

# Factors associated with the success of external cephalic version (ECV) of breech presentation at term

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## Summary

**Objective:** To evaluate the predictors of success of ECV for breech presentation at term. **Methods:** A retrospective study was conducted over a 3-year period from 2005-2007, where 101 patients who had singleton breech presentation at term were undergoing external cephalic version (ECV) after 37 weeks of gestation at two major teaching hospitals in the North of Jordan. Comparative analysis was made between the successful ECV and unsuccessful ECV groups. The collected data were analysed by using statistical analysis Student's t-test and Mann-Whitney test as appropriate and on discrete results chi square or Fisher's exact test when appropriate. The differences were considered significant at a  $p$  value of  $< 0.05$ . **Results:** The ECV success rate was 72.3%. Favourable factors for success were multiparity (95.5% vs 4.1%,  $p = 0.0001$ ), flexed breeches (74% vs 26%,  $p = 0.002$ ), posterior placenta (38.6% vs 16.4%,  $p = 0.0001$ ) and anterior fetal back (53.4% vs 34.8%,  $p = 0.03$ ). Once turned the babies remained cephalic until delivery. All the 28 cases who had failed ECV had caesarean section. Among those who had a successful external cephalic version, the incidence of intrapartum caesarean section was only 8.2% which was lower than that of the average of both units caesarean rate (28%). There were no complications related to the ECV procedure in the study. **Conclusion:** Multiparity, flexed breech, posterior placenta, and anterior foetal back were the most favourable factors for successful ECV in our study. Moreover, with careful evaluation of individual predictors patient selection and success rates can be optimised.

**Key words:** ECV; Breech presentation.

## Introduction

Breech presentation occurs in 3-4% of all pregnancies at term [1]. In many countries, caesarean section (CS) is now considered the preferred mode of delivery for pregnant women with breech presentation at term. This trend was adopted following the Term Breech Trial which demonstrated lower neonatal risks with CS compared to vaginal breech delivery [2, 3]. Caesarean delivery for breech presentation accounts for approximately 15% of all abdominal deliveries [4]. Recent studies have described the predictors of success of external cephalic version (ECV), such as multiparity, amniotic fluid volume, foetal weight, and the type of breech [5, 6].

ECV is now routinely offered in many obstetric units with significant reduction in the breech presentations and number of CS performed for this malpresentation. Therefore, ECV has become an attractive alternative to CS of breech presentation at term [7-9]. In spite of the fact that ECV is a safe and effective procedure when performed at term, the mothers' and obstetricians' acceptance to have a trial varies [10]. Leung *et al.* reported mothers' refusal of an ECV attempt from 18% to 76% [11]. The success rate of ECV has been reported to vary from 41% to 77% [12-14].

In Jordan, as in many other developing countries, where ECV is not a popular procedure, CS is usually the mode of choice for the delivery of a woman with breech presentation at term.

This retrospective study evaluates the factors associated with the success of ECV for breech presentation at term in two obstetric units in the North of Jordan.

## Materials and Methods

A retrospective study and chart review was performed to evaluate ECV for breech presentation at term in two obstetric units: King Abdullah University Hospital (KAUH) and Prince Rashid Ben Al-Hassan Military Hospital (PRBAMH) in Irbid, northern Jordan. The study was conducted over a 3-year period from January 2005 to December 2007.

Data was retrieved from the medical records at the two hospitals by using Excel spread sheets. The hospital charts of all pregnant women with breech presentation at term were reviewed to collect the following data: age, weight, parity, gestational age, type of breech, position of foetal back, placental location, amniotic fluid index, mode of delivery, foetal weight, Apgar score, and foetal gender.

The exclusion criteria for ECV included patients who had any contraindication to vaginal delivery (e.g., placenta previa), multiple pregnancies, previous uterine scar, major foetal abnormality, intrauterine growth restriction (IUGR), abnormal cardiotocogram in established labor, premature rupture of membranes (PROM), preeclampsia, oligohydramnios (amniotic fluid index  $< 5$  cm), and polyhydramnios (amniotic fluid index  $> 25$  cm), as well as taking into consideration the obstetrician's and patient's involvement in the study.

