

External cephalic version: How to increase the chances for success

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➔ Increasing the use of ECV in breech-presenting fetuses at term has the potential to turn the tide on cesarean delivery rates in this population. Certain techniques can help facilitate successful version and the likelihood of vaginal delivery, with low risk to mother and baby.

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About 3% to 4% of all fetuses at term are in breech presentation. Since 2000, when Hannah and colleagues reported finding that vaginal delivery of breech-presenting babies was riskier than cesarean delivery,¹ most breech-presenting neonates in the United States have been delivered abdominally²—despite subsequent questioning of some of that study's conclusions.

Each year in the United States, approximately 4 million babies are born, and fetal malpresentation accounts for 110,000 to 150,000 cesarean deliveries. In fact, about 15% of all cesarean deliveries in the United States are for breech presentation or transverse lie; in England the percentage is 10%.³ Fortunately, the repopularized technique of external cephalic version (ECV), in which the clinician externally rotates a breech- or transverse-lying fetus to a vertex position (FIGURE, page 30), along with the

facilitating tools of tocolysis and neuraxial analgesia/anesthesia, is helping to reduce the number of breech presentations in fetuses at term and thus the number of cesarean deliveries and their sequelae—placenta accreta, prolonged recovery, and cesarean deliveries in subsequent pregnancies.

Reluctance to perform ECV is unfounded

In the United States, the practice of offering ECV to women who present with their fetus in breech presentation at term varies tremendously. It is routine at some institutions but not even offered at others.

Many ObGyns are reluctant to perform ECV. Cited reasons include the potential for injury to the fetus and mother (and related liability concerns), the ease of elective cesarean delivery, the variable success rate of ECV (35% to 86%),⁴ and the pain that women often have with the procedure. According to the literature, however, these concerns either are unfounded or can be mitigated with use of current techniques. Multiple studies have found that the risk of ECV to the fetus and mother is minimal, and that tocolysis and neuraxial anesthesia can facilitate the success of ECV and relieve the pain associated with the procedure.



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Indications for ECV

The indications for ECV include breech, oblique, or transverse lie presentation after 36 weeks' gestation and the mother's desire to avoid cesarean delivery. A clinician skilled in ECV and a facility where emergency cesarean delivery is possible are essential.

There are several instances in which ECV should not be attempted.

Contraindications include:

- concerns about fetal status, including non-reactive nonstress test, biophysical profile score <6/8, severe intrauterine growth restriction, decreased end-diastolic umbilical blood flow
- placenta previa
- multifetal gestation before delivery of first twin
- severe oligohydramnios
- severe preeclampsia
- significant fetal anomaly
- known malformation of uterus
- breech with hyperextended head or arms above shoulders, as seen on ultrasonography.

More controversial contraindications include prior uterine incision, maternal obesity (body mass index >40 kg/m²), ruptured membranes, and fetal macrosomia.

Optimal timing for the ECV procedure

Current practice is to wait until 36 to 37 weeks to perform ECV, as most fetuses spontaneously move into vertex presentation by 36 weeks' gestation. This time frame has several advantages: Many unnecessary attempts at ECV are avoided; only 8% of fetuses in breech presentation after 36 weeks spontaneously change to vertex⁵; many fetuses revert to breech if ECV is performed too early; and prematurity generally is not an issue in the rare case that immediate delivery is required during or just after attempted ECV.

ECV during labor. Performing ECV during labor appears to pose no increased risk to mother or fetus if membranes are intact and there are no other contraindications to the procedure. Some clinicians perform ECV

only during labor. The advantages are that the fetus has had every chance to move into vertex presentation on its own, the equipment used to continuously monitor the fetus during ECV is in place, and cesarean delivery and anesthesia are immediately available in the event ECV is unsuccessful.

The major disadvantage of waiting until labor is that the increased size of the fetus makes ECV more difficult. In addition, the membranes may have already ruptured, and the breech may have descended deeply into the pelvis.

Success rates in breech-to-vertex conversions

In 2016, the American College of Obstetricians and Gynecologists (ACOG) reported an average ECV success rate of 58% (range, 16% to 100%).⁶ ACOG noted that, with transverse lie, the success rate was significantly higher. Other studies have found a wide range of rates: 58% in 1,308 patients in a Cochrane review by Hofmeyr and colleagues⁷; 47% in a study by Beuckens and colleagues⁸; and 63.1% for primiparas and 82.7% for multiparas in a study by Tong Leung and colleagues.⁹ These rates were affected by whether ECV was performed with or without tocolysis, with or without intravenous analgesia, and with or without neuraxial analgesia/anesthesia (TABLE, page 29).

