

# Planned vaginal delivery versus elective caesarean section in singleton term breech presentation: a study of 1116 cases

François Golfier<sup>a</sup>, Fabien Vaudoyer<sup>a</sup>, René Ecochard<sup>b</sup>, Fabienne Champion<sup>a</sup>,  
Philippe Audra<sup>c</sup>, Daniel Raudrant<sup>a,\*</sup>

<sup>a</sup>Departments of Obstetrics and Gynecology, Claude Bernard University, Hôtel Dieu Hospital, School of Medicine, Lyon, France

<sup>b</sup>Edouard Herriot Hospital, Lyon, France

<sup>c</sup>Department of Epidemiology and Public Health, Lyon, France

Received 29 September 2000; accepted 26 February 2001

## Abstract

**Objective:** To compare neonatal and maternal morbidity and mortality between planned vaginal delivery and elective caesarean section for singleton term breech presentation. **Study design:** We studied retrospectively all deliveries of singleton breech presentations at term in the public Hospitals of Lyon between 1 January 1991 and 31 December 1995. To take only the effect of delivery on the fetus into account, we eliminated high risk pregnancies and fetal malformations. Fetal parameters were corrected perinatal mortality, Apgar score < 7 at 1 and 5 min, umbilical cord arterial pH < 7.15, neurological disorders, trauma and need for neonatal intensive care. Maternal parameters were mild, moderate and severe complications. **Results:** Of the 1116 breech presentations, 702 (62.9%) underwent an elective caesarean section and 414 (37.1%) a planned vaginal delivery. In the latter group, 342 (30.6%) had a vaginal delivery and 72 (6.5%) a non-elective caesarean section. Infants for whom the vaginal route was planned were at higher risk of mortality and morbidity. There were 2 deaths in this group and none in the elective caesarean section group and all fetal parameters were poorer: more Apgar < 7 at 5 min (RR: relative risk = 3.05; 1.03–9.05), arterial pH < 7.15 (RR = 1.64; 1.11–2.43), intubations (RR = 7.35; 2.10–25.6), neurological disorders, trauma (RR = 4.24; 1.66–10.8), transfer to intensive care units (RR = 3.23; 1.57–6.64). The overall maternal morbidity was lower in the planned vaginal delivery group (RR = 0.65; 0.44–0.94) but this was only because of less mild complications. The moderate and severe complications were the same in the two groups (RR = 0.97; 0.59–1.57). **Conclusions:** Planned vaginal delivery in singleton term breech presentation increases the risk of death and of neonatal complications. Elective caesarean section increases the risk of only mild maternal complications. For these reasons, elective caesarean section should be preferred for singleton term breech presentations. © 2001 Elsevier Science Ireland Ltd. All rights reserved.

**Keywords:** Breech delivery; Vaginal delivery; Caesarean section; Mortality; Morbidity

## 1. Introduction

Delivery of breech presentation has always given rise to controversy. Vaginal delivery for breech still has the reputation of being accompanied by a fetal mortality and morbidity 4–6 times higher than for vertex presentation [1]. However, the optimal mode of delivery remains to be determined. Some recent studies recommend elective caesarean section [2,3,4,21] while others are against [5,18]. After a consensus conference [6] in 1993, the FIGO recommended the widespread use of caesarean section in the case of breech presentation in developed countries. It does not explicitly

condemn vaginal delivery but lays down strict conditions for it to be performed.

In developed countries, the rate of elective caesarean section in the case of breech presentation is increasing steadily while we are still unable to clearly assess the possible benefits for the child nor the induced maternal morbidity. The ideal solution would be to have available randomized prospective studies comparing the two attitudes: elective caesarean section and planned vaginal delivery (whatever the final delivery route). Unfortunately, there are extremely few randomized studies [7,8] and the sample size is too small to permit definitive conclusions. For many reasons (technical, lack of experience in vaginal delivery), no result of any large-scale randomized trial had been published to date. In this situation, we can only rely on the result of meta-analysis or on those

\* Corresponding author. Tel.: +33-4-72413252; fax: +33-472413901.  
E-mail address: daniel.raudrant@chu-lyon.fr (D. Raudrant).

of retrospective studies including a large number of cases.

