CHAPTER 64

Unstable Lie, Malpresentations, and Malpositions
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INTRODUCTION

The concepts of unstable lie, malpresentation, and malposition have not changed for centuries probably, and there is no reason to anticipate a significant change will present in the foreseeable future. Various techniques for improving diagnostic accuracy and clinical care are periodically proposed and either become established clinical practice or disappear, sometimes to be resurrected at a later date.

Near term and during labor, the fetus usually assumes a longitudinal lie and presents to the maternal pelvis with the head, the neck flexed, and the vertex in the lowermost part of the uterus. In approximately 5% of labors, the lie is not longitudinal; this can be dangerous for both mother and fetus and demands intervention. As with much of medicine, the prior identification of the pregnancy at particular risk for unstable lie, malpresentation, or malposition can prompt intervention in advance of a complication developing and improve the outcome. Although relevant to unstable lie and malpresentation, this chapter does not consider issues relating to fetal breech presentation in detail because these are dealt with elsewhere (see Chapter 63).

DEFINITIONS

Unstable Lie

Unstable lie is a description generally used beyond 37 weeks' gestation when the fetal lie and presentation repeatedly change, the lie varying between longitudinal, transverse, and oblique, and the presentation between cephalic, limbs, breech, or a combination. Conventional wisdom teaches that the fetal presentation will not be cephalic at the start of the third trimester in around 25% pregnancies and this proportion drops to around 3% to 5% by term. This teaching is supported by longitudinal ultrasound examination studies.1-4

By 37 weeks' gestation, the fetus usually adopts a “stable” lie and presentation that will be unchanging until labor, fetal position, describing the relationship of the fetal back to the maternal side, may and often does change. A longitudinal fetal lie is, however, unlikely to change once labor has established, unless the presenting part is “high” in relation to the pelvis, and particularly if there is polyhydramnios or the maternal abdominal wall muscles are weakened by high parity.

Malpresentation Including Compound Presentation

The presenting part is defined as that part of the fetus that is lowermost in the uterus. The vertex is the “normal” and most common presenting part. The alternatives include face, brow, breech, and shoulder; compound presentations involve more than one fetal part presenting to the pelvis. This may include a combination of the head with a limb or limbs and any presentation that includes the umbilical cord.

Malposition

Fetal malposition occurs when the vertex presents to the maternal pelvis in a position other than flexed occipitoanterior. Malpositions thus include occipitotransverse and occipitoposterior positions and may involve asynclitism (sideways tilt of the head).

Figure 64–1 shows the various positions that the vertex, brow, or face may adopt during labor.

ETIOLOGY

Unstable Lie

Unstable lie is much more common in parous than in nulliparous women and may be caused by or associated with a number of factors. Any situation that discourages or prevents the fetal head or breech from entering the maternal pelvis may predispose to an abnormal and/or unstable fetal lie. Figure 64–2 illustrates many of these factors.

Maternal Factors

HIGH PARITY

Reduced maternal abdominal wall muscle tone leading to a failure to brace and maintain a longitudinal fetal lie is probably the most frequent factor. There is a commonly held view that the highly parous uterus also has reduced muscle
tone, thereby contributing to instability of the fetal lie, but this has not been proved and is, therefore, of questionable relevance.

PLACENTA PREVIA
A persistently changing fetal lie may be the only clinical feature leading to the diagnosis of placenta previa. In addition, the placenta situated in the fundus may also predispose to an unstable lie.\(^4\)

PELVIC CONTRACTURE
Reduced pelvic dimensions or a distorted pelvic cavity due to congenital malformation, disease processes compromising bone development, or trauma to the pelvis, can prevent the presenting pole engaging in the pelvis in late pregnancy.

PELVIC TUMORS
Ovarian cysts of only moderate dimensions situated in the pouch of Douglas and fibroids in the lower pole of the uterus, as well as those that are pedunculated and occupying the sacral curve, can prevent the fetal head or breech entering the pelvis and predispose to a transverse or oblique lie.

UTERINE MALFORMATION
Uterus cordiformis, subseptus, or septus can be causative, but more severe forms of anomaly including uterus unicorns, bicornis, and didelphys are less likely to lead to an unstable lie because of the restricted capacity of the uterine cavity; a predisposition to fetal breech presentation, however, often results.

DISTENDED MATERNAL URINARY BLADDER
Maternal urinary retention with bladder distention can cause a changing fetal lie, usually only temporarily, with resolution occurring with urinary voiding or bladder catheterization.
Fetal Factors

POLYHYDRAMNIOS
Polyhydramnios (excessive volumes of amniotic fluid) may produce marked uterine distention, enabling the fetus to move around more freely. This probably represents the most common “pathologic” cause for an unstable lie and is also potentially the most hazardous for mother and fetus (see Chapter 12).

OLIGOHYDRAMNIOS
By restricting fetal movement, oligohydramnios can prevent the fetus presenting by the breech from undergoing complete spontaneous version to cephalic.

MULTIPLE PREGNANCY
The discovery of an abnormal lie during the last 3 weeks of pregnancy may arouse suspicion of a multiple pregnancy and lead to investigations that result in the diagnosis being reached. Nowadays, such a diagnosis is unlikely to have been missed until this stage of pregnancy with the widespread use of routine ultrasonography during the first 20 weeks of gestation. When the lie of one or both fetuses repeatedly changes, there is usually polyhydramnios.

FETAL MACROSOMIA
Fetal macrosomia produces the same effect as pelvic contraction and must also be considered in such cases.

