Mal-presentations and mal-positions including breech delivery

Introduction

Malpresentations and malpositions can be due to maternal pathology (e.g. contracted pelvis or uterine fibroids), or fetal pathology (e.g. hydrocephalus), which ideally should be diagnosed antenatally. Most often, there is no apparent cause.

Malpresentations are all presentations of the fetus other than vertex, for example face or breech presentation.

Malpositions are abnormal positions of the vertex of the fetal head (with the occiput as the reference point) relative to the maternal pelvis.

A fetus in an abnormal position or presentation may result in prolonged or obstructed labour.

Management

Review progress of labour using a partograph.

Note: Observe the mother closely. Malpresentations increase the risk for uterine rupture because of the potential for obstructed labour.

Table 1 is a Table of diagnostic features of malpositions and malpresentations

Assessing the fetal position

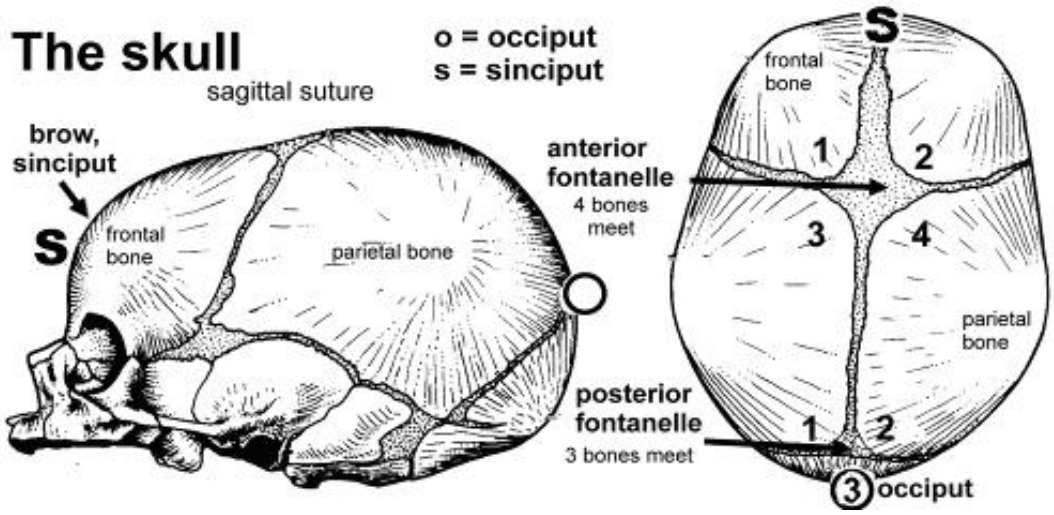
Determine the presenting part

The most common presentation is the vertex of the fetal head.

If the *vertex is the presenting part*, use landmarks of the fetal skull to determine the position of the fetal head (Figure 1). However, although the anterior fontanelle is larger than the posterior and has 4 sutures leading from it, one of them is small and may be difficult to feel.

Determine the position of the fetal head

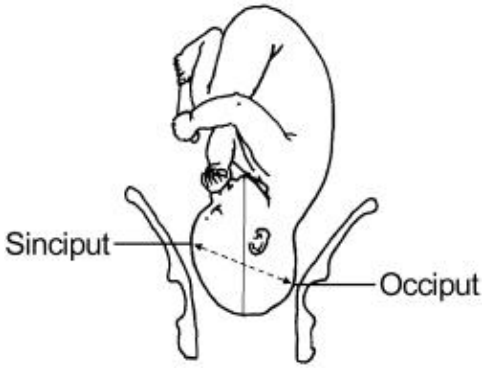
Figure 1 The fetal head



The fetal head normally engages in the maternal pelvis in an occiput transverse position.
With descent, the fetal head rotates so that the fetal occiput is anterior in the maternal pelvis (Table 1).
Failure of an occiput to rotate to an occiput anterior position should be managed as an occiput posterior position.

An additional feature of a normal presentation is a well-flexed vertex (figure 2), with the fetal occiput lower in the vagina than the sinciput.

Figure 2 Well flexed vertex presentation {near here}



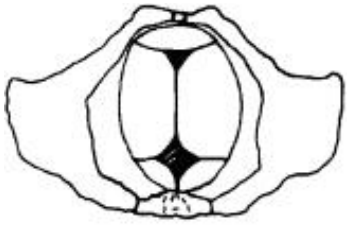
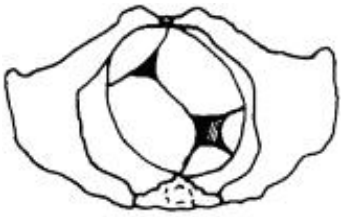
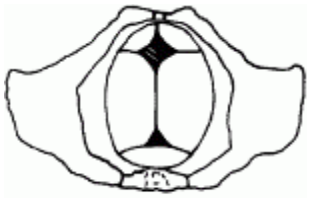
If the fetal head is well-flexed with occiput anterior or occiput transverse (in early labour), proceed with delivery.

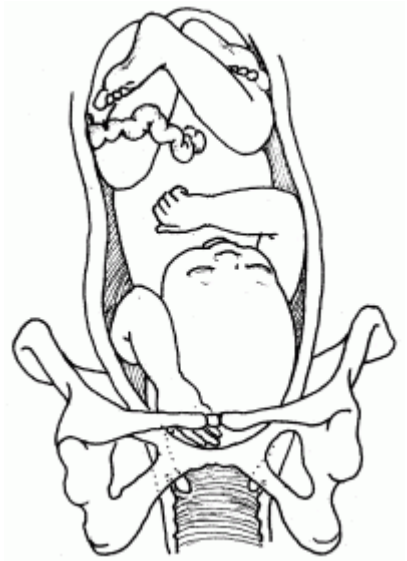
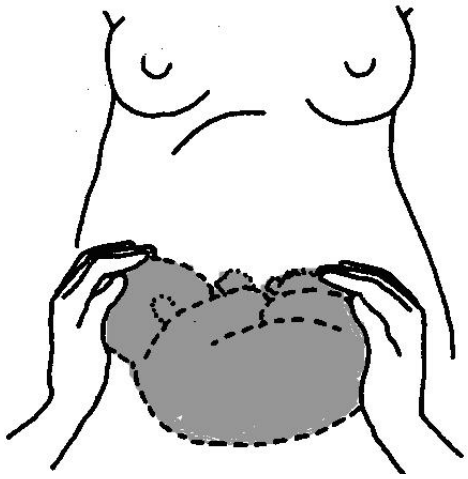
If the fetal head is not occiput anterior, identify and manage the malposition (table 1).

If the fetal head is not the presenting part or the fetal head is not well-flexed, identify and manage the malpresentations (Table.1)

Table.1 Table of diagnostic features of malpositions and malpresentations {near here)

Position	**Observations**	**Picture from introitus**
MALPOSITIONS		

OCCIPUT ANTERIOR	**On vaginal examination providing the head is flexed** only the posterior fontanelle with 3 sutures entering it is felt	 Occiput anterior  Left occiput anterior  Right occiput anterior
OCCIPUT POSTERIOR	On **vaginal examination**, the posterior fontanelle is towards the sacrum and the anterior fontanelle may be easily felt if the head is deflexed On abdominal examination the lower part of the abdomen is flattened, fetal limbs are palpable anteriorly	 Occiput posterior  Left occiput posterior
MALPRESENTATIONS		
BROW PRESENTATION is caused by partial extension of the fetal head so that the occiput is higher than the sinciput	On **abdominal examination**, more than half the fetal head is above the symphysis pubis and the occiput is palpable at a higher level than the sinciput. On **vaginal examination**, the anterior fontanelle and the orbits are felt.	

FACE PRESENTATION is caused by hyper-extension of the fetal head so that neither the occiput nor the sinciput are palpable on vaginal examination.	On **abdominal examination**, a large amount of head is palpable on the same side as the back, without a cephalic prominence on the same side as the limbs. On **vaginal examination**, the face is palpated, the examiner's finger enters the mouth easily and the bony jaws are felt.	 
COMPOUND PRESENTATION occurs when an arm prolapses alongside the presenting part.	Both the prolapsed arm and the fetal head present in the pelvis simultaneously.	
TRANSVERSE LIE AND SHOULDER PRESENTATION	The fetus lies in the transverse position with usually the shoulder presenting. On **abdominal examination**, neither the head or buttocks can be felt at the symphysis and the head is usually in the flank On **vaginal examination**, a shoulder may sometimes be felt. An arm may prolapse and the elbow, arm or hand may be felt in the vagina	

BREECH PRESENTATION occurs when the buttocks and/or the feet are the presenting parts.	On **abdominal examination**, the head is felt in the upper abdomen and the breech in the pelvic brim. Auscultation locates the fetal heart higher than expected with a vertex presentation. On **vaginal examination during labour**, the buttocks and/or feet are felt; thick, dark meconium is normal.	 extended legs  flexed legs  footling  a single footling presentation

