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## Vaginal delivery of the second twin in unengaged cephalic presentation

Birgit Arabin<sup>a,b</sup>, Ioannis Kyvernitakis<sup>c,d</sup>, Amr Hamza<sup>e</sup>, Hoilger Maul<sup>f</sup>, Mariarosaria Di Tommaso<sup>g</sup>, Jim van Eyck<sup>h</sup> and Jacky Nizard<sup>i</sup>

<sup>a</sup>Centre for Research & Development, Clara Angela Foundation Witten and Berlin, Witten, Germany; <sup>b</sup>Department of Obstetrics Charite, Humboldt University Berlin, Berlin, Germany; <sup>c</sup>Department of Obstetrics and Gynecology, Bürgerhospital, Frankfurt, Germany; <sup>d</sup>Dr. Senckenberg Foundation, Johann-Wolfgang-Goethe University, Frankfurt, Germany; <sup>e</sup>Department of Obstetrics and Gynaecology, Universitätsklinikum des Saarlandes, Homburg, Germany; <sup>f</sup>Department of Pre-and Perinatal Medicine, Askepios Barmbek, Hamburg-Barmbek, Germany; <sup>g</sup>Department of Perinatal Medicine, University of Florence, Florence, Italy; <sup>h</sup>Department of Perinatal Medicine, Isala Klinieken Zwolle, Zwolle, Netherlands; <sup>i</sup>Department of Maternal-Fetal Medicine, l'Hôpital de la Pitié Salpêtrière, Paris, France

### ABSTRACT

In accordance with women's preferences guidelines, referring to population-based and randomized trials, which recommends counseling women with vertex-first twins to attempt a vaginal delivery. Yet, the rising rates of twin caesareans are associated with the decline in skills of senior and junior obstetricians. Although noncephalic second twins have been in the focus of interest, prompt delivery of cephalic second twins can be trickier when the head does not engage. We illustrate how to avoid complications during instrumental delivery or internal podalic version and breech extraction of the second twin encouraging to start when membranes are still intact.

### ARTICLE HISTORY

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### KEYWORDS

Assisted vaginal delivery; discrepancies of birth management within Europe; medical education; multiple pregnancy; risk management

### Introduction

Risk-stratified analyses have demonstrated wide variations of the mode of delivery within Europe in both singleton and twin pregnancies [1]. In twins, the cesarean rates varied between 31.1% in Island and 98.8% in Malta. The Netherlands and France had significantly lower rates (43.9 and 54.8%) as compared to Germany and Italy with 74.8 or 85.6% respectively [1]. According to a French prospective population-based cohort study vertex-first twins born between 32 and 37 gestational weeks by planned caesareans as compared to vaginal deliveries had higher composite neonatal mortality and morbidity rates with 5.3 versus 3.0% respectively: OR 1.85, 95% confidence interval (CI) 1.29–2.67 [2]. Composite neonatal mortality and morbidity did not differ when either supervised residents or senior physicians had performed maneuvers in a second nonvertex twin: 13/545 (2.4%) versus 29/831 (3.5%); adjusted relative risk 0.78, 95% CI 0.35–1.74 [3]. Even for preterm vertex-first twins born between 24 and 34 gestational weeks, the Epipage-2 study found that the outcome up to 2 years did not differ between twins with cesarean or vaginal delivery [4]. Similarly, the randomized Twin Birth Trial showed that in vertex-first twin pregnancies,

a planned cesarean does neither improve short nor long-term neonatal outcome provided “an experienced obstetrician was involved” [5,6]. Practical experience and a proactive systematic approach are crucial to avoid acidosis which increases with 1%/min during the second stage in the second twin [7]. In 2011, maneuvers were illustrated for the delivery of the second nonvertex twin by illustrating manual extraction of the second twin in breech or transverse position with intact membranes [8]. Accordingly, we have introduced teaching mannequins with the second twin in fluid-filled membranes used and appreciated during hands-on courses of the European board and College of Obstetrics and Gynaecology (EBCOG) Congresses.

