

RETROSPECTIVE STUDY
OUTCOME OF TERM BREECH DELIVERY IN HOSPITAL
SULTAN ISMAIL JOHOR BAHRU

BY

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ABBREVIATIONS

ACOG	American Association of Obstetrics and Gynecology
AFI	Amniotic Fluid Index
AS	Apgar Score
CTG	Cardiotocograph
CTG	Cephalopelvic disproportion
ECV	External Cephalic Version
EFW	Estimate Fetal Weight
HIE	Hypoxic Ischemic Encephalopathy
HSIJB	Hospital Sultan Ismail Johor Bahru
HSIAPPS	Hospital Sultan Ismail Application System
LSCS	Lower Segment Caeserean Section
PPH	Postpartum hemorrhage
RCOG	Royal College of Obstetrics and Gynecology
SVD	Spontaneous Vertex Delivery
VBD	Vaginal Breech delivery
SD	Spontaneous Delivery
NICU	Neonatal Intensive Care Unit
TBT	Term Breech Trial

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Abstract

Objective : To evaluate the maternal and perinatal morbidity and mortality in caesarean delivery group and vaginal delivery group of breech presentation at term.

Method : We retrospectively reviewed all breech presentation completed 37 weeks from September 2012 until January 2014 using birth registry book and HSIAPPS computer system.. The details included the antenatal review, intrapartum events, immediate postpartum event and neonatal outcome. Patient was contacted via phone to enquire about the postpartum complication.

Results: A total of 160 patient were recruited in this study. 83 patients (51.9%) underwent caesarean section and 77 patient successfully had vaginal delivery (48.1%). One patient (1.3%) from vaginal delivery developed episiotomy wound breakdown. No postpartum hemorrhage observed in vaginal delivery. Two patients (2.4%) in caesarean section group had primary postpartum hemorrhage and required blood transfusion. No endometritis, postpartum pyrexia and maternal mortality seen. The maternal complication was not significant for both group. There was no significance different between the Apgar Score (AS) at 5 and 10 minutes for both group ($p>0.05$). 2 babies (16.7%) from vaginal delivery developed skin laceration at genital area, however there was no neonatal complication such as head entrapment, limbs fracture, skull fracture, and internal organ injury in both groups. No neonatal mortality seen in this study.

Conclusion : There was no significant maternal and neonatal mortality and morbidity

observed in this study.

ABSTRAK

Objektif : Menilai kesan dan impak terhadap kesihatan pesakit dan bayi di antara kelahiran secara normal dan pembedahan bagi kandungan songsang.

Metodologi : Kami mengkaji secara retrospektif pesakit yang mempunyai kandungan songsang berusia lebih dari 37 minggu dari bulan September 2012 sehingga Januari 2014 melalui buku kelahiran dan sistem perisian HSIAPPS. Semua informasi berkaitan pemeriksaan semasa mengandung, semasa waktu kelahiran, sejour selepas kelahiran dan kesihatan bayi selepas diahirkkan dicatat. Pesakit dihubungi melalui telefon untuk mengetahui samada berlaku komplikasi sewaktu tempoh berpantang

Keputusan : Sebanyak 160 pesakit yang dipilih untuk kajian ini. Sebanyak 83 pesakit (51.9%) melahirkan bayi secara pembedahan caesarean dan selebihnya secara songsang biasa (n=77, 48.1%). Seorang pesakit (1.3%) yang bersalin secara kelahiran songsang biasa mengalami koyakan episiotomy terbuka. Tiada kejadian tumpah darah (PPH) berlaku di dalam kumpulan yang bersalin secara songsang biasa. Sebanyak 2 pesakit (2.4%) dalam kumpulan pembedahan caesarean mengalami tumpah darah (PPH). Kedua-dua pesakit ini memerlukan transfusi darah selepas pembedahan. Pesakit yang menjalani pembedahan caesarean tinggal lebih lama di dalam wad berbanding bersalin biasa (3.2 ± 0.76 vs 1.3 ± 0.81). Tiada kematian ibu dicatatkan. Tiada perbezaan yang signifikan dari segi skor Apgar pada 5 minit dan 10 minit untuk kedua-dua kaedah kelahiran. 2 bayi (16.7%) mengalami luka kecil di bahagian alat sulit. Tiada komplikasi seperti retak tempurung kepala, retak tulang panjang, kecederaan organ dalaman dan

kematian dicatatkan. Tiada perbezaan yang signifikan bagi bilangan kemasukkan bayi ke unit rawatan rapi bayi (NICU). Durasi kemasukkan bayi ke dalam NICU lebih lama bagi bayi yang dilahirkan secara biasa berbanding secara pembedahan caeseren (4.0 ± 2.04 vs 1.9 ± 1.86) disebabkan komplikasi yang bukan berkaitan dengan kaedah kelahiran.