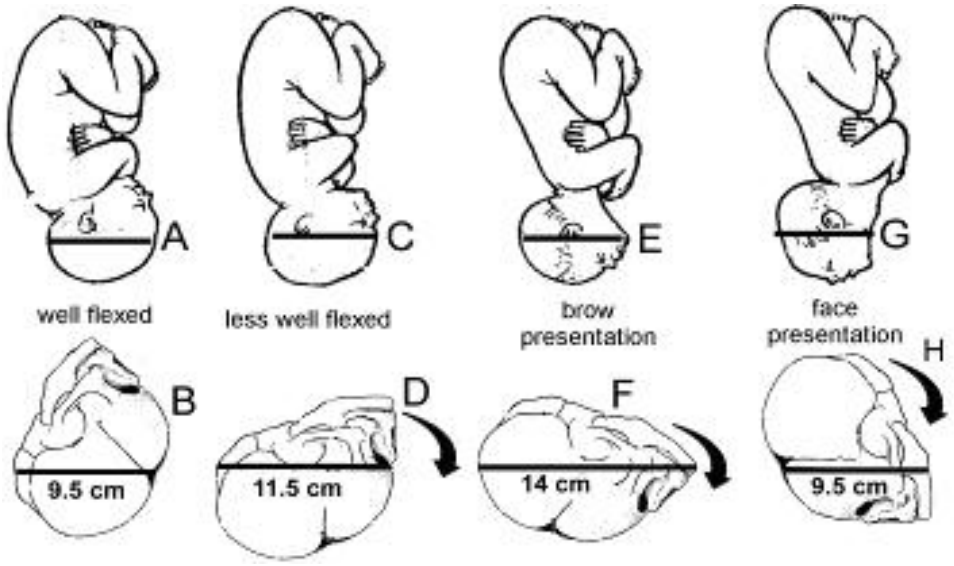


Figure 3 Diameter of presenting part changes as extension occurs

Malpositions of the fetal head

As a baby's head extends (deflexes), the diameter that has to pass through the mother's birth canal gets greater, until the baby becomes a brow presentation (14 cm). Then it gets smaller as the baby becomes a face presentation (see Figure 3)

Figure 3 A, C, E and G are all vertex presentations. The only normal one is the well flexed head A. As A turns through to become G, a baby's head gets more and more extended (deflexed).

Labour gets more difficult as the head extends, with brow and mento-posterior face presentations being impossible to deliver vaginally.

A face presentation is easier to deliver than a brow. This is because the head has now become fully deflexed.

The vertex presentations in Figure 3 show the diameters of the skull. When the head is well flexed (A) the shortest diameter of the skull is entering the mother's pelvis. In a brow presentation (E, most difficult) the longest diameter is trying to enter it.

Management of malpositions

Occiput posterior positions

Fifteen to 20 % of term cephalic fetuses are in an occiput posterior (OP) position before labour and approximately 5 % are OP at delivery. Most fetuses (around 90%) rotate to the occiput anterior (OA) position, some, maintain a persistent OP position, and others rotate from OA to OP position.

Arrested labour may occur when the head does not rotate and/or descend. Delivery may be complicated by perineal tears or extension of an episiotomy. The newborn infant is more likely to need resuscitation.

Diagnosis of OP position in the second stage is generally made by digital examination, but if there is uncertainty, ultrasound examination is both useful and accurate.

Management

There is no effective method to facilitate rotation from occiput posterior to occiput anterior before labour begins.

In the first Stage

Manual rotation (see below) must not be attempted in the first stage of labour as it can lead to prolapsed cord or complex presentations such as hand. It is also technically more difficult and may introduce infection.

1. If there are signs of obstruction or the fetal heart rate or pattern is abnormal (less than 110 or more than 160 beats per minute or abnormal dips) at any stage, deliver by Caesarean section if this can be safely undertaken.

2. If the membranes are intact, rupture them.

3. If there are no signs of obstruction, augment labour with oxytocin.

In the second stage

If the cervix is fully dilated:

• if the fetal head is more than 2/5 or 3/5 palpable above the symphysis pubis, or the leading bony edge of the head is above -2 station and there is fetal distress and/ failure to descend perform caesarian section.

• if the fetal head is less than 2/5 or 3/5 above the symphysis pubis, or the leading bony edge of the head is between 0 station and -2 station: try manual rotation (see below)

Expectant management of OP position is, however, appropriate in the presence of a reassuring fetal heart rate, adequate space on clinical examination of the pelvis, and continued progress in the second stage. More than 50 % of multiparous women and more than 25 % of nulliparous women with persistently OP fetuses achieve spontaneous vaginal delivery.

Thus, it is not appropriate routinely to perform prophylactic rotation at the beginning of the second stage.

Delivery from an OP position rather than rotation (see below) is more appropriate in women who, on clinical examination, have ample room between the fetal occiput and maternal sacrum/coccyx and when the pelvis is too narrow to permit anterior rotation (women with an anthropoid pelvis with a narrow transverse diameter and women with an android pelvis with a narrow arch.

Manual rotation

Successful rotation after the onset of the second stage is more likely to be successful if performed before arrest occurs. Manual rotation can convert 90% of OP or transverse arrest situations to OA.

Manual rotation is more successful in multiparous women and young women.

Rotation is important if there is a need for a fast delivery and/or if minimal or slow descent after a trial of pushing.

First empty the bladder.

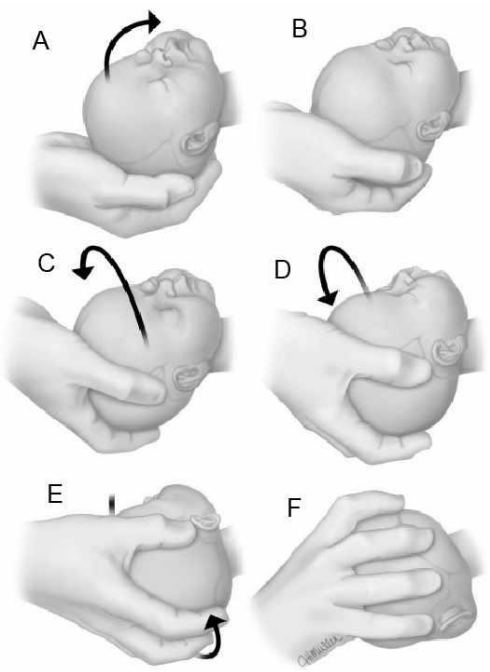
There are two methods for rotating the fetus.

1. FINGER ROTATION A hand is inserted into the vagina with the palm upward. Digital rotation is performed by placing the tips of the index and middle fingers in the anterior segment of the lambdoid suture near the posterior fontanelle (Figure 4).

The fingers are used to flex and slightly dislodge the vertex, rotating the fetal head to the OA position via rotation of the operator's hand and forearm. The thumb may also be used with gentle downward pressure more anteriorly on the parietal bone to aid in this rotation. The fetal head should be held in place for a few contractions to prevent rotation back toward the posterior position.

Figure 4 Finger rotation of occiput posterior to occiput anterior position

2. MANUAL ROTATION The operator's four fingers are placed behind the posterior parietal bone with the palm up and the thumb over the anterior parietal bone. The right hand is used for left OP position and the left hand is used for right OP position. The head is grasped with the tips of the fingers and thumb. During a contraction, the patient is encouraged to push and the operator attempts to flex and rotate the fetal head anteriorly. Occasional, mild upward pressure may help to slightly displace the head and facilitate rotation (Figure 5)



If rapid delivery is indicated, failed manual rotation may be followed by vacuum delivery from the OP position. Manual rotation performed prior to instrumental birth has little or no increase in risk to the pregnant woman or to the fetus.

Ventouse or forceps delivery should never be attempted above +2 station or if the head is more than 3/5 above the symphysis pubis.

Spontaneous rotation to the anterior position occurs in 90% of cases. Arrested labour may occur when the head does not rotate and/or descend. Delivery may be complicated by perineal tears or extension of an episiotomy.

1. If there are signs of obstruction or the fetal heart rate or pattern is abnormal (less than 110 or more than 160 beats per minute or abnormal dips) at any stage, deliver by Caesarean section if this can be safely undertaken.

2. If the membranes are intact, rupture them.

3. If the cervix is not fully dilated and there are no signs of obstruction, augment labour with oxytocin.

4. If the cervix is fully dilated but there is no descent in the expulsive phase, assess for signs of obstruction and if there are no signs of obstruction, augment labour with oxytocin.

5. If the cervix is fully dilated:

- and if the fetal head is more than 3/5 palpable above the symphysis pubis, or the leading bony edge of the head is above -2 station, perform caesarian section.
- and if the fetal head is between 1/5 and 3/5 above the symphysis pubis, or the leading bony edge of the head is between 0 station and -2 station: it may be appropriate to undertake delivery by vacuum extraction after symphysiotomy.
- and if the head is not more than 1/5 above the symphysis pubis, or the leading bony edge of the fetal head is at 0 station, deliver by vacuum extraction or forceps.

If the operator is not proficient in symphysiotomy, perform caesarean section.

Delivery of a brow presentation (see Table 1)

In brow presentation, engagement is usually impossible, and arrested labour is common. Spontaneous conversion to either vertex presentation or face presentation can rarely occur, particularly when the fetus is small or when there is fetal death with maceration. It is unusual for spontaneous conversion to occur with an average-sized live fetus once the membranes have ruptured.

If the fetus is alive, deliver by caesarean section if this can safely be undertaken.

If the fetus is dead and:

- the cervix is not fully dilated, deliver by caesarean section
- the cervix is fully dilated, deliver after craniotomy

If the operator is not proficient in craniotomy, deliver by caesarean section.

Do not try to deliver a brow presentation by vacuum extraction, outlet forceps or symphysiotomy.

Delivery of face presentation (see Table.1)

Background

Occurs in 1 in 500 to 1 in 1,000 pregnancies. It is due to extension of the fetal neck, either from a fetal abnormality or progression from a deflexed occipito- posterior position in labour. Diagnosis is important as it may be mistaken for breech presentation.

Diagnosis

Face presentation may be detected on ultrasound scan before labour but the majority are unpredictable as they arise in labour.

On abdominal examination, a large amount of head is palpable on the same side as the back, without a cephalic prominence on the same side as the limbs.

On vaginal examination: in early labour the presenting part is high. Landmarks are the mouth, jaws, nose, and malar and orbital ridges. The presence of bony gums (alveolar margins) distinguishes the mouth from the anus. The mouth and the zygoma ridges of the maxillae (upper jawbone) form the corners of a triangle, whilst the anus is on a straight line between the ischial tuberosities.