## 2. Materials and methods

The aim of the study was to compare the effects on the child and the mother of two attitudes: elective caesarean and planned vaginal, whether the final outcome be a true vaginal delivery or a caesarean section performed during labor.

The files were classified in one or the other of these two groups depending on the original decision without knowing the real mode of delivery. The decision to perform an elective caesarean section or a planned vaginal delivery was taken either during the consultation at the 9th month, or during a supplementary consultation near term, or upon entry into the delivery room if the type of presentation was not known beforehand. This decision was in all cases confirmed by the obstetrician on duty upon the admission to the delivery room. Elective caesarean section was chosen in the following cases, uterine scar or malformation, small pelvic diameters by pelvimetry (transverse diameter of the inlet < 12.5 cm, obstetric conjugate < 10.5 cm, bischial diameter < 9.5 cm), macrosomia suspected on ultrasound (biparietal diameter > 9.7 cm, estimated fetal weight > 4000 g at term), bad clinical impression in the case of a post-term, premature rupture of the membranes of >12 h without spontaneous labor, hyperextension of the fetal head at the beginning of labor. The complete breech was not considered an indication for elective caesarean section neither was footling breech which was treated as the complete breech.

We carried out a retrospective study [25] including all singleton term breech births (between 37 and 42 complete weeks) in the four public maternity hospitals of the “Hospices Civils de Lyon” between 1 January 1991 and 31 December 1995. These four maternity hospitals, situated in the urban community of Lyon, performed 46.382 deliveries during this period. The physicians working in these four hospitals had the same training and worked alternatively in the four maternities. Identification of cases was possible through the computerized system of administrative management of patients GEMA V2. All the information was collected from the obstetrical files. We found 1135 singleton term breech presentations, which represent 2.4% of the deliveries performed during this period. An external cephalic version was attempted in 456 cases (41%) with immediate failure or spontaneous reversion of the fetus; these cases were included in our study. To measure only the effect of the mode of delivery on the state of the fetus, we excluded all files where a maternal or a fetal pathology could have affected the state of the mother or her child at birth. Thus, we eliminated 19 cases, six for maternal reasons (four diabetes mellitus, one severe pregnancy-induced hypertension, one accidental maternal trauma), 12 for fetal reasons

(five congenital malformations, six intrauterine growth restrictions with weight at birth <2000 g, one severe toxoplasmosis), one for a maternofetal reason (intrauterine growth restriction with HELLP syndrome). About 1116 breech presentations could then be analyzed.

We have taken into account the perpartum and neonatal mortality. The neonatal morbidity factors were acidosis defined by an umbilical cord arterial pH < 7.15; early neonatal distress (Apgar score < 7 at 1 min) and persistent distress (Apgar score < 7 at 5 min) the need for intensive care in the delivery room by external heart massage or intubation, obstetrical trauma (hematoma, lacerations, bistouri wound, brachial plexus injuries, fracture of the clavicle, pneumothorax), transfer to a neonatal intensive care unit, minor or major neurological disorders (major tonic disorders, convulsions) diagnosed and managed by the neonatologist.

We studied the maternal mortality and morbidity based on the World Health Organization definitions. The maternal morbidity included minor complications (isolated hyperthermia and cystitis) complications of moderate severity (pyelonephritis, endometritis, wall abscess or hematomas, moderate trauma related to obstetrical or surgical maneuvers) severe complications (blood transfusion, deep thrombosis, disseminated intravascular coagulation, intestinal injuries or other serious trauma).

Statistical analysis was performed in collaboration with the Department of Epidemiology and Public Health at the Hôtel Dieu Hospital of Lyon. Rate comparison was made by a Mantel–Haenszel test or, for the smallest numbers by a Fisher’s exact test with a 95% confidence interval.

