Operative Delivery

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KEY POINTS

1. Operative delivery is defined as any procedure undertaken to facilitate delivery of an infant.
2. Operative delivery methods include vacuum-assist delivery, forceps delivery, and cesarean section.
3. Operative delivery should be undertaken for specific indications and those indications should be specifically noted in labor record.

BACKGROUND

Although most deliveries will result in spontaneous vaginal delivery, under some circumstances, additional assistance is required to deliver the infant. Operative delivery is defined as any procedure undertaken to facilitate the delivery of the infant. These procedures may include vacuum-assist delivery, use of forceps, and cesarean delivery.

FORCEPS DELIVERY

The use of forceps has become increasingly uncommon in obstetrics and is now relatively uncommon. The use of forceps, however, remains a critical skill in modern obstetrics and a familiarity with the indications and general use of forceps is important for all providers of obstetrical care. The use of forceps should always be preceded by an assessment of the risks and benefits measured against the possibility of a cesarean section. Because of the skill and experience required to effectively utilize forceps and the potential complications associated with inappropriate use, forceps delivery should only be attempted...
for specific indications, when superior alternatives are not available or have been attempted, and by a provider with experience in both the identified indication and the appropriate use of forceps.

A variety of forceps models exist and providers should be familiar with the available types and the indications for their use. In general, all forceps consist of two pieces with curved blades and locking handles. The curve of the blades is designed to accommodate the fetal head and the maternal pelvis. The blades are not interchangeable and must be positioned correctly to assist with the two principle activities of traction and fetal rotation.

Complications associated with the use of forceps include extension of the episiotomy, laceration, uterine or bladder rupture, transient facial paralysis, and intracranial damage.

The use of forceps is classified in part on the position of the infant in the birth canal. Historically, forceps have been used with fetuses in a variety of positions and in varying degrees of descent in the birth canal. Modern use of forceps is primarily limited to two areas, outlet forceps use and low forceps use.

Outlet forceps is defined as the use of forceps for an infant that is crowning with the skull at the pelvic floor. In addition, the position of the infant head must be identified with the sagittal suture in the anterior–posterior, right–left occiput anterior or right–left occiput posterior positions. Use of outlet forceps should be limited to no more than 45° of fetal rotation.

Low forceps is defined as use of forceps for an infant whose skull has reached at least +2 station but that is not yet at the pelvic floor. Because low forceps use is, by definition, associated with less advanced infant progression through the birth canal, delivery may be associated with either less than or more than 45° of rotation.

Indications for forceps delivery include failure to progress with a prolonged second stage of labor, maternal cardiac or pulmonary disease, or nonreassuring fetal heart tracings. As previously noted, however, each of these indications should be considered in relation to the possibility of cesarean section as an alternative to forceps use.

**Use of Forceps**

Prior to the use of forceps, providers must first assess the adequacy of labor, maternal pelvic adequacy, fetal position and station, and must identify the specific indication for forceps use. There must be adequate uterine contractions, no evidence of cephalopelvic disproportion, and the fetal head must be at or below +2 station with an appropriate presentation.

The steps involved in the use of forceps to effect forceps delivery are as follow:

1. Identify specific indication.
2. Rule out contraindications to forceps delivery, including assessment of maternal pelvic adequacy (ischial spine prominence, sacral contour, and suprapubic arch size).
3. Assess risks and benefits of cesarean section as an alternative.
4. Determine fetal head presentation.
5. Determine fetal head station.
6. Prepare for cesarean section in case of failed forceps delivery.
7. Place forceps appropriately.
8. Gentle traction and or rotation for delivery.

**VACUUM-ASSIST DELIVERY**

The use of vacuum-assist is similar to that of forceps. Providers should be aware that the use of vacuum-assist rather than forceps does not alter the necessary steps prior to delivery. Although the mechanics of placement and delivery may appear to be less complex than for forceps delivery, vacuum-assist delivery remains an operative delivery with associated risks and benefits and specific indications and contraindications.

A variety of vacuum-assist devices exist and providers should be familiar with the specific device utilized at their institution. In general, vacuum-assist devices consist of a cup applied to the fetal head, a handle for providing traction, a mechanical or electric device for producing vacuum pressure, and a meter for measuring pressure.

Indications for vacuum-assist delivery are similar to those for outlet forceps delivery. The nature of the vacuum-assist device does not allow for fetal head rotation and attempts to rotate the head may result in characteristic lacerations of the scalp. Contraindications to the use of vacuum-assist devices include cephalopelvic disproportion and abnormal presentation. As with forceps delivery, all vacuum-assist deliveries should be preceded by an assessment of the risks and benefits of cesarean section as an alternative operative option.

The steps involved in the use of vacuum-assist to effect delivery are as follow:

1. Identify specific indication.
2. Rule out contraindications to vacuum-assist delivery, including assessment of maternal pelvic adequacy (ischial spine prominence, sacral contour, and supra-pubic arch size).
3. Assess risks and benefits of cesarean section as an alternative.
4. Determine fetal head presentation.
5. Determine fetal head station.
6. Prepare for cesarean section in case of failed forceps delivery.
7. Place vacuum-assist device appropriately.

Delivery with a vacuum-assist device is somewhat different than with forceps. The cup is applied over the sagittal suture approximately 3 cm in front of the posterior fontanelle. Negative pressure (vacuum pressure) is developed and gentle traction is applied with contractions. Traction should not be applied
in the absence of contractions and no attempt should be made to rotate the position of the fetal head. In general, delivery should be expected within a few contractions and in no more than 30 minutes. If the infant has not been delivered, the attempt should be considered failed and cesarean section should be performed.

**CESAREAN SECTION**

Cesarean section is the operative delivery of the infant through an abdominal and uterine incision. The placenta and membranes are also delivered transabdominally. The indications for cesarean section include all instances when vaginal delivery is either contraindicated or not feasible. For a complete description of cesarean section, providers should consult a text on operative obstetrics.