

Breech Birth Guidelines

Background

The Term Breech Trial (TBT) was the largest randomized clinical trial ever undertaken on term breech mode of delivery. In countries with a low perinatal mortality rate, the trial showed no difference in perinatal mortality between a planned cesarean delivery (CD) and a trial of labor (TOL) but a difference in “serious” short-term neonatal morbidity: 0.4% versus 5.1%.

On the other hand, one half of the TBT sample was followed beyond two years, at which time there was no difference in the combined perinatal death and abnormal neurological outcome: 3.1% in the planned CS group, and 2.8% in the TOL group. Ironically, at two years of age, the only significant difference in infant outcome was fewer “medical problems in the past several months” in the TOL group (15% vs. 21%; $P = 0.02$).

In the PREMODA study, a multicentre prospective descriptive study four times larger than the TBT, the overall, cesarean delivery was planned in 69% and a TOL undertaken in 31%, consistent with non-randomization. Of 2526 women having a TOL, 1796 (71%) delivered vaginally for an overall vaginal birth rate of 22.5%.

In North America, over 100 000 women have pregnancies that remain breech at term annually. With a success rate similar to that of the PREMODA study, some 25 000 could safely avoid Cesarean delivery.

Breech presentation is increased with fetal prematurity. Vaginal breech delivery may be associated with increased risk in these preterm infants. The fetal head circumference to abdominal circumference ratio is larger than that of a mature fetus thus increasing risk of possible complications such as head entrapment and cord prolapse. Cesarean delivery may be preferred in these cases.

Multiple gestations also are at risk of fetal breech malpresentation. Delivery options of gestations of breech-breech, vertex-breech, and vertex-transverse pregnancies include: vaginal delivery, Cesarean delivery, or vaginal delivery with second twin external version, breech extraction, internal podalic version with breech extraction, or Cesarean delivery. There is no recent data to support the recommendation of Cesarean delivery to patients whose second twin is in non-vertex presentation. However, the decision for management of delivery may be related to both provider experience and patient selection criteria. Ultrasound and adequate regional anesthesia should be utilized.

Benchmarks

In June 2009 the Society of Obstetricians and Gynaecologists of Canada issued Clinical Practice Guideline No. 226, which noted:

- Long-term neurological infant outcomes do not differ by planned mode of delivery even in the presence of serious short-term neonatal morbidity.

- Careful case selection and labor management in a modern obstetrical setting may achieve a level of safety similar to elective Cesarean delivery.

- Planned vaginal delivery is reasonable in selected women with a term singleton breech fetus.

-With careful case selection and labor management, perinatal mortality occurs in approximately 2 per 1000 births and serious short-term neonatal morbidity in approximately 2% of breech infants. Many recent retrospective and prospective reports of vaginal breech delivery that follow specific protocols have noted excellent neonatal outcomes.

In 2010 the American College of Obstetricians and Gynecologists' Committee on Obstetric Practice reaffirmed the following recommendation in ACOG Committee Opinion No. 340:

-Planned vaginal delivery of a term singleton breech fetus may be reasonable under hospital-specific protocol guidelines for both eligibility and labor management. (Table 1)

Criteria

- No contraindication to vaginal birth (see below)
- Estimated fetal weight at least 2500 g and not more than 4000 g
- Gestational age 36 weeks or more
- No hyperextension of the fetal head (i. e., an extension angle of greater than 90 degrees)
- Frank or complete breech presentation (incomplete breech presentation is a contraindication)
- Spontaneous labor
- Adequate maternal pelvis
- Absence of fetal anomaly that may cause dystocia
- Staff skilled in breech delivery and immediate availability of facilities for safe emergency cesarean delivery (e. g., anesthesia, obstetrical, and pediatric personnel, surgical facilities and personnel).

Contraindications

- Cord presentation
- Fetal growth restriction or macrosomia
- Any presentation other than a frank or complete breech with a flexed or neutral head attitude
- Clinically inadequate maternal pelvis
- Fetal anomaly incompatible with vaginal delivery
- Other conditions present precluding vaginal delivery (e.g. placenta previa)

Table 1 Labor Management Tips

Epidural analgesia is useful because it relieves pain, prevents the mother from pushing involuntarily before full cervical dilatation, and provides anesthesia if obstetrical maneuvers are needed to facilitate delivery. However, it is important that the mother be able to push effectively when the breech descends to the pelvic floor.

Avoid induction of labor.

Oxytocin infusion may be used for hypocontractile uterine activity in the latent phase of labor or after epidural anesthesia. Poor progress in the active phase may be an indicator of fetopelvic disproportion and the decision to initiate oxytocin augmentation should be done with close observation of progression once active labor has commenced. Additionally, oxytocin augmentation may be considered during second stage for the purpose of assistance to maternal expulsive efforts.