## 3. Results

Among the 1116 singleton term breech presentations, we identified 702 (62.9%) elective cesarean section and 414 (37.1%) planned vaginal deliveries. Among these 414 patients, 342 delivered vaginally (30.6%) and 72 (6.5%) by non-elective caesarean section. Of these 1116 women, 628 were primiparous (56.3%) and 488 were multiparous (43.7%). About 782 fetuses were in frank breech presentation (70.1%) and 334 were in complete breech presentation (29.9%).

Maternal age distribution was identical in the two groups (mean 29 years). As for parity, there were slightly more primiparous in the elective caesarean section group, 68 versus 54% in the planned vaginal delivery group ( $P = 0.05$ ). Frank breech presentations were 70.5% in the elective caesarean section group and 69.3% in the planned vaginal delivery group ( $P > 0.05$ ). Mean birth weight of infants at birth was similar in the two groups (elective cesarean section = 3206 g, planned vaginal delivery = 3164 g,  $P > 0.05$ ), but the percentage of macrosomic infants (>4000 g) was three-fold higher in the elective cesarean section group (RR = 3.09, 1.46–6.5, 95% CI).

In the elective cesarean section group, regional anesthesia predominated and represented 76.5% of the cases. The rest were done under general analgesia. It is to be noted that, in the elective cesarean section group, seven patients delivered vaginally (1%). These seven patients, for whom an elective cesarean section was planned, delivered rapidly, before or during the preparation in the operating room. We included these seven deliveries in the elective cesarean section group, the planned “treatment” being elective caesarean section.

In the planned vaginal delivery group, all these patients received continuous fetal heart rate monitoring during labour. Among the 414 patients of the planned vaginal delivery group, the rate of regional anesthesia was 57.7%, the rate of general anesthesia 5.8 and 36.5% delivered either without anesthesia or with local anesthesia. In the 342 patients who had effectively delivered vaginally, the rate of regional anesthesia was 46% and only one delivered under general anesthesia. An episiotomy was necessary in 83% (95% in the primiparous women). In 42 cases (12%), delivery was accomplished without any obstetrical maneuver; in 266 cases (78%) assistance to free the fetal head (Bracht's maneuver) or the shoulders (Lovset maneuvers) was necessary. Other more complex interventions were also performed, 10 Mauriceau maneuvers (3%), 22 forceps for the aftercoming head (6%), three reduction maneuvers of the hand (0.9%), six total breech extractions (1.7%). There were 19 cases of prolapse of the umbilical cord among the 414 planned vaginal deliveries (4.6%), four of which patients delivered vaginally. Among the 72 non-elective caesarean sections, 34 (47%) were performed because of fetal heart rate abnormalities due in 15 patients (21%) to prolapse of

the umbilical cord. Prolonged first stage of labor accounted for 33 cases (46%), prolonged phase of expulsion (>15 min) for five cases (7%).

### 3.1. Neonatal results

The neonatal results are given in Table 1. We had two early neonatal deaths in the planned vaginal delivery group, the first by cord prolapse in complete breech presentation at the onset of labor. An emergency caesarean section did not prevent death at the 4th day of life. The second followed total extraction for fetal distress during the second stage of labor. No neonatal death was observed in the elective cesarean section group.

Apgar scores < 7 at 1 min were observed more often in planned vaginal delivery (RR = 1.99; 1.43–2.78). Apgar scores < 7 at 5 min shows neonatal distress. They were more often seen in the planned vaginal delivery group (RR = 3.05; 1.03–9.05). In parallel, almost all intubations were in this group. Also, umbilical cord blood pH was recorded in only 679 cases (planned vaginal delivery = 235, elective caesarean section = 444). Neonatal acidosis occurred more frequently in the planned vaginal delivery (RR = 1.64; 1.11–2.43). Minor neurological disorders (seven cases) and severe ones (two cases) were observed only in the planned vaginal delivery group. The minor disorders corresponded to persistent tonus abnormalities, the severe to convulsive states. The only follow-up information available concerned short term evolution. Apart from the two neonatal deaths, it was favorable in all cases. The obstetrical traumas were 4 times more frequent in the

