic pain, which is continuous and does not correspond to the uterine action. When the scar rupture contraction ceases, the mother rapidly becomes shocked. Rupture through a scar has less chance of infection than a rupture due to obstructed labour.

The presenting part does not descend to the pelvic brim in spite of strong contraction. The cervical os dilates slowly and hangs loosely like an empty sleeve and the membranes rupture early or the bag of water is elongated like a sausage.

The Late Signs of Scar Rupture

The following are some of the late signs associated with scar rupture:

- Mother is dehydrated, shows ketosis and is in severe pain
- Rapid pulse and pyrexia of over 38°C
- Poor urinary output, concentrated with ketosis and often blood stained
- Uterus gets moulded round the foetus
- Strong uterine contraction, which does not relax between contractions
- A Bundle's ring
- On vaginal examination, the vagina is hot and dry
- Presenting part is high, wedged and immovable
- There is over lapping of foetal bones and big caput succedaneum
- The mother is exhausted before the rupture, and she will probably cry out during the rupture and complain of a sharp pain in the lower abdomen
- She feels something has given way and soon presents with shock

Rupture Secondary to Manipulation

The general condition of the mother will change, and this could be discovered when the hand is still in the uterus. After any difficult manipulation, the uterus must be explored to rule out injury or rupture. Caesarean section is preferred to difficult manipulation.

Rupture Secondary to Oxytocic Drugs

This is common when close monitoring is not done. There is less danger when these drugs are used as a dilute in an intravenous drip. The risk is much greater in multipara where many cases of rupture have followed unmonitored use of oxytocic drugs.

Write down all that you can think of in the management of ruptured uterus.
The management of a ruptured uterus

- Combat shock by putting up an intravenous drip of saline and elevate foot of the bed
- Inform the doctor or theatre staff to prepare for an emergency caesarean section
- Prepare the mother physically and psychologically for theatre
- Take blood for grouping and cross matching

The options to perform a hysterectomy or to repair the rupture depend on the extent of the trauma and the mother's condition. A hysterectomy is done if the rupture is beyond repair. If the rupture is repaired, you should stress to the mother the importance of not conceiving until at least a year after the operation. Emphasise that she should always deliver by caesarean section and there should be no trial of labour whatsoever.

Post operative care should be followed as in the case of caesarean section.
Can you think of all the complications that may occur?

There are several complications of ruptured uterus to the mother. These include:

- Paralytic ileus
- Peritonitis
- Septicaemia
- Urinary tract infection
- Renal failure
- Death

The foetus may experience complications such as birth asphyxia, stillbirths in complete rupture and neonatal death.

Prevention of Uterus Rupture

Prevention is possible through good antenatal care after a thorough history taking. Refer high risk patients with previous scars and contracted pelvis for assessment. Vigilant observations in labour, especially in trial and induction of labour are necessary. You should be able to recognise, at an early stage, signs of obstructed labour and ruptured uterus. Maternal education is important in case of risk factors such as a previous scar. The community should be educated on pregnancy and childbirth complications. They should be advised on the need to deliver in a hospital rather than at home.

Shoulder Dystocia

Shoulder dystocia is said to have occurred when there is:

- Failure of the shoulder to rotate spontaneously into anterior, posterior diameter

of the pelvis outlet after delivery of the head

Predisposing factors include unusually large infants, foetal anomalies, post term pregnancy, maternal age of over 35 years and high parity.You should watch out for the following warning signs:

- There is slow advance of the head and failure of the head to rotate externally following restitution
- Slow crowning of the head
- There are difficulties in extension of the face during delivery of the head
- There is slow restitution of the occiput to the lateral position

Management of Shoulder Dystocia

You should take the following steps as part of the process of management:

- Explain the situation to the mother and reassure her.
- Position the mother either left lateral with buttocks at the edge of the bed or lithotomy with buttocks slightly beyond the edge.
- Ask your assistant to summon the doctor.
- If the shoulder is caught on the pubic bone the rotation will fail.
- Your assistant should try to dislodge the shoulder. They push the anterior shoulder abdominally towards the middle line, while at the same time you attempt to pull the same shoulder forwards vaginally.
- Simultaneously apply traction to the head on downward, backward direction.
- When you have managed to bring down the anterior shoulder, rotate and deliver it.

Change of the Maternal Position to Help Release the Foetal Shoulders

McRober's manoeuvre is a useful position. The mother is asked and helped to lie flat on her back and bring her knees as far as possible up to the chest. This manoeuvre has been proved to rotate the symphysis pubic angle posteriorly. The midwife creates pressure gently at the mother's legs and her abdomen. The impact of the anterior shoulder is released by this pressure.