The best indication of adequate fetopelvic proportions is good progress in labor. Failure to progress for two hours despite adequate uterine contractions is an indication for CD.

A fetal scalp ECG electrode may be inserted onto the buttock.

Assessing full dilatation in breech presentation is more difficult than in cephalic presentation because the fully dilated cervix does not disappear behind the cephalic crown. Instead, the cervix remains palpable as the fetal trunk descends through it.

Descent is regarded as adequate if the breech reaches the level of the ischial spines when the cervix is 6 cm dilated and reaches the pelvic floor at full dilatation.

The primary expulsive force of delivery of the fetal breech, trunk, and head is through maternal expulsive efforts. A passive second stage (i. e., delayed pushing) for up to 90 minutes is acceptable. However, once the woman starts bearing down, failure of the breech to descend and deliver within 60 minutes should be managed by cesarean delivery rather than breech extraction.

Management

1. If no contraindication to external cephalic version (ECV) or labor, recommend (ECV):
 - a. ECV lowers the likelihood of C/D; likelihood of emergency C/D <1%.
 - b. ECV acceptable with prior C/D or in early labor with intact membranes.
 - c. Ensure operating room available; IV in place; U/S guidance.
 - d. Give RhoGam anti-D immune globulin if mother is Rh negative.
2. If ECV unsuccessful or declined, then options are trial of labor (TOL) or elective C/D.
3. For TOL, selection criteria are:
 - a. Informed consent:
 - i. Small risk to fetus with careful TOL or pre-emptive C/D: approximately 0.2% of perinatal mortality or hypoxic ischemic encephalopathy and 2% short-term morbidity. Long-term outcomes equivalent.
 - ii. Possibility of small increased risk to fetus of TOL, perhaps 1/500.
 - iii. Approximate 40-71% chance success with TOL.
 - iii. Normal birth = less maternal risk (bleeding, infection, hysterectomy, blood transfusion, death) and less risk in future pregnancies of abnormal placentation, stillbirth, and uterine rupture.
 - b. Pre-labor U/S:
 - i. Frank or complete breech. If foot/feet leading but hips flexed = complete breech. "Footling" diagnosis requires extended hip: very unusual in normally grown fetus at term with closed cervix and intact membranes, but may occur during labor.
 - ii. C/D recommended for footling breech unless delivery imminent.
 - iii. No fetal growth restriction (FGR).
 - iv. Head attitude neutral or flexed.
 - v. No presenting umbilical cord evident on U/S or pelvic exam.
 - c. Estimated Fetal Weight between 2500 and 4000g
 - ii. Under 2800g - beware fetal growth restriction (FGR) in larger woman at term.
 - iii. Over 4000g may be acceptable in larger woman or with proven pelvis.
 - iv. Best indicator of adequate fetal-pelvic proportion is good progress in labor.

- d. Obstetrician who is comfortable with plan must be available:
 - i. More experienced obstetricians can back up those less experienced.
 - ii. Document on-call plan on LDR chart prior to labor.

4. Consultation with OB/GYN

-after the above has been accomplished, please help the patient arrange a consultation with an OB/GYN familiar with this procedure for a confirmation of the details and to set appropriate expectations for the patient and her family

5. Labor management:
 - a. Notify obstetrician on admission.
 - b. If no recent U/S, perform on admission unless advanced labor, then can perform bedside.
 - c. IV saline lock, type and screen on admission in labor.
 - d. Clear fluids in labor.
 - e. Avoid early AROM unless clear indication.
 - f. Immediate vaginal exam with SROM to exclude prolapsed cord.
 - g. In first stage, continuous EFM. Intermittent auscultation acceptable for deeply engaged frank breech, if baseline normal.
 - h. Expect minimum 0.75 cm/h progress after cervix 4 cm dilated and fully effaced.
 - i. Continuous electronic fetal monitoring in second stage.
 - j. Progressive descent expected in 2nd stage. Passive 2nd stage = maximum 90 min; active pushing = maximum 60 min. C/D if delivery not imminent after 2.5 hrs.
 - k. Delivery in OR. Operating room staff, anesthetist, & pediatrician in hospital for double set-up during active 2nd stage. (See Appendix 1)
 - l. Piper forceps, pudendal block set, #10 scalpel blade and #3 scalpel handle in delivery room, step stools, and ultrasound at bedside.
 - m. Extra attendant for maneuvers, if needed.
 - n. Consider placement of Foley in 2nd stage
 - o. Umbilical arterial and venous cord gases for breech deliveries.