Women were admitted to the delivery room and consented to the procedure and possible emergency CS if needed. A reactive cardiotocogram (CTG) and known rhesus blood group were prerequisites for the procedure. Obstetric history was reviewed and an ultrasonographic (US) scan was performed before the procedure to exclude any contraindications.

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ECV was only performed by physicians who were experienced in performing the procedure. US examination was performed immediately after the procedure to confirm successful version and to exclude foetal bradycardia. The CTG was then repeated at the conclusion of the version. Women who had successful version and reactive CTG were discharged home and followed in an antenatal clinic waiting for spontaneous labour. The option of immediate induction of labour after successful version was allowed. Women who had an unsuccessful ECV were advised to have an elective CS. No anaesthesia, analgesia, or sedation were used during ECV.

Statistical analysis was performed as comparative analysis between the successful and failed ECV groups using the Student's t-test and Mann-Whitney test as appropriate and on discrete results chi square or Fisher's exact test when appropriate. The differences were considered significant at  $p < 0.05$ .

## Results

During the 3-year study period, there were a total of 20,000 deliveries of which 5,600 caesarean sections were performed giving a caesarean section rate of 28%. There were 620 singleton breech presentations at term. Of the 620, only 101 charts were reviewed in this study. Those cases that were included in our study were mainly those who accepted the ECV attempt (obstetrician or patient). The two groups were similar in baseline characteristics (Table 1). Only eight patients were rhesus negative, and they received anti-D prophylaxis at the conclusion of the procedure.

Table 2 shows a comparison of the clinical features of the participants.

Table 3 shows the clinical outcomes in both groups.

## Discussion

The rising caesarean section rate with its associated maternal morbidity and cost encouraged obstetricians to seek an alternative other than vaginal delivery for the management of breech at term and that is ECV. This technique has been known for 50 years [15].

There has been a resurgence in the use of external cephalic version in recent years possibly due to a few factors. First, due to the medicolegal aspect in considering the morbidity of vaginal breech delivery a liability, and residents are less and less experienced in delivering breeches vaginally. Finally, healthcare providers have been pressured to consider the economic impact of caesarean birth [16].

Previous studies have examined maternal and foetal factors related to successful ECV [5, 17-19]. The factors have varied from study to study and conclusions have been inconsistent. Kok and colleagues studied in a meta-analysis 53 primary articles reporting on 10,149 women and found that multiparity, nonengagement of the breech, a relaxed uterus, a palpable foetal head, and maternal weight less than 65 kg were good factors for successful ECV [20].

Our success rate of ECV at term of 72% compares favourably with that of previous reports. Although a

Table 1. — Baseline characteristics of women with successful and unsuccessful ECV at term in the north of Jordan Hospital population (2005-2007).

	ECV successful n = 73 (72.3%)	ECV unsuccessful n = 28 (27.3%)
Mean maternal age + SD	31y + 4.9	28.6 + 5.6
Gest. age at ECV (mo.)	39.7 + 1.9	39.2 + 1.5
Maternal weight + SD (kg)	73 + 5.7	70 + 7.2

Table 2. — Comparison of clinical features of women with successful and unsuccessful ECV at term in the north of Jordan Hospital population (2005-2007).

		ECV successful n = 73 (72.3%)	ECV unsuccessful n = 28 (27.7%)	Significant $p < 0.05$
Parity	nulliparous	3 (4.1%)	15 (53.6%)	0.0001
	multiparous	70 (95.9%)	13 (46.4%)	
Types of breech	flexed	54 (74%)	11 (39.3%)	0.002
	extended	19 (26%)	17 (67.9%)	
Foetal position	back posterior	32 (34.8%)	19 (54.5%)	0.03
	back anterior	39 (53.4%)	6 (21.4%)	
	back lateral	2 (2.8%)	3 (10.7%)	
Placental localisation				0.0001
	anterior	12 (16.4%)	21 (75%)	
	posterior	61 (83.6%)	7 (25%)	
Amniotic fluid index		11.9 + 2.2	10.9 + 2.5	ns

ns = not significant.