Supra Pubic Pressure

Make an episiotomy to enlarge the outlet and reduce pressure at the pelvic floor.

While you exert traction to the head downwards and backwards, hook the fingers into anterior axilla and rotate its shoulder forwards. When the shoulders are in anterior posterior, conduct the delivery as usual.

Rubin's Manoeuvre

Identify the posterior shoulder on vaginal examination. Insert two fingers and push the posterior shoulder in the direction of the foetus chest. If the anterior shoulder dislodges, rotate it away from the symphysis pubic and deliver the anterior shoulder.

Zavanelli Manoeuvre

This manoeuvre is done as a last option to save the life of the baby. The obstetrician reinserts the head into the vagina by reversing the mechanism and caesarean section is done immediately.
Advise the mother on the proper diet to prevent big babies. A proper assessment of the baby's size at 36 weeks by the doctor should enable you to decide the proper mode of delivery.
There are several complications associated with shoulder dystocia.

- Two thirds of the patients will have blood loss of more than 1,000mls
- Maternal death may result from uterine rupture
- Neonatal asphyxia
- Brachial plexus injury
- Neonatal morbidity may be as high as 42%

Amniotic Fluid Embolism

This is a very rare catastrophic condition. Amniotic fluid embolism can occur at any gestation but it is most common at the end of the first stage of labour. The amniotic fluid enters the maternal circulation through the uteri-placental site. An emboli is formed which obstructs one of the pulmonary arteries or alveolar capillaries. It is associated with strong contractions, the membranes having ruptured. The body responds into two phases.
In the initial phase, the pulmonary artery goes into vaso spasm causing hypoxia. In the second phase, there is left ventricular failure, haemorrhage, and blood coagulation disorders followed by pulmonary oedema.

Can you think of what the predisposing factor and signs and symptoms are?

Predisposing factors include:

- Hypertonic uterine action
- Placenta abruptio, where the barrier between maternal circulation and amniotic sack is breached and the placenta bed is disrupted
- Procedures like insertion of intrauterine catheter
- Rupture of membranes
- Caesarean section
- Inter-uterine manipulation, for example, podalic version

Signs and symptoms of the condition are as follows:

- Onset of sudden maternal respiratory distress
- Severe dyspnoea
- Cyanosis
- Hypotension

The mother may get convulsions and collapse immediately after.

Management of Amniotic Fluid Embolism

The following procedures should be followed when trying to manage the condition:

- Administer oxygen
- Commence resuscitation at once
- Give aminophyllin slowly to reduce bronchial spasm
- Give fresh blood or fibrinogen to combat hypofibrinogen anaemia
- Maintain an intake and output chart checking on urinary output
- Assist delivery

In most cases the prognosis is poor.

The mother should be transferred to the intensive care unit.
You should always remember that there are several complications associated with the condition and you should be on the look out for them. These include disseminated intravascular coagulation, haemorrhage before amniotic fluid embolism and acute renal failure. Also note that perinatal mortality and morbidity are high if amniotic fluid embolism occurs before the birth of the baby.

Acute Inversion of the Uterus

Inversion of the uterus refers to when the uterus has turned inside out.

Classify the three degrees of inversion of the uterus.
Inversion can be classified as follows:

- First degree, where the fundus reaches the internal os.
- Second degree, where the corpus of the uterus is inverted to internal os.
- Third degree, where both the uterus, cervix and vagina are inverted and are visible at the vagina.

Classification of inversions is also based on the time they occur. Acute refers to immediate prolapsed after delivery while the placenta is still attached. Subcute and chronic refer to an inversion, which happens 24 hours later.
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The predisposing causes of acute inversion of the uterus:

- Management of third stage of labour
- Combining fundal pressure and cord traction while conducting third stage
- Use of fundal pressure before separation of placenta
- Placenta acreta
- Unknown cause, such as when the prolapse happens spontaneously
- Sudden emptying of the gravid uterus
- Short cord

How can you diagnose acute inversion of the uterus?

How to diagnose acute inversion of the uterus:

- Haemorrhage between 800ml – 1,880ml, which depends on the degree of placenta adherent on the uterine wall
- Shock due to pain, which is caused by the stretching of peritoneal nerves and the ovaries being pulled
- No fundus is palpable abdominally
- If inversion is partial, the fundus will not be visible per vagina
- On vaginal examination a mass may be felt

The faster the inversion is reversed, the less the risk to the mother. Remember that in an emergency you need effective teamwork. The more medical personnel, the quicker the work is done.

