

Vaginal Delivery of the Second Nonvertex Twin

Avoiding a Poor Outcome When the Presenting Part Is Not Engaged

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PROCEDURES FOR DELIVERING THE SECOND NONENGAGED NONVERTEX TWIN

Model 1: Dichorionic Diamniotic Twin Pregnancy: Vertex–Transverse Position

A gravida 1 woman with dichorionic diamniotic twins was admitted at 36 weeks of gestation for rupture of membranes of the first twin (Fig. 1A). Informed consent was obtained and the patient opted for vaginal delivery and epidural analgesia. After spontaneous delivery of the first twin, ultrasonography confirmed the second twin in a transverse position with intact membranes (Fig. 1B). By inserting one hand between the membranes and the uterine wall until reaching the fetal hips and slowly turning the fetus into breech position, under cardiotocographic and ultrasonographic control, the second twin was delivered (Fig. 1 C–E). Rupture of membranes occurred during the foot extraction (Fig. 1F).

Model 2: Monochorionic Diamniotic Twin Pregnancy: Vertex–Breech Position

A gravida 2 para 1 woman with monochorionic diamniotic twins was admitted in labor with the first twin in vertex and the second in breech position at 36 weeks of gestation (Fig. 2A). She was informed about risks of a vaginal delivery, mainly the small

chance of acute intertwin transfusion, but opted for vaginal delivery with epidural analgesia. Immediately after the delivery of the first twin the umbilical cord was clamped. Because the second twin was not engaged but presented with forelying feet, the obstetrician decided to insert the hand between membranes and uterine wall, verifying hips, thighs, and feet under cardiotocographic and ultrasonographic guidance (Fig. 2 B–C). The second twin was delivered 3 minutes after the birth of the first. Rupture of membranes occurred during the foot extraction (Fig. 2D).

QUESTIONS FOR THE SPECIALIST

What Is the Distribution of Positions of Twins at the End of Pregnancy?

Twin pregnancies and consequently their delivery have increased by 50–80% in Western countries since the 1970s, owing to higher maternal age and use of fertility treatments. No evidence suggests that vaginal delivery is contraindicated neither in dichorionic nor in monochorionic diamniotic twins. Mainly in cases of monochorionic diamniotic twins the time interval between delivery of the first twin and second twin should be short and intense surveillance is mandatory.¹ Twin sets fall into three categories (Box 1).² Pairs with the first twin in transverse or in breech position should be scheduled for a planned cesarean. Controversies relate to the delivery of twins with the first twin in vertex position (in total more than 80%), mainly if the second twin is in nonvertex position (38.4%). Independent of the position, monochorionic monomaniotic twins should be delivered by cesarean. This advice is supported by expert opinion rather than by results from randomized trials, which are hardly to be performed.

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Box 1. Distribution of Different Positions in Twin Pregnancies Before Delivery

Twin A vertex with twin B vertex: 42.5%

Twin A vertex with twin B nonvertex: 38.4%

- With twin B breech: 26%
- With twin B transverse: 11.3%
- With twin B oblique: 1.1%

Twin A nonvertex: 19.1%

- Breech–vertex: 6.9%
- Breech–breech: 6.1%
- Breech–transverse: 4.7%
- Breech–oblique: 0.3%
- Transverse–vertex: 0.6%
- Transverse–transverse: 0.5%

How Do Guidelines “Guide” Us in Decision Making?

Guidance related to delivery of twins is poor and lacks uniformity. The American College of Obstetricians and Gynecologists’ guidelines state: “The route of delivery should be determined by the position, the ease of fetal heart rate (FHR), maternal and fetal status. Data are insufficient to determine the best route of delivery.”³ European guidelines do not sup-

ply us with more details; even worse, in Germany there are no guidelines at all. Only the recent French guidelines use professional consensus and evidence levels and state that, “... the immediate and permanent availability of an obstetrician with experience in the vaginal delivery of twins is required and epidural anesthesia is desirable” and “... that studies on the mode of delivery lack of power. However, active management of the second twin and in cases of nonvertex position, breech extraction, possibly after internal maneuvers is recommended as opposed to oxytocin infusion, pushing or artificial rupture of membranes.”⁴

What Are the Risks of a “Prophylactic” Cesarean Delivery?

No study shows maternal advantages of a prophylactic cesarean, but many series demonstrate an increased maternal morbidity and higher risks for subsequent pregnancies.