The presentation of the second twin may still change during labor preferably in multiparous women or early gestational age [9]. Counseling women is challenging because outcomes are rarely associated with a theoretical plan but rather with the final reality of the delivery [10]. A combination of both twins in the cephalic presentation is regarded as least risky but can be tricky when the second twin remains unengaged and prompt delivery is indicated. The French National College of Obstetricians and Gynaecologists (CNGOF)

clinical practice guidelines is the only one encouraging and describing active management in the high and mobile cephalic presentation of the second twin [11]. Meanwhile, a French group analyzed 127 twin pregnancies with a trial of vaginal delivery for the second twin in high cephalic presentation. Comparing spontaneous delivery, instrumental or breech extraction after internal podalic version, the authors found no significant difference among the groups in terms of maternal, fetal and neonatal well-being. In contrast to common belief, instrumental delivery was feasible, with a mean time interval between the first and second delivery of less than 15 min, even when performed by a trainee [12]. The rates of spontaneous deliveries, instrumental deliveries, and manual maneuvers were 80/127 (63%), 39/127 (31%), and 8/127 (6%) respectively. Encouraged by these results, we illustrate our empiric stepwise procedure in nonengaged cephalic dichorionic diamniotic or monochorionic diamniotic twins with intact membranes of the second twin. A secondary analysis of the Twin Birth Trial was an additional stimulus which demonstrated women's desire to be involved in decision-making. Thereby they would prefer a vaginal delivery which was also associated with greater satisfaction across all study groups [13]. Who doubts that obstetricians are ethically obliged to be prepared for frequently unexpected challenges during the preferred way of delivery?

### **Preparation for a vaginal vertex-first twin delivery**

Before a vaginal delivery for multifetal gestation is scheduled, placenta previa, vasa previa or poor fetal condition of one of the twins must be excluded. Women should be counseled in time for epidural anesthesia to limit pain caused by intrauterine maneuvers without delay. Otherwise, short general anesthesia following local protocols may be recommended, which would also be required in case of an emergency cesarean. For all maneuvers, artificial rupture of the membranes of the second twin should be postponed. Transabdominal and/or transperineal ultrasound -preferably with color- should be available and is indicated for visualizing the umbilical cord or fetal extremities in all cases of doubts.

### **Stepwise decision-making in second nonengaged cephalic twins with intact membranes**

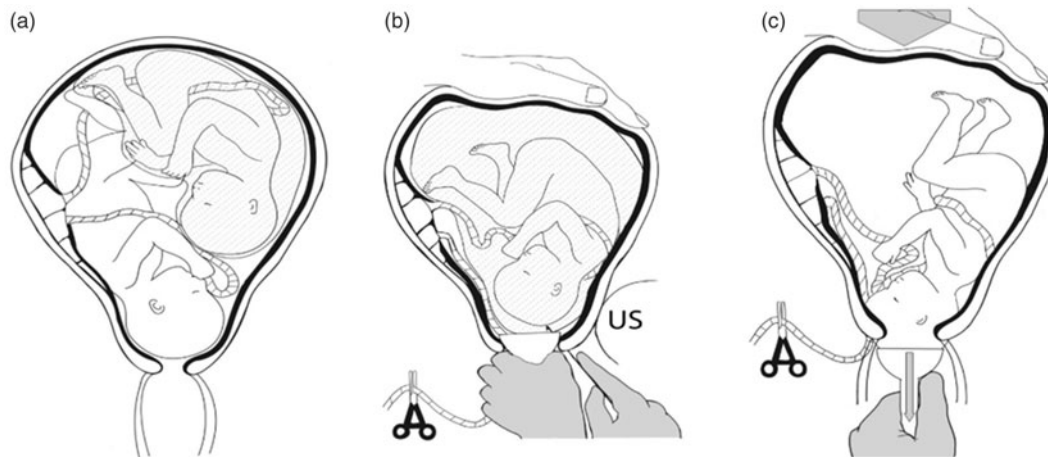
A systematic review comparing a trial of instrumental vaginal delivery in operating theatres to immediate

caesareans could not reveal significant differences in singletons [14]. For twins, this has not been evaluated, but depending on the clinical experience and the clinical scenario, this can be deliberately decided with neonatologists and anaesthesiologists stand-by. We propose a stepwise decision process in case the second twin remains high and maternal and/or fetal conditions indicate rapid delivery of the second twin even after direct delivery and clamping of the umbilical cord of the first twin. Before an instrumental delivery is attempted and the head cannot be clinically assured, transabdominal, possibly combined with transperineal (color) ultrasound should exclude that neither the pulsating umbilical cord nor the extremities should precede the head of the second twin within the lower uterine segment and that the cervix is fully dilated. For an instrumental delivery, the cervix should remain fully dilated. Otherwise, podalic version and extraction should be performed. The recent Canadian guideline about instrumental deliveries recommends to individually weigh the risks and benefits, as a safe delivery more depends on "adequate clinical experience than the procedure itself" (II-B) and that "boards should grant privileges for the performance to an appropriately trained individual (III-C)" [15]. This holds also true for the delivery of twins.