Table 1  
Neonatal outcomes<sup>a</sup>

	Planned vaginal delivery (n = 414)	Elective caesarean section (n = 702)	RR (95% CI)
Corrected neonatal mortality	2 (0.5)	0	
Apgar score <7 at 1 min	67 (16.2)	57 (8.1)	1.99 (1.43–2.78) <sup>b</sup>
Apgar score <7 at 5 min	9 (2.2)	5 (0.7)	3.05 (1.03–9.05) <sup>b</sup>
Intubations	13 (3.1)	3 (0.4)	7.35 (2.10–25.6) <sup>b</sup>
External cardiac massage	14 (3.4)	7 (1.0)	3.39 (1.38–8.33) <sup>b</sup>
Arterial cord blood pH < 7.15	(n = 235) <sup>c</sup> 40 (17)	(n = 444) <sup>c</sup> 46 (10.4)	1.64 (1.11–2.43) <sup>b</sup>
Minor neurological disorders	7 (1.7)	0	P < 0.001 <sup>d</sup>
Major neurological disorders	2 (0.5)	0	P = 0.13 <sup>d</sup>
Obstetrical trauma	15 (3.6)	6 (0.8)	4.24 (1.66–10.8) <sup>b</sup>
Hématoma	10 (2.4)	2 (0.3)	
Lacerations	2 (0.5)	0	
Bistoury wound	1 (0.2)	2 (0.3)	
Brachial plexus injury	1 (0.2)	1 (0.1)	
Fracture of the clavicle	0	1 (0.1)	
Pneumothorax	1 (0.2)	0	
Transfers to intensive care units	21 (5.1)	11 (1.7)	3.23 (1.57–6.64) <sup>b</sup>

<sup>a</sup> Values of n (%).

<sup>b</sup>  $\chi^2$ -test.

<sup>c</sup> Number of known pH.

<sup>d</sup> Fisher's exact test.

Table 2  
Maternal morbidity<sup>a</sup>

	Planned vaginal delivery (n = 414)	Elective caesarean section (n = 702)	RR (95% CI)
Overall maternal morbidity	34 (8.2)	89 (12.7)	0.65 (0.44–0.94) <sup>b</sup>
Moderate and severe complications	24 (5.8)	42 (6)	0.97 (0.59–1.57) <sup>b</sup>
	VD (n = 342) 16 (4.7), NEC (n = 72) 8 (11.1)		0.42 (0.19–0.95) <sup>b</sup>
Transfusions	4 (1.0)	2 (0.3)	
Deep veinous thrombosis	3 (0.7)	1 (0.1)	
Diffuse intravascular coagulation	0	1 (0.1)	
Uterine inversion	0	1 (0.1)	
Intestinal injury	0	1 (0.1)	
Wall complications	17 (4.1)	18 (2.5)	
Endometritis	12 (2.9)	14 (2.0)	
Pyelonephritis	1 (0.2)	3 (0.4)	
Bladder injury	3 (0.7)		
Mild complications	10 (2.4)	47 (6.7)	0.46 (0.24–0.9) <sup>b</sup>
Hyperthermia	8 (1.9)	34 (4.8)	
Cystitis	2 (0.5)	13 (1.8)	

<sup>a</sup> Values of n (%).<sup>b</sup>  $\chi^2$ -test; VD: vaginal delivery; NEC: non-elective caesarean section.

planned vaginal delivery group (RR = 4.24; 1.66–10.8) but the performance of an elective caesarean section did not avoid the risk of trauma: a reversible paralysis of the brachial plexus indeed occurred in both groups.