FETAL ABNORMALITIES
Significant hydrocephaly, tumors of the fetal neck or sacrum, fetal abdominal distention as with hydrops fetalis, and fetal neuromuscular dysfunction (including extended legs) may impede or discourage engagement of a fetal pole in the maternal pelvis. In cases of intrauterine death, the fetus is more likely to present abnormally due to loss of tone, sometimes requiring delivery by cesarean section because vaginal birth is impossible.

Compound Presentation

Compound presentations are most usually associated with polyhydramnios and high parity and are more common during the early weeks of the third trimester. Multiple pregnancies, especially monoamniotic, represent a particular risk. Pelvic tumors, including uterine fibroids situated low in the uterine body or an ovarian cyst situated in the pouch of Douglas, also predispose to compound presentations.

Malpositions

Data derived from ultrasound examinations at the start of labor have suggested that the majority (68%) of occipitoposterior positions confirmed toward the end of labor were in an occipitoposterior position at the beginning of labor; the other 32% were initially in an occipitoanterior position, and these labors are more likely to result in an assisted delivery.

Pelvic shape is probably the major determinant of fetal position prior to labor. When the anteroposterior dimension of the pelvic brim equals or exceeds that of the transverse dimension (the android pelvis), occipitoposterior positions are favored. Thus, women with an android pelvis are more likely to have an occipitoposterior position in late pregnancy and at the start of labor because the larger dimensions toward the back of the pelvis encourage the broader occiput to be accommodated there rather than in the anterior compartment. In addition, when there is a high-assimilation pelvis with an extra vertebral included in the formation of the sacrum, the inclination of the brim increases and favors an occipitoposterior position. The much less common anthropoid-shaped pelvis, with lessening of the posterosagittal diameter (the distance between the midpoint of the widest transverse diameter and the sacrum), affects not only the brim but also commonly extends to the lower levels of the pelvis and to the outlet. In particular, the concavity of the sacrum from promontory to tip is often reduced or abolished (flat sacrum), leaving a reduced space in which the sinciput can turn, should internal rotation commence. This leads to the head becoming impacted in the pelvis, resulting in a “deep transverse arrest.” It has been suggested that increased muscle tone in the extensor muscles of the fetus might also predispose to an occipitoposterior position, but there is little evidence to support this theory.

Most important is the observation that a high proportion of women with a malposition who make poor progress through labor often respond to augmentation of uterine contractions with oxytocin and achieve a successful spontaneous vaginal delivery. This suggests that the quality of uterine contractions plays a significant part in determining the position and attitude of the fetal head. As well as uterine contraction strength being important, there is now good evidence that the tone of the pelvic floor is relevant. Use of

Brow and Face Presentations
The majority of cases of brow and face presentation are thought to arise when there is a minor degree of deflexion of the presenting vertex, which then undergoes further extension. With increasing extension, a brow becomes a face presentation. This may occur during the antepartum period, resulting in a primary face presentation, or during labor, resulting in a secondary face presentation. Primary presentations are generally associated with fetal malformations, including anencephaly, meningocele, dolichocephaly, congenital branchiоcele, goiter or other anterior neck tumors, and tense extensor neck muscles. Polyhydramnios with the increased space within the uterus and a tight nuchal cord have also been implicated as predisposing factors. Secondary presentations are thought to be associated with a contracted or abnormally shaped pelvis. This was considered responsible for 40% of face presentations in a series reported from the Johns Hopkins Hospital early in the last century. It is also much more common in preterm labor, probably due to the more capacious pelvis being able to accommodate the relatively small fetus.
regional anesthesia for the management of pain relief during labor has been implicated as a mechanism for the increased rates of malposition in late labor,\textsuperscript{14,15} although this is disputed. Regional anesthesia provides an extremely effective method of reducing the distress of labor, distress that is more common with a preexisting occipitoposterior position. The issue of cause and effect thus comes into play. The experience reported from Dublin provides some evidence to suggest that regional blockade is not causal in the evolution of fetal malposition. It was noted that despite a 30-fold increase in intrapartum epidural usage between 1975 and 1998, occipitoposterior position at the end of a first labor decreased from 3.8% to 2.4%.\textsuperscript{15,16}

**INCIDENCE**

**Unstable Lie**

Figures are not generally available for the incidence with which unstable lie is encountered antenatally; it is influenced by the proportion of multiparas and particularly the numbers of grand-multiparas in the population. Also, in societies where malnutrition is prominent and maternal or fetal skeletal deformities are relatively more common, the incidence will be higher. In a well-nourished and developed population where high parity (>4) is uncommon, the incidence will be in the range of 0.1% to 1.0%, and the occurrence rate of transverse lie in labor is in the region of 0.4%.\textsuperscript{17}

**Compound Presentations**

There is a relatively sparse literature on the incidence of compound presentations that involve one or more limbs and the fetal head or breech. Overall, the incidence has been quoted to be between 1 in 377 and 1 in 1213 deliveries.\textsuperscript{18-20} Personal experience suggests that the lower incidence is more usual in the developed world. Combinations involving the upper limbs and head are the most common. Diagnosis in late labor is the usual situation, with as many as 50% of compound presentations being diagnosed during the second stage of labor.