Kesimpulan : Tiada perbezaan komplikasi yang signifikan kepada pesakit dan juga bayi bagi kaedah kelahiran secara normal ataupun pembedahan caesarean bagi kandungan songsang.

Introduction

A breech presentation is defined as the condition in which the baby is in longitudinal lie and the buttocks or lower extremities presenting at the pelvic brim with the head occupying upper pole of uterus. The incidence of breech deliveries varies from institute to institute and is noted to vary according to gestation of pregnancy. It is around 40% at 20 weeks, 6-8% at 34 weeks and 3-4% of singleton pregnancy at term (RCOG, 2006).

Although its low incidence towards term, breech presentation and its management still remain controversy till date. The options in managing breech at term are external cephalic version, vaginal breech delivery and caesarean section.

External cephalic version (ECV) is the transabdominal manual rotation of fetus into cephalic presentation. Initially popular after 1960's and 1970's, however ECV virtually disappeared after reports of fetal deaths following the procedure (Hofmeyr GJ, 1983). There has been renewed interest in ECV in the last few years after rigorous scientific appraisal of several randomised controlled trials (Lau TK *et al* 1997).

Vaginal delivery were previously the norm until 1959 when it was proposed that all breech presentation should be delivered abdominally to reduce perinatal morbidity and mortality (Obwegeser *et al*, 1996). This was supported by publication of Term Breech

Trial (TBT) in 2000 which changes the mode of breech delivery tremendously from vaginal delivery to caesarean section.

In 2001, the RCOG recommend planned caesarean section for women with a breech presentation. However with the continuing criticism on the TBT worldwide especially in a non-western country the RCOG 2006 have published more balanced set of guidelines to incorporate these concern.

Eventhough it is easy to perform caesarean section with less risk to the fetus, never to forget the complication which may arise in the short term and the long term to the mother. Parents must be informed about potential risks and benefits to the mother and neonate for ECV, vaginal breech delivery and caesarean delivery. Discussion of risks should not be limited to current pregnancy but also to the effect of caesarean section on the future pregnancy.

In Malaysia, data from the annual report in Hospital Tuanku Jaafar Seremban (2007) shows a breech delivery rate of 91% via caesarean section compared to 70% in Hospital Sultan Ismail in the same year. This clearly points that there is difference in contributing factors among both patients and doctors involved in decision making in breech delivery in these two hospitals within two different regions in Malaysia itself.

It remains a concern that the reduction of experienced physicians to teach younger practitioners will lead to the abandonment of vaginal breeches altogether. For those wishing to learn the art of vaginal breech deliveries, simulation training with pelvic

models has been advocated to familiarize trainees with the procedure in a non-threatening environment.

This study is done to evaluate the maternal and perinatal morbidity and mortality in a center where the ECV and vaginal breech were widely done. Hopefully this study will encourage more centers in Malaysia to do similar studies or audit especially in East Malaysia so that the outcome of each mode of delivery will be more accurate and significant.

Literature Review

Breech presentation occurs in 3-4% of all deliveries. There are three types of breech presentation, the most common is frank breech (50- 70%), followed by complete breech (5-10%) and footling or incomplete breech (10-30%). In addition to the above, breech births in which the sacrum is the fetal denominator can be classified by the position of a fetus. Thus sacro-anterior, sacro-transverse and sacro-posterior positions all exist, but left sacro-anterior is the commonest presentation. Sacro-anterior indicates an easier delivery compared to other forms.

Predisposing factors for breech presentation include prematurity, uterine abnormalities, pelvic masses, placenta praevia, fetal abnormalities (e.g. CNS malformations, neck masses, aneuploidy) and multiple gestations.

The management of breech presentation remains an area of intense controversy. Various options are External Cephalic Version (ECV), planned caesarean section and vaginal delivery. These options will be describe in details.