In the only randomized controlled trial Rabinovici et al⁵ stated that, “... a cesarean delivery increased maternal febrile morbidity but did not improve neonatal outcome of either twin.”⁵ Stress incontinence is not increased by vaginal delivery of

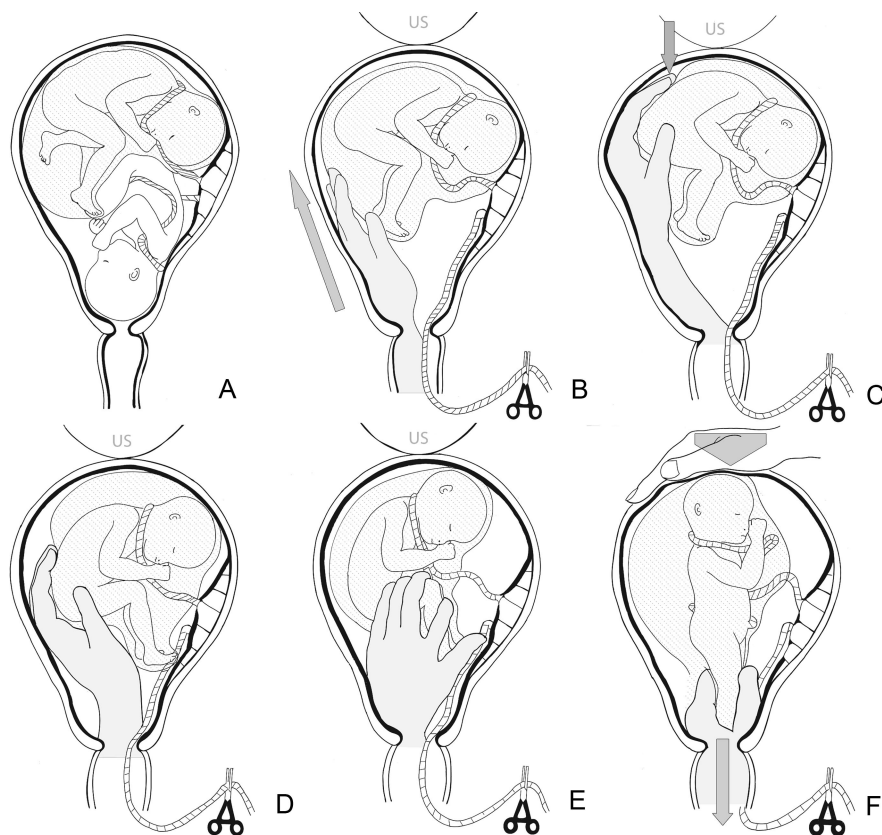


Fig. 1. Delivery of twins in vertex–dorsoanterior transverse position (A). After the delivery of the first twin, ultrasonography is performed immediately by an assistant or the obstetrician. After diagnosing the nonengaged twin in transverse position, one hand is moved slowly between membranes and uterine wall to the fetal hips (B), the hips are softly pushed down (C), and, under ultrasonographic guidance, the hand is moved to the thigh and the feet (D, E), all in a relaxed uterus—eventually with the aid of tocolytics. Only when it is certain that the hand of the obstetrician can grip the feet, a total extraction is performed possibly with some support by an assistant (F). In case of spontaneous rupture before or during the maneuver, the procedure is performed more rapidly. Reprinted with permission from the Clara Angela Foundation, copyright 2011.

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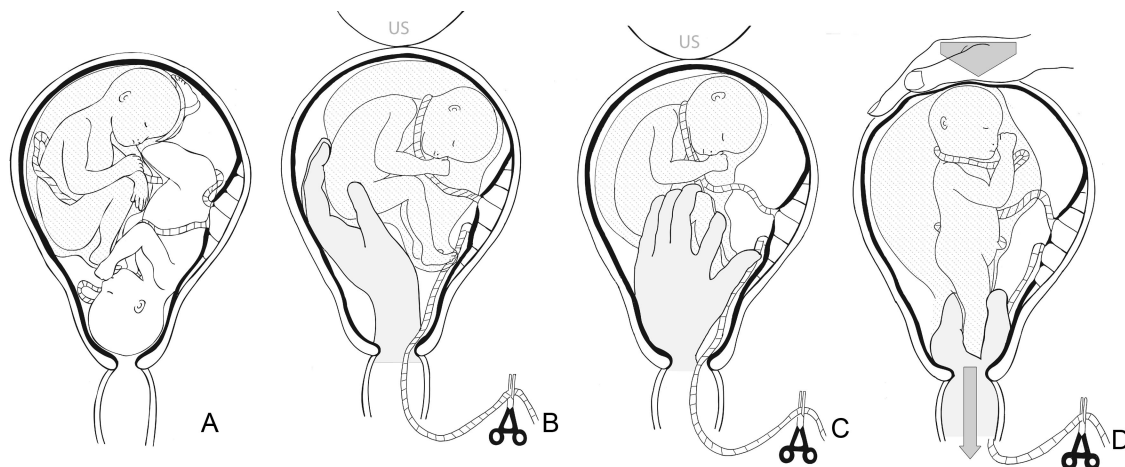