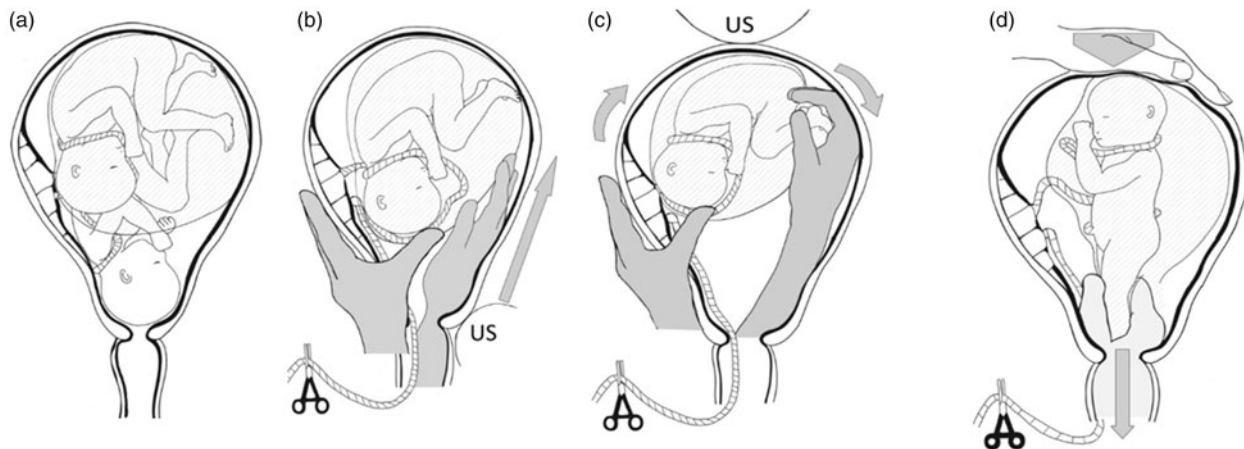
### **Suggested procedures**

#### ***Instrumental vaginal delivery of the second cephalic twin***

Nonengagement of a second twin is rarely caused by a mismatch between fetal and maternal anatomy but rather by dystocia. Therefore, a relatively high instrumental delivery cannot have the same restrictions as in singletons. However, a forceps delivery carries a high risk for high degree perineal tears, even in twin deliveries [16]. Amniotomy without engagement bears the risk of prolapsed cord, cervical spasm and sudden uterine contraction reducing further oxygen supply. To avoid panic situations indicating a cesarean for the second twin we recommend the following procedure: with the first signs indicating delivery, we place the (possibly smaller sized) cup of the vacuum on the lowest part of the intact membranes. Only then, we ask an assistant to cautiously push the second twin towards the cup and puncture the membranes laterally of the cup (Figure 1(b)). The cup is placed as soon as the occiput is reachable, then the suction is started. Continuous fundal pressure facilitates a cautious extraction (Figure 1(c)). Usually, delivery is thereby performed by one prolonged traction. When the membranes of the second twin are not (any longer) intact and



**Figure 1.** Instrumental vaginal delivery of the second nonengaged cephalic twin (a) Before delivery of the 1st twin. (b) After delivery of the 1st twin: ultrasound exclusion of umbilical cord or fetal extremities, placing the vacuum cup, lateral puncture of the membranes, sucking with continuous fundal pressure. (c) Extraction of the 2nd twin with continuous fundal pressure in one traction.



**Figure 2.** Manual version and extraction of the second nonengaged cephalic twin if possible, with intact fetal membranes (a) Before delivery of the 1st twin. (b) After delivery of the 1st twin: ultrasound detection of the umbilical cord and/or fetal extremities, alternatively, head not reachable, insertion with the face-opposite hand between fetal membranes and uterine wall, external lifting of the fetal head. (c) Cautious grasping of the feet (possibly with ultrasound control) and rotating the 2nd twin in a complete breech position without losing contact. (d) Extraction of the 2nd twin with continuous fundal pressure. The rupture of membranes will occur during the version or extraction procedure.

prompt delivery is indicated the procedure follows common protocols. In case of any difficulty to place the cup, a switch to internal version and extraction should be decided.