External cephalic version

ECV is defined as transabdominal manual rotation of the fetus from breech into cephalic presentation. RCOG currently recommends offering ECV to eligible patients after 36 completed weeks of gestation.

a) Selection criteria

The suitable criteria for ECV is singleton pregnancy, normal fetus, normal amniotic fluid index, no nuchal cord and placenta is in the upper segment

b) Protocols and procedure

In term of protocol for ECV, patient must be fasted for at least 6 hours prior to the procedure. The electrocardiograph is done, blood is taken for full blood count, renal profile and blood for grouping, screen and hold. The ECV is done with the maternity operation theatre available to equip for emergency cesarean delivery. An ultrasound machine and an experienced clinician must be available. Patient must be attached to cardiac monitoring throughout this procedure. Cardiogram (CTG) tracing must be done for at least 30 minutes before and after ECV. Tocolytic agent is given via slow intravenous infusion and ECV will be started once pulse rate reaches 100 beats per minutes or when patient experience palpitation.

With the woman placed in the supine position, the abdomen is liberally coated with ultrasonic gel in order to decrease friction and lessen the chances of an excessive manipulation. External version can be performed by one or two persons experienced in the procedure. Initially, the degree of engagement of the presenting part should be determined and gentle disengagement performed if possible.

If one practitioner is performing the ECV, one hand is placed on the fetal head and the other is on the fetal buttocks. If two practitioners are performing the ECV, one controls the fetal head while the other controls the fetal buttocks.

Usually a forward roll is attempted first. A backward roll can follow if the forward roll is unsuccessful.

The fetal heart rate should be checked every few minutes and all maneuvers halted if the fetal heart rate is not reassuring. If the heart rate is repeatedly abnormal, the procedure should stop. The procedure should also be aborted for maternal discomfort not tolerated by the patient.

Although there are no large studies evaluating the number of ECV attempts, most studies attempt ECV no more than 3 or 4 times. If ECV is unsuccessful after 3 to 4 attempts, the fetus is unlikely to turn and the procedure should end.

After the ECV, the fetus should be monitored until a reassuring tracing is obtained.

In one study by Johnson *et al* (1995) an acoustic stimulator has been shown to facilitate change of the fetal spine from midline to lateral, consequently improving the chances of success.

c) Success rate

The reported success rate of ECV ranges from 35% to 86%, with a commonly quoted figure of 50% (Yogev *et al* 2002, Caukwell *et al* 2002, Leung *et al*, 2000, Hofmeyr GJ *et al*, 2004).

d) Complication

In term of complication, the overall perinatal mortality was 0.16% and other reported complications were transient fetal heart rate changes (5.7%), persistent fetal heart rate changes (0.37%) and vaginal bleeding (0.4%). Fetomaternal

hemorrhage occurred 3.7% of the time. The reported incidence of placental abruption was 0.12% and the rate of emergency cesarean was 0.43% (Collaris *et al*, 2004). There was also a 3% risk of spontaneous reversion to breech presentation after successful ECV at or beyond 36 weeks gestation (Collins *et al*, 2007).

e) New issues regarding ECV with previous caeserean section scar

Studies support the safety of external version in women who are candidates for vaginal birth after cesarean delivery (VBAC) and in women with a transverse lie (Flamm *et al* 1991, Phelan *et al*, 1985). External version has been used successfully in VBAC candidates without any incidence of uterine rupture thus reducing the cesarean section rate by 50 percent (ACOG 2010, Sela HY *et al* 2009, De Meeus JB *et al* 1998, Flamm BL *et al* 1991).

f) Cost effectiveness

Zhang *et al* (1993) and Gifford *et al* (1995) reported that a strategy of routine external version for a breech presentation at term resulted in more cost effective per individual when compared with routine scheduling of a cesarean delivery.

Vaginal breech delivery

Vaginal breech delivery can be associated with a higher risk of perinatal mortality and short-term neonatal morbidity in a non-skilled clinicians compared to delivery by elective caesarean section, however study of long term follow-up at many centers found that the neonatal neurological outcomes did not differ between either mode of delivery (Kumari *et al* 2004, Sanchez Ramos *et al* 200, Daniel *et al* 1998).

a) Selection criteria

The criteria to allow vaginal breech delivery are flexed or extended legs, the pregnancy is between 37-42 weeks and no evidence of cephalopelvic disproportion (CPD). By the ultrasound the estimation of the fetus is between 2.5 kg to 3.5 kg with well flexed head.

b) Protocols and procedure

Monitoring labour progress in first stage is done as in usual manners. Cervical dilation should be 1cm per hour from 4cm for all women regardless of parity. In the absence of adequate progress in labour, caesarean section is recommended.

