

Original Article

A Five Year Study of the Mode of Delivery and Immediate Outcome of Term Singleton Breech Delivery

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ABSTRACT

Objective: To evaluate the mode of delivery and the immediate maternal and neonatal outcome of 690 consecutive term singleton breech deliveries in a single center

Study Design: Retrospective observational study

Setting: Farwania Hospital, Ministry of Health, Kuwait

Subjects: A review of the maternal and neonatal charts of all women who delivered singleton breech fetuses between 1999 and 2003 was undertaken. They are classified into: Group A - Women who fulfilled the criteria for trial of vaginal delivery which was further divided into two sub-groups:

A1- Women who ultimately delivered vaginally and,

A2- Women who had emergency cesarean section during trial of vaginal delivery.

Group B - Women who did not meet these criteria and underwent scheduled cesarean section.

Main Outcome measures: Maternal and neonatal outcome

Results: Group A consisted of 408 (59.1%) women who fulfilled the criteria for vaginal delivery. In this group 304 (74.5%) delivered vaginally (A1 subgroup). One hundred and four women (25.5%) had emergency cesarean section during trial of vaginal delivery (A2 subgroup). Group B consisted of 282 (40.9%) women who did not fulfill the criteria for vaginal delivery and underwent scheduled cesarean section. The overall cesarean section rate was 55.94%. There were no maternal deaths. Maternal morbidity occurred in both groups but did not assume statistical significance.

Conclusion: There was no significant difference in the outcome of babies born following a trial of vaginal delivery and scheduled cesarean section in selected cases of term singleton breech presentation. Careful selection of cases resulted in 75% of cases being offered a trial of vaginal delivery and to achieve it successfully.

KEY WORDS: assisted breech delivery, cesarean section, maternal outcome, neonatal outcome, trial of vaginal delivery, Term Breech Trial (TBT)

INTRODUCTION

Breech deliveries occur in approximately 3% of all term singleton deliveries. Risk of poor perinatal outcome is associated with vaginal birth in most reports^[1]. For the same reason their management remains one of the most controversial topics in obstetrics. Over the recent past, it has been widely held that a policy of routine cesarean section (CS) improves the perinatal outcome in these pregnancies without increasing the rate of maternal mortality or morbidity.

The Term Breech Trial (TBT)^[1] was a multicenter, randomized, controlled clinical trial that compared planned CS and planned vaginal birth for 2088 women who had a singleton fetus in a frank or complete breech presentation at term and who were without contraindications to labor and/or vaginal birth. It concluded that planned CS reduces risk of adverse perinatal outcome.

The impact of this report in Kuwait was a rising CS rate. Women in this part of the world have a high parity and concern that CS delivery may have an impact on the future reproductive potential of women made the results of this study unacceptable in most centers.

We adopted a policy of careful selection of candidates with a singleton breech presentation at term and offered them a trial of vaginal delivery. The purpose of this study was to compare immediate neonatal and major maternal mortality and morbidity after term vaginal and abdominal delivery of a singleton breech fetus in a single center where uniform criteria had been applied in selecting the mode of delivery.

SUBJECTS AND METHODS

Between January 1, 1999 and December 31, 2003, 690 women had term singleton breech deliveries

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at our center. This represented 2.4% of all term deliveries during this five year period.

Gestational age was determined on the basis of the last menstrual period when menstrual cycles were regular. If menstrual cycles were irregular or not available, an ultrasound performed between the eighteenth and twenty second week of gestation was used to calculate the gestational age.

When breech presentation was suspected on clinical examination in a patient during late third trimester, ultrasound was done to confirm the presentation, type of breech, placental localization and expected fetal weight. Ultrasound was also done in patients with previously undiagnosed breech who came to the hospital in labor to confirm the above parameters.

During the study period, following criteria were applied to select candidates for trial of vaginal delivery:

- Frank or complete breech presentation
- No evidence of feto-pelvic disproportion
- Expected fetal weight of 1500 - 3800 gm
- Absence of previous scar on the uterus, previous perinatal mortality or severe morbidity
- Nulliparity was considered a contraindication to vaginal delivery
- No evidence of hyperextension of head

Every attempt was made to estimate expected fetal weight by ultrasonography when possible. Expected fetal weight was estimated by clinical assessment when unbooked patients presented in advanced labor. Only in four cases we had to resort to clinical estimation of fetal weight as these patients were in advanced labor with the cervix more than 7 cm dilated at the time of admission to labor ward.