### **Manual maneuver of version and extraction with intact membranes**

Intact membranes within a noncontracted uterus not only prevent uterine or cervical contraction and cord prolapse combined with fetal bradycardia, but also facilitate rotation of the second twin. Long sterile gloves should be used for internal maneuvers before inserting one hand (opposite to the fetal face) between the membranes and the uterine wall.

The procedure may be controlled by ultrasound and fetal heart rate monitoring. Once the feet can be grasped through the membranes as recommended for second nonvertex twins [8,11], it can be helpful to simultaneously push the fetal skull upwards (externally) to slowly turn the baby into breech position (Figure 2(b–c)). Rupture of membranes may occur when grasping the feet or during the extraction (Figure 2(d)).

### **Comment**

Guidelines still lack uniformity and precision related to procedures. “The route of delivery should be determined by the position, the fetal heart rate, or maternal and fetal status” is stated by American College of

Obstetricians and Gynaecologists [17]. The Italian guideline recommends in vertex-first twins and an estimated weight >1500 g “vaginal birth as a reasonable option provided the obstetrician is experienced in version and extraction” (II-B) [18]. Nevertheless, Italian experienced obstetricians do not seem to teach the inexperienced staff, or defensive medicine drives caesareans much higher than in France or the Netherlands. Therefore, innovation and novel provider-focused strategies are required to reverse relinquished skills for future generations, as stated by an inquiry within the USA [19]. This is not possible without guidance. Except for France, clinical guidelines do not supply details related to surgical or manual procedures; in Germany, there is no guideline at all.

More than 80% of twin sets present as vertex-first near term, in 43% both twins are in vertex position [20]. Although this combination is rarely regarded as potentially problematic, experienced clinicians know that it is easier to immediately deliver a second twin in the foot or breech than in a nonengaged cephalic presentation. In cases where oxytocin was augmented or pushing stimulated, acidosis and poor oxygenation may already be present before any maneuver is performed. Courageous trainees may rupture the membranes of the second twin too early with the undesired consequences of cord prolapse and cervical spasm, thus impairing vaginal delivery due to “iatrogenic” fetal bradycardia. Apart from maternal risks and frustrations associated with an unplanned operation, cesarean deliveries of second twins are associated with high neonatal morbidity (19.8 versus 9.5% after a vaginal and 9.8% after a planned cesarean, respectively) [21]. It is not surprising that a linear correlation exists between the frequency of combined spontaneous-cesarean deliveries and of total scheduled caesareans in the same department with obstetricians provoking instead of preventing a cesarean in a second twin. Accordingly, at least two-thirds of combined deliveries are considered avoidable [22]. In addition, a prolonged course of delivery in twins bears a high risk of uterine atony irresponsive to management with oxytocin. Therefore, all maneuvers were pragmatically illustrated by the first author (BA) for their former residents and fellows (JK, AH) who are meanwhile consultants and still use the described protocol for their trainees. The protocol was also confirmed and followed by experienced obstetricians in different European countries (MdT, HM, JN) who are therefore co-authors. Since the described maneuvers are frequently used as a final option, research design is still missing. This may be regarded as a weakness but

“double-blind randomization” is not an option. In times when clinical studies are frequently designed and written by epidemiologists or unexperienced clinicians it should be stressed, that empirical skills are prerequisite before performing retrospective or prospective clinical trials.

## Conclusion

The author team has reached professional consensus on the described procedures and plans to evaluate typical mistakes leading to combined deliveries within each country. In how far systematic hands-on training and implementation may lead to lower rates of caesareans for both twins or at least for the second twin remains to be evaluated.

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## Ethics approval

**Statement:** The clinical procedures were not part of a systematic research protocol but rather part of good clinical practice.

## Disclosure statement

All authors declare to have no financial, personal, political, or intellectual conflict of interest.