Augmentation of not normally considered, however may be only used in individualised special circumstances for uterine dystocia if there is no clinical suspicion of CPD. Encourage active pushing when the women has a strong urge, or the buttocks are on view. Delivery is in lithotomy position and episiotomy is done to facilitate birth.

Fetal breech delivery manoeuvres should only be applied after spontaneous delivery to the level of the umbilicus. Supra-pubic pressure may aid flexion of the head. Nuchal arms may be reduced by the Lovset manoeuvre. After-coming head may be delivered with forceps, or by the Maricueau- Smellie-Viet manoeuvre. If fetal head entrapment occur, the cervical incisions (Dührssen incisions) may be needed to release the entrapment. The operator must be ready to deal with extensions into the lower uterine segment and broad ligament, significant bleeding, and failure of this technique to allow the delivery of the fetal head. One to three incisions can be performed by placing the fingers inside the cervix and cutting the full length of the cervical lip at the 2, 10, and 6

o'clock positions. Symphysiotomy has also been described. This should only be performed by experienced clinicians. Even in skilled hands, it may be associated with an unacceptably high risk of injury to the maternal urinary tract. During the second stage the paediatrician must be present to anticipate a difficult delivery.

c) Complications

Complications of vaginal breech birth include Erb's palsy, fractures to the clavicle, humerus or femur, and dislocation of the hips or shoulders. Trauma to the abdominal structures may occur if the fetal abdomen is grasped incorrectly, some bruising may be noted especially to male genitalia and other complications such as cerebral haemorrhage or fractures, or spinal cord injury are additional risk factors (Gilbert *et al* 2003, Rietberg *et al* 2005, Thanyarat 2005, Samina *et al* 2008).

Planned caesarean section

A Caesarean section is a surgical procedure in which incisions are made through a mother's abdomen to deliver one or more babies.

a) Selection criteria

Women with breech who are not suitable for vaginal delivery, failed ECV and not consented for vaginal delivery. The indication for caesarean section are cord round neck/ nuchal cord, suspected fetal anomaly from USG, extended head by ultrasound, abnormal liquor volume either oligohydroamnios (AFI less than 6) or polyhydroamnios (AFI more than 24), previous history of caesarean section delivery or myomectomy, condition contraindication for vaginal breech such as

placenta praevia, lower segment uterine fibroid, suspected contracted pelvis/cephalopelvic disproportion and lastly patient request for caesarean section.

b) Complications

Caesarean section complication can be divided in short, intermediate and long term complication. The short term complication includes anaesthetics complication, intraoperative complication such as torrential bleeding that may require blood transfusion, extended uterine tear, adjacent organ injury and wound hematoma (Harper MA *et al* 2003, Shearer EL 1993). The intermediate complication includes endometritis, pelvic infection, wound infection and breakdown (Hemminki E 1996). The long term can be ectopic pregnancy, miscarriage, placenta praevia, placenta abruption, caesarean hysterectomy due to placenta accrete, reduced fertility, adhesion colic and scar dehiscence or rupture in subsequent pregnancies (Murphy DJ *et al* 2002, Lydon-Rochelle M *et al* 2001, Al-Took S *et al* 1999, Schuitemaker N *et al* 1997, Petitti DB 1985).

Even though there are options of external cephalic version and vaginal breech delivery for management of breech delivery at term, there is still ongoing debate world widely regarding this options compared to caesarean section. This is mainly influenced by the Term Breech Trial (TBT).