The incidence of cord presentation, when a segment of umbilical cord is situated between the fetal presenting part and the cervix with intact membranes, has not been widely reported. Although cord prolapse, by definition following membrane rupture, occurs in around 1 in 300 to 1 in 700 total births,\textsuperscript{5,7,21-22} 1 in 900 cephalic presentation labors, 1 in 56 breech labors, 1 in 23 twin labors,\textsuperscript{7} and 1 in 5 to 1 in 10 compound presentations that involve a limb.\textsuperscript{18,19,23} Thus, cord prolapse in a singleton pregnancy with a cephalic presentation at term has an incidence of around 1 in 1400 labors. These rates are almost certainly lower than the incidence of cord presentation, because recognized cord presentation is likely to be managed by cesarean section before prolapse occurs.

**Brow and Face Presentation**

Face presentation in labor has an incidence of between 1 in 200 and 1 in 500 labors,\textsuperscript{24-28} and brow presentations around 1 in 600 to 1 in 1500 deliveries.\textsuperscript{27-29} The incidences during pregnancy are less well documented, especially for brow presentation, because it is probable that this presentation is only transient, with reversion to vertex presentation with flexion of the neck or face presentation with further deflexion.

**Malpositions**

During the antepartum period, prior to the onset of labor, the occipitoposterior position exists in around 11% of singleton pregnancies.\textsuperscript{30,31} Once labor starts, the incidence is in the region of 20% to 25%; if the fetal back is on the maternal left, the occipitoposterior position is much less common than when the back is on the maternal right.\textsuperscript{20} It is said to be more common in cases of membrane rupture before the onset of labor, with an incidence of 27%.\textsuperscript{32} When there is an occipitoposterior position at the start of labor, this position will remain to the end of labor in 20% to 35%, indicating that 65% to 80% undergo spontaneous rotation during labor. Only approximately 1% to 5% are delivered in an occipitoposterior position.\textsuperscript{33,34}

**DIAGNOSIS**

**Unstable Lie**

This diagnosis is made when a varying fetal lie during the last month of gestation is found at repeated clinical examinations. Occasionally in those women in whom clinical examination is not easy (including those with a raised body mass index), the diagnosis may fortuitously be made by an ultrasound examination performed for other reasons. An unstable lie would appear to be more common than is presently thought, from the evidence of the frequency with which fetal breech presentation is missed prior to the onset of labor despite frequent and recent antenatal clinical examinations. Further, the observation of spontaneous and unexpected version of the fetus from a cephalic to breech presentation during the last weeks before birth adds weight to this observation.\textsuperscript{15,36}

**Compound Presentations**

A compound presentation involving a fetal arm with the head or an arm with a leg is likely to be diagnosed only during the antepartum period as a coincidental finding at an ultrasound examination or rarely on radiographic or magnetic resonance imaging. The high nonengaged head that cannot be encouraged into the maternal pelvis might prompt an ultrasound examination that leads to the diagnosis.

Diagnosis during labor may be suspected because of delay in the presenting part entering the pelvis, which is confirmed on vaginal examination by identifying the errant limb or limbs. Occasionally, the diagnosis is made unexpectedly at a vaginal examination during preterm labor when the maternal pelvis is large and the interloping limb with the head or breech does not delay engagement of the presenting part.

Compound presentations involving the umbilical cord are usually classified according to Naegele, who distinguished “presentation” before membrane rupture and “prolapse” after membrane rupture. A diagnosis of cord presentation will not usually be made prior to the onset of labor except in those cases of an unstable lie when a vaginal examination
is performed as part of the assessment for the strategy for continued management. Although some have documented reaching the diagnosis with ultrasound, this is not a widely reported observation, and cord prolapse occurring during subsequent labor appears to be an infrequent consequence.

**Face Presentation**

Older texts report that abdominal palpation allows the diagnosis of face presentation by the recognition of a much broader than usual lower pole presenting to the pelvis and the marked depression between the fetal back and the occiput (Fig. 64–3). This is more easily demonstrated if the fetus is lying in a dorsoanterior or mentoposterior presentation, which is less common than a mentoanterior presentation. It is also said that the fetal heart sounds are very easily heard when listened to over the fetal chest, especially with a mentoanterior position; this potentially valuable clinical sign is lost if hand-held Doppler machines are routinely used to detect fetal heart pulsations in preference to a Pinard stethoscope. Despite this, the author's experience is that these clinical signs are difficult to elicit, even in those cases of face presentation already confirmed by radiology or ultrasonography.

Confirmation of the presentation should be made by vaginal examination during the intrapartum period. The obstetrician, however, should be wary of confusing a face and a breech presentation; facial edema readily forms during labor and, with the added difficulty associated with a high presenting part and a poorly dilated cervix, differentiation can be difficult. Identification of the supraorbital ridges, the ridge of the nose, and the alveolar processes within the mouth should establish the diagnosis. If the technology is available, an ultrasound examination can be used to confirm the clinical suspicion.

**Brow Presentation**

Although occasionally a brow presentation may be recognized during the antenatal period, usually coincidentally at an ultrasound examination, this is not permanent in most instances. The suspicion of a broader than expected head resting above the pelvic brim compared with the size of the body may (rarely) lead the astute clinician to suspect this possibility. Diagnosis during the intrapartum period is likely to be made only in advanced labor when the cervix is moderately well dilated and the brow is palpable to the examining fingers. Identification of the anterior fontanelle and the supraorbital ridges confirms the diagnosis, but any significant caput succedaneum can mask these landmarks. As with face presentations, ultrasound examination is the most practical way to confirm or refute the diagnosis.