## References

- [1] Macfarlane AJ, Blondel B, Mohangoo AD, et al. Wide differences in mode of delivery within Europe: risk-stratified analyses of aggregated routine data from the Euro-Peristat study. *BJOG: Int J Obstet Gy.* 2016; 123:559–568.
- [2] Schmitz T, Prunet C, Azria E, et al. Association between planned cesarean delivery and neonatal mortality and morbidity in twin pregnancies. *Obstet Gynecol.* 2017;129:986–995.
- [3] Schmitz T, Korb D, Azria E, et al. Neonatal morbidity after management of vaginal noncephalic second-twin delivery by residents. *Obstet Gynecol.* 2018;132: 1377–1385.
- [4] Sentilhes L, Lorthe E, Marchand-Martin L, et al. Planned mode of delivery of preterm twins and neonatal and 2-year outcomes. *Obstet Gynecol.* 2019;133: 71–80.
- [5] Asztalos EV, Hannah ME, Hutton EK, et al. Twin Birth Study. 2-year neurodevelopmental follow-up of the randomized trial of planned cesarean or planned vaginal delivery for twin pregnancy. *Am J Obstet Gynecol.* 2016;214:e1–e19.

- [6] Barrett JF, Hannah ME, Hutton EK, et al. A randomized trial of planned cesarean or vaginal delivery for twin pregnancy. *N Engl J Med*. 2013;369:1295–1305.
- [7] Axelsdóttir Í, Ajne G. Short-term outcome of the second twin during vaginal delivery is dependent on delivery time interval but not chorionicity. *J Obstet Gynaecol*. 2018; 1–5.
- [8] Arabin B, Kyvernitakis I. Vaginal delivery of the second nonvertex twin: avoiding a poor outcome when the presenting part is not engaged. *Obstet Gynecol*. 2011; 118:950–954.
- [9] Panelli DM, Easter SR, Bibbo C, et al. Clinical factors associated with presentation change of the second twin after vaginal delivery of the first twin. *Obstet Gynecol*. 2017;130:1104–1111.
- [10] Salvesen K. Counselling is difficult when outcomes are associated with mode of delivery and not with the plan for mode of delivery. *BJOG: Int J Obstet Gy*. 2015;122:1663.
- [11] Vayssière C, Benoist G, Blondel B, et al. Twin pregnancies: guidelines for clinical practice from the French College of Gynaecologists and Obstetricians (CNGOF). *Eur J Obstet Gynecol Reprod Biol*. 2011;156:12–17.
- [12] Roesch M, Bourtembourg A, Panouillères M, et al. Second twin delivery in cephalic presentation. Apropos of a series of 127 patients. *J Gynecol Obstet Biol Reprod (Paris)*. 2016;45:291–299.
- [13] Murray-Davis B, McVittie J, Barrett JF, et al. Exploring women's preferences for the mode of delivery in twin gestations: results of the Twin Birth Study. *Birth*. 2016; 43:285–292.
- [14] Majoko F, Gardener G. Trial of instrumental delivery in theatre versus immediate caesarean section for anticipated difficult assisted births. *Cochrane Database Syst Rev*. 2012;10:CD005545.
- [15] Cargill YM, MacKinnon CJ. No. 148-guidelines for operative vaginal birth. *J Obstet Gynaecol Can*. 2018; 40:e74–e80.
- [16] Rosen H, Barrett J, Okby R, et al. Risk factors for obstetric anal sphincter injuries in twin deliveries: a retrospective review. *Int Urogynecol J*. 2016;27: 757–762.
- [17] American College of Obstetricians and Gynecologists Committee on Practice Bulletins-Obstetrics, Society for Maternal-Fetal Medicine, ACOG Joint Editorial Committee. ACOG Practice Bulletin #56: Multiple gestation: complicated twin, triplet, and high-order multifetal pregnancy- # 56. *Obstet Gynecol*. 2004;104(4): 869–883.
- [18] Italian Society of Gynaecology and Obstetrics (SIGO). Gestione della Gravidanza multipla linee guida Fondazione Gonfalonieri, Aragonese su Mandato SIGO, AOGOI, AGU; 2016. Available from: [www.sigo.it](http://www.sigo.it)
- [19] Easter SR, Taouk L, Schulkin J, et al. Twin vaginal delivery: innovate or abdicate. *Am J Obstet Gynecol*. 2017;216:484–488.e4.
- [20] Chervenak FA, Johnson RE, Youcha S, et al. Intrapartum management of twin gestation. *Obstet Gynecol*. 1985;65:119–124.
- [21] Rossi AC, Mullin PM, Chmait RH. Neonatal outcomes of twins according to birth order, presentation and mode of delivery: a systematic review and meta-analysis. *BJOG*. 2011;118:523–532.
- [22] Blickstein I. Special situations in labor and delivery of multiples. In: Blickstein I, Keith L, editors. *Multiple pregnancy, epidemiology, gestation and perinatal outcome*. London: Taylor & Francis; 2005. p. 680–682.