TBT is a study conducted by Hannah and was published in 2000. It involved 121 centres in 26 countries. 2088 women with a singleton fetus in breech presentation were randomly assigned planned caesarean section or planned vaginal birth. Women having a

vaginal breech delivery had an experienced clinician at the birth. Mothers and infants were followed-up to 6 weeks postpartum. The primary outcomes were perinatal mortality, neonatal mortality, or serious neonatal morbidity; and maternal mortality or serious maternal morbidity. Of the 1041 women assigned planned caesarean section, 941 (90.4%) were delivered by caesarean section. Of the 1042 women assigned planned vaginal birth, 591 (56.7%) delivered vaginally. Perinatal mortality, neonatal mortality, or serious neonatal morbidity was significantly lower for the planned caesarean section group than for the planned vaginal birth group (17 of 1039 [1.6%] vs 52 of 1039 [5.0%]; relative risk 0.33 [95% CI 0.19-0.56]; $p < 0.0001$). There were no differences between groups in terms of maternal mortality or serious maternal morbidity (41 of 1041 [3.9%] vs 33 of 1042 [3.2%]; 1.24 [0.79-1.95]; $p = 0.35$).

(Hannah *et al* 2000).

Concerning the TBT, there are certain issues that is debatable in this study

- a) This study is done at 121 centres, mostly at the western country where the caesarean section is done widely. This study should enrol centres from developing counties like China, Indonesia, Malaysia and Pakistan, so the result will be more generalised due to higher number of patient in different part of the world and will reflect the true outcome.
- b) TBT include non footling and uncertain type of breech presentation in the study which were delivered vaginally and included in the final results. The trial of vaginal breech delivery should be done in patient with confirm frank breech. The footling presentation will have higher risk to develop cord prolapse in labour and may contribute to the morbidity of the babies delivered vaginally.

- c) Many women who delivered vaginally was attended by midwives or clinician who was not experienced enough, which worsen the complication during delivery. To prevent biased, only a clinician or obstetrician who have experienced and skills should be involve in delivering the women vaginally. Comparison should be made between the outcomes of baby with the clinician experience.

A survey of TBT collaborators, from 80 centers in 23 countries, reported increase more than 50% to 80% of change rate in clinical practise from vaginal breech delivery to planned caesarean section for all term breech babies after Hannah trial was published (Reitberg *et al* 2005, Hogle *et al* 2003, Roberts *et al* 2003, Phipps *et al* 2003).

Other centres in developing country like Pakistan and Thailand still practising vaginal breech delivery widely. Two studies conducted in these country and show no difference in the maternal morbidity and mortality between vaginal delivery and caesarean section (Samina *et al* 2008, Thanyarat Dittakarn 2005).

There were two large scale retrospective studies conducted in California and Norway comparing the outcome of vaginal breech delivery and caesarean section. In 2003, Hopkins did a retrospective study which involved 725 women over 21 years (1981 till 2001) in University of California. There was no neonatal deaths or seizures in both group. However there was a 5.2% increment in NICU admission for vaginal delivery and 2.4% for caesarean section. However, there were 54 cases of wound infection and endometritis found in caesarean section group and 6 cases of perineal infection in the vaginal delivery group (LM Hopkins *et al*, 2006).

In Norway, a study was conducted at the Sorlandet Hospital Kristiansand between 2001 to 2011. Out of the 568 women, elective caesarean section was planned in 279 cases and vaginal delivery was planned in 289 cases. Emergency caesarean section was performed in 104 planned vaginal deliveries for complications occurred during intrapartum and maternal request. There were 8 babies reported to have Apgar score less than 7 in 5 minutes in vaginal delivery group whereas nil in caesarean section group. 29 babies borned via vaginal delivery were admitted to NICU compared to 2 in caesarean section group. There was no significant difference in term of birth injury for both groups (Vistad.I *et al*, 2013).

Study Objectives

1. To evaluate the maternal morbidity and mortality in caesarean section and vaginal delivery for breech presentation at term. Assessment of outcome that will be analysed are

- a) Maternal mortality
- b) Caesarean section wound complication such as infection or breakdown
- c) Perineum wound complication such as infection or breakdown
- d) Post-delivery endometritis
- e) Blood loss
 - More than 500 ml for vaginal breech delivery
 - More than 1 litre for LSCS
- f) Need of blood transfusion
- g) Duration of admission

2. To evaluate neonatal outcomes in caesarean section group and planned vaginal delivery group for breech presentation at term. The neonatal outcomes that will be analysed are

a) Apgar scores at 5 and 10 minutes

- More than 7 : normal
- 4-6 : fairly low
- Less than 3 : critically low

b) Birth trauma such as

- Head entrapment
- Limbs fracture
- Skull fracture
- Internal organ injury
- Skin laceration

c) Admissions and length of stay neonatal intensive care unit

d) Perinatal mortality