Table 3. — Clinical outcomes of successful and unsuccessful ECV groups in the north of Jordan Hospital population (2005-2007).

		ECV successful n = 73 (72.3%)	ECV unsuccessful n = 28 (27.7%)	Significant $p < 0.05$
	IOL	18 (24.7%)	0 (0%)	
Mode of delivery	Vag. delivery	67 (91.8%)	0 (0%)	
	CS	6 (8.2%)	28 (100%)	
Foetal weight		3.26 + 0.23	3.2 + 0.28	
Apgar score		9 + 0.68	8.7 + 0.57	
Foetal gender	male	39 (53.4%)	13 (46.4%)	ns
	female	34 (46.6%)	15 (53.6%)	

ns = not significant.

IOL = induction of labor.

higher success rate of 77% has been reported for ECV at term [13], the majority of the larger series had lower figures ranging from 51% to 58% [12, 14]. In other studies the success rate was reported to range from 41% to 97%; the lower figures were from Europe and the highest were African [21].

Unfortunately, not all women present with equal chances of a successful procedure, and improved subject selection would increase success rates. We found in our study that the chance of success was increased when the woman was multiparous, the baby presented as a flexed breech, the placenta was posterior in location, the foetal back was anterior and liquid volume was normal, and this concurs with the findings of other researchers [22-24]. Such positive factors for successful ECV would potentially be beneficial in counseling pregnant women about an ECV attempt. Fortunato *et al.* demonstrated that posterior foetal back position significantly decreased the

success of ECV at term [17] which was also demonstrated in our study with significant increase in the success rate compared with posterior foetal back.

The effect of placental location on the success of ECV has been contradictory. Although, some studies found no association between placental location and ECV success [17, 25], Ferguson *et al.* and Newman *et al.* reported higher failure rates with anterior location [6, 20], while, Brocks *et al.* reported an increased success rate with an anterior placenta [26]. Our study determined a posterior placenta to be a significant predictor of success.

Interestingly, in our study the caesarean section rate in the successful ECV group was significantly lower than the background unit caesarean section rate (8.2% vs 28%) and it was slightly higher in multiparous than nulliparous women (7.1% vs 3.0%), whereas previous studies demonstrated an increase in the rate of caesarean sections in women who had undergone successful version [12, 27]. Vezina *et al.* found that the odds of a caesarean delivery after successful ECV was increased four-fold and two-fold in nulliparous and multiparous women, respectively, when compared with women with spontaneous vertex presentation [28]. Laros *et al.* reported a caesarean section rate of 30% in patients after successful ECV compared with 15% in all term singleton pregnancies with cephalic presentation; this large number of abdominal deliveries was due to a significantly higher incidence of foetal distress and dystocic labour [12]

Although it has been recognised that there is higher perinatal mortality and morbidity associated with breech presentation which may be related to foetal congenital malformations, birth asphyxia or trauma [3], breech presentation, regardless the mode of delivery, is a signal for potential foetal handicap [29]. Hannah *et al.* also showed that compared with caesarean delivery, vaginal breech delivery was associated with a poor foetal outcome [2]. Collaris and Oei reported the possible complications associated with ECV such as abnormal CTG either transient (5.7%) or pathological (0.37%), vaginal bleeding (0.47%), placental abruption (0.12%) and emergency caesarean section (0.43%) [30]. In our study there were however no foetal or maternal complications reported in relation to either ECV or caesarean delivery.

In conclusion, multiparity, flexed breech, posterior placenta, and anterior foetal back were the most favourable factors for successful ECV in our study. Moreover, with careful evaluation of individual predictors patient selection can be optimised and success rates and ECV may offer a safe and effective alternative to caesarean section resulting in vaginal delivery with rapid maternal recovery and normal infant bonding.

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