The final decision regarding the route of delivery was made by the most senior obstetrician present on the basis of these preset criteria. The protocol for management of labor was based on the following broad guidelines. Induction of labor by PGE2 vaginal pessaries was used for standard obstetrical indications. Induction of labor with amniotomy or syntocinon was not used. All fetuses were monitored by continuous electronic fetal monitoring throughout labor. Cervical dilatation and descent of the breech during labor was plotted on the partogram for early identification of abnormal progress. Augmentation of labor by amniotomy and/or syntocinon were used to treat ineffective uterine contractions in labor. After full dilatation of the cervix descent of the breech to the pelvic floor was expected within one hour and delivery being anticipated within one hour of beginning active pushing. An experienced midwife, two obstetricians and a neonatologist were present at

delivery in most cases.

The choice of anesthesia and analgesia during labor was decided by the woman and her caregivers. Delivery was by means of assisted breech delivery. The key principles of vaginal breech delivery were:

- Never be in haste
- Always keep fetus with back anterior
- To allow the delivery of the fetus upto the umbilicus spontaneously and minimum intervention thereafter with no traction of the body

Difficulty in delivery of the shoulders was dealt with by Lovset's maneuver. Controlled delivery of the aftercoming head using either the Mauriceau-Smellie-Veit technique or forceps was employed. Episiotomy was not used routinely for all cases.

On the basis of intention to treat the study population was divided into two groups. Group A comprised of 408 women who met the criteria for vaginal delivery. Group B comprised of 282 women who were judged unsuitable for vaginal delivery according to these preset criteria and who therefore underwent scheduled CS before labor.

The data from group A were further analyzed by subdividing the group into two sub-groups. Group A1 were those who actually delivered vaginally and group A2 were those who eventually underwent CS in labor.

The primary measures of infant outcome were intrapartum and neonatal mortality, incidence of five minute Apgar scores of less than six, incidence of endotracheal intubation before twenty four hours of age, admission to neonatal special care unit, incidence of other traumatic intrapartum or postpartum complications and incidence of neonatal sepsis (proven by culture).

The primary maternal outcome measures were mortality and major non-febrile morbidity like hysterectomy, cervical laceration, thrombosis, hemorrhage (> 1500 ml blood loss or the need for blood transfusion), collapse, coagulation abnormalities, readmission to hospital or wound dehiscence.

Statistical package (Epicalc 2000) was used for data analysis. The difference between the proportions of the groups was tested by the Z test. A value of p less than 0.05 was considered significant.

RESULTS

Out of a total number of 690 cases who had breech presentation at term, Group A consisted of 408 (59.1%) women. These women were offered a trial of vaginal delivery. Of the women who were offered a trial of vaginal delivery 304 (74.5%) ultimately had an assisted breech delivery and 104 women (25.5%) had an emergency CS in labor.

Group B consisted of 282 women (40.9%) who had scheduled CS. The overall CS rate in breech

Table 1: Selected maternal outcome variables in patients with trial of labor (Group A) and scheduled CS (Group B)

	Group A (n = 408)	Group B (n = 282)	p-value
Incomplete rupture of uterus	1	0	0.853
PPH	1	1	0.648
DVT	0	2	0.325

PPH = post-partum hemorrhage, DVT = deep vein thrombosis

Table 3: Comparison of selected maternal outcome variables between the three groups (A1, A2 and B)

	A1 (n = 304)		A2 (n = 104)		B (n = 282)	
	n	p-value	n	p-value	n	p-value
Incomplete rupture of uterus	1	0.573	0	-	0	-
Traumatic PPH	1	0.573	0	-	1	0.603
DVT	0	-	0	-	2	0.446

presentation was 55.94% and the vaginal delivery rate was 44.06%.

The common indications for non-elective CS in labor were: failure to progress - 35 (33.6%), presumed fetal distress - 28 (26.9%), diagnosis during labor of exclusion criteria - 14 (13.4%), cord prolapse - 2 (1.9%) and eclampsia - 2 (1.9%).

