

Effect of External Cephalic Version in Reducing the Incidence of Cesarean Section for Breech Presentation at Term

External Cephalic Version in Reducing the Incidence of C-Section

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ABSTRACT

Objective: To see the effect of external cephalic version in reducing the incidence of cesarean section for breech presentation at term.

Study Design: Descriptive case series study

Place and Duration of Study: This study was conducted at the Obstetrics and Gynecology Department of Bolan Medical Complex Hospital Quetta from April, 2014 to October, 2014.

Materials and Methods: A total of 100 cases fulfilling the inclusion/exclusion criteria were enrolled. After the confirmation of diagnosis of breech presentation by ultrasound, external cephalic version was carried out in labour room with external fetal monitor. In case of success woman were allowed to go into spontaneous labour to see the success of the procedure (spontaneous vaginal delivery).

Results: A total of 100 patients were included in the study. The mean age of patients was 27.60 years with standard deviation of 6.552 years. Out of 100 patients, 66 (66%) patients had efficacy (spontaneous vaginal delivery) after successful external cephalic version while 34 (34%) patients had no efficacy (spontaneous vaginal delivery) after successful external cephalic version.

Conclusion: External cephalic version is a safe procedure with a high success rate. This will provide an alternate management option by reducing caesarean sections for breech presentation without causing any harm to mothers and their fetuses.

Key Words: External cephalic version, breech presentation, caesarean sections

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INTRODUCTION

Breech presentation is among the most common occurring abnormal presentation with a ratio of about 3-4% out of all deliveries. Previously, till the 15th century, the breech presenting babies were always delivered vaginally. There were several maneuvers to assist the breech delivery, especially delivery of the extended arms and/or the after coming head are widely practiced. Some obstetricians applied forceps to the coming head. External Cephalic Version (ECV) was introduced in the mid-16th century and popularized to avoid breech delivery.

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Breech vaginal birth is not a standard of care and a big proportion of singleton breech presentations lead to a cesarean delivery.¹

Meanwhile, the cesarean delivery rate in the United States has reached an all-time high of 31.1% and continues to increase annually. The primary cesarean delivery rate is similarly at an all-time high despite recommendations from health workers 2010 for a primary cesarean rate of 15%. Of these, an increasing number of primary cesarean deliveries are performed for breech presentation. The reasons are less clear even though fewer women opt for attempted external cephalic version (ECV). External cephalic version (ECV) is the manipulation of the fetus through maternal abdomen to cephalic presentation.²

Management of fetus with breech presentation has been area of great controversy and changing practice. Until 1960s, the breech fetuses were delivered vaginally, however, by 1970s studies suggested that vaginal breech delivery were more hazardous for the baby in terms of morbidity and also mortality. ECV is a skill as well as an art that could be easily acquired, and has been practiced since the time of Aristotle (384-322 BC). External cephalic version also decreases neonatal morbidity and mortality by decreasing the incidence of cord prolapse and unattended precipitated breech

delivery. Nevertheless, the Royal College of Obstetricians and Gynecologists (RCOG) and American College of Obstetricians and Gynecologists (ACOG) currently recommend that every pregnant women with an uncomplicated singleton breech presentation at term needs to be offered external cephalic version.^{3,4}

The Complications of ECV reported at term includes fracture of the baby's femur, sinusoidal baby's heart rate pattern, prolonged tachycardia baby, and fetal-maternal hemorrhage. The rate of caesarean section (C-Section) during labor was reported to be greater following successful ECV than in spontaneous cephalic presentation. Elective caesarean section was found to be safer for the fetus as well as for the mother when compared with intention to deliver vaginally. But as caesarean is a major surgical process and no doubt associated with several maternal and fetal complications of its own.^{5,6}

This means that measures to reduce the incidence of breech presentation have become more important and the effect of any such measure on the incidence of cesarean section will be more marked. For this reason, ECV has become a valuable option in the management of breech fetus at term with a success rate of about 60 to 70 percent. Many adjuvant methods such as tocolysis, epidural and fetal acoustic stimulation have been shown to improve the success of external cephalic version. Beta mimetic agents, as tocolytic, increased the success rate of external cephalic version.^{7,8}

Careful evaluation of the factors that influence success make this simple procedure safer and routine use of ECV in selected cases can reduce the rate of cesarean about two third and long-term studies has proved the safety of ECV for the fetus as well as for the mother.^{9,10}

MATERIALS AND METHODS

The study design is Descriptive case series and was conducted at obstetrics and gynecology department of Bolan Medical Complex Hospital Quetta. Sample sizing was done by taking the percentage of successful ECV in women with breech presentation at term that is 70%, margin of error 9% and confidence level 95% then at least a sample of **100** women was required. Sampling technique used is Non probability consecutive.

The study was conducted from April 30, 2014 to October 29, 2014 at obstetrics and gynecology department of Bolan Medical Complex Hospital Quetta. The study sample included all the antenatal multigravida patients with breech presentation, confirmed by ultrasonography, gestational ages were between 37 to 41 weeks determined by last menstrual period with Intact membranes on clinical examination and adequate liquor (amniotic fluid index >8cm) by ultrasonography examination.

The study sample excluded patients with gestational age below 37 weeks, patients having multiple gestations, low-lying placenta confirmed by ultrasonography, having per vaginal bleeding anytime during current pregnancy, having any type of fetal anomaly and having any indication for cesarean section on the history and examination.