Fig. 2. Delivery of twins in vertex–breech position (A). After the delivery of the first twin, ultrasonography is performed immediately by an assistant or the obstetrician. After diagnosing the nonengaged breech, possibly with fore lying feet, the hand slowly moves between membranes and uterine wall to the hips and the thigh (B, C), all in a relaxed uterus- eventually with the aid of tocolytics. Only when it is certain that the hand of the obstetrician can grip the feet, a total extraction is performed possibly with some support by an assistant (D). In case of spontaneous rupture before or during the maneuver the procedure is performed more rapidly. Reprinted with permission from the Clara Angela Foundation, copyright 2011.

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twins compared with cesarean delivery. Only total intrauterine weight, fundal pressure, or symptoms of prenatal or postnatal incontinence increase this risk for permanent stress incontinence.⁶

It has been proven that the downstream risks for further pregnancies increase with each cesarean delivery: Clark et al have demonstrated that the rate of placenta previa, placenta accreta, placenta increta, and placenta percreta increases with the number of prior (0–4) cesarean deliveries from 0.6 to 10% for placenta previa and from 0.06% to 6.7%, respectively, for placenta accreta, placenta increta, or placenta percreta. The risk in patients with previous placenta previa of having an additional placenta accreta, placenta increta, or placenta percreta increases from 5% to 67% in patients with either no or four cesarean deliveries, respectively, in previous pregnancies.⁷

Two recent, large multicenter studies address the mode of twin deliveries: Vendittelli et al analyzed a cohort of 2,597 deliveries at 34 weeks of gestation with the first twin in cephalic presentation by an intention-to-treat analysis (evidence level II). Neonatal complications were lower after vaginal delivery compared with scheduled cesarean delivery (26.5% compared with 31.7%, $P=.005$) even if only the second twin was considered (27.6% compared with 32.7%, $P=.005$). The authors concluded that the policy of a planned cesarean delivery for pregnancies after 34 weeks of gestation cannot be supported.⁸ Similarly, Rossi et al found in a meta-analysis of

39,571 twin pregnancies that neonatal morbidity was lower after vaginal delivery (1.1%) than after scheduled cesarean delivery (2%) ($P=.01$, odds ratio [OR] 0.40, 95% confidence interval [CI] 0.2–0.81) for twin A and without significant differences between the two planned delivery modes for twin B. When outcomes were stratified for presentation and delivery mode, mortality was lower after vaginal delivery (0.6%) for both vertex and nonvertex twin B compared with cesarean delivery (0.8%, $P=.008$, OR 1.25, 95% CI 1.06–1.47).⁹

What Are the Potential Risks of a Combined Delivery?

Cesarean delivery for the second twin is regarded as the least desirable mode of delivery as the mother suffers from a tiring labor in addition to the risks deriving from a major operation. In retrospective audits, the indications were classified as follows¹⁰: The emergency situation could not be predicted, such as abruption, cord prolapse, or cervical spasm, or could be predicted but the obstetrician thought that vaginal delivery would be too risky.

Furthermore, there were failures to diagnose the situation before; such as dorsoinferior transverse position with legs not reachable. We admit, that it may be more difficult in a dorsoinferior compared with a dorsosuperior transverse position to reach the feet. However, it is not obsolete to perform a version and extraction in a dorsoinferior position in a relaxed



uterus combining ultrasonography and manual experience to grasp the posterior-most foot so that the second twin will rotate the back anteriorly. The anesthesia team and adequate nursing and pediatric staff should be present in case that the maneuver fails.

