Efficacy of External Cephalic Version with Tocolysis in Late Pregnancy

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Objective: *To study the success rate and identify factors influencing the success rate of external cephalic. version (ECV) at Bhumibol Adulyadej Hospital.*
Study design: *Prospective descriptive study.*
Setting: *Department of Obstetrics and Gynecology, Bhumibol Adulyadej Hospital.*
Material and Method: *All parturients attending the obstetrics unit at Bhumibol Adulyadej Hospital between October 1, 1997 and September 30, 2006, having completed 36 or more gestational weeks with singleton non-vertex fetus, who had no exclusion criteria for ECV were given full information concerning a trial of ECV, risk of cesarean section, and risk of emergency breech deliveries. Those who chose to undergo ECV after counseling were recruited and gave signed consent. One hundred and forty singleton, pregnant women with non-vertex presentation participated in this study.*
Results: *The success rate of ECV was 71.43%. Birth weight significantly affected the success rate of ECV. Maternal weight, parity, gestational age, and placental site did not have any effect on the outcome. All fetuses in the present study were subsequently delivered without significant morbidity and no cases of perinatal mortality were recorded.*
Conclusion: *ECV is a safe procedure with a high success rate in selective cases. ECV, thus, is an effective alternative practice for non-vertex presentation, which can also reduce the rate of breech delivery and cesarean section. The major benefits of external cephalic version are reduced maternal morbidity and mortality from surgery.*

Keywords: *External cephalic version, Success rate, Non-vertex presentation*

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Perinatal mortality and morbidity are increased in persistent breech presentation. Retrospective study comparing breech and vertex presentation at term have shown a perinatal mortality rate ratio of 4.3:1 to 2:1 and a perinatal morbidity rate ratio of 5:1 (asphyxia), 4:1 (neurological problem), and 2.2:1 (traumatic damage)[1-3]. The overall neonatal mortality and morbidity resulting from trauma were increased significantly in the planned vaginal delivery groups[4]. The success rate of ECV 36.7% was reported by Nor Azlin et al in 2005[5], 39% was reported by Nassar et al in 2006[6] and 67% was reported by Fevi-Wabaso et al in 2006[7]. Favorable factor for success were multiparity, unengaged breech, normal liquor volume and posterior placenta[7]. There was no increased risk of complications after external cephalic version[6]. Ritrodine tocolysis appear to reduce the failure rate of external cephalic version at term[8-12]. Attempted external cephalic version reduces the women's risk of vaginal breech delivery and cesarean section[13].

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Material and Method

The present research has been approved by the hospital ethical committee. During the present study period from October 1, 1997 to September 30, 2006, all parturients attending the obstetrics unit at Bhumibol Adulyadej Hospital, having completed 36 or more gestational weeks with singleton non-vertex fetus, who

had no exclusion criteria for ECV were given full information concerning a trial of ECV, risk of cesarean section and risk of emergency breech deliveries. Those who chose to undergo ECV after counseling were recruited and gave signed consent. These patients underwent a complete general and obstetrics history and examination, together with a non stress test to assess fetal well-being and tocography.

Exclusion criteria for ECV in the present study were[14]:

1. Previous uterine scar and uterine abnormality
2. Multiple pregnancies
3. Evidence of uteroplacental insufficiency
4. Significant third trimester bleeding
5. Suspected intrauterine growth restriction
6. Amniotic fluid abnormalities
7. Maternal cardiac disease
8. Uncontrolled hypertension
9. Non-reassuring fetal monitoring pattern

In the remaining parturients, ECV was attempted following these preparatory steps:

a) Written consent to the procedure was obtained from all patients attempting ECV.

b) Physical examination, including general status, weight, blood pressure, pulse rate, heart sound, lung fields and abdominal scar as well as palpation of the abdomen and uterus. Both fetal heart rate tracing and uterine contractions were recorded.

c) Ultrasound was performed. The exact fetal position, amniotic fluid volume and placental site were noted.

d) Tocolysis was achieved by intravenous terbutaline (Bricanyl). A single dose (0.3-0.5 mg) was administered before ECV was attempted.

The procedure was performed under double set up conditions, NPO 6 hours, operation facilities were immediately available. After assessing the exact fetal position, the operators gently displaced the breech from the pelvic brim superiorly, then by applying simultaneous circular steady pressure on the head, neck and upper back of the fetus with one hand and the breech of fetus with the other hand in a forward somersault direction and backward somersault direction if the first attempt failed.