Management of Uterus Inversion

Inform the mother what has happened and reassure her. Call for help from other midwives.

Give instructions as follows:

- One of your assistants should call the doctor
- The other assistant should elevate the foot of the bed and give pethidine 100gm to relieve pain
- The assistant should then fix a canular, remove blood for cross match and fix an infusion

You should then use Johnson's manoeuvre. Try to push the fundus using the palm of your hand. Direct the fundus to the vagina and towards the posterior fornix. Lift the uterus towards the membranes with steady pressure and return to position. Once the uterus is in position, instruct your assistant to give 0.5gm oxitocin while you hold the uterus until you feel a hard contraction. Then the placenta can be delivered by using control cord traction. If the doctor comes before you finish the procedure, they can take over. In a health centre you should refer the mother to the hospital if you succeed, for further management.

Insert a giving set into the vagina. Use one hand to seal the vaginal orifice. Your assistant should instil a warm saline through the giving set. After pouring several litres the pressure will build up in the vagina. This pressure will restore the normal position of the uterus.

Medical Management of Inverted Uterus

If inversion is not possible manually, it may be due to a cervical constriction ring. The doctor will prescribe a relaxant to relax the cervical os and facilitate the replacement of the inversion.

Hypovalaemic Shock

You have come across haemorrhaging in the previous topic. Haemorrhaging is one of the main contributors to shock. You will now look at how bleeding causes shock.

Shock

Shock refers to the collapse of the circulation system, which results in the reduction of blood flow to the tissue. This causes dysfunction of organs and cells. In obstetric shock, the condition may be due to complications of pregnancy and labour.

Shock can be divided into three categories; can you think what these are?

Three types of shock

- Hypovolaemic, which is as a result of reduction in intravascular volume.
- Cardiogenic, which is due to the inability of the heart to pump blood.
- Distribute, which results from a malfunction in the vascular system causing maldistribution of the circulatory systems. This can be caused by septic and anaphylactic shock.

There are several causes of obstetric shock.

The causes of obstetric shock

- Haemorrhage during pregnancy, labour and puerperium
- Obstetric trauma such as difficult instrumental delivery, forcible breech extraction, manual removal of placenta or caesarean section
- Prolonged labour
- Fluid loss, for instance, excessive diuresis or hyperemesis gravidarum
- Supine hypotensive syndrome
- Pulmonary embolism, which may dislodge and cause oxygen deprivation
- Reaction due to blood transfusion or drugs

The condition develops in several stages, which you will now study in detail.

The Initial Stage

The venous return to the heart is decreased due to reduction of blood or fluid. There is also a reduction in stroke volume and cardiac output caused by inadequately filled ventricles of the heart. There is a fall in blood pressure, which decreases oxygen supply to the tissue and affects the function of the cells.

Compensatory Stage

At this stage the body can compensate for up to 10% of fluid volume. When it reaches 20-28% it begins to fall. The sympathetic nervous system responds to a drop in cardiac output by constricting vessels in the gastro-intestinal tract, kidney, skin and lungs. This causes the skin to be pale and cool. Peristalsis slows, urinary output is poor and gas exchange in the lungs is impaired. This causes ischaemia and collapse of alveoli, ultimately leading to respiratory failure known as ‘adult respiratory distress syndrome’. Blood is distributed to the vital organs only.

There is an increased heart rate in an effort to improve cardiac output and blood

pressure. The pupils dilate and the sweat glands are stimulated causing the skin to be moist and clammy. Adrenaline and aldosterone from the adrenal medulla and adrenal cortex are released. The posterior pituitary lobe also produces an antidiuretic hormone, which causes vasoconstriction in an attempt to improve cardiac output. Venous return to the heart increases but cannot be sustained for long unless fluid loss is replaced.

Looking at this mechanism you will notice how important it is to replace the lost fluid.

Hypovolaemic Stage

When the compensatory mechanism begins to fail, there is a further fall in cardiac output and blood pressure. Vital organs lack perfusion and coronary arteries lack supply. There is poor peripheral circulation. The pulse is either weak or absent. In the brain, the level of consciousness deteriorates and the mother becomes
increasingly unresponsive.
The renal tubules become ischaemic, leading to kidney failure. Waste products such as urea and creatinine are not excreted, resulting in their increased presence in the blood. The gut's function as barrier fails due to ischaemia and gram-negative bacteria are able to enter the blood stream.
The liver can no longer metabolise drugs and hormones. As the bilirubin can no longer be conjugated, it builds up and jaundice develops. With the liver failing to act as a filter, there is a build up of lactic acid and ammonia in the blood due to the failure of waste metabolism. Liver enzymes are released in the blood circulation by dead hepatic cells.

