ORIGINAL ARTICLE

Introducing Routine External Cephalic Version for the Management of the Malpresenting Fetus Near Term

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Summary

Background: The aim of this study was to assess the efficacy and safety of external cephalic version (ECV) when its use was introduced in the routine management of breech presentation and transverse lie after 36 weeks by obstetricians with limited prior experience with the procedure. The influence of various factors on the outcome of ECV was also studied.

Methods: Retrospective study of 44 consecutive cases of ECV which were analysed with respect to outcome, parity, type of breech, placental site and birth weight.

Results: ECV was successful in 45% of women. 80% of women with successful ECV delivered vaginally while 10% underwent spontaneous reversion to a non-cephalic presentation. In contrast, only 15% of women with failed ECV delivered vaginally. Parity, type of breech presentation and placental location did not significantly affect the outcome of ECV although there was a trend towards better success rate of ECV with multiparity, flexed breech presentation, transverse lie and posteriorly-located placentae. The mean birth weight of fetuses of women with successful ECV was significantly heavier than those of women who failed ECV ($p<0.001$). No significant fetal or maternal morbidity occurred as a result of ECV in this study.

Conclusion: ECV is a safe and effective procedure that is useful in the management of breech presentation and transverse lie near term. The lack of prior experience with the procedure does not appear to influence the success rate or morbidity.

Key Words: Caesarean section, Breech presentation, Transverse lie

Introduction

External cephalic version (ECV) is a procedure in which the fetus is manually rotated from a non-vertex to a vertex position. ECV had apparently been practised since the time of Aristotle[1] (384 to 322 b.c.), who stated that many of his fellow

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authors advised midwives who were confronted with a breech presentation to "change the figure and place the head so that it may present at birth." However, external version eventually fell out of favour as a result of several concerns: its high rate of spontaneous reversion (turning back to breech presentation) if performed before 36 weeks of gestation, possible fetal complications, and the assumption that an external version converts only those fetuses to vertex that would have converted spontaneously anyway.

More recent evidence from systematic reviews suggest that when ECV was performed after 36 weeks gestation, there was a significant reduction in non-cephalic presentations in labour as well as caesarean sections[2]. The safety of the procedure has also been demonstrated. Initial reports[3] in the mid-1970s of a procedure-related fetal loss rate of 1% appear to be an over-estimate and are probably related to the previous practice of performing ECV in preterm pregnancies. ECV is most widely used to correct a breech presentation. The safety of vaginal breech delivery has been a long-standing controversy. Recent evidence from a large randomised controlled trial[4] has shown that fetal morbidity and mortality are lower in fetuses delivered by routine elective lower segment caesarean section (LSCS) when compared with a vaginal breech delivery. This multi-centre study also failed to show any significant difference in serious maternal morbidity or mortality of women delivered by elective LSCS for breech presentation when compared to vaginal breech delivery.

These recent findings support the efficacy and safety of ECV as well as underline its increasingly important role in the management of breech presentations. As increasing numbers of breech pregnancies are likely to be delivered by LSCS, ECV will gain importance as the only method by which women with breech presentations can ultimately have a vaginal delivery. There is also evidence to support the use of ECV in transverse lie[5].

In our unit, ECV was practised only selectively until 1999. Since January 2000, we have implemented a policy of offering ECV to all women with breech presentations and transverse lie when not contraindicated in an effort to reduce the caesarean section rate for breech presentation. We were interested to establish whether good outcomes could be obtained when ECV was used in this setting by obstetricians with limited experience with the procedure and, hence, present the data of the first 44 of these cases.

Materials and Methods

Patients were recruited from the antenatal clinics at the Obstetrics and Gynaecology Centre, Singapore General Hospital at or after 36 completed weeks of gestation. Patients with contraindications to ECV (Table I) were excluded.