Avoid damaging the eyes by trauma or antiseptics.

Ventouse must not be used.

In early labour, particularly with the occipito-posterior position and a multiparous patient, deflexion is common. In such cases, uterine contractions often cause increased flexion, and delivery will proceed as normal. If extension occurs however, a brow presentation and finally the fully extended face will result. Most face presentations therefore only become obvious late in labour.

Descent is usually followed by internal rotation with the chin passing anteriorly. If the chin is towards the pubis (mento-anterior), then the baby can often be delivered normally, although an episiotomy is usually necessary. If the chin lies towards the back, then delivery will not occur and a caesarean section will be required.

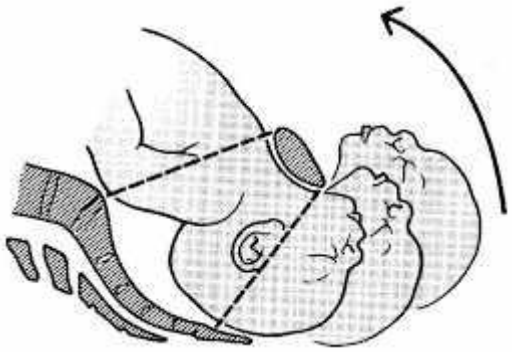
The widest biparietal diameter is 7cm behind the advancing face, so even when the face is distending the vulva, the biparietal diameter has only just entered the pelvis. Descent is less advanced than vaginal examination suggests, even allowing for gross oedema. The head is always higher than you think.

Abdominal examination is vital.

The head is born by flexion, causing considerable perineal distension in the process and risking considerable perineal trauma: *consider an episiotomy*. Anterior rotation having occurred, the neck comes to lie behind the symphysis pubis and the head is born by flexion. The shoulders and body are born in the usual way.

With satisfactory uterine action and mento-anterior (MA) position, spontaneous delivery or easy "lift out" (forceps only) assisted delivery will ensue in 60-90% of cases (see Figure 6).

Figure 6 Mento anterior position {near here}



If spontaneous delivery of a mentoanterior face does not occur, a "lift out" forceps delivery can be performed (see section on forceps delivery).

In mento-posterior (MP) positions (Figure 7), the neck is too short to span the 12cm of the anterior aspect of the sacrum. Additionally the neck would have to be extended to pass under the symphysis but it is already maximally extended. Delivery is impossible unless a very small fetus or one that is macerated allows the shoulders to enter the pelvis at the same time as the head.

Figure 7 Mento posterior position

Even with MP positions, anterior rotation will occur in the second stage in 45-65% so that persistent MP position or mento-transverse arrest is encountered in only 10% of face presentations.

Persistent MP positions are usually delivered by caesarean section (if possible and safe) to reduce fetal and maternal morbidity.

After birth, the oedema and bruising of a child's face may persist for some days, and may make feeding difficult.

Vaginal manipulation of persistent MP position has been successfully achieved with ultrasound guidance.

Management

- Make a diagnosis.
- Check for cord presentation or prolapse.
- Continuously monitor fetal heart rate.
- Examine regularly to check progress is adequate.
- Give oxytocin if progress not satisfactory.
- *Do not use* scalp electrodes or perform fetal blood sampling.
- If the position is mento-anterior, vaginal delivery should be possible.
- Perform an episiotomy.
- If fetus is persistently presenting mento-posterior, deliver by caesarean section (if appropriate resources and safe).

Delivery of compound presentations (see Table 1)

Here more than one part of the fetus is facing the cervix, for example an arm prolapsing alongside the presenting part. It is more common in prematurity. It can be managed expectantly in the early stages of labour in the multiparous patient, with active treatment only being required if there is a delay in the first or second stages of labour.

Transverse and oblique lies (see Table 1)

Background
These are-associated with prematurity, uterine fibroids and placenta praevia, and consequently are associated with high maternal and fetal morbidity. Always try to identify the underlying pathology if any.

If the membranes are intact in early labour external cephalic version is worth attempting (see below under breech).

The presentation of shoulder, limb or cord in the presence of ruptured membranes means that Caesarean section is the only option for delivering a viable infant. If the fetus is dead, unless it is very small and macerated, it is safer to perform a destructive procedure.

Practical points to remember

- Try to identify the cause of the abnormal lie (ultrasound) if any

- **Positively exclude placenta praevia with ultrasound before conducting digital vaginal examinations, although if there has been no vaginal bleeding this is unlikely.**
- Caesarean section can be extremely difficult:
  - The lower segment will be poorly formed.
  - Fibroids, when present, can distort anatomy and inhibit access.
  - Placenta praevia is associated with severe haemorrhage.
- A vertical uterine incision may sometimes be most appropriate for the above reasons.
- Keep the membranes intact while making and extending the uterine incision. as this helps with manipulating the fetus into a longitudinal plane for delivery.
- If there is any difficulty in delivering a fetal head or breech, then find, grasp and bring down a foot (recognisable by the heel) into the wound.
- If delivery is still impossible, the uterine incision can be extended upwards in the midline, making an 'inverted T'. **It is essential if an extended uterine incision has been undertaken to undertake an elective Caesarean section in subsequent pregnancies, because of the risk of uterine rupture in labour.**

Breech delivery (see Table 1)

Background

At 28 weeks, 20% of babies present by the breech, but most fetuses will turn spontaneously so that only 3-4% will remain breech at term. There is a higher rate with prematurity. Vaginal delivery (although safer for the mother than caesarean section) carries higher risk of perinatal and neonatal mortality and morbidity due to birth asphyxia and trauma.

Hazards of vaginal breech delivery
Compared to the cephalic presentation at term, there is a greater risk of perinatal and neonatal mortality and morbidity, due principally to fetal congenital anomalies and birth trauma/asphyxia. In terms of maternal outcomes, vaginal birth is generally better for mother than CS, as the operative complications associated with major abdominal surgery and the resulting uterine scar are avoided. All of these are especially relevant in poorly- resourced countries.

Minimising problems

Options

- If no associated complications of pregnancy (e.g. previous Caesarean section, pre-eclampsia)) explain the 3 options to the patient and her family:
  1. external cephalic version (ECV),
  2. trial of vaginal breech,
  3. elective caesarean section (CS) only if safe.
- On current evidence, all women with uncomplicated breech presentation at term should be offered ECV.
- If CS, wait until 39+ weeks (babies may still turn spontaneously until then).
- A trial of vaginal breech delivery is appropriate if *both* mother and baby are of normal proportions.
  - The presentation should be either frank (hips flexed, knees extended) or complete (hips flexed, knees flexed but feet not below the fetal buttocks).
  - There should be no evidence of feto-pelvic disproportion: adequate pelvis - using clinical judgment and Estimated Fetal Weight (EFW) <4000g (clinical measurement).
  - In some smaller women it may be appropriate to exclude a vaginal breech option where the EFW is <4000g provided CS is safe.
  - There should be no evidence (on ultrasound) of hyper-extension of the fetal head.

Fetal complications of breech presentation

- cord prolapse
- birth trauma as a result of extended arm or head, incomplete dilatation of the cervix or cephalopelvic disproportion
- asphyxia from cord prolapse, cord compression, placental detachment or arrested head
- damage to abdominal organs
- broken neck.

External cephalic version (ECV)

Background

Current recommendations in well -resourced countries are that ECV be carried out with the mother wide awake, but 'starved', having made her informed choice and having given consent for caesarean section if necessary, close to theatre, after fetal monitoring has been carried out ,and using ultrasound guidance, and tocolysis where necessary. These safety guidelines minimise the risks of maternal injury and fetal distress, allowing early detection and treatment, if necessary. However, in resource limited settings, the avoidance of breech delivery by ECV is highly beneficial and the method described below is a reasonable compromise.

ECV may be performed between 37 and 42 weeks if there is a single uncomplicated breech pregnancy. There should be no previous uterine scars, previous ante-partum bleeding, fibroids or a placenta praevia. On admission, the fetal heart should be listened to regularly. If available, ultrasound should be performed to demonstrate the fetal presentation, a good amount of liquor, a flexed fetal head and the position of the fetal legs. The mother should be awake and consent to the procedure.