**Malpositions**

It is often written that the outline of the distended uterus occasionally suggests an occipitoposterior position by the “flatness” and a dip between the head and the trunk. Certainly, fetal movements may be readily observed over much of the anterior surface of the abdomen if the baby is active at the time of the examination. However, the fetal back may be difficult to identify on palpation, although the shoulder is felt toward the flank with the limbs often obvious to palpation over the abdomen. With Pawlik’s grip, the sinciput is said to be prominent, but personal experience would not suggest this to be a reliable feature. Importantly, the fetal heart is heard maximally in the flank to which the back is directed; the Pinard stethoscope allows this clinical sign to be elicited whereas the small Doppler fetal heart detectors generally do not. An ultrasound examination would confirm or refute the clinical findings.

During labor, the anterior fontanelle is easier to reach when the position is occipitoposterior rather than occipitoanterior, although caput succedaneum can make this difficult, especially late in labor. Palpation of the more anterior ear can be helpful, but this may be misleading if the pinna has been turned forward. At this examination, not only the degree of flexion but also any asynclitism should be noted. Diagnosis of a deep transverse arrest should not present difficulties unless there is marked caput succedaneum or prominent asynclitism. Once again, palpation of the fetal ear could
be helpful, or if available, ultrasound to confirm the position.⁴⁰,⁴¹

**RISKS**

**Unstable Lie and Compound Presentation**

There are no hazards to mother or fetus during the antenatal period from unstable lie per se. It is possible that cord entanglement is a greater risk, although this has not been positively shown. During the latter weeks of pregnancy, spontaneous resolution to a longitudinal lie before the onset of labor occurs in approximately 85%. ³²-³⁴

There are, however, very serious risks to mother and fetus with the onset of labor if the lie is not longitudinal. Once the membranes rupture, with or without accompanying uterine contractions, there is approximately a 9% risk of cord prolapse if the fetal lie is oblique or transverse or the presenting part is high above the pelvic inlet.⁴⁵ This may result in damaging hypoxia or even stillbirth, perinatal death has generally been reported in 5% to 10% of cases⁷,⁴⁶,⁴⁷ or, according to one series, as high as 43%. ⁴⁸ The risk of hypoxic damage is less well documented and it may be as infrequent as 1% in survivors,⁷ although this must depend on the speed and availability of first aid to rescue the situation. Keeping the interval between cord prolapse and delivery as brief as possible is likely to be important.⁴⁶,⁴⁹

If labor starts when the lie is not longitudinal, a compound presentation may result or the pelvis may remain empty. If left unattended, fetal distress will eventually supervene, ultimately resulting in fetal death. A Bandl or retraction ring (Fig. 64–4) may form, making delivery even by cesarean section potentially hazardous.⁵⁰ In addition, uterine rupture is a real possibility especially in multiparas, with an incidence of 3%,⁵¹ with potentially serious consequences for mother and fetus (see Chapter 67).

**Malpresentation**

**Face**

Cord prolapse may be marginally increased with a face over vertex presentation, but once established in labor with the head engaged in the pelvis, this is no more likely. Progress should be as for a vertex presentation without any additional risk to the fetus because the presenting head diameters are similar (Fig. 64–5). However, with the largest presenting diameter (biparietal) displaced toward the back of the pelvis, a generous episiotomy should be performed to reduce the risk of a third-degree tear. Providing the face is mentoanterior, vaginal delivery is likely. If there is any delay in delivery, assistance with forceps is appropriate but the ventouse is contraindicated because it cannot be applied safely with a face presentation. The parents should be advised in advance of delivery that their baby will initially appear very unattractive owing to the inevitable bruising and marked edema, both of which disappear within a few hours of birth.

**Brow**

There are no added risks to the mother with a fetal brow presentation during the antenatal period. As with a face presentation, the risk of cord presentation and prolapse is increased.

**Malpositions**

Few risks are associated with a fetal malposition prior to labor. As already stated, there is a belief that prelabor rupture of the membranes is more common with an occipitoposterior position. Because the head is usually not engaged and may not be well settled into the pelvis, the risk of cord prolapse is marginally increased.

Once in labor, progress may be slower than with an occipitoanterior position and maternal discomfort is often increased, particularly in the back. In addition to a protracted first stage of labor, there is often a delay during the second stage with the need for augmentation of contractions with oxytocin, and maybe manual rotation or instrumental delivery using ventouse or forceps with or without initial rotation. With the present reluctance to engage in rotational forceps deliveries, especially if fetal distress is suspected, together with the higher failure rates with the ventouse, delivery by cesarean section is increased.
It has been shown by one group that the occipitoposterior position that persists to the time of vaginal delivery presents a significant risk of anal sphincter damage for all parities.  

**MANAGEMENT OPTIONS**

**Unstable Lie and Compound Presentation**

**Prenatal**

During the antenatal period, management can be expectant or active, whereas delivery can either await spontaneous onset of labor or be arranged as a planned event. An algorithm of the various options is illustrated in Figure 64–6.

**EXPECTANT MANAGEMENT**

Once an unstable lie is identified, no specific action is taken in anticipation that the lie will become longitudinal before the membranes rupture or labor starts: this is likely to occur in more than 80% of cases.  

Manipulation to a longitudinal lie at an antenatal examination can sometimes be performed. Every attempt should be made to identify any obvious mechanical cause for the unstable lie, especially if it is likely to result in obstructed labor requiring elective cesarean section. The patient should be advised of the risks associated with an unstable lie and the need for urgent attention should labor start or the membranes rupture. If she lives a long distance from the delivery unit, it may be wise to
admit her at 37 to 39 weeks’ gestation to await the onset of labor to ensure prompt attention if required. A number of physical exercises, including adopting the knee-elbow position for short periods each day, have been advocated to encourage spontaneous version, generally from a breech to a cephalic presentation. Such maneuvers possibly improve the chances of longitudinal lie by 5% to 10%, but there is no established evidence base for this proposition.