The labour ward protocol for ECV was applied as follows:

1) Consent for ECV obtained
2) Ultrasound examination performed to confirm breech presentation
3) Electrocardiogram (ECG) and cardiotocogram (CTG) performed to establish maternal and fetal well-being.
4) Blood drawn for group and save
5) Intravenous terbutaline 25 mg given as a a slow bolus injection
6) ECV performed
7) Post-procedure CTG performed
8) Patients discharged from labour suite if well

Technique of ECV

We perform ECV in the labour ward where adjacent operating theatres are available for an emergency caesarean section if required. A water-based gel is liberally applied over the abdomen to reduce friction and aid manipulation. The breech is first disengaged from the pelvis and each pole is grasped with one hand. The fetus is then gently rotated. A forward roll is attempted

first and a backward roll tried if the former is unsuccessful. We do not allow each attempt to last more than 5 minutes and the mother should feel only mild discomfort during the attempt. The fetal heart is auscultated every 2 minutes. At the end of the attempt, the fetal presentation is confirmed by ultrasound. No more than 3 attempts at ECV are made. These measures ensure that the mother is not subjected to excessive discomfort. A cardiotocograph (CTG) is performed at the end of the procedure. Patients are discharged home if this is satisfactory.

Results

ECV was performed on a total of 44 women between 1 January 2000 to 31 March 2001. Four women had transverse lie while 40 had breech presentations. The procedure was performed by 9 obstetricians ranging in seniority from registrar grade to senior consultant. Most had only limited prior experience with ECV, having only practiced it selectively. ECV was successful in 20 (45%) women. Sixteen (80%) of the women with successful ECV delivered vaginally. In two women (10%) who had successful ECV, the fetuses underwent spontaneous version to breech presentation and transverse lie respectively prior to the onset of labour. These two women subsequently underwent elective LSCS. One patient with a successful ECV was lost to follow up. Only one of the 16 women who had cephalic presentations at the onset of labour underwent an emergency LSCS for a failed induction of labour. The Caesarean section rate for the successful ECV group was 3 out of 20 or 15%. Hence, 85% of women with successful ECV and 94% of women with cephalic presentations at the onset of labour delivered vaginally.

Fourteen of the 23 women who failed ECV declined further assessment for vaginal breech delivery and opted for an elective LSCS. Nine women were assessed for vaginal delivery by estimation of fetal weight, clinical and X-ray pelvimetry. Four were judged to be suitable for a trial of vaginal delivery but 2 of these women subsequently declined a trial and had elective LSCS. Only 2 women with failed ECV eventually had a trial of vaginal breech delivery. Both delivered vaginally. The overall caesarean section rate for the failed ECV group was 92%. The mode of delivery for the study patients is summarised in Table II.

Table III shows the outcome of ECV according to parity. There were 21 primipara and 23 multipara in this series. The success rate for primipara was 38 % while that for multipara was 52%. The presentation i.e. extended breech, flexed breech or transverse lie is as shown in Table IV. There were no footling breeches in this study. ECV was successful in all women with transverse lie, 53% of flexed breeches and 30% of extended breeches. The outcome of ECV with placental site was studied and is shown in Table V. The birth weights of fetuses in the study are shown in Table VI. Women who had successful ECV had significantly heavier fetuses than those who failed ECV.

Table I: Exclusion Criteria for External Cephalic Version

Multiple pregnancy
Evidence of utero-placental insufficiency
Significant third-trimester bleeding
Suspected intrauterine growth restriction
Amniotic fluid abnormalities
Uterine malformations
Placenta praevia
Maternal cardiac disease
Pregnancy-induced hypertension
Uncontrolled hypertension
A non-reassuring fetal monitoring pattern
Major fetal anomaly

Table II: Mode of delivery of study patients

	Successful ECV	Failed ECV
Total women (n=44)	20 (45 %)	24 (55 %)
Vaginal delivery	16 (80 %)	2 (8 %)
LSCS	3 (15 %)	22 (92 %)
Lost to follow up	1 (5 %)	0

Table III: Outcome of ECV with parity

Parity	Successful ECV	Failed ECV
Primipara (n=21)	8 (38 %)	13 (62 %)
Multipara (n=23)	12 (52 %)	11 (48 %)

Chi-square test (primipara vs multipara)
p <1 (not significant)

Table IV: Outcome of ECV with presentation

Presentation	Successful ECV	Unsuccessful ECV
Flexed (n=17)	9 (53 %)	8 (47 %)
Extended (n=23)	7 (30 %)	16 (70 %)
Transverse lie (n=4)	4 (100 %)	0

Chi-square test (extended vs flexed breech): $p < 0.20$ (not significant)

Table V: Outcome of ECV with placental location

Placental site	Successful ECV	Failed ECV
Fundal (n=3)	1 (33 %)	2 (66 %)
Anterior (n=25)	9 (36 %)	16 (64 %)
Posterior (n=16)	10 (62 %)	6 (38 %)
Total (n=44)	20 (45 %)	24 (55 %)