Frequently iatrogenic measures can lead to unnecessary combined delivery. Artificial rupture of membranes or liberal use of oxytocin without engagement of the leading part and prolonged interval between delivery of both twins cause fetal distress, uterine contraction around a malpresented fetus, or even cervical spasm, leading to difficulties in delivering the second twin vaginally and also during a subsequently indicated cesarean delivery. It is not surprising that apart from maternal risks associated with an unplanned operation, a cesarean delivery for the second twin is combined with a high neonatal morbidity: 19.8% (2,331/11,716) compared with 9.5% (10,873/115,005) in the vaginal delivery group ($P<.001$, OR 0.55, 95% CI 0.41–0.74) and compared with 9.8% (11,278/114,369) in a planned cesarean delivery group ($P<.001$, OR 0.47, 95% CI 0.43–0.53), respectively.⁹

Another important issue is the experience of the obstetrician. Some hospitals cannot provide patients with a 24-hour specialist in high-risk pregnancies. There is a linear correlation between the frequency of combined deliveries and the frequency of planned cesarean deliveries in the same department. If specialists have less experience in vaginal deliveries of twins they more often resort to a cesarean delivery in a second twin.¹⁰ Two-thirds of combined deliveries are perhaps avoidable, and they have an increased risk for immediate maternal complications such as hemorrhage or infection as well as later complications such as adhesions, uterine rupture, and abnormal placentation.¹⁰

What Are the Advantages Delivering a Nonengaged Nonvertex Second Twin With Intact Membranes?

The described techniques have not only been performed in these two single patients but in series of twin pregnancies with comparable combinations, all by an experienced obstetrician and a resident in training. A logical consequence from the cited studies is to deliver vertex-first twins vaginally even if the second twin is in nonvertex position and to avoid combined delivery. Many studies supporting prophylactic cesarean in twin pregnancies with the first in vertex position lack any prospective or retrospective audit related to the operator's skill and experience, subsets of different positions (eg, foot lying breech or

breech), comorbidity, and chorionicity, which all influence the results.

Ultrasonography is capable of differentiating whether membranes of the second twin are still intact or not. A few publications already support maneuvers with intact membranes in the second twin.^{8,11} Standard obstetric texts rarely describe techniques related to a nonengaged second twin in either position but sometimes even recommend rupture of membranes before performing version or extraction. Rates of complications of maneuvers with either intact or ruptured membranes cannot be compared and we would not support randomized trials related to this difference because the risks of uterine contraction around a nonengaged twin, cord prolapse, and fetal distress after rupture of the second membranes are obvious. Oxytocin is only indicated if the second twin is in vertex position with some contact to the birth canal, fetal heart rate (FHR) monitoring is normal, and spontaneous contractions are not effective. In all cases where a manual version or extraction are scheduled, oxytocin should be avoided, tocolytics may be indicated and antibiotics should be applied in cases with internal maneuvers.

In patients where membranes of the second twin rupture before or during birth of the first twin, the techniques would be the same, but should be performed immediately after delivery of the first twin in a relaxed uterus. The patient should not push and pain relief should be assured to perform these maneuvers rapidly but without panic. Waiting too long may not only increase the risk of prolapsed cord but also of acidemia in the second twin even if FHR pattern is reassuring.¹²

Why Do Obstetricians Presently Resist Performing Intrauterine Maneuvers?

Historically, midwives and physicians have delivered twins vaginally from complicated positions with little medical or technical support. Meanwhile, fetal ultrasonography, intrapartum monitoring and medication during delivery have been introduced, all of which are particularly useful for the delivery of the second twin. Nevertheless, many obstetricians have lost the intention or capability to actively deliver the second nonengaged nonvertex twin. Cruikshank has stated that, "... physicians trained after the 1970s have no idea how to perform internal maneuvers."¹³ How can we allow this ignorance as maternal-fetal specialists?

Wisdom derives from looking to the past and the future in the same time. This is an appeal to our professional integrity to teach residents and specialists to combine old techniques with modern achieve-



ments. Randomized trials about different modes of delivery in vertex-first twin pregnancies and a nonengaged nonvertex second twin will hardly be possible because this situation is frequently only diagnosed after the delivery of the first twin, which is not a good moment to ask for participation apart from other biases such as skills of the operator, FHR pattern, and uterine relaxation. Evidence of large observational trials and beneficence toward all three patients does not necessarily support a scheduled cesarean delivery in vertex-first nonvertex second twin pregnancies but rather a nuanced approach, where patients should be encouraged to deliver vaginally in perinatal centers with sufficient expertise and all described facilities. Studies should not be content with immediate outcomes, but also include results from retrospective audits and long-term follow up before making too early conclusions.

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