Methodology
The membranes must be intact, with adequate amniotic fluid and no complications of pregnancy

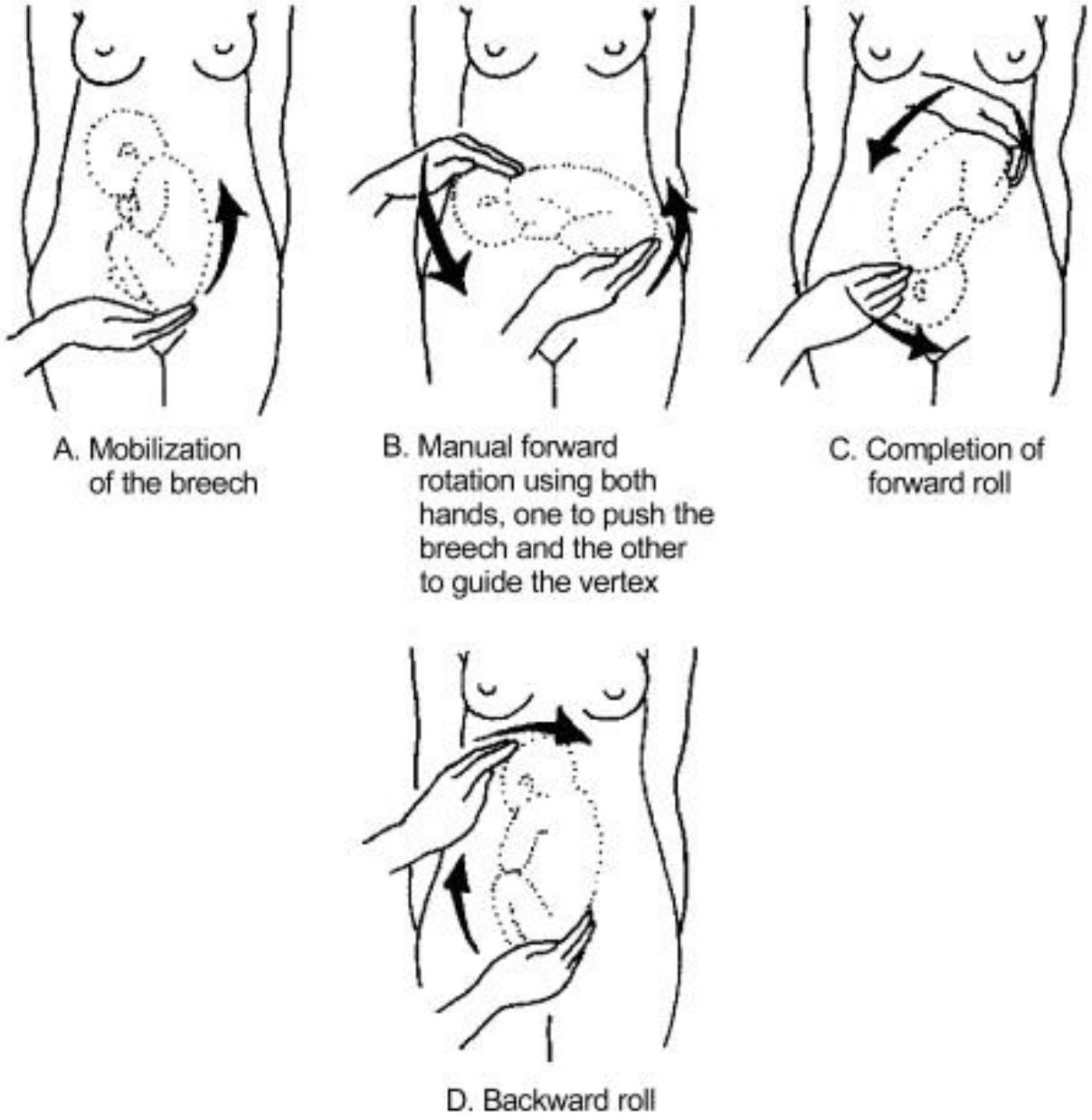
Procedure: External cephalic version

If possible, use ultrasound to demonstrate fetal position, adequate liquor, a flexed fetal head, a free loop of cord and the position of the fetal legs (extended or flexed).

- The mother lies on the side (usually her right) which will allow a forward somersault (from 'left sacro- anterior' position - which is the commonest breech position).
- The bed is tilted head down to allow gravity to assist in disengaging the breech.
- If the uterus is relaxed, an attempt is carried out to turn the baby - disengaging the breech with one hand and flexing the head further with the other.
    - This should not hurt the mother but will be uncomfortable; the movement on her abdomen is made easier by using lubricant e.g. sweet almond oil, talc or ultrasound gel).
    - *See* Figure 8 for illustration of the manouvres
- Ensure fetal heart rate is normal (110-160 beats/minute).
- In well-resourced settings only and with relatively only slightly more success, and if the uterus is not relaxed, tocolysis may be helpful. Give 250 microgram subcutaneously.
- The fetal heart rate should be listened to regularly during the procedure.
- Whether the ECV is successful or not, after the procedure listen carefully to the fetal heart every 5 minutes for 30 -60 minutes. If this is normal, the mother is allowed home.
- If the first attempt is unsuccessful, consider bringing the mother back the next day for a repeat trial.

- If the fetal heart rate becomes abnormal, turn the woman onto her left side or into the recovery position and reassess every 5 minutes. If FHR does not become normal within 30 minutes, deliver by CS, if available and safe to do.
- In well-resourced settings where blood group including rhesus factor is universally collected and where the mother is rhesus negative, 500 international units of anti-D immunoglobulin should be given after ECV. Unfortunately, anti-D immunoglobulin is expensive.

Figure 8 External cephalic version



.

Figure 8 shows the steps in ECV. It shows how a right-handed person would turn a baby. If you are left-handed, turn the baby the other way.

A, place one hand below the breech, and your other hand above the head.
Lift the breech out of the pelvis.
Bring the head and breech closer together so as to flex the baby.
B, and **C**, turn the baby by guiding the head forwards as you lift the buttocks up. In this way you make the baby do a forward somersault (turn head over heels).
D, if you fail to turn the baby, try turning with a backward somersault.

All mothers should be warned about the possible subsequent risks of reduced fetal movements, vaginal bleeding, rupture of the membranes or onset of labour. If ECV is successful, the pregnancy can be managed as a cephalic presentation. If unsuccessful, future management should be discussed and a decision made regarding elective caesarean section or trial of vaginal breech delivery.

Trial of vaginal breech delivery

This is a difficult issue where there is limited availability of safe surgery or surgery without delay. A trial may not be appropriate if:

- the mother is very small *and/or* the baby is large.
- evidence of fetal-pelvic disproportion: an inadequate pelvis, using clinical judgment and estimated fetal weight exceeding 4Kg.
- evidence (on ultrasound) of hyper-extension of the fetal head.

If there has been a previous caesarean section or other scar in the uterus, a repeat CS may be preferable, although this will depend on the availability of safe surgery. Moving the woman to a waiting home next to a unit providing comprehensive EmOC from 37 weeks gestation (if available) may be a good option.

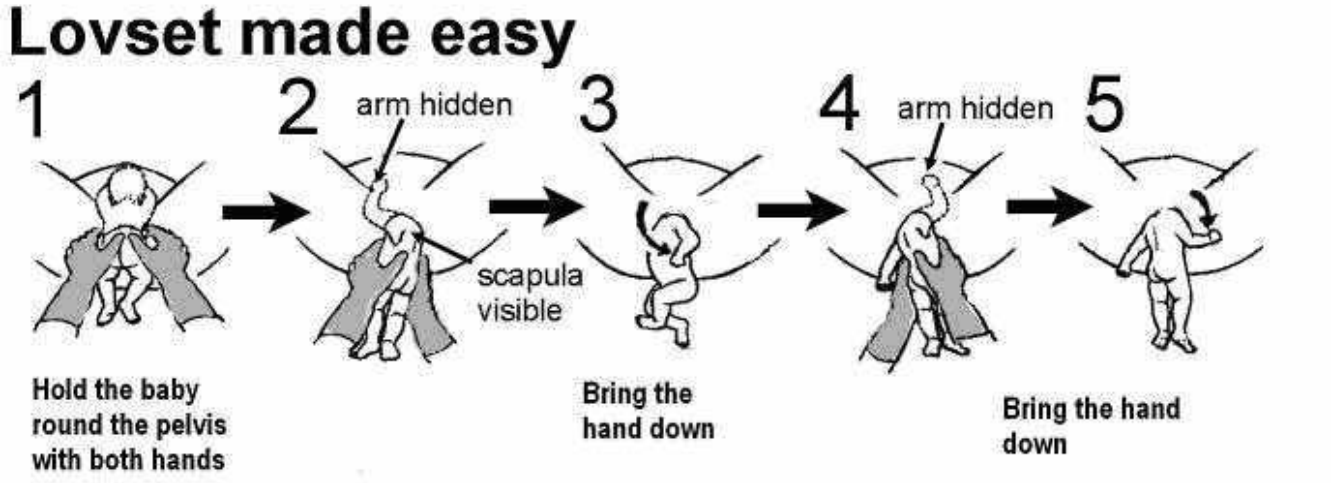
Procedure

- The mother should confirm her informed choice of vaginal delivery if it is safe to undertake a caesarean section both in the short and long term. .
- If in hospital an obstetrician, anaesthetist and operating theatre should be ready.
- Careful fetal monitoring and documentation of the partograph undertaken.
- The bladder must be emptied either naturally or by in-out catheter.
- If spontaneous rupture of membranes occurs, do a vaginal examination to check for cord prolapse. Meconium is common and not a sign of fetal distress.
- Amniotomy may be used to accelerate labour, and careful use of oxytocin may be used to correct poor uterine activity if the mother is having her first baby. However, oxytocin should only be used in a well resourced hospital. Oxytocin should not be used for poor progress due to poor uterine contractions in a mother who has previously given birth.
- Caesarean section should be considered if there is poor progress or fetal distress.
- Ensure a health worker with adequate experience in delivering breech babies vaginally is present during the second stage.

The basic principle of delivering a breech is to avoid interfering:

- Active pushing should not be encouraged until the breech has descended to the pelvic floor and the cervix is fully dilated as confirmed by vaginal examination (VE).
- Sitting the patient up at this stage may help to encourage descent of the breech. An *episiotomy* may well be required, but should not be performed until the anus is visible or until the baby's buttocks are distending the perineum.
- The breech will usually rotate spontaneously to lie with the sacrum anteriorly (rarely it will try to turn posteriorly - **this must be prevented**)
- Extended legs are delivered by flexing the knee joint of the baby and then extending at the hips.
- The baby is *supported* only when the arms are delivered and the nape of the neck becomes visible. (Avoid holding the baby's abdomen as internal organs may be traumatized; the pelvis should be held gently).
- As the mother pushes, the anterior shoulder tip will become visible. A finger is run over the shoulder and down to the elbow to deliver the arm. The other shoulder will rotate anteriorly spontaneously to allow similar delivery of the other arm. If the arms are not delivering spontaneously despite the shoulders being visible, then Lovsets manoeuvre should be undertaken (see Figure 9) Traction on the baby combined with rotations as hown (multiple if necessary) will usually result in each arm dropping out of the cervix. Minimal assistance by the health worker running a finger along the arm to disengage it may sometimes help.