**ACTIVE MANAGEMENT**

Admission is often advised from 37 to 39 weeks’ gestation, which provides the opportunity for (1) daily observations of fetal lie and presentation to be made, (2) active treatment to correct the lie if necessary, (3) calling for immediate assistance upon membrane rupture or the onset of labor, and (4) urgent delivery if the lie is not longitudinal, fetal distress occurs, or the cord is presenting or has prolapsed. Evidence to support this approach is provided by one small study of expectant management for unstable lie after 37 weeks’ gestation that reported that 17% presented in labor with a transverse lie and 6% had a prolapsed cord resulting in neonatal death in 1%. If spontaneous resolution to a longitudinal lie occurs and a cephalic or breech presentation is maintained for 48 hours, the women may be discharged home to await labor. Some currently discourage labor with a breech presentation and reference should be made to the relevant chapter on this topic (see Chapter 63). If spontaneous resolution of an abnormal lie does not occur, an active approach to management may be adopted. External cephalic version can be attempted if facilities permit immediate delivery in the event of placental abruption, membrane rupture, cord prolapse, or acute fetal distress for any reason. Rhesus immunophylaxis should be given to at-risk women either before or soon after the version attempt, and an estimate of the volume of any fetomaternal hemorrhage made about 20 minutes after the attempt at version, using the Kleihauer-Betke method or flow cytometry to determine whether additional prophylaxis is necessary. If a longitudinal lie is not maintained, the version can be repeated as often as necessary, and if unsuccessful, the women should be kept in the hospital after the birth. The success of version for unstable lie is unclear, but it is probably greater than for breech presentation, which is usually quoted around 40% to 65%. Tocolysis can be used, including infusions of ritodrine 50 μg/min for 15 minutes or terbutaline sulfate 250 μg intravenously over 1 to 2 minutes, but is often unnecessary with a transverse or oblique lie (see Chapter 63).

In the event the lie remains unstable, a stabilizing induction may be performed usually at 38 to 39 weeks’ gestation. Following transfer to the labor suite, an external cephalic version is performed if necessary to convert the fetal lie to longitudinal. Once the fetus is in position, regular abdominal palpations are performed to confirm the lie is maintained and a titrated intravenous infusion of oxytocin commenced to stimulate uterine contractility. Although contractions can also be stimulated with local (vaginal) or oral prostaglandins, this is probably less advisable because the response to prostaglandins can be unpredictable and occasionally hyperstimulation occurs, which would be especially concerning if the lie reverts to oblique or transverse, when tocolysis and/or emergency cesarean section is required. As soon as contractions are occurring at 10-minute intervals or more frequently, a low amniotomy is performed, having ensured at vaginal examination that the lie is still longitudinal, the presentation is not compound, and in particular, the cord is not presenting. If the cord presents, an emergency cesarean section is necessary. Once low amniotomy is performed, a reasonable volume of amniotic fluid should be released, followed by confirmation that the cord has not prolapsed and the presenting part is fixed in the pelvic brim. Thereafter, once labor is established, management continues as for uncomplicated cases, being ever mindful that cord prolapse might still occur.

Hindwater amniotomy using a Drew-Smythe catheter can be performed providing a low posterior placenta has been excluded by an ultrasound examination. The catheter is guided through the cervix between the uterine wall and the fetal membranes behind the presenting part, taking all possible care to avoid trauma to the fetus and the uterine wall. When in position, with the catheter tip above the presenting part, the stylet in the catheter is advanced to puncture the membranes and allow a controlled release of amniotic fluid. This procedure aims to reduce the chances of cord prolapse occurring, but it is rarely used in modern practice.

Finally, a decision to deliver by elective antepartum cesarean section at 38 to 40 weeks’ gestation has been reached by an ultrasound examination. The catheter is guided through the cervix between the uterine wall and the fetal membranes behind the presenting part, taking all possible care to avoid trauma to the fetus and the uterine wall. When in position, with the catheter tip above the presenting part, the stylet in the catheter is advanced to puncture the membranes and allow a controlled release of amniotic fluid. This procedure aims to reduce the chances of cord prolapse occurring, but it is rarely used in modern practice.

**Intrapartum**

When the fetal lie is transverse or oblique and the membranes rupture or labor starts, the options for management are illustrated in the algorithm in Figure 64–7, which depend on (1) whether there is a cord presentation or prolapse, (2) the stage of labor whether before full cervical dilation or during the second stage, and (3) whether the membranes are intact or ruptured.