### 3.2. Maternal results

Maternal results are given in Table 2. There were no maternal death. The overall percent age of complications was not in favor of elective caesarean section (8.2% complications for planned vaginal delivery against 12.7% for elective cesarean section; RR = 0.65; 0.44–0.94). However, this difference was only due to minor complications and there was no significant difference for moderate and severe complications (RR = 0.97; 0.59–1.57). Also important is the fact that, in the planned vaginal delivery group, the most severe complications were observed in six cases that needed emergency caesarean section.

### 3.3. Analysis of risk factors

In the planned vaginal delivery group, we analyzed three parameters that could have biased the neonatal prognosis: type of presentation, parity and duration of the phase of

expulsion. We recorded 287 frank breech and 127 complete breech presentations. The neonatal results are presented in Table 3. There was no significant difference in terms of neonatal distress at 5 min of life (Apgar < 7 and/or need for intensive care in the delivery room) between the two types of presentation (RR = 0.49; 0.97–1.26; 95% CI). In contrast, there was a clear difference in terms of cord prolapse during labor: 17 (13.4%) cord prolapses occurred in complete breech presentation and 2 (0.7%) in frank breech presentation (RR = 19.2, 4.5–81.9; 95% CI). The cord prolapse was responsible of 40% of fetal distress during labor. The role of parity was analyzed by comparing the outcomes of delivery of 222 primiparous women and 192 multiparous women for whom vaginal delivery was authorized (Table 3). There was no significant difference in neonatal distress at 5 min (RR = 0.69, 0.28–1.71; 95% CI). When vaginal delivery is planned, primiparity does not appear to be a factor of poor prognosis but is accompanied by a greater risk of arrest of the aftercoming head below the pelvic inlet: 10.3 versus 4.4% in the multiparous woman (RR = 2.49; 1.14–5.43; 95% CI). Duration of the second stage of labour is exactly known in 267 of the 342 vaginal deliveries. A prolonged expulsion phase (>15 min) increases markedly the fetal risk (RR = 4.79; 1.7–13.5; 95% CI). This might be explained by

Table 3  
Analysis of risk factors (planned vaginal delivery)<sup>a</sup>

Factor studied	Distress at 5 min <sup>b</sup>	Factor studied	Distress at 5 min <sup>b</sup>	RR (95% CI)
Frank breeches (n = 287)	9 (3.1)	Complete breeches (n = 127)	8 (6.3)	0.49 (0.97–1.26) <sup>c</sup>
Primiparous (n = 222)	8 (3.6)	Multiparous (n = 192)	10 (5.2)	0.69 (0.28–1.71) <sup>c</sup>
Expulsion ≤ 15 min (n = 218)	7 (3.2)	Expulsion > 15 min (n = 39)	6 (15.4)	0.21 (0.07–0.59) <sup>c</sup>

<sup>a</sup> Values of n (%).<sup>b</sup> Apgar score < 7 at 5 min and/or intensive care in delivery room.<sup>c</sup>  $\chi^2$ -test.

Table 4  
Analysis of risk factors (elective caesarean section)<sup>a</sup>

	Regional anesthesia (n = 532)	General anesthesia (n = 163)	RR (95% CI)	P
Apgar < 7 at 1 min	19 (3.6)	37 (22.7)	(0.09–0.27)	<0.001 <sup>b</sup>
Distress at 5 min <sup>d</sup>	0	10 (6.1)	–	<0.001 <sup>c</sup>

<sup>a</sup> Values of n (%).

<sup>b</sup>  $\chi^2$ -test.

<sup>c</sup> Method of Mehta et al. [17].

<sup>d</sup> Apgar < 7 at 5 min and/or intensive care in delivery room.

the duration of the expulsion phase or by the often associated obstetrical maneuvers.

In the elective caesarean section group, we analyzed the neonatal results according to the type of anesthesia (Table 4). These results are, at 5 min of live, in favor of regional anaesthesia (RR = 0.16; 0.09–0.27; 95% CI). A low Apgar score in the case of general anesthesia corresponds most often to a sleeping new born but leads to intensive care procedures that are sometimes invasive.