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Video references:

WHO RHL Vaginal Breech:

<https://www.youtube.com/watch?v=G5c4GAxmEgE&list=PL68EE6D503647EA2F&index=11>

Vaginal Breech Education:

<https://www.youtube.com/watch?v=PRZ47zdEAzo>

<https://www.youtube.com/watch?v=LajPSMTJLt4&list=UUvBMITTuK6M1xROuYv4VydA&index=7>

Pipers Forceps:

http://www.uptodate.com/contents/image?imageKey=OBGYN/73745&topicKey=OBGYN%2F5384&source=outline_link&search=breech&utdPopUp=true

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Appendix 1 Delivery Tips

Adequate exposure is recommended to include having the bed broken down completely. Episiotomy is often recommended. While episiotomy will not create more room in the bony pelvis, it will enable the operator to perform various manipulations more easily, including emergency procedures such as Piper forceps application. Episiotomy is very difficult to perform once the whole body is delivered.

Trunk and legs

Maternal expulsive efforts alone should be adequate to deliver the fetus' buttocks and lower limbs if not extended. The mother is encouraged to bear down until the feet, legs, and trunk to the scapulae are visible. Fetal traction should be avoided, and fetal manipulation must be applied only after spontaneous delivery to the level of the umbilicus. The body is supported in a plane at or below the horizontal plane of the birth canal.

If the legs are extended after the umbilicus has delivered, the operator may use his/her fingers to exert pressure on the back of the knee (Pinard maneuver) and guide the thigh away from the trunk as the trunk is rotated in the opposite direction. This causes the knee to flex and allows extraction of the foot and the leg. The same procedure can be repeated, if needed, to deliver the other leg and foot.

Cord pulsation is checked and a small loop pulled down to prevent traction on the cord before the trunk delivers. When the umbilicus delivers, a loop of several inches of cord should be gently pulled down. This prevents tension on the cord as the body delivers, and also allows easy monitoring of the fetal pulse by palpation.

Meconium passage is not uncommon.

The fetus may be grasped by the operator's fingers on the fetal pelvis, with thumbs on the sacroiliac regions. This avoids placing the hands too high on the fetus and injuring abdominal organs such as the spleen, adrenals, or liver.

Arms

After delivery of the trunk and legs, the mother is asked to push again and the shoulders should present in the anterior-posterior plane and deliver spontaneously, one at a time, along with the arms, which are usually crossed in front of the chest.

Shoulder dystocia with breech presentation is usually due to extension of the arms or nuchal arms. This is typically caused by traction on the baby early in the delivery. If the trunk is pulled down, the arms can drag behind, whereas uterine contractions and maternal expulsive efforts tend to push the entire fetus in its normal flexed attitude into the birth canal.

If the arms do not deliver spontaneously, intervention may be required. The baby is held by the hips or bony pelvis, never by the abdomen, as injury to the kidneys/adrenals is possible. We wrap the legs/pelvis in a towel to provide a good grip and keep the back upwards. The baby is

rotated through 180 degrees to deliver the first shoulder and arm, then in the opposite direction so the other shoulder and arm deliver under the symphysis pubis.

This rotatory maneuver carries an eponym in Great Britain, where it is called the Lovsett maneuver. The second rotation may be assisted by gentle traction on the delivered arm in the direction of the rotation.

Failure of the shoulders and arms to deliver with simple rotation of the trunk is dealt with by sliding an index finger along the baby's scapula, over the shoulder, and into the antecubital fossa. The elbow is then swept in front of the baby's face and downward to the chest, at which point the arm can be delivered. This procedure is repeated for the other side. Gentle rotation of the fetal trunk at the same time, keeping the back anterior (ie, toward the ceiling), will assist this maneuver.

If the arms remain trapped behind the neck, the fetus can be rotated so the chest is facing the symphysis pubis. This helps to dislodge the nuchal arm(s) and allows the elbow to be swept down and extracted, as described above. Arm extraction can cause shoulder dislocation or broken bones, but these complications are less morbid than prolonged dystocia resulting in asphyxia.

Head

At this stage, the baby's head may start to appear without any further effort on the operator's part. If the hairline is not visible after the shoulders have delivered, the baby's body is turned to face the floor and suprapubic pressure is applied by an assistant to flex the head and push it down into the pelvis (Bracht maneuver).

Once the hairline is visible, the head is delivered. We prefer to use forceps for delivery of the aftercoming head. If forceps delivery is not possible or desired, the fetus' legs are swung upwards, keeping the vulva completely covered with the operator's other hand to keep the head from "popping." This hand is then opened slowly to allow first the baby's face and then the remainder of the head to deliver with maternal expulsive efforts.