Fetal heart activity was monitored every 1 minute by real time ultrasound during the operation. The post operative non-stress test was assessed. Antenatal care, management of labor and delivery did not differ from other parturients. Data were analyzed and presented as percentage (%), mean $\pm$ standard deviation (SD) and range. The Student t-test was used to compare the continuous variables and the Chi-square test was used to compare the discrete data between the successful group and failed group. A p-value of less than 0.05 was set as statistically significance different.

Results

One hundred and forty parturients were identified as having a non-vertex fetus in the 36th gestation week or after in the study period. Two parturients had done ECV twice.

Successful ECV was achieved in 71.43% of the attempted versions (100/140), of which 40 parturients had an unsuccessful version. Sixty-five parturients with successful ECV delivered vaginally and thirty-five parturients in this group had cesarean section for various indications such as fetal distress, cephalopelvic disproportion, and failure to progress (Table 1).

Thirty-six parturients in the failed ECV group had elective cesarean sections. Only four parturients were suitable and agreeable for a trial of vaginal breech delivery as shown in Table 1.

All of the post-operated non stress tests were reactive and none of the parturients delivered in the present study, whether successful or not, had an adverse outcome. In the present study, all cases of successful ECV were subsequently found to be present at delivery in a vertex presentation and none in the failed ECV group had a spontaneous reversion after attempting ECV.

Successful ECV was significantly associated with vaginal delivery ($\chi^2 = 34.57$, $p < 0.001$) as shown in Table 1 and the chance of success was also enhanced through a vaginal delivery as opposed to a cesarean delivery. The cesarean section rate for the successful ECV group was 35%. In contrast, the cesarean rate after unsuccessful ECV was as high as 90%.

The mean birth weights in the successful group were 3240.05 ± 377.123 grams and failed group were 3094.75 ± 410.491 grams. The mean birth weights were converse to a significant degree, with successful ECV. The mean birth weight in the successful group were higher than those of the failed group, statistically as shown in Table 2.

The effect of parity, gestational ages, placental site and amniotic fluid volume were examined on the success rate of ECV. The authors found that parity, gestational ages, and placental site had no significant effect on the success rate of the procedure, there were 100 successful versions in the 140 cases with normal

amniotic fluid volume with ECV as shown in Table 3.

In the present study, maternal weight did not have any effect on the outcome. The mean maternal weight was not statistically different between the successful and failed group as shown in Table 4.

Discussion

The incidence of breech presentation at term is about 3-4% of singleton deliveries[15]. Before the resurgence of the use of ECV, management of breech presentation consisted of either routine cesarean

Table 1. Outcome of ECV at Bhumibol Adulyadej Hospital

	Vaginal delivery	Cesarean section	Total
Successful group	65	35	100
Failed group	4	36	40
Total	69	71	140

$\chi^2 = 34.57$, $p < 0.001$

Table 2. Birth weight and group of ECV

	Birth weight (grams)		
	Mean $\pm$ SD	Minimum	Maximum
Successful group (n = 100)	3,240.05 $\pm$ 377.123	2554	4220
Failed group (n = 40)	3,094.75 $\pm$ 410.491	2230	4050

Student t-test 2.08, p = 0.047

Table 3. Success rate of ECV and associated factors (n = 100)

Factors associated the success rate of ECV		Success rate (%)	χ^2	p
Parity	Primipara	66.67	2.136	0.144
	Multipara	77.97		
Gestational ages	$\leq$ 39 weeks	73.08	2.423	0.120
	> 39 weeks	50.00		
Placental site	Anterior	67.27	0.767	0.381
	Non-anterior	74.12		
AFI	$\geq$ 5, < 25	71.43		

Table 4. Maternal weight and group of ECV

	Maternal weight (kg)		
	Mean $\pm$ SD	Minimum	Maximum
Successful group (n = 100)	63.26 $\pm$ 7.547	48.0	88.0
Failed group (n = 40)	63.93 $\pm$ 8.265	50.0	83.0

Student t-test = 0.463, p = 0.644

delivery or a selected trial of labor. However, over the past two decades, theoretically for safety concerns regarding the fetus, the rate of cesarean delivery for breech presentation has increased from 14% in 1970 to the current rate of up to 100% at some institutions[16]. Routine use of ECV could reduce the rate of cesarean delivery by about two third[17].