Final Irreversible Stage of Shock

The distractions of the cells are irreparable causing multisystem failure and ultimately death.

Outcome of Shock

Early arrest of the cause and replacement of body fluid will give full recovery.

At times the mother may survive but develop permanent damage to various organs. This is referred to as Sheehan’s syndrome. Death is usually due to a delay in treatment.

Management of Hypovolaemic Shock

Urgent resuscitation measures should be applied to prevent irreversible damage to the patient.
The first thing you should do is to maintain a clear airway by turning her on one side. If she is unconscious, insert an airway by turning her on one side and administer oxygen, 40% at the rate of four to six litres.
Find the source of bleeding, whenever possible and try to stop the bleeding. Replace fluid immediately. Take blood for a cross match and give blood transfusion as and when ready. Meanwhile a plasma expander such as dextran, haemocel or glucose saline (1 litre) should be administered as soon as possible.

When the blood is ready, the first 1,200mls should be given rapidly (within 30 minutes). The doctor should remain with the patient during this exercise. Avoid excessive warmth

as it will interfere with the constriction of the peripheral blood vessels, which usually occurs in response to shock.

Remember:
Constriction of blood vessels improves cardiac output and blood pressure.

Elevate the foot of the bed by 30cm. This will raise blood pressure 10mm Hg by gravity. This allows the blood to flow to vital centres in the brain.
Hydrocortisone 100-500mg is given slowly in cases of suparenal failure. A sedative may be necessary in the case of restlessness to calm an apprehensive patient.

Observations

The following observations should be made while monitoring the patient:

- Assess level of consciousness, noting signs of restlessness or confusion
- Monitor blood pressure continuously, about every 15-30 minutes
- Cardiac rhythm needs to be monitored continuously
- Measure urine output hourly by the use of indwelling catheter
- Take hourly temperature and observe the colour of the skin. Improvement to normal body temperature and colour may mean the function of the organs is going back to normal. Persistence of subnormal temperature means the reverse
- The infusion quantity and rate should be maintained accurately by measuring haemodynamic pressure in the right atrium
- Observe further occurrence of bleeding

Septic Shock

This is also known as endotoxic or bactereamic shock. The main cause of septic shock is gram-negative organism such as Escherichia coli, Bacillus Proteus or Pseudomonas pyocyaneus. These organisms are commonly pathogenic in the female genital tract. Gram-positive bacteria, viral or fungal infection, do not commonly cause septic shock. In 20-30% of cases, the cause of infection is combined organisms, and treatment becomes complex.
Can you think what the causes of septic shock are?

Septic Shock

Septic shock can be caused by prolonged rupture of membranes and puerperal sepsis, especially in cases of caesarean section.
The primary response of the body to septic shock is the release of histamine and enzymes produced by damaged cells. This contributes to an increase in the permeability of capillaries and vasodilatation. Mediators of opposite action are also produced causing vasoconstriction. Vasodilatation is the overall response and causes the reduction of the systemic vascular resistance. Cardiac output remains elevated

during this first phase of vasodilatation. The mother's face is flushed, her skin is warm and moist. Temperature ranges between 38 and 41°C. Systolic blood pressure is less than 90mm Hg.
In the second or late phase of vasoconstriction, there is cold hypotension. The continuity of hypotension and vasodilatation causes damage to the kidneys with reduced glomerular filtration due to the constriction of lobules and acute tubular necrosis followed by oliguria.
Adult respiratory syndrome is present in many cases. Haemorrhage occurs due to disseminated intravascular depression, which results in multisystem organ failure. There is mental confusion, coma and cardiac failure, which result in death.
Identify the source of infection by taking specimens including high vaginal swab, multistream urine and blood cultures. Check the infusion site and indwelling catheter for signs of contamination and change where appropriate.

Drug Therapy for Septic Shock

Use quick fluid therapy including glucose, saline, rigers, lactate or whole. An injection of dopamine, 20mg per kilogram, is infused in the vasodilation stage. Hydrocortisone is given, 100mgs IV stat, followed by 100mg six hourly until the pulse and blood pressure are stabilised.
Antibiotics are commenced immediately after the specimens for culture and other investigations are completed. These include:

- Gentamycin 80mg IV eight hourly
- Metronidazole 500mg IV eight hourly
- Ampicillin 500mg IV six hourly
- These should be administered until the bowel sound returns. You should then continue with 400mg metronidazole orally eight hourly for 10 days.