Likelihood of vaginal delivery after successful ECV

The rate of vaginal delivery after successful ECV is roughly half that of fetuses that were never in breech presentation.¹⁰ In successful ECV cases, dystocia and nonreassuring fetal heart rate patterns are the major indications for cesarean delivery. Some experts have speculated that the factors leading to near-term breech presentation—such as an unengaged presenting part or a mother's smaller pelvis—also may be risk factors for dystocia in labor. Despite this, the rate of vaginal delivery of successfully verted babies has been reported to be as high as 80%.¹⁰

As might be expected, post-ECV vaginal



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deliveries are more common in multiparous than in primiparous women.

Risks of ECV: Generally low and manageable

Although multiple problems may occur with ECV, generally they are rare and reversible. For instance, Grootsholten and colleagues found a stillbirth and placental abruption rate of only 0.25% in a large group of patients who underwent ECV.¹¹ Similarly, the rate of emergency cesarean delivery was 0.35%. In addition, Hofmeyr and Kulier, in their Cochrane Data Review of 2015, found no significant differences in the Apgar scores and pH's of babies in the ECV group compared with babies in breech presentation whose mothers did not undergo ECV.⁷ Results of other studies have confirmed the safety of ECV.^{12,13}

One significant risk of ECV attempts is fetal-to-maternal blood transfer. Boucher and colleagues found that 2.4% of 1,244 women who underwent ECV had a positive Kleihauer-Betke test result, and, in one-third of the positive cases, more than 1 mL of fetal blood was found in maternal circulation.¹⁴ This risk can be minimized by administering Rh₀ (D) immune globulin to all Rh-negative mothers after the procedure.

Even these small risks, however, should not be considered in isolation. The infrequent complications of ECV must be compared with what can occur with breech-presenting fetuses during labor or cesarean delivery: complications of breech vaginal delivery, cord prolapse, difficulties with cesarean delivery, and maternal operative complications related to present and future cesarean deliveries.

Alternative approaches to converting breech presentation of unproven efficacy

Over the years, attempts have been made to address breech presentations with measures short of ECV. There is little evidence that these measures work, or work consistently.

- **Observation.** After 36 weeks' gestation, only 8% of fetuses in breech presentation

TABLE Factors that affect the ECV success rate

Increase ECV success rate	Decrease ECV success rate
Transverse or oblique lie	Ruptured membranes
Multiparity	Macrosomic fetus
Amniotic fluid index >18	Relative oligohydramnios
Breech unengaged	Maternal obesity
Smaller fetus	Primigravida status
Patient with normal body mass index	Anterior placenta
Clinician experienced in ECV	Mother's inability to relax anterior abdominal wall muscles
Placenta on posterior wall of uterus	Clinician's inability to locate fetal head by palpation
Complete (vs footling) breech	Contracting or tense myometrium
Tocolysis	
Neuraxial analgesia/anesthesia	

Abbreviation: ECV, external cephalic version.

spontaneously move into vertex presentation.⁵

- **Maternal positioning.** There is no good evidence that such maneuvers are effective in changing fetal presentation.¹⁵
- **Moxibustion and acupuncture.** Moxibustion is inhalation of smoke from burning herbal compounds. In formal studies using controls, these techniques did not consistently increase the rate of movement from breech to vertex presentation.¹⁶⁻¹⁸ Likewise, studies with the use of acupuncture have not shown consistent success in changing fetal presentation.¹⁹

Methods to facilitate ECV success

Two techniques that can facilitate ECV success are tocolysis, which relaxes the uterus, and neuraxial analgesia/anesthesia, which relaxes anterior abdominal wall muscles and reduces or relieves ECV-associated pain.