#### 4. Discussion

This retrospective study shows that planned vaginal delivery is accompanied by a higher neonatal risk. The two deaths occurred in the planned vaginal delivery group and all the neonatal results: Apgar scores < 7 at 1 and 5 min, intensive care maneuvers, arterial blood pH < 7.15 and transfers to intensive care units, were less favorable in this group than in the elective cesarean section group. Neurological disorders were observed only in the planned vaginal delivery group. We do not have any available long term results. By extrapolation, if we had adopted from 1991 to 1995 a policy of systematic elective cesarean section for all singleton term breech presentations, there would have been 342 supplementary caesarean sections and the rate of the sections in the “Hospices Civils de Lyon” would have risen by 0.78%. It may be thought that the 414 presentations of the planned vaginal delivery group would have had the neonatal results of the elective cesarean section group. We would have avoided two neonatal deaths, 12 Apgar scores < 7 at

5 min, 11 intubations, 9 neurological disorders and 14 transfers to neonatal intensive care units.

The same results are found in almost all recent studies (Table 5) whether it be the meta-analysis of Cheng and Hannah [2] (12,278 cases), that of Gifford [3] (3056 cases) or the analysis of the Swedish register of birth of Roman [4] (15,818 cases). Only Irion et al. [5] found no significant difference in terms of neonatal morbidity between planned vaginal delivery and elective caesarean section, but the tendency was not in favor of planned vaginal delivery.

Planned vaginal delivery is statistically accompanied by a lower rate of maternal morbidity than elective caesarean section. Various recent publications [2,4,5] agree on this matter (Table 5) and this was always the argument used against the policy of systematic caesarean section for breech presentation. However, one should bear in mind the great statistical weight of mild maternal complications in this type of study (cystitis and isolated hyperthermia). If we consider only moderate and severe complications, there is no difference between planned vaginal delivery and elective cesarean section. Furthermore, non-elective caesarean sections are accompanied by an increased morbidity. This appears in our study and in that of Roman [4] who found the same maternal morbidity in the case of vaginal delivery and elective caesarean section (1.8 and 1.7%, respectively) and a higher risk (2.8%) in case of non-elective caesarean sections. The more vaginal deliveries is attempted in breech presentation, the higher the percentage of non-elective caesarean sections. This rate was 17.4% in our study and reached 57% in the meta-analysis of Cheng and Hannah [2]. Any attitude recommending a return to vaginal delivery in breech

Table 5  
Review of the literature<sup>a</sup>

Planned vaginal delivery/elective caesarean section	Cheng, Hannah [2]		Roman et al. [4]		Irion et al. [5]		Our study	
	OR	P	OR	P	RR	P	RR	P
Corrected perinatal mortality	3.86	<0.05	2.5	<0.05			2/0 <sup>b</sup>	2/0 <sup>b</sup>
Apgar <7 at 5 min	1.95	<0.05	9.5	<0.05	2.53	0.30	3.05	0.03
Obstetrical trauma	3.96	<0.05	12.2	<0.05			4.24	0.001
Maternal mortality	2/2 <sup>b</sup>	2/2 <sup>b</sup>						
Maternal morbidity	0.61	<0.05			0.63	0.001	0.65	0.02

<sup>a</sup> OR: odds ratio.

<sup>b</sup> n in each arm.

presentation will be accompanied by higher rate of moderate and severe maternal complications related to these non-elective caesarean sections [19].