The Mauriceau-Smellie-Veit maneuver is helpful for delivery of the head. The middle finger of one hand is placed in the mouth, and the second and fourth fingers on the malar eminences to promote flexion and descent while counter-pressure is applied to the occiput with the middle finger of the other hand.

With either forceps or spontaneous delivery, it is essential that the baby's legs be kept vertically in the air, but the trunk should be no more than 45 degrees above horizontal; this avoids traction on the cervical spine during delivery of the head. If the body is bent backwards too far (eg, over the mother's abdomen), hyperextension of the neck can occlude the vertebral arteries and can lead to necrosis of the cervical cord. Excess weight on the cervical spine from downward traction can have the same effect or dislocate the baby's neck.

As the mouth and nose appear over the perineum they may be suctioned. The cranial vault then delivers by further flexion. The operator may use a Ritgen technique on the perineum. As the head finally emerges, the infant's body actually flips over past vertical onto the mother's abdomen.

If there is any limitation in the space afforded for manual manipulation of the fetal head, then episiotomy can be helpful. This only increases soft tissue area and will not assist in limitations of delivery related to the bony pelvis.

Use of forceps

Piper forceps can be helpful for the delivery of the aftercoming head. The baby's feet are grasped and, using as much traction as required to keep the body straight and take weight off its neck, they are swung upwards to no more than 45 degrees above horizontal, where they are held by an assistant using a towel to make certain they do not slip. The operator then applies Piper's forceps.

The assistant moves the infant's body to the mother's right so the operator, in a kneeling position, can apply the left blade. Initially the handle of the forceps is held below the mother's thigh, almost at right angles to her body and to her right. Using two fingers of the right hand as a guide, the toe of the blade is eased into the vagina and directed upward at an angle about 45 degrees below the horizontal plane and over the infant's right ear. The left hand gradually moves the handle along a curve, downward and toward midline, while the fingers of the right hand guide the toe and protect the vaginal wall and side of the infant's head.

Unlike a cephalic delivery, a breech delivery means that the smallest part of the baby's skull appears at the vulva first with the large parietal area at the back of the pelvis. Thus, if the forceps handle is brought to midline too soon after insertion of the blade, the distal part of the blade will dig into the side of the baby's head and it will not be possible to lock the handles. The tip must be kept directed at the maternal sacrum for as long as possible, which means that the guiding hand has to be inserted well into the vagina until the tip has passed around the occiput.

The assistant then moves the infant to the left and a similar procedure is performed for insertion of the right blade. The handles are locked when both handles reach midline, and the infant's body straddles the shank.

Elevating the handles of the forceps and mild traction results in flexion and extraction of the head. Since the shanks of the forceps have a large axis traction curve built in, no special maneuvers such as the Pajot maneuver are required to ensure that traction is in the correct vector. The primary motion of the forceps is to raise the handles in a large arc, starting about horizontal and ending at or past vertical. This arc will flex the head through the pelvis with exactly the same geometry as the MSV maneuver, but with greatly increased leverage due to the length of the forceps. None of the flexing maneuvers of the MSV maneuver are required when the Pipers are used.

Head entrapment

The preterm fetus is at risk because its fetal head-to-abdominal circumference ratio is larger than that of a mature baby; therefore, the premature breech head may be caught in a partially dilated cervix, resulting in acute asphyxia from compression of the umbilical cord.

This can also happen with a larger baby, especially if the mother begins to push before full cervical dilatation occurs. In both premature and mature babies in breech presentation, the skull may not have sufficient time to mold when passing through the bony pelvis. This may also play a role in head entrapment and can result in damage to the occipital bone during delivery.

Head entrapment, if encountered, may result in poor outcome. Attempted efforts to facilitate the delivery of the fetal head include uterine relaxation, Dührssen's cervical incisions, and more

advanced measures. If the head is entrapped, the preferred option is to administer a uterine relaxant, either a beta adrenergic agonist (eg, terbutaline 0.25 mg subcutaneously) or nitroglycerin lingual aerosol (1.2%): 2 squirts (0.4 mg per one squirt). Duhrssen's incisions may allow increased space within the cervix to allow fetal head delivery. One, two, or three incisions may be made. They have been described at the 2, 6, and 10 o'clock positions of the cervix. Incision of the cervix may lead to urinary tract injury (thus avoidance of the 12 o'clock position is recommended) and can lead to significant risk of hemorrhage (from laceration of the cervical branches of the uterine arteries). The ability to perform these incisions on a term fetus may be significantly limited. Other more advanced measures including symphysiotomy or Zavenelli maneuver for the replacement of the fetus are associated with significant maternal and fetal morbidity and mortality risk and may be of little utility after prolonged head entrapment.