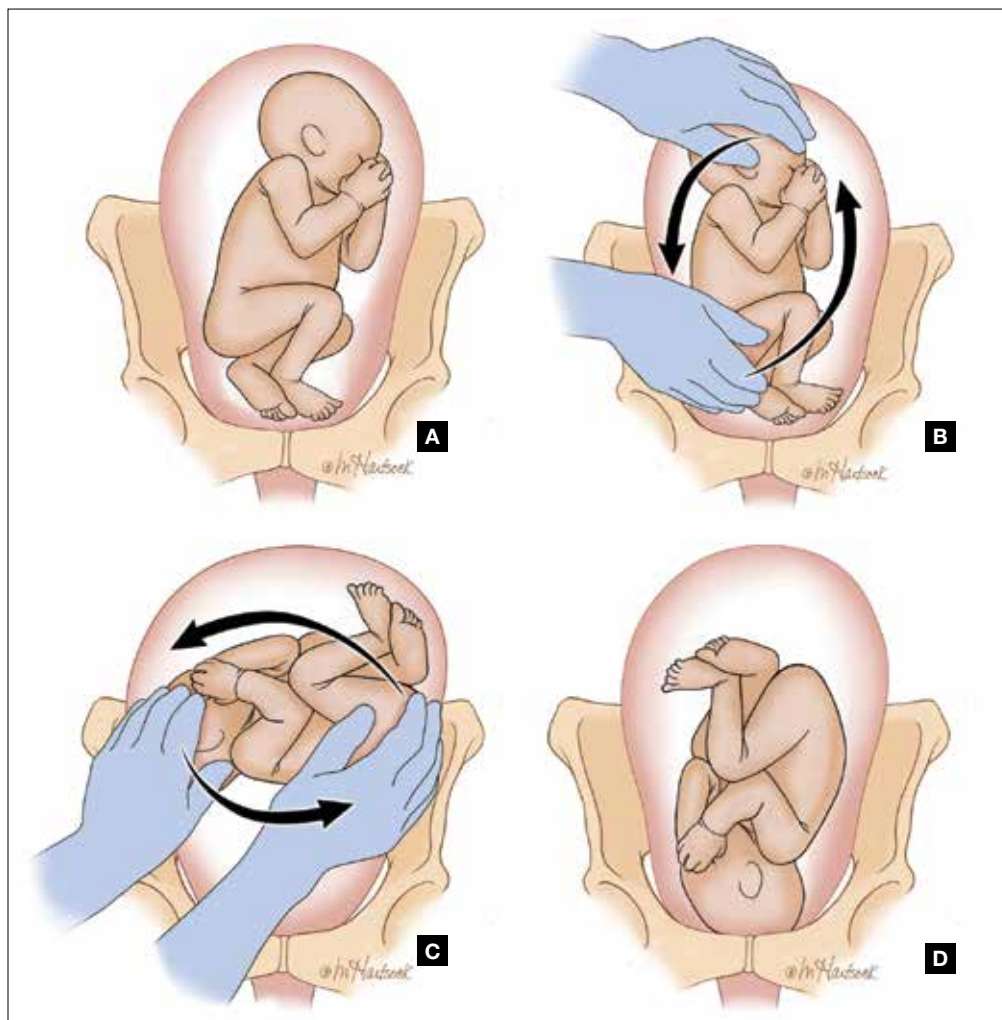
Tocolysis

In tocolysis, a medication is administered to reduce myometrial activity and to relax the uterine muscle so that it stretches more easily around the fetus during repositioning. Tocolytic medications originally were studied for



Tocolysis, which relaxes the uterus, and neuraxial analgesia/anesthesia, which relaxes anterior abdominal wall muscles and reduces ECV-associated pain, can facilitate ECV success

FIGURE External cephalic version technique



In external cephalic version, the clinician externally rotates a breech- or transverse-lying fetus to a vertex position. The illustration shows a backflip rotation maneuver. The American College of Obstetricians and Gynecologists recommends a forward rotational maneuver to be attempted first.

Source: Koutrouvelis GO; American College of Obstetricians and Gynecologists' Committee on Practice Bulletins—Obstetrics. Practice Bulletin No. 161: External cephalic version. *Obstet Gynecol.* 2016;127(2):e54–e61.

FAST TRACK

Several studies have found that nifedipine is less effective than terbutaline in facilitating ECV

their use in decreasing myometrial tone during preterm labor.

Tocolysis clearly is effective in increasing ECV success rates. Reviewing the results of 4 randomized trials, Cluver showed a 1.38 risk ratio for successful ECV when terbutaline was used versus when there was no tocolysis. The risk ratio for cesarean delivery was 0.82.²⁰ Fernandez, in a study of 103 women divided into terbutaline versus placebo groups, had a 52% success rate for ECV with the terbutaline group versus only

a 27% success rate with the placebo group.²¹

Tocolytic medications include terbutaline, nifedipine, and nitroglycerin.

Tocolysis most often involves the use of β_2 -adrenergic receptor agonists, particularly terbutaline (despite the boxed safety warning in its prescribing information). A 0.25-mg dose of terbutaline is given subcutaneously 15 to 30 minutes before ECV. Clinicians have successfully used β_2 -adrenergic receptor agonists in the treatment of patients in preterm labor, and there are more data on this

ILLUSTRATION: MARCIA HARTSOCK FOR OBG MANAGEMENT

class of medications than on other agents used to facilitate ECV.