The drawback of our study and of most other studies that dealt with this subject is that they were retrospective. Wright [1], in 1959, recommended systematic caesarean section in the case of breech presentation, but since then only two randomized studies [7,8] have been published. The authors concluded that delivery of breech presentation vaginally may be reasonably attempted in selected patients. However, their numbers were too small (70 planned vaginal deliveries versus 35 elective cesarean sections for Gimovsky et al. [7], 115 planned vaginal deliveries versus 93 elective cesarean sections for Collea et al. [8]) for their conclusions to be valid. Several retrospective studies have already compared vaginal delivery to caesarean section whatever the context [18] but such studies are difficult to analyze because the non-elective caesarean sections penalize the elective cesarean section group. On the other hand, there are several monocentric studies comparing the two mode of delivery, planned vaginal whatever the outcome and elective cesarean, but the majority of these studies include too small numbers of cases [12–14,20,21] over too long periods of time [9,22,23] thereby, exposing them to bias related to management modifications regarding both the mother and the newborn. Two new types of retrospective studies appeared during the early 90s: the meta-analyses [2,3,24] and the studies on regional or national birth registers [4,10,11]. Their main advantage is the recruitment of a larger number of cases, but they do present certain drawbacks (inhomogeneity of populations, inclusion criteria, lack of detailed medical information, old studies). The best known one is that of Cheng and Hannah [2] in which 24 methodologically acceptable publications were analyzed (8080 planned vaginal deliveries versus 4198 elective cesarean sections). This Canadian study, published in 1993, served as a preliminary to a large-scale multicenter and international randomized trial comparing planned vaginal delivery and elective caesarean section in term breech presentation [15]. A Canadian consensus on the management in case of singleton term breech presentation [16] constituted, in 1994, the first step of this trial, which has not been published yet.

At the present time, it is not possible to recommend any particular management in singleton term breech delivery without taking into account the recommendations of the FIGO Committee on Perinatal Health. While acknowledging the lack of randomized studies, FIGO underlines the present widespread use of elective caesarean section in the industrialized countries (up to 90%) and without definitely forbidding planned vaginal delivery, it requires such strict conditions that planned vaginal delivery can be rarely performed. External cephalic version is highly recommended in order to reduce the number of term breech presentations. Footling breech should be individualized and represents a strict contra-indication to any attempt of vaginal delivery. Local conditions should all be very

favorable. During delivery, the obstetrician, the anesthesiologist and the neonatologist should be present. Delivery should be accomplished by one expulsive effort if possible and total breech extraction is proscribed. The committee insists also on the need to inform the patient.

Widespread practice of elective caesarean section for breech presentation will also lead to a lack of experience in vaginal breech delivery. Because of this, obstetricians will no longer have the necessary training in case of unforeseen breech delivery. In our study, seven patients of the elective cesarean section group delivered by the natural route before the transfer to the operating room. These rapid deliveries occurred without any problem. At the present time, the rate of breech delivery by the vaginal route is already low in industrialized countries and it can no longer be considered that the obstetricians of these countries have the sufficient experience, 0.8 deliveries per obstetricians per year in Sweden between 1987 and 1993 [4]. The setting up of trainers specialized in breech deliveries becomes a necessity.

## 5. Condensation

Planned vaginal delivery in singleton breech presentation increases the risk of neonatal death and complications compared to elective caesarean section.

## Acknowledgements

Departments of Obstetrics and Gynecology: Edouard Herriot Hospital: J.M. Thoulon, FEFC Croix Rousse Hospital: R.C. Rudigoz, FEFC Lyon Sud Hospital: M. Berland, FEFC Claude Bernard University, School of Medicine, Lyon, France.

## References

- [1] Wright RC. Reduction of perinatal mortality and morbidity in breech delivery through routine use of caesarean section. *Obstet Gynecol* 1959;14:758–63.
- [2] Cheng M, Hannah M. Breech delivery at term/a critical review of the literature. *Obstet Gynecol* 1993;82:605–18.
- [3] Gifford DS, Morton SC, Fiske M, Kahn K. Reviews: a meta-analysis of infant outcomes after breech delivery. *Obstet Gynecol* 1995;85:1047–54.
- [4] Roman J, Bakos O, Cnattingius S. Pregnancy outcomes by mode of delivery among term breech births: Swedish experience 1987–1993. *Obstet Gynecol* 1998;92:945–50.
- [5] Irion O, Heirsbrunner Almagbaly P, Morabia A. Planned vaginal delivery versus elective caesarean section: a study of 705 singleton term breech presentations. *Br J Obstet Gynaecol* 1998;105:710–7.
- [6] Künzel W. Recommendations of the FIGO Committee on Perinatal Health on guidelines for the management of Breech delivery. *Int J Gynecol Obstet* 1994;44:297–300.
- [7] Gimovsky M, Wallace R, Schinfrin B, Paul R. Randomized management of the nonfrank breech presentation at term: a preliminary report. *Am J Obstet Gynecol* 1983;146:34–40.