Data collection procedure: All the patients who fulfilled the inclusion criteria coming to gynae OPD at Bolan Medical complex Hospital Quetta were enrolled in the study. The informed consent was obtained after explaining each patient about the aim, method, benefits and potential hazards of the procedure like rupture of membranes, preterm labour, fetal bradycardia and fetal distress, and alternative options, like emergency cesarean section or breech vaginal delivery if procedure fails, was discussed. Subjects were informed that participation is voluntary and they may withdraw any time during the procedure. After that detailed history was taken, clinical examination was done which includes, General physical examination, per-abdominal examination, per-vaginal examination and detailed obstetrical ultrasonography report was requested to confirm the diagnosis of breech presentation, the type of breech, localization of placenta, viability of the fetus, amount of liquor and estimated fetal weight. Cardiotocography was performed to confirm a normal reactive heart rate pattern. After the confirmation of diagnosis by ultrasound the procedure was performed. The ECV was carried out in labour room with external fetal monitor and ultrasound machine adjacent to bed and with full preparation for cesarean section, Anesthetist and pediatrician were informed, procedure was carried out by a senior obstetrician with sufficient expertise in performing ECV, No premedication was used except for anxiolytics that was given to the morning of ECV to anxious women only. Maternal cooperation and relaxation was obtained by proper explanation of the procedure, after that woman was positioned supine with a slight lateral tilt, first the buttocks of the fetus was displaced upward and laterally away from the pelvis to iliac fossa and then fetus was turn in direction of forward role gently by applying pressure to the buttocks using right hand as well as to the head using left hand. Sustained pressure for 5 minutes was enough as intermittent pressure my cause discomfort to mother, the success rate was improved by coinciding the application with fetal movements ,as the active baby turned itself quickly, after successful version the attitude of the fetus was maintained manually for few minutes. In case of success woman were allowed to go into spontaneous labour and called for follow-up after one week or if she gone in to the labour, but irrespective of outcome a cardiotocography repeat ultrasound and complete examination of the patient were done to assess the fetomaternal condition

and success of the procedure (spontaneous vaginal delivery).

Data Analysis: Data was analyzed by using statistical package for social science (SPSS) version 17.0. Mean and standard deviation was calculated for age and birth weight and parity. Frequency and percentage were calculated for success (spontaneous vaginal delivery) and parity. Stratification with respect to age and parity was done. Post stratification chi-square test was applied. P value ≤ 0.05 was taken as significant.

RESULTS

A total of 100 patients were included in the study. The mean age of patients was 27.60 years with standard deviation of 6.552 years. The minimum age of patients was 16 years, maximum age of patients was 40 years, range age of patients was 24 years, median age of patients was 28 years and mode age of patients was 23 years as shown in table 1.

Out of 100 patients, 40 patients were 16-24 years of age group, 33 patients were in 25-32 years of age group and 27 patients were in 33-40 years of age group.

Out of 100 patients, 22 patients were in 37 weeks of gestation, 28 patients were in 38 weeks of gestation, 31 patients were in 39 weeks of gestation and 19 patients were in 40 weeks of gestation.

24 patients were para-II, 28 patients were para-III, 32 patients were para-IV and 16 patients were para-V.

Out of 100 patients, 66 (66%) patients had efficacy (spontaneous vaginal delivery) after successful external cephalic version while 34 (34%) patients had no efficacy (spontaneous vaginal delivery) after successful external cephalic version.

Table No.1: Age statistics of patients in years

Total no of patients (n)	Valid	100
	Missing	0
Mean age of patients in years		27.60
Median age of patients in years		28
Mode age of patients in years		23
Std. Deviation		6.552
Range age of patients in years		24
Minimum age of patients in years		16
Maximum age of patients in years		40

26 patients in 16-24 years of age group had efficacy (spontaneous vaginal delivery) while 14 patients had no efficacy (spontaneous vaginal delivery), 22 patients in 25-32 years of age group had efficacy (spontaneous vaginal delivery) while 11 patients had no efficacy (spontaneous vaginal delivery) and 18 patients in 33-40

years of age had efficacy (spontaneous vaginal delivery) while 9 patients had no efficacy after successful external cephalic version with insignificant p value of 0.985 as shown in table no: 2

11 patients of 37 weeks of gestation had efficacy (spontaneous vaginal delivery) while 11 patients had no efficacy, 17 patients of 38 weeks of gestation had efficacy (spontaneous vaginal delivery) while 11 patients had no efficacy, 23 patients of 39 weeks of gestation had efficacy (spontaneous vaginal delivery) while 8 patients had no efficacy and 15 patients of 40 weeks gestation had efficacy (spontaneous vaginal delivery) while 4 patients had no efficacy after successful external cephalic version with insignificant p value of 0.157 as shown in table no: 3.

Table No.2: Comparison of efficacy (spontaneous vaginal delivery) after successful external cephalic version in different age group of patients

Age group of patients	Efficacy of external cephalic version (spontaneous vaginal delivery)		Total	p-value
	Yes	No		
16-24 years of age group	26 65.0%	14 35.0%	40 100.0%	0.985
25-32 years of age group	22 66.7%	11 33.3%	33 100.0%	
33-40 years of age group	18 66.7%	9 33.3%	27 100.0%	
Total	66 66.0%	34 34.0%	100 100.0%	

Table No.3: Comparison of efficacy (spontaneous vaginal delivery) after successful external cephalic version in different gestational age of patients

Gestational age of patients	Efficacy of external cephalic version (spontaneous vaginal delivery)		Total	P-value
	