Figure 9 Breech delivery Lovset's method



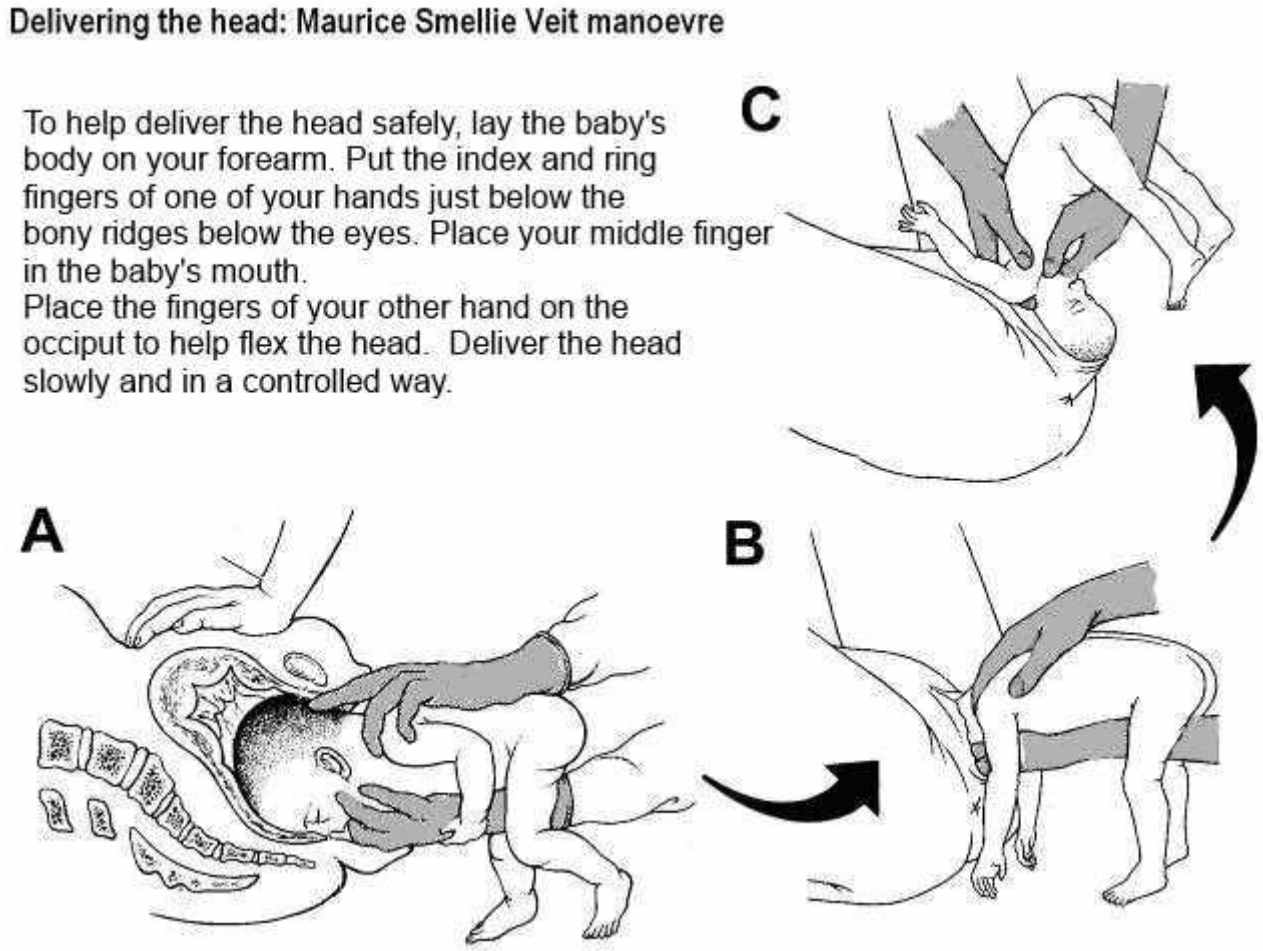
- The baby lies supported as the head engages and the neck comes into view (Figure 10).

Figure 10 Breech delivery: the baby should hang until the hair line at the back of the neck is seen

- Delivery of the head may then be performed by the Maurice-Smellie-Veit manoeuvre (Figure 11). The right hand is placed into the vagina, the fetus is supported on the right forearm, the middle finger of hand is passed into the baby's mouth and the first and third fingers are placed **just below** the bony ridges of the lower part of the orbits (the maxilla). The eyes must not be compressed. Pressure is applied to flex and deliver the head. The left hand is used to press upwards and posteriorly on the back of the fetal head to encourage flexion.

Alternatively, forceps may be used to achieve the controlled delivery of the head. An assistant should hold the baby's feet to elevate the body above the horizontal to allow the operator access to apply forceps. The nape of the neck must be in view before the baby's body is lifted upwards, or damage to the fetal neck may be caused. It is also essential that the baby is not lifted too high as this will damage the neck.

Figure 11 Breech delivery: delivering the head by the Maurice-Smellie-Veit manouvre



If the head fails to descend into the pelvis, that is the nape of the neck does not appear, first check that the cervix is fully dilated. If it is not then it will need to be incised. If the cervix is fully dilated and if possible, forceps (ideally Piper's) may be applied to the fetal head to facilitate delivery. If these fail, a symphysiotomy should be considered. All 3 of these maneuvers are potentially dangerous for the mother. If the fetus dies, then a destructive procedure should be undertaken.

Elective caesarean section for breech

This is advisable for:

- failed external cephalic version
- double footling breech
- a very large fetus
- a small or malformed maternal pelvis
- hyperextended or deflexed fetal head

Before and at operation:

- explain to the woman that she will have a scarred uterus, which may create problems in future pregnancies

- ensure that the presentation remains breech before anaesthetising the patient
- note that if the uterine incision is too small, there can be difficulty delivering the after-coming head
- remember to keep the fetal back upwards during delivery.

.

SECTION 10 Quiz 10

1) Which of the following are normal fetal presentations?

a) fully flexed vertex
b) brow
c) face

ANSWERS:

1. a

SECTION 10 Quiz 11

1) Regarding face presentation which of the following statements are correct?

a) it may be mistaken for breech
b) is most often obvious early in labour
c) if the chin is towards the pubis a Caesarean section will always be needed
d) episiotomy is usually needed for vaginal delivery
e) if spontaneous delivery of a mento-posterior face does not occur, a 'lift out' forceps delivery can be performed.

ANSWERS:

1. a,d

SECTION 10 Quiz 12

1) Which of the following statements are true regarding the occipital-posterior position?

a) Can be manually rotated during labour
b) may be suspected on abdominal examination when the lower part of abdomen is flattened and the fetal limbs are palpable anteriorly
c) on vaginal examination the anterior fontanel may be felt easily
d) may lead to a prolonged first stage of labour
e) is more likely to lead to assisted delivery than the occipital-anterior position

ANSWERS:

1. a,b,c,d,e

SECTION 10 Quiz 13

1) **Which of the following statements are true regarding the brow position?**

a. is caused by partial extension of the fetal head, so the synciput is higher than the occiput
b. may lead to face presentation later in labour
c. will allow the anterior fontanel and supra-orbital ridges to be felt on vaginal examination
d. will lead to Caesarean delivery if presentation remains brow

ANSWERS:

1. b,c,d

SECTION 10 Quiz 14

1) Which of the following statements are true regarding external cephalic version for breech presentation?

a) it is contraindicated if there has been previous APH
b) 3 attempts should be made at between 34 and 36 weeks gestation
c) should not be performed for 2nd twin if transverse lie
d) anti D should be given to the mother if she is rhesus negative
e) if unsuccessful, Caesarean section is the only option

2) A Trial of vaginal breech delivery is appropriate under which of the following conditions?

a) Mother and baby are of normal proportions
b) presentation of breech is footling
c) a skilled birth attendant with adequate experience in vaginal breech delivery is present at 2nd stage

3) **When delivering a breech which of the following statements are true?**

a) active pushing should be encouraged to aid descent of the breech to the pelvic floor
b) the baby must be prevented from turning so that the back is posterior
c) the baby is only supported when the arms are delivered and nape of neck is visible
d) the anterior shoulder is delivered by the Mauriceau-Smellie-Veit procedure
e) if the nape of the neck does not appear, a symphysiotomy may be considered

ANSWERS:
1. a,d (perform between 37 and 42 weeks) 2. a,d 3. b,c,e

SECTION 10 Quiz 15

1) Transverse and oblique lies are associated with which of the following?

a) a high maternal morbidity
b) a high fetal morbidity
c) uterine fibroids
d) placenta praevia

2) When performing Caesarean section for transverse lie which of the following statements are true?

a) a vertical skin incision may be more appropriate than a transverse
b) placenta praevia is associated with severe haemorrhage
c) it is often easier to manipulate the fetus into a longitudinal plane for delivery after the membranes have been ruptured
d) bringing a foot into the wound can help to deliver the baby

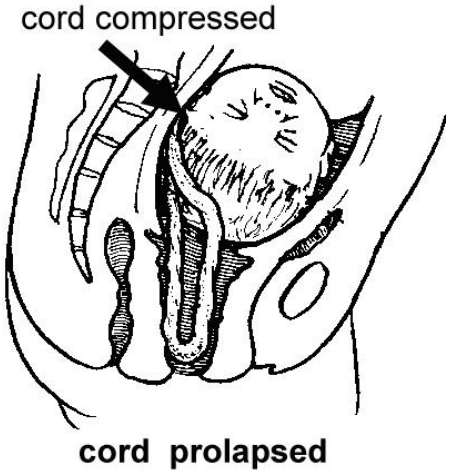
ANSWERS:
1. a,b,c,d, 2. a,b,d

Prolapsed umbilical cord

Incidence

Prolapse of the cord occurs in approximately 0.2% of all births, mostly in multiparous mothers. There is significant risk of fetal death due to mechanical compression of the cord and spasm of the cord vessels when exposed to cold air.