- [8] Collea JV, Chein C, Quilligan EJ. The randomised management of term frank breech presentation at term: a study of 208 cases. *Am J Obstet Gynecol* 1980;137:235–44.
- [9] Bilodeau R, Marier R. Breech presentation at term. *Am J Obstet Gynecol* 1978;130:555–7.
- [10] Lindqvist A, Norden-Lindeberg S, Hanson U. Perinatal mortality and route of delivery in term breech presentations. *Br J Obstet Gynaecol* 1997;104:1288–91.
- [11] Kiely j. Mode of delivery and neonatal death in 17,587 infants presenting by the breech. *Br J Obstet Gynaecol* 1991;98:898–904.
- [12] Audra P, Putet G. Do any indications remain for vaginal delivery in breech presentation. *Rev Fr Gynécobstet* 1990;85(10):545–8.
- [13] Audra P, Bretonnes S, Mellier G. Term breech delivery: routine caesarean versus induced labor. *Contracept Fertil Sex* 1997;25(2): I–IV.
- [14] Dubois C, Dufour P, Quandalle F, Lanvin D, Levasseur M, Monnier JC. Breech presentation: management (304 cases). *Contracept Fertil Sex* 1998;26(5):363–71.
- [15] Hannah M, Hannah W. Feasibility of a randomised controlled trial of planned caesarean section versus vaginal delivery of term breech presentation at term. *Am J Obstet Gynecol* 1996;174(4):1393–4.
- [16] Hannah WJ, Allardice J, Amankwah K, et al. The Canadian consensus on breech management at term. *J SOGC* 1994;16: 1839–58.
- [17] Mehta CR, Patel NR, Gray R. On computing on exact confidence interval for the common odds ratio in several two by two contingency tables. *J. Am. Stat. Assoc.* 1985:969–73.
- [18] Tatum RK, Orr JW, Soon S, Huddleston JF. Vaginal breech delivery of selected infants weighing more than 2000 g. A retrospective analysis of seven years' experience. *Am J Obstet Gynecol* 1985;152(2):145–55.
- [19] Songane FF, Thobani S, Malik H, Bingham P, Lilford RJ. Balancing the risks of planned caesarean section and trial of vaginal delivery for the mature, selected, singleton breech presentation. *J Perinat Med* 1987;15(6):531–43.
- [20] Mecke H, Weisner D, Freys I, Semm K. Delivery of breech presentation infants at term. An analysis of 304 breech deliveries. *J Perinat Med* 1989;17(2):121–6.
- [21] Koo MR, Dekker GA, Van Geijn HP. Perinatal outcome of singleton term breech deliveries. *Eur J Obstet Gynecol Reprod Biol* 1998; 78(1):19–24.
- [22] Green JE, McLean F, Smith LP, Usher R. Has an increased caesarean section rate for term breech delivery reduced in incidence of birth asphyxia, trauma and death. *Am J Obstet Gynecol* 6 Pt 1;142(1982): 643–8.
- [23] Graves WK. Breech delivery in 20 years of practice. *Am J Obstet Gynecol* 1980;137(2):229–34.
- [24] Bingham P, Lilford RJ. Management of the selected term breech presentation: assessment of the risks of selected vaginal delivery versus caesarean section for all cases. *Obstet Gynecol* 1987;69(6): 965–78.
- [25] Vaudoyer F. Planned vaginal delivery versus elective caesarean section in term breech presentation: a study of 1116 cases, vol. 139. Th. Med: Lyon, 1998.