**FIRST STAGE OF LABOR**

Management depends on whether the fetal membranes are intact or ruptured. With intact membranes, an external version can be attempted. This is performed between contractions with or without tocolysis to relax the uterus before the attempt. Tocolytic agents that can be used in this situation include β-agonists such as terbutaline infused at 5 to 20 μg/min, salbutamol (albuterol) 2.5 to 4.5 μg/min, ritodrine 100 to 350 μg/min, or the oxytocin antagonist atosiban, given as a single intravenous bolus dose of 6.75 mg. If the version is successful, a repeat vaginal examination should be performed to exclude cord presentation or prolapse. Once this has been confirmed, labor can be allowed to establish, ensuring the lie remains longitudinal until the presenting part engages in the pelvis.
with progress augmented with oxytocin if necessary. If the version has been unsuccessful, delivery by cesarean section should be performed (see later discussion). With ruptured membranes, delivery by cesarean section is generally the only option unless the woman is in very early labor and an attempt at external cephalic version is successful. If there is a compound presentation involving a hand or arm, attempts should be made at vaginal examination to push the arm up or nip one of the fetal fingers to try to encourage its withdrawal from in front of the head. It is also reasonable to allow labor to continue with close supervision in anticipation that spontaneous withdrawal will occur with continuing uterine contractions causing discomfort to the arm and hand; cord prolapse is a remote but real possibility.

A shoulder presentation, which may include an arm prolapsed into the vagina, is a serious situation (see Fig. 64–4). Clamping of the uterine wall around the fetus by a retraction or Bandl’s ring may have contributed. Delivery must be by cesarean section. Administration of a uterine relaxant such as halothane administered by the anesthetist can facilitate the delivery, which is most safely achieved through a classic uterine incision. This incision allows the fetus to be withdrawn through the fundus of the uterus, whereas a lower segment incision makes it nearly impossible to manipulate the fetus into a position that will allow delivery without damage to the fetus and uterus. This approach to delivery is still indicated even if the fetus has already died, to avoid uterine rupture and other serious uterine trauma at the time of the delivery.

SECOND STAGE OF LABOR WITH INTACT MEMBRANES

If fetopelvic disproportion has been excluded, correction to a longitudinal lie by external cephalic or internal podalic version followed by an assisted vaginal cephalic or breech delivery should be anticipated. If internal podalnic version is attempted, this requires adequate anesthesia (either general or fully effective regional block). Using appropriate aseptic techniques, the obstetrician introduces a hand into the uterus, confirms the foot of the anteriorly positioned leg by identifying the heel, and applies traction on the foot, withdrawing the foot and leg and subsequently the breech through the vagina (Fig. 64–8). It is ideal if both feet can be grasped and pulled down, as this avoids the “splits,” with one leg down and one leg up, which can splint the baby and lead to a difficult delivery. The management is then as described for breech extraction (see Chapter 63). Great care must be taken to avoid both fetal bony injury and laceration of the uterus. Tocolysis may be helpful for this procedure. If version is not successful, delivery should be achieved by cesarean section; attempts at version should be performed only when immediate resort to section is available. The obstetrician should be aware of the possibility of atonic primary postpartum hemorrhage when uterine relaxants have been administered to assist the delivery (see Chapter 75).

SECOND STAGE OF LABOR WITH RUPTURED MEMBRANES

If there is a compound presentation involving a hand and the fetal head is engaged in the pelvis, it may be possible with vaginal manipulation to encourage the hand to withdraw from the pelvis so that an assisted vaginal delivery can
continue. Otherwise, cesarean section is required. If the fetus is in a transverse or oblique lie or there is a significant compound presentation, delivery should be performed as urgently as possible using a classic cesarean section incision unless an attempt at external version can be successfully made on opening the abdominal wall immediately before the uterus is incised. A transverse incision in the lower uterine segment may be inadequate for fetal extraction because the loss of amniotic fluid reduces the surgeon’s ability to manipulate the fetus within the uterus. Struggling to deliver the fetus through a lower segment incision can cause serious trauma to the fetus, uterus, or both, and the uterine incision will probably need to be extended to an inverted T- or U-shaped incision. Such incision extensions may result in compromised healing and a vulnerable area of scar integrity, which may predispose to uterine rupture in future pregnancies or labors.

CORD PRESENTATION AND PROLAPSE—FIRST STAGE OF LABOR

With cord presentation, delivery by cesarean section should be organized with some urgency if fetal distress is suspected. Cord prolapse before full dilation of the cervix requires a “crash” or “category 1” cesarean section. While preparations are in hand for the surgery, an attempt should be made to reduce any pressure on the umbilical cord that could restrict or obstruct the cord circulation with consequent fetal hypoxia. A number of strategies have been used or proposed. Probably the most widely adopted involve applying digital counterpressure with the gloved fingers within the vagina or moving the patient into the Trendelenberg or knee-chest positions. Alternatives recommended include bladder catheterization and distention, wrapping the exteriorized cord in warm saline-soaked swabs, or manually replacing the cord into the vagina. Although the attempt at replacement of the cord may be successful (see Chapter 69), there are concerns that its manipulation might provoke vascular spasm of the vessels and further compromise fetal oxygenation.

CORD PRESENTATION AND PROLAPSE—SECOND STAGE OF LABOR (See Also Chapter 69)

Cord presentation at full dilation may be managed by external cephalic or internal podalic version if the lie is not longitudinal, and following amniotomy, proceeding to assisted vaginal delivery. Delivery by cesarean section should be arranged urgently if the expertise for version is not immediately available or the attempt is unsuccessful. If cord prolapse has occurred and the lie is not longitudinal, a crash/category 1 cesarean section is required. If the lie is longitudinal, immediate vaginal delivery using forceps for a cephalic presentation or breech extraction should be advanced if the necessary skills are available and the presenting part is low enough in the pelvis. Because the ventouse is associated with a higher failure rate than forceps, forceps should perhaps be preferred if the necessary skill is available.