Figure.1 Sagittal view showing compressed cord



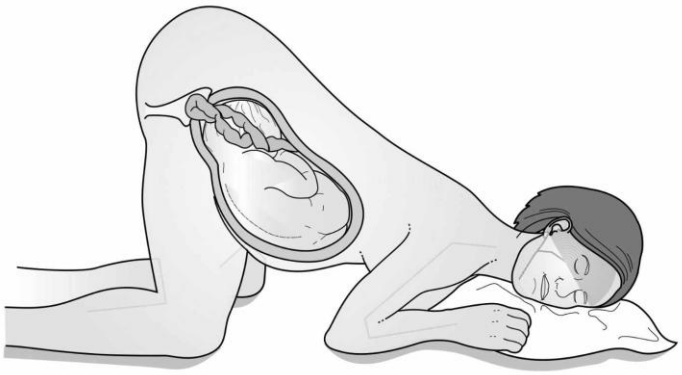


Figure.2 Prolapsed cord presenting

Risk factors for prolapsed cord

The presenting part does not remain in the lower uterine segment due to:

Fetal Causes

- Malpresentations: for example: complete or footling breech, transverse and oblique lie.
- Prematurity or low birth weight
- Polyhydramnios

- Multiple pregnancy
- Anencephaly

Maternal Causes

- Contracted pelvis
- Pelvic tumours

Other Predisposing Factors

- Low grade placenta praevia
- Long cord
- Sudden rupture of membranes in polyhydramnios

Management of prolapsed cord

The longer the time between the diagnosis of cord prolapse and delivery, the greater the risk of stillbirth and neonatal death. If the baby is dead, deliver in the safest way for the mother.

1. Assess fetal viability: if the baby is alive and of a viable gestation (fetal heart sounds heard with a Pinard or ideally hand held ultrasound fetal heart rate detector eg sonicaid), urgently relieve pressure on the cord by placing in the knee elbow or exaggerated Sims position. This gives time for decision making.

2. Discontinue oxytocin if being used.

3. Buy time to allow baby to be delivered by giving tocolysis with terbutaline 250 micrograms every 6 hours subcutaneously.

4. If fetus is alive, prepare for either emergency vaginal delivery or emergency caesarean section, assuming that this can safely be undertaken.

5. If fully dilated in a multigravida woman and delivery likely within 5 minutes attempt ventouse. If a ventouse is not available and the head is engaged, forceps may be used.

6. If caesarean section is safe and the only option (cervix not fully dilated, fetus alive and viable) , fill the bladder to raise the presenting part off the compressed cord for an extended period of time allowing the woman or girl to be transferred to the operating theatre.. Insert 500ml sterile IV fluid into the bladder using an IV giving set attached to a Foley catheter inserted into the bladder. Inflate the balloon of the Foley catheter, clamp it and attach drainage tubing and urine bag. The full bladder may also decrease or inhibit uterine contractions. The bladder must be emptied by unclamping the catheter before opening the peritoneal cavity for Caesarean section. *Mark the mother's abdomen to ensure that this is not forgotten. At skin incision, the bladder clamp must be released and the bladder emptied.*

7. Ensure venous access is in place with reliable IV cannula.

8. Transfer woman to theatre in exaggerated Sims position on a trolley

Figure 3 Maternal positions to immediately relieve pressure on prolapsed cord

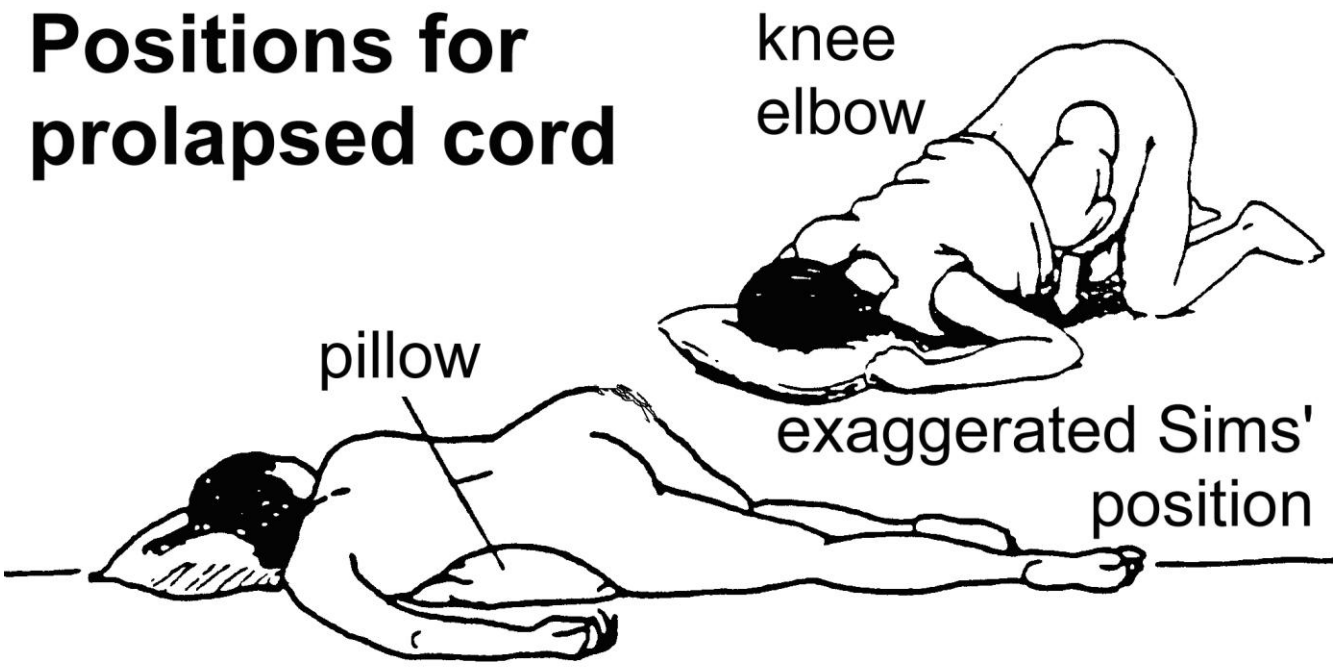


Figure 4 Elevate the fetal presenting part by inflating the bladder with sterile IV fluid

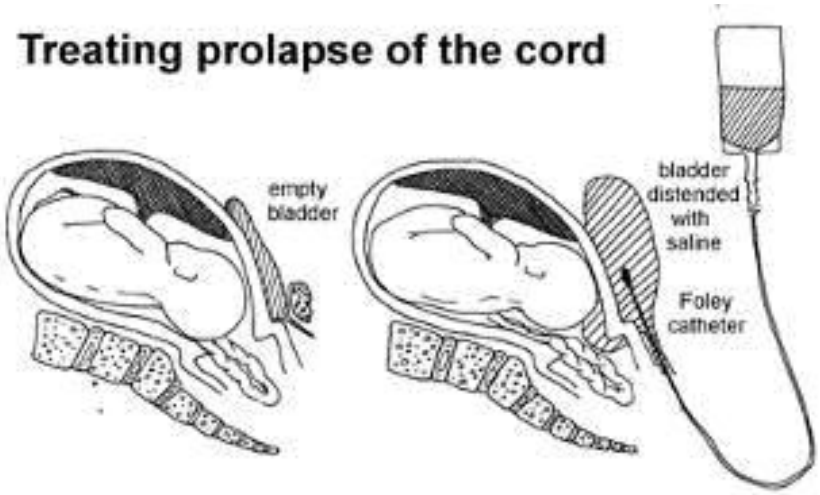
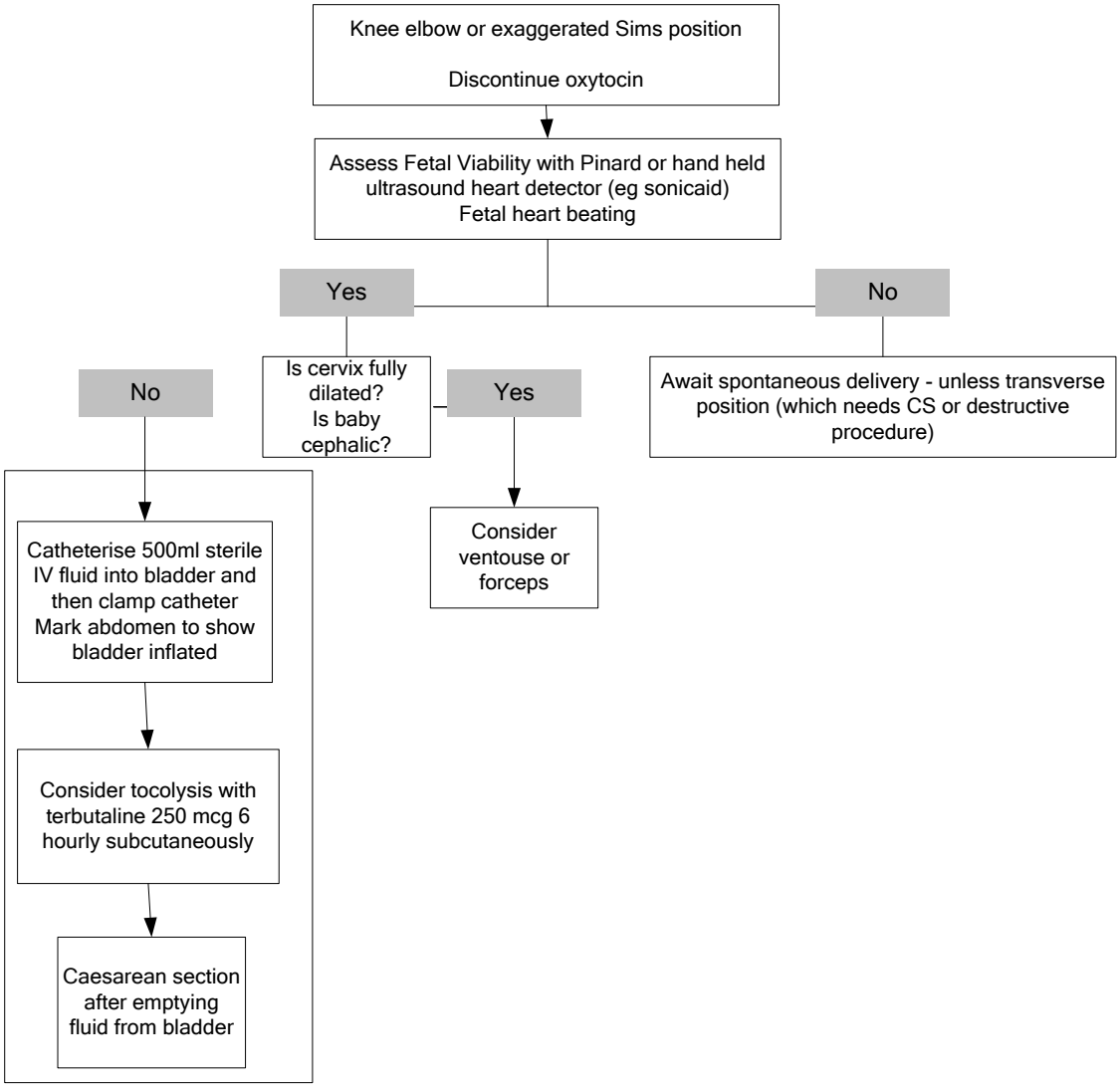