Chi-square test (anterior vs posterior placentae): $p < 0.10$ (not significant)

Table VI: Effect of fetal weight on outcome of ECV

Outcome	Mean	Min	Max
Successful	3356	2890	3865
Failed	2948	2280	3660

Student's t-test: $p = 0.001$

Discussion

The increasing caesarean section rate for breech presentation is a problem faced by most obstetric units. The safety of vaginal breech delivery is a long-standing controversy in modern obstetrics because of its associated higher perinatal mortality and morbidity[6,7] when compared to vertex presentations. The debate between universal elective operative delivery or selective trial of vaginal breech delivery was addressed in a recently-published multi-centre randomised controlled trial[4] that revealed an overwhelming fetal benefit without any increase in serious maternal morbidity and mortality in the elective LSCS group. The implication of these findings is that universal elective LSCS for breech presentation is likely to become standard practice. The importance of ECV is that when it is successful, it removes the risks associated with vaginal breech delivery.

The use of tocolytics at the time of ECV has been shown to increase the success rate of the procedure[8] with minimal risks from adverse effects. Other studies report that the effect of tocolytics on the success rate of ECV reduces with the increasing experience of the operator but nevertheless remains significant[9]. As this series represents our initial experience with ECV in a centre that previously did not practice routine ECV, we feel that tocolytics played an important role in achieving a successful version.

The success rate of ECV has been reported[10] to range from 25% to 97%. Our success rate of 44% is close to the typical success rate of 50%. The high proportion of vaginal deliveries in the successful ECV group attests to the favourable impact that ECV is likely to have on the caesarean section rate for breech presentation. Equally important is the finding that only 2 patients in the failed ECV group delivered vaginally and none of the fetuses which failed ECV underwent spontaneous cephalic version. The possible reasons for a high elective LSCS rate following failed ECV include maternal preference, unfavourable clinical or X-ray pelvimetry and large estimated fetal size. Whatever the reason, it emphasises the point that very few women who remain in breech presentation after an attempted ECV will achieve vaginal deliveries.

Many prognostic factors for a successful ECV have been identified and some authors have even devised a scoring system to predict the likelihood of a successful version[10]. We studied the influence of some of these factors on the success rate of ECV in our series. Both multiparity and a flexed breech have been reported in other studies as a positive predictor of successful ECV[11]. In this study, there was a non-significant trend towards successful ECV with multiparity and flexed breech presentations. Although all 4 women with transverse lie had successful versions, the small numbers of these women in our study did not allow us to make statistical analysis of the effect of a transverse lie on the outcome of ECV.

When the association between placental site and successful ECV was studied, we found that ECV was more likely to succeed in patients with a posterior rather than anterior placentae although, again, this trend did not reach statistical significance. The effect of a fundal placenta on ECV is not possible to quantify in our study as only 3 patients had fundal placentae. Women with successful ECV had fetuses with significantly higher mean birth weights when compared to those with failed ECV. This effect can be attributed to the fact that in larger fetuses the breech is less likely to be engaged in the pelvis hence facilitating its manipulation at time of ECV.

Our experience with ECV certainly supports current belief that the procedure is generally safe. None of the women in our study required an emergency caesarean section for fetal distress. Two women had transient fetal bradycardia recorded on the cardiotocograph which resolved

spontaneously within 3 minutes. All the women in this series delivered neonates who were in good condition. Spontaneous reversion to breech presentation or transverse lie following successful ECV is estimated[12] to be 6%. In our study, this occurred in two women (10%). However, one of these women had a fetus in transverse lie for which spontaneous reversion is likely to be more common. This is because in transverse lie, the factors that maintain the fetus in a longitiudinal lie at term are likely to be deficient. Although not our practice, it has been suggested that ECV can be repeated safely in women whose fetuses undergo spontaneous reversion[13].

This review of external cephalic version using tocolysis by obstetricians with limited prior experience with the procedure is encouraging as it demonstrates both the relative efficacy as well as the safety of the procedure. Our experience suggests that lack of prior experience with the procedure should not be an obstacle to introducing its routine use. As the learning curve for ECV is reported to be steep[14], we can expect an even higher success rate as experience with the procedure in our department increases. The potential benefits of the procedure for both mother and fetus more than justify its use in any obstetric unit.

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