The indications for elective CS were: primigravid breech -134 (47.5%), previous CS with breech - 93 (32.9%), estimated fetal weight (EFW) greater than 3800 gms - 34 (12%), maternal request - 12 (4.2%), intra-uterine growth retardation (IUGR) - 3 (1%), previous myomectomy - 1 (0.3%), footling - 2 (0.7%), hydrocephalus - 1 (0.3%), previous intra-uterine fetal death (IUFD) - 1 (0.3%) and previous neonatal death (NND) - 1 (0.3%).

No maternal deaths occurred during the period. Maternal morbidity occurred in both groups. Table 1 presents selected maternal outcome variables in patients with trial of vaginal breech delivery and scheduled CS.

One patient in group A had incomplete rupture of uterus following delivery of an anencephalic fetus which required laparotomy and repair. Another patient had traumatic postpartum hemorrhage following cervical tear which was repaired and the patient received two units of blood postoperatively. Two patients in Group B developed deep venous thrombosis.

Using the Epicalc 2000 test, there was no significant difference in maternal outcome between the two groups ($p > 0.05$).

There were two stillbirths and three neonatal deaths in the study period. One of the still births was an anencephalic fetus. The second patient presented with IUFD following premature rupture

Table 2: Selected neonatal outcome variables in patients presenting with trial of vaginal delivery (Group A) versus scheduled CS (Group B)

	Group A (n = 408)	Group B (n = 282)	p-value
Five minute Apgar score less than 6	3	0	0.393
NICU admission	5	4	0.903
Intubations	2	1	0.747
Trauma	0	1	0.853

NICU = Neonatal Intensive Care Unit

Table 4: Comparison of selected neonatal outcome variables between the three groups (A1, A2 and B)

	A1 (n = 304)		A2 (n = 104)		B (n = 282)	
	n	p-value	n	p-value	n	p-value
Five minutes Apgar score <6	3	0.725	0	-	0	-
NICU admission	3	0.725	2	0.920	4	0.914
Intubations	2	0.987	0	-	1	0.603
Trauma	0	-	0	-	1	0.603

of membranes and cord prolapse at home. Three babies died in the immediate neonatal period because of multiple congenital anomalies.

Table 2 presents selected neonatal outcome variables in patients who had a trial of vaginal delivery (Group A) versus scheduled CS (Group B).

The immediate neonatal condition was assessed by Apgar scores only because cord blood gases are not routinely done in our center. There was a trend towards more infants who had a trial of vaginal delivery to have an Apgar score less than six. However they did not reach statistical significance. The neonates admitted to the NICU in the immediate neonatal period in both groups were all discharged well from the hospital within ten days. Of course long term follow up is required to see the ultimate outcome of these babies to identify whether there were any long-term sequelae. Using the Epicalc 2000 test, there was no statistical significance in the immediate neonatal outcome in any of the selected outcome variables between Groups A and B.

The data were also further analysed between three groups. Group A1 consisted of patients who had assisted vaginal delivery, Group A2 consisted of patients who had emergency CS during trial of vaginal delivery and Group B consisted of patients who had scheduled CS.

Table 3 represents the statistical analyses of selected maternal outcome variables between the three groups and Table 4 represents the statistical

analyses between selected neonatal outcomes between the three groups.

DISCUSSION

The policy of routine CS has been adopted in most centers following the results of the TBT^[1]. This would dramatically increase the overall CS rate with its impact on future reproductive potential. Most centers are now reporting an increase from 50 to 80%^[2-4] in CS rates for breech presentation. A recent study demonstrated that this may decrease perinatal mortality from 0.35 to 0.18%. It means that approximately 175 extra CSs will have to be performed to prevent one perinatal death^[2]. Thus in the future, we will have to counsel and treat more pregnant women who have undergone CS. There is always the risk of scar rupture during labor, albeit small in future pregnancies^[5,6]. The rate of repeat CS for the next baby after elective CS for breech presentation is 43.8%^[7]. In the long term, it would lead to increasing number of obstetricians lacking clinical experience in conducting breech vaginal deliveries.

Given the interests of the population to maintain high parity and avoid CS, a long and hard thought has to be given to whether the results of the TBT can be applied here as well. In many clinics we have managed vaginal breech deliveries following a protocol for selecting cases for trial^[8] with a tradition of years without notable adverse effects. It was in this context that this retrospective study was conducted. Our study confirmed that vaginal breech delivery can be accomplished with good perinatal outcome.