The authors of recent literature review of 25 studies on the efficacy of ECV calculated an overall success rate of 63.3%, with a range of 48 to 77%[17].The success rate of the present study was 71.43% highly comparable to most studies [18,19]. Most of 25 studies documented minimal risks, including umbilical cord entanglement, abruptio placenta, preterm labor, premature rupture of membranes (PROM) and severe maternal discomfort. Overall complication rates have ranged from about 1 to 2% since 1979[17]. In another study[20], fetal heart rate changes occurred in 39% of fetuses during ECV attempts, but these changes were transient and had no relationship to the final outcome. All fetuses in the present study were subsequently delivered without significant morbidity and no cases of perinatal mortality were recorded. The high proportion of vaginal deliveries (65%) in the successful ECV group comparing this rate to the failed ECV group (10%) and this rate in the group of non-vertex fetus that had no ECV intervention, showed its possible favorable outcome in decreasing the cesarean rate.

The factors associated with successful ECV were evaluated.The present study showed that only birth weight was an important factor in the outcome. Maternal weight, parity, gestational ages, placental site did not have any effect on the outcome.

In the present study, the maximum maternal weight was 88.0 kg, and had no significance on the success rate of the procedure in accordance with other reports[21,22].But one author found obesity to be associated with a higher failure rate[23]. The authors assume that abdominal wall thickening may the questionable and will need further studies to confirm this.

In the present study, the placental site was not found to have a significant effect on the outcome of ECV as was found by Fianu et al[24]. This is in contrast to others studies[25] that demonstrated an adverse effect on the outcome for the anterior placental site.

Total deliveries in Bhumibol Adulyadej Hospital are about 5,000 per year. The incidence of breech presentation at term in the present report is about 3.86% [26]. Nowadays, most of the physicians will perform cesarean section in case of breech presentation. This might increase the risk to both the mother and the fetus. In addition, it can increase the expense up to 12,000 to 15,000 baht. If the authors can perform the successful external cephalic version (ECV), most of the fetuses would be able to be delivered vaginally. The expense of normal delivery in the government hospital is approximately 2,000 to 3,000 baht plus 500 baht for the ECV procedure. Therefore, if the authors can perform a successful ECV, the authors could save at least 10,000 baht per case.

The present report shows the effectiveness of ECV at term in clinical practice. The authors hope to promote its use. The number of cases in the present study is not enough to confirm the safety of the procedure. However, the risk is generally considered small as reviewed by Zhang et al[17]. The use of ECV can produce considerable cost savings in the management of the breech fetus at term and can reduce maternal morbidity and mortality from surgery. ECV at term using tocolytics should be part of the routine management of breech presentation in view of its effectiveness.

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ผลของการหมุนเปลี่ยนท่าทารกเป็นท่าศีรษะทางหน้าท้องด้วยการใช้ยา tocolysis

วิบูลย์ เรืองชัยนิคม, สราวุธ สารภักดิ์, สินาท พรหมมาศ

เพื่อศึกษาอัตราความสำเร็จและปัจจัยที่เกี่ยวข้องกับอัตราความสำเร็จของการหมุนเปลี่ยนท่าทารกเป็นท่าศีรษะทางหน้าท้องที่โรงพยาบาลภูมิพลอดุลยเดช ในสตรีตั้งครรภ์ทารกท่าก้น หรือท่าขวาง ครรภ์เดี่ยว อายุครรภ์มากกว่าหรือเท่ากับ 36 สัปดาห์ ฝากครรภ์ที่โรงพยาบาลภูมิพลอดุลยเดช ตั้งแต่ วันที่ 1 ตุลาคม พ.ศ. 2540 ถึง วันที่ 30 กันยายน พ.ศ. 2549 อัตราความสำเร็จเท่ากับร้อยละ 71.43 พบว่าน้ำหนักทารกมีความสัมพันธ์กับอัตราความสำเร็จอย่างมีนัยสำคัญ น้ำหนักมารดา อายุครรภ์ และตำแหน่งของรก ไม่มีความสัมพันธ์กับอัตราความสำเร็จ จากการศึกษานี้ไม่พบภาวะแทรกซ้อนแก่มารดาและทารก โดยสรุปหัตถการนี้มีความปลอดภัยและมีอัตราความสำเร็จสูง ถ้ามีการคัดเลือก ผู้ป่วยที่เหมาะสม ทั้งยังสามารถลดอันตรายจากการคลอดทารกท่าก้นทางช่องคลอดและสามารถลดอัตรา การผ่าตัดคลอดของทารกท่าก้นและท่าขวาง ประโยชน์ที่สำคัญอีกอย่างหนึ่งของหัตถการนี้ คือ ช่วยลดอันตราย ของมารดาอันอาจเกิดจากการผ่าตัดคลอด