**SUMMARY OF MANAGEMENT OPTIONS**

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<thead>
<tr>
<th>Management Options</th>
<th>Evidence Quality and Recommendation</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Prenatal (See Fig. 64–6)</strong></td>
<td>GPP</td>
<td>—</td>
</tr>
<tr>
<td>Confirm diagnosis with ultrasound if necessary.</td>
<td>—/GPP</td>
<td>—</td>
</tr>
<tr>
<td>Investigate for possible causes including history and ultrasound examination.</td>
<td>—/GPP</td>
<td>—</td>
</tr>
<tr>
<td>Discuss options and risks.</td>
<td>—/GPP</td>
<td>—</td>
</tr>
<tr>
<td><strong>Expectant Management</strong></td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>If noncephalic after 36 wk—“wait and see” policy—danger of cord prolapse or admission in advanced labor with a malpresentation.</td>
<td>GPP</td>
<td>69</td>
</tr>
<tr>
<td>Advice to adopt knee-chest maneuver to promote cephalic version has not been shown to be of value and is not recommended.</td>
<td>Ia/A</td>
<td>—</td>
</tr>
</tbody>
</table>
Malpresentation

Prenatal

Once an identifiable specific cause for the malpresentation has been diagnosed if present, such as polyhydramnios, a distended urinary bladder or a pelvic ovarian cyst, treatment of the cause may be indicated. For those cases without identifiable cause, there are no recognized and universally accepted procedures to use for correcting a fetal brow or face presentation. In view of the increased risk of cord presentation and thus cord prolapse with brow presentation, the woman should be advised of early admission when labor starts or membrane rupture occurs.

As with unstable lie, admission from 39 weeks’ gestation should be considered for this reason, although there is little objective evidence to support this recommendation. If delivery at this gestation is indicated for other reasons, planned cesarean section without recourse to labor may be safer than inducing labor if there is a high presenting fetal part. The alternative is labor induction with either local prostaglandins or intravenous oxytocin, with low amniotomy once contractions are established and the fetal head is engaged or fixed in the pelvic brim. Preparation should have been made to allow for rapid cesarean section should cord presentation or prolapse be diagnosed, with the woman forewarned of this possibility.

Intrapartum

Labor management is the same as for a vertex presentation, assuming routine maternal and fetal observations are satisfactory and progress in labor is maintained. Many brow presentations convert to a face or vertex, and the majority of face presentations present as mentoanterior. Oxytocin augmentation is acceptable if uterine contractions are inadequate, but caution should always be shown because labor may become obstructed with dire consequences if left unattended. If progress in labor is slow, resort to cesarean section may be a wiser option. Figure 64–9 illustrates the management options.

Once full dilation is reached with a brow presentation, spontaneous delivery will not follow unless the fetus is very small or the pelvis is unusually capacious. Providing the assessment of the pelvis indicates that there is no evidence of absolute disproportion, the presentation can be converted with rotational forceps to face or vertex, whichever proves to be the easier, and then delivered. Some have advised the use of the ventouse in this situation, but this requires the cup...
to be applied behind the bregma and this is unlikely to be possible in the majority of cases (see Chapter 72). The majority view is that unless the head is engaged in the pelvis at the start of vaginal manipulations, delivery by cesarean section is recommended.

With a face presentation, vaginal delivery should be anticipated if the head is engaged, with the delivery occurring spontaneously or assisted with forceps. The head should be in a mentoanterior position at the delivery, corrected by forceps rotation if necessary (see Chapter 72). The ventouse has no place in the management of a face presentation. Thus, cesarean section may be necessary if the obstetrician does not have the necessary skills to conduct a rotational forceps delivery.

**SUMMARY OF MANAGEMENT OPTIONS**

**Face and Brow Presentation**

<table>
<thead>
<tr>
<th>Management Options</th>
<th>Evidence Quality and Recommendation</th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Prenatal</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confirm diagnosis—examination; ultrasound.</td>
<td>—/GPP</td>
<td>—</td>
</tr>
<tr>
<td>Assess for causal factors.</td>
<td>—/GPP</td>
<td>—</td>
</tr>
<tr>
<td>Interventions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Perform cesarean section if arrested progress in labor.</td>
<td>—/GPP</td>
<td>—</td>
</tr>
<tr>
<td>• Offer cesarean section as an alternative to labor.</td>
<td>—/GPP</td>
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</tr>
</tbody>
</table>

**Labor and Delivery (See Fig. 64–9)**

<table>
<thead>
<tr>
<th>Management Options</th>
<th>Evidence Quality and Recommendation</th>
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</tr>
</thead>
<tbody>
<tr>
<td>First Stage of Labor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Establish diagnosis by vaginal examination ± ultrasound.</td>
<td>—/GPP</td>
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</tr>
</tbody>
</table>
### Management Options

<table>
<thead>
<tr>
<th>Management Options</th>
<th>Evidence Quality and Recommendation</th>
<th>References</th>
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</thead>
<tbody>
<tr>
<td><strong>Prenatal</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Brow Presentation</strong></td>
<td>—/GPP</td>
<td>—</td>
</tr>
<tr>
<td>Allow labor to progress with careful monitoring of progress.</td>
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<tr>
<td>If spontaneous conversion to face or vertex, anticipate spontaneous vaginal delivery.</td>
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<td></td>
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<tr>
<td>Perform assisted vaginal delivery.</td>
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<td></td>
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<tr>
<td>Offer cesarean section if arrested progress in labor.</td>
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<td></td>
</tr>
<tr>
<td>Offer cesarean section if pelvic disproportion is suspected.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Face Presentation</strong></td>
<td>—/GPP</td>
<td>—</td>
</tr>
<tr>
<td>If mentoanterior, allow labor to proceed anticipating vaginal delivery.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Offer cesarean section if mentoposterior or if pelvic disproportion is suspected.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Second Stage of Labor</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Persistent Brow Presentation</strong></td>
<td>—/GPP</td>
<td>—</td>
</tr>
<tr>
<td>Rotate and convert to vertex or face and deliver.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recommend cesarean section if pelvic disproportion is suspected.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Face Presentation</strong></td>
<td>—/GPP</td>
<td>—</td>
</tr>
<tr>
<td>Spontaneous delivery as mentoanterior with adequate episiotomy.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rotate to mentoanterior and deliver.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recommend cesarean section if pelvic disproportion is suspected.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

GPP, good practice point.