Although nifedipine is as effective as terbutaline in the temporary treatment of preterm uterine contractions, several studies have found this calcium channel blocker less effective than terbutaline in facilitating ECV.^{22,23}

The uterus-relaxing effect of nitroglycerin was once thought to make this medication appropriate for facilitating ECV, but multiple studies have found success rates unimproved. In some cases, the drug performed more poorly than placebo.²⁴ Moreover, nitroglycerin is associated with a fairly high rate of adverse effects, such as headaches and blood pressure changes.

Neuraxial analgesia/anesthesia

Over the past 2 decades, there has been a resurgence in the use of neuraxial analgesia/anesthesia in ECV. This technique is more effective than others in improving ECV success rates, it reduces maternal discomfort, and it is very safe. Specifically, it relaxes the maternal abdominal wall muscles and thereby facilitates ECV. Another benefit is that the anesthesia is in place and available for use should emergency cesarean delivery be needed during or after attempted ECV. Neuraxial anesthesia, which includes spinal, epidural, and combined spinal-epidural techniques, is almost always used with tocolysis.

The major complications of neuraxial analgesia/anesthesia are maternal hypotension and fetal bradycardia. Each is dose related and usually transient.

In the past, there was concern that using regional anesthesia to control pain would reduce a patient's natural warning symptoms and result in a clinician applying excessive force, thus increasing the chances of fetal and maternal injury and even fetal death. However, multiple studies have found that ECV complication rates are not increased with use of neuraxial methods.

Higher doses of neuraxial anesthesia produce higher ECV success rates. This dose-dependent relationship is almost surely attributable to the fact that, although lower

dose neuraxial *analgesia* can relieve the pain associated with ECV, an *anesthetic* dose is needed to relax the abdominal wall muscles and facilitate fetus repositioning.

The literature is clear: ECV success rates are significantly increased with the use of neuraxial techniques, with anesthesia having higher success rates than analgesia. Reviewing the results of 6 controlled trials in which a total of 508 patients underwent ECV with tocolysis, Goetzinger and colleagues found that the chance of ECV success was almost 60% higher in the 253 patients who received regional anesthesia than in the 255 patients who received intravenous or no analgesia.²⁵ Moreover, only 48.4% of the regional anesthesia patients as compared with 59.3% of patients who did not have regional anesthesia underwent cesarean delivery, roughly a 20% decrease. Pain scores were consistently lower in the regional anesthesia group. Multiple other studies have reported similar results.

Although the use of neuraxial anesthesia increases the ECV success rate, and decreases the cesarean delivery rate for breech presentation by 5% to 15%,²⁵ some groups of obstetrics professionals, noting that the decreased cesarean delivery rate does not meet the formal criterion for statistical significance, have expressed reservations about recommending regional anesthesia for ECV. Thus, despite the positive results obtained with neuraxial anesthesia, neither the literature nor authoritative professional organizations definitively recommend the use of neuraxial anesthesia in facilitating ECV.

This lack of official recommendation, however, overlooks an important point: While the cesarean delivery percentage decrease that occurs with the use of neuraxial anesthesia may not be *statistically* significant, the promise of a pain-free procedure will encourage more women to undergo ECV. If the procedure population increases, then the average ECV success rate of roughly 60%⁶ applies to a larger base of patients, reducing the total number of cesarean deliveries for breech presentation. As only a small percentage of the 110,000 to 150,000 women with breech presentation at 36 weeks currently elects to



Higher doses of neuraxial anesthesia produce higher ECV success rates, possibly because the higher anesthetic dose relaxes the abdominal wall muscles and facilitates fetus repositioning

undergo ECV, any increase in the number of women who proceed with attempts at fetal repositioning **once procedural pain is no longer an issue** will accordingly reduce the number of cesarean deliveries for the indication of malpresentation.

Overarching goal: Reduce cesarean delivery rate and associated risks

In the United States, increasing the use of ECV in cases of breech-presenting fetuses would reduce the cesarean delivery rate by about 10%, thereby reducing recovery time

for cesarean deliveries, minimizing the risks associated with these deliveries (current and future), and providing the health care system with a major cost savings.

Tocolysis and the use of neuraxial anesthesia each increases the ECV success rate and each is remarkably safe within the context of a well-defined protocol. Reducing the pain associated with ECV by administering neuraxial anesthesia will increase the number of women electing to undergo the procedure and ultimately will reduce the number of cesarean deliveries performed for the indication of breech presentation. 🚫

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