Figure 5 Pathway of care for prolapsed cord {near here}



SECTION 10 Quiz 16

1) Risk factors for cord prolapse include which of the following?

a) prematurity
b) low grade placenta praevia
c) polyhydramnios
d) long cord
e) small pelvis

2) Management of cord prolapse includes which of the following?

a) assessing fetal heart and/or cord pulsation
b) considering assisted vaginal delivery if cervix is fully dilated
c) Catheterisation of the bladder and instilling 500 ml of 0.9% saline into bladder
d) Caesarean section after releasing bladder clamp at skin incision
e) Left lateral tilt position

ANSWERS:

1. a,b,c,d,e 2. a,b,c,d

Severe infection in the puerperal period

Diagnosis of infection after childbirth

Table 1 Symptoms and signs of infection to lead to diagnosis and treatment

Symptoms	**Signs**	**Investigations**	**Diagnosis**	**Treatment**
Rigors/chills Lower abdominal/pelvic pain Foul smelling liquor Persistent light vaginal bleeding History of incomplete placenta delivered History of prolonged rupture of membranes, frequent unsterile vaginal examinations in labour	Fever (usually > 38 degrees C Tender uterus Shock Delayed rate of involution of uterus	Full blood count including White blood cell count Blood culture Lochia for microscopy, culture and sensitivity	**Endometritis**	Treat shock urgently if present IV antibiotics Ampicillin 2 g IV/IM every 6 hours; - PLUS Gentamicin 80mg IV/IM every 8 hours or 5mg/Kg body weight IV/IM once every 24 hours; - PLUS Metronidazole 500 mg IV every 8 hours
Breast pain Rigors	Tender over breast Red wedge shaped area of induration of one breast Fever > 38 degrees C		**Mastitis**	If evidence of bacterial infection is suspected give anti-staphylococcal antibiotics Flucloxacillin or cephalexin orally for 7 days
Breast pain Rigors/chills/malaise	Swinging fever Fluctuant swelling in the breast, possibly with pointing and draining of pus		**Breast abscess**	Surgical drainage If systemically very unwell anti-staphylococcal antibiotics IV

				Flucloxacillin or Cefotaxime or ceftriaxone
History of Caesarean section Rigors, chills, malaise	High, swinging fever Swelling and redness around incision		**Wound abscess**	Surgical drainage
Severe abdominal pain Vomiting	High fever Abdominal distension Rigid abdomen Absent bowel sounds Shock (see above for signs)		**Peritonitis**	Treat shock IV antibiotics Naso- gastric tube Immediate laparotomy in operating theatre
Lower abdominal pain Diarrhea History of CS	Swinging fever Swelling in adnexae or pouch of Douglas Tender uterus Ultrasound	Full blood count including White blood cell count Blood culture Pus for microscopy, culture and sensitivity	**Pelvic abscess**	IV antibiotics Ampicillin 2 g IV/IM every 6 hours; - PLUS Gentamicin 80mg IV/IM every 8 hours or 5mg/Kg body weight IV/IM once every 24 hours; - PLUS Metronidazole 500 mg IV every 8 hours Surgical drainage
Pain in the lower abdomen or loin Nausea/vomiting Increased frequency of passing urine	High fever Tender one of the loins over the kidney Normal bowel sounds	Microscope urine Stick tests for infection (if available) Urine culture and	**Pyelonephritis**	IV antibiotics (see chapter … If shock , initiate immediate treatment

		sensitivity if possible		
Difficulty breathing Cough sometimes with expectoration Pleuritic chest pain	Fever Respiratory distress Signs of consolidation/effusion	Chest Xray Ultrasound if effusion	**Pneumonia**	IV antibiotics (*see* chapter 2.8.A
Rigors Headache Muscle/joint pains	Fever Enlarged spleen Shock Reduced consciousness Jaundice Anaemia Fitting	Full blood count Thick film for parasites Blood glucose	**Malaria**	Anti-malarial drugs (*see* chapter 2.8.D)

Endometritis (the most serious and common cause of puerperal sepsis)

Accounts for up to 15% of maternal deaths in poorly resourced countries.

Infection of retained products of conception is the most common cause (suspect if excessive vaginal bleeding or poor involution of uterus). This can lead to long-term health problems - infertility, chronic pelvic inflammatory disease, ectopic pregnancies.

Defined as infection of the genital tract any time between the onset of rupture of the membranes or labour and the forty second day following delivery or abortion, in which two or more of the following are present:

- abdominal/pelvic pain
- fever of 37.5 degrees C or more (can be masked by paracetamol/other anti-pyretic drugs)
- abnormal quantity of vaginal discharge
- foul odour of discharge
- delay in the rate of involution of the uterus

Puerperal sepsis can present with few symptoms (woman feels unwell and usually has a fever). It can also advance rapidly to become life-threatening within hours.
Pathogens causing sepsis:

Most commonly, Group A Beta Haemolytic Streptococcus often of community origin, endotoxin producing enterobacteria e.g. E coli, less commonly clostridia and bacteroides, chlamydia and mycoplasma. Bacterial infections are often mixed.

Risk factors

- Prolonged rupture of membranes (> 48 hours before delivery)
- Contact with others with a bacterial throat infection (Streptococcus)
- Frequent (particularly unsterile) vaginal examinations
- Prolonged and obstructed labour
- Instrumentation e.g. forceps delivery
- Caesarean section (especially in an emergency)
- Retained products of conception
- Lack of sanitary towels and hygienic materials to manage lochia during the post natal period
- Sickle cell disease

Pathogenesis

- Endotoxin is released from cell wall of gram negative bacteria.
- Endotoxins can cause shock
- Extensive tissue necrosis, even gangrene, may occur, especially in the uterus

Prevention

- Antibiotic prophylaxis for prolonged rupture of membranes, manual removal of placenta and caesarean section
- Antiseptic cream for vaginal examinations (e.g. hibitane obstetric cream)
- Provision of sanitary towels and other hygienic items to all women/girls who have given birth and where family poverty prevents availability

Complications

1. Wound infection, wound dehiscence/burst abdomen
2. Peritonitis
3. Ileus
4. Septicaemia, possibly accompanied by shock
5. Abscess formation in cul-de-sac and sub-diaphragmatic space
6. Adnexal infections
7. Ovarian abscess
8. Pelvic abscess
9. Breast infection/abscess
10. Deep vein thrombosis/pulmonary embolus

Investigation

High vaginal swab if bacteriology available

MSSU and microscopy of urine

Treatment

Treat as an emergency including IV fluid boluses if shock is present and if: persistent tachycardia exceeding 100 to 110/minute, hypotension (systolic BP less than 90 to 100 mmHg), increased

respiratory rate (> 25/minute), confusion or disorientation, oliguria (< 30 ml/hour), rash or bradycardia (<50/minute).

Give antibiotics until fever-free for 48 hours or 7-10 days:

- ampicillin 2 g IV every 6 hours;
- PLUS gentamicin 80mg IV/IM every 8 hours or 5mg/Kg body weight IV/IM once every 24 hours;
- PLUS metronidazole 500 mg IV every 8 hours;

If *fever is still present 72 hours after initiating antibiotics*, re-evaluate and consider revising diagnosis.

Oral antibiotics are not necessary after stopping IV antibiotics.

If retained placental fragments are suspected, perform a digital exploration of the uterus to remove clots and large pieces. Use ovum forceps or a large curette if required but be very careful not to penetrate the uterine wall, which is very soft at this stage. Where general anaesthesia is not available, agents such as ketamine may be considered for this procedure.