### Malposition

#### Prenatal

There is probably little benefit from trying to alter an occipitoposterior position diagnosed during the antenatal period because the majority of cases correct themselves before or after labor starts. There may be some virtue in advising the woman that (1) her membranes may rupture prior to the onset of contractions, (2) labor may be more uncomfortable and possibly more prolonged, and (3) there is a greater chance of requiring an instrumental delivery or cesarean section, compared with an occipitoanterior position. Some women say that they find difficult labor easier to cope with if forewarned and they may be more inclined to choose a regional anesthetic early in labor. Conversely, many occipitoposterior positions will spontaneously correct to occipitoposterior during labor, in which case anxiety will have been generated to no purpose, but it may increase the likelihood of a maternal request for delivery by antepartum cesarean section. Some have suggested the patient adopts a variety of positions to encourage rotation of the fetus. An analysis of the literature, concentrating on the use of the maternal hands-knees position during the antenatal and intrapartum periods, concluded that this position compared with others resulted in a short-term reversion to an anterior position. There is no indication that this strategy improves labor outcome, however.

#### Intrapartum

When the diagnosis of malposition is made early in labor, as much information as possible should be gathered about the fetal position, including (1) the amount of head palpable per abdomen, (2) the degree of deflexion and asynclitism, (3) the amount of molding and caput formation, (4) the level of the presenting part in relation to the ischial spines, and (5) maternal pelvis size and shape. Issues relating to fetal well-being including fetal heart rate pattern and the state of the liquor should also be taken into account, as with all labors.

Options at this point are as illustrated in the algorithm (Fig. 64–10) and include:
- No specific action if acceptable progress is being made.
- Providing oxytocin augmentation if uterine contractions are incoordinate, infrequent, or of poor quality.
- Encouraging the patient to lie on the same side as the fetal back.
- Abandoning labor in favor of cesarean section.

Once the second stage of labor has been reached, spontaneous delivery in the occipitoposterior position may result, or spontaneous rotation may still occur with delivery.
Occipitoposterior position

- Non-progressive 1st stage
  - Consider different maternal positions or oxytocin infusion
- 2nd stage
  - Non-progressive
  - Progressive

Persistent occipitoposterior position
- Consider oxytocin augmentation
  - Cesarean section
  - Deliver as occipitoposterior
  - Rotate to occipitoanterior and deliver
  - Cesarean section
  - Spontaneous vaginal delivery

Deep transverse arrest

Summary of Management Options

Malposition

<table>
<thead>
<tr>
<th>Management Options</th>
<th>Evidence Quality and Recommendation</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Prenatal</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No specific managements of proven benefit.</td>
<td>Ib/A</td>
<td>69</td>
</tr>
<tr>
<td><strong>Labor and Delivery (See Fig. 64–10)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>First Stage of Labor</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anticipate possible protracted uncomfortable labor.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Offer regional analgesia if appropriate.</td>
<td>—/GPP</td>
<td>—</td>
</tr>
<tr>
<td>- Augment with oxytocin infusion.</td>
<td>Ib/A</td>
<td>73</td>
</tr>
<tr>
<td>Consider cesarean section if secondary arrest.</td>
<td>—/GPP</td>
<td>—</td>
</tr>
<tr>
<td><strong>Second Stage of Labor</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spontaneous rotation and delivery in occipitoanterior position</td>
<td>—/GPP</td>
<td>—</td>
</tr>
<tr>
<td>Spontaneous delivery in occipitoposterior position.</td>
<td>—/GPP</td>
<td>—</td>
</tr>
<tr>
<td>Partial resolution to deep transverse arrest:</td>
<td>—/GPP</td>
<td>—</td>
</tr>
<tr>
<td>- Rotation and delivery in occipitoanterior position.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Cesarean section.</td>
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</tr>
</tbody>
</table>

occipitoposterior. Alternatively, delivery may be delayed by a persistence of the occipitoposterior position or incomplete rotation to a deep transverse arrest. It has been suggested that mechanical rotation to the occipitoposterior position followed by delivery should be avoided if fetal distress is suspected when delivery by cesarean section is favored. The decision on management at this stage should logically be determined by assessing which method of delivery is most likely to result in an earlier and less traumatic birth.
Persistent occipitoposterior position:
- Oxytocin augmentation to achieve a spontaneous delivery.
- Assisted delivery in occipitoposterior position.
- Rotation to occipitoanterior position and delivery.
- Cesarean section.

GPP, good practice point.

SUGGESTED READINGS


REFERENCES

For a complete list of references, log onto www.expertconsult.com.
REFERENCES


42. Chenia F, Crowther C. Does advice to assume the knee-chest position reduce the incidence of breech presentation at delivery? Birth 1987,14:75–78.