We did not find a statistically different risk of neonatal complications between infants born after a trial of vaginal delivery (whether born vaginally or after CS in labor) and those born by elective CS. After exclusion of the major malformations, all neonatal complications were resolved by the time of discharge. One limitation was the absence of information on long-term maternal and infant outcome.

Regarding maternal outcomes, the case that had incomplete rupture uterus during the delivery of an anencephalic fetus deserves special mention. This patient was a grand multipara who had no antenatal checkups. Consequently anencephaly was diagnosed when an ultrasound was performed when she reported near term. Labor was induced with prostaglandin vaginal pessary, 3 mg, which was applied once and she had amniotomy and syntocinon augmentation eight hours later. She was in labor for seven hours and had an easy vaginal delivery. Rupture uterus was diagnosed with the delivery of the placenta and she had a laparotomy and repair immediately thereafter. We believe that

the cause of the rupture uterus was not the vaginal breech delivery *per se*, but multifactorial, taking into account the fact that she was a grand multipara and received prostaglandin induction followed by labor augmentation with amniotomy and syntocinon.

The fact that two patients developed deep venous thrombosis following CS despite thromboprophylaxis emphasizes the need for careful evaluation of risk factors and stricter postoperative care and awareness.

The TBT used, data collected from 121 centers in 26 different countries. This will certainly collect a large number of cases for analysis and consequently have greater statistical power. We recognize that observational studies may be biased and that a comparison of policies for breech deliveries will be more valid in randomized trials. But it is also worth noting that ensuring consistent quality of care and data collection over such a wide population is difficult. Also changes in demographic and population setups in different countries are likely to influence practice and decisions. Our data results are from a single institution in which uniform criteria were applied prospectively for the selection of patients for trial of vaginal delivery.

There was a trend towards more babies being born with Apgar scores less than six. This finding is in agreement with earlier reports^[8-10]. It is possible that variables such as assignment of Apgar scores, decision to intubate *etc.* were influenced by the neonatologists awareness of the route of delivery. It also suggests a greater tendency for acute fetal distress during delivery causing transient perinatal hypoxia. Therefore, when managing breech deliveries, special attention has to be paid to possible signs of fetal distress. In the TBT continuous electronic fetal monitoring was not a prerequisite for trial of vaginal delivery. It is likely that at least a few cases of perinatal mortality and morbidity may have not been diagnosed in the absence of continuous monitoring which could have been avoided by timely CS.

The finding of a low Apgar score may have limited prognostic value for long term morbidity and thus is of questionable clinical importance. Probably the most effective means of reducing the risk of low five minute Apgar scores is for a CS to be undertaken more liberally during labor if fetal heart rate monitoring is not reassuring. In such a situation the need for long term follow up of infants delivered by breech presentation has to be emphasized. Good perinatal outcome^[11,12] following vaginal delivery in breech presentation at term has been reported in two studies following the TBT.

Our study permitted approximately 60% of women with breech presentation at term to attempt vaginal delivery out of which 75% delivered

vaginally. These results are comparable with other published studies. In one large single center study^[13] a trial of labor was offered in 72% cases with a success rate of 53%. In another such study, trial was offered to 55% of women with a success rate of 70%^[14].

It is also noteworthy to understand that delivering a fetus by CS is not risk free. The fetus has to be brought through both abdominal and uterine incisions and is best accomplished by an obstetrician who is an expert in vaginal breech delivery. In the United States, majority of maternal-fetal medicine units network faculty concluded that residency training for vaginal breech delivery was inadequate. Maintenance of skills in vaginal breech delivery is important in large obstetric units^[15]. Furthermore, women would be denied the option of vaginal delivery even when they request it. We suggest that careful selection of women to whom we propose a vaginal delivery, and the presence in the labor ward of an experienced team of obstetricians, anesthetists and neonatologists may be more important in the ultimate outcome than the planned mode of delivery.

CONCLUSION

Difference in short term outcome variables in term breech presentations delivered following a trial of vaginal delivery and scheduled CS did not assume statistical significance. Serious maternal morbidity occurred in both groups but the difference was not statistically significant. Seventy five percent women offered a trial of vaginal delivery after careful selection of cases were successful in completing it. In this context there is no sufficient data to warrant routine CS for all term, singleton, breech presentation in units having practiced vaginal breech delivery for years with minimal adverse outcome.

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