If there is no improvement with conservative measures, and there are symptoms and signs of general peritonitis (abdominal pain, fever and abdominal tenderness with rebound tenderness), perform a laparotomy to drain the pus and if uterus is the source do not leave it too late to perform hysterectomy.

Wound infections

Wound infections may be superficial or deep. Superficial infections involve the skin and subcutaneous tissues, but not the rectus sheath (fascia). Superficial infections may present with cellulitis or abscess formation. Cellulitis should be treated with antibiotics; this may prevent the development of a wound abscess.

Clear or purulent fluid extruding from the wound should raise concern that the infection is deep to the sheath. Where there is abscess formation, the wound should be opened by removing sutures to skin and subcutaneous tissues, to allow drainage of pus. Antibiotics are not always required if an abscess is drained and the surrounding tissues appear healthy.

The wound may require debridement if there is suspicion of tissue necrosis. If the sheath looks healthy and intact, the fascial sutures should be left in situ. The wound should be packed with a damp dressing, which is changed every 24 hours.

If the sheath appears necrotic or infected, it should be opened and the peritoneal cavity inspected for collections of pus. If pus is present, it should be evacuated, and a broad corrugated drain left in situ in the peritoneal cavity to facilitate drainage post-operatively.

Necrotising fasciitis is a relatively uncommon but potentially life-threatening variant of wound infection, which presents with rapidly-spreading cellulitis, with severe pain and tenderness. Urgent wide debridement of necrotic tissue is required, with antibiotics as for deep wound infection (see below). Secondary closure should be undertaken two to four weeks later, provided that the infection has resolved.

Antibiotic regimes for wound infections

Where possible, swabs should be taken for culture & sensitivity before starting antibiotics.

Superficial infections

Ampicillin 500 mg by mouth, four times per day for 5 days;

PLUS metronidazole 500 mg by mouth, three times per day for 5 days.

Deep infections

Benzyl penicillin, 2 million units (1200mg) IV every 6 hours;

PLUS gentamicin 80mg IV/IM every 8 hours or 5mg/Kg body weight IV/IM once every 24 hours;

PLUS metronidazole 500 mg IV every 8 hours;

IV antibiotics should be continued until at least 48 hours after the pyrexia has settled.

The patient may then be switched to oral antibiotics, as above.

Peritonitis

Treat shock, if present, then:

- provide nasogastric suction.
- infuse IV fluids for maintenance and replacement.
- give antibiotics IV til fever-free for 48 hours:
  - Ampicillin/amoxicillin 2 g IV/IM every 6 hours;
  - PLUS gentamicin 80mg IV/IM every 8 hours or 5mg/Kg body weight IV/IM once every 24 hours;
  - PLUS metronidazole 500 mg IV every 8 hours.
- if necessary, perform a laparotomy to repair diseased or injured bowel.

Pelvic abscess

Give antibiotics before draining the abscess and continue until fever-free for 48 hours:

- Ampicillin/amoxicillin 2 g IV every 6 hours;
- PLUS gentamicin 80mg IV/IM every 8 hours or 5mg/Kg body weight IV/IM once every 24 hours;
- PLUS metronidazole 500 mg IV every 8 hours.

If the abscess is *fluctuant in the cul-de-sac*, drain the pus through the cul-de-sac----culdocentesis (*see* below). If the *spiking fever continues*, perform a laparotomy.

Bowel may be secondarily involved in the inflammatory process, and care must be taken to avoid bowel perforation.

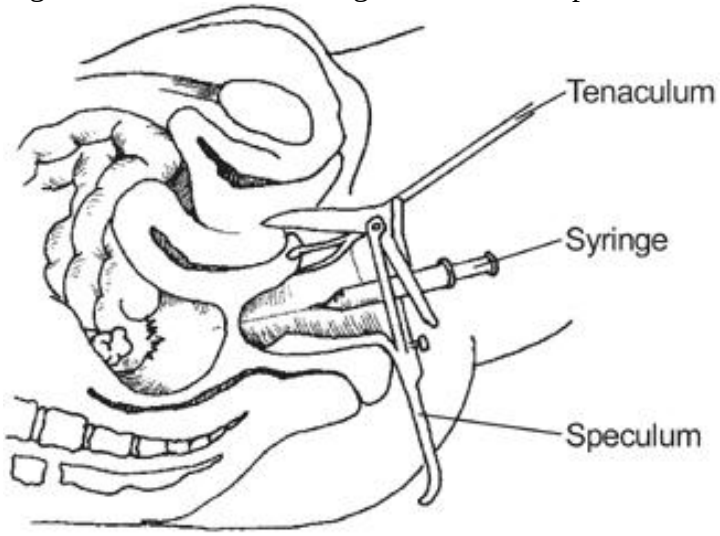
Peritonitis may develop in association with pelvic abscess. Prompt nasogastric suction and administration of intravenous fluids are important, as well as IV antibiotic therapy as above.

Culdocentesis and colpotomy

Culdocentesis for the detection of pus

- Apply antiseptic solution to the vagina (especially the posterior fornix).
- Infiltrate with lignocaine 1%.
- Gently grasp the posterior lip of the cervix with a tenaculum and gently pull to elevate the cervix and expose the posterior vagina.
- Place a long needle (e.g. spinal needle) on a syringe and insert it through the posterior vagina, just below the posterior lip of the cervix (*see* Figure 1)
- Pull back on the syringe to aspirate the cul-de-sac (the space behind the uterus).
  If pus is obtained, keep the needle in place and proceed to colpotomy (see below).

Figure 1 Culdocentesis: diagnostic needle aspiration of the cul-de-sac



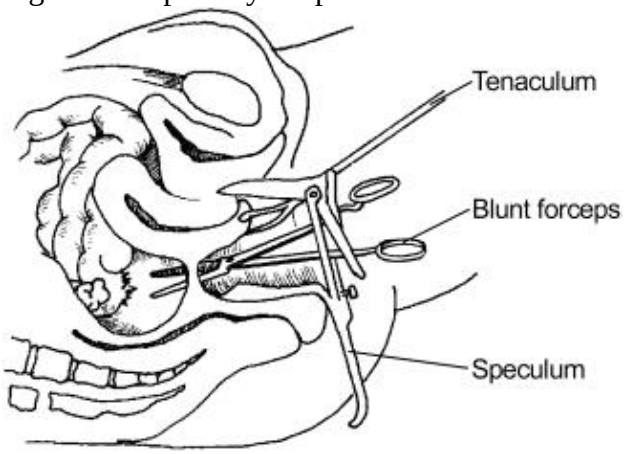
Colpotomy for a pelvic abscess

If *pus is obtained* on culdocentesis, keep the needle in place and make a stab incision at the site of the puncture:

Remove the needle and insert blunt forceps or a finger through the incision to break loculi in the abscess cavity (Figure.2)

- Allow the pus to drain;
- Insert a disinfected soft rubber corrugated drain through the incision;
  - If a surgical drain is not available a make-shift drain can be prepared by cutting off the fingertips of a disinfected rubber glove.
- If required, use a stitch through the drain to anchor it in the vagina;
- Remove the drain when there is no more drainage of pus.
- If **no pus is obtained**, the abscess may be higher than the pouch of Douglas. A laparotomy will be required for peritoneal lavage (wash-out).

Figure 2 Colpotomy for pelvic abscess



Mastitis

Mastitis may be infective or non-infective, varying in severity from mild local erythema and tenderness through to abscess and septicaemia.

- Non-infective mastitis may be due to a blocked lactiferous duct, or to difficulties with breastfeeding technique. It may lead to infective mastitis.

- Infective mastitis is common in lactating women. It is usually caused by the bacterium Staphylococcus, which generally responds to a 7 to 10 day oral course of Flucloxacillin or a cephalosporin, both of which are safe to take while breastfeeding.

Mastitis usually presents with a hot, red, swollen section of one breast. It may be associated with 'flu-like symptoms, namely pyrexia of 38C or above, chills and myalgia.

Treatment

Continue breastfeeding

Although the symptoms of mastitis may discourage breastfeeding, it is important to try to continue. Regular breastfeeding will help to:

- remove any blocked breast milk from the breast
- resolve the symptoms of mastitis more quickly
- prevent mastitis from becoming more serious

The milk from the affected breast may be a little saltier than normal, but is safe for the baby to drink. Any bacteria that are present in the milk will be harmlessly absorbed by the baby's digestive system and cause no problems.

*Breastfeed frequently on the affected side, in order to empty the breast of retained milk***.** The baby can empty the breast more efficiently than a breast pump. However, if the baby is not feeding well, a *breast pump or hand expression* will be needed to get the milk out. It may be less painful if the affected breast is given to the baby second, after the let-down reflex has occurred.

Mastitis can usually be successfully treated by resting, drinking plenty of fluids and varying the baby's position at the breast. It is important to ensure that the baby is properly attached to the

nipple, and that the breast is empty after the feed. It may be necessary to feed more frequently, and express remaining milk after a feed. Paracetamol is useful for pain control. Massaging the areas of tenderness may be beneficial.

Preventing mastitis

The following advice should be given to any mother who has suffered mastitis:

- Relieve engorgement promptly. Milk that doesn't flow gets thicker and clogs the ducts.
- Breastfeed frequently. Don't restrict the length of feedings.
- If the mother feels her breasts getting full, encourage the baby to feed without waiting for the baby to initiate this

Repeated mastitis

This is usually the result of irregular breastfeeding patterns such as missing feeds and giving bottles in place of breast feeds. Recurrent mastitis may also result from tiredness and stress.

Which antibiotics are best? The bacteria involved in mastitis is usually staphylococcus, and the two most effective antibiotics are cloxacillins and cephalosporins which are safe to take while breastfeeding. A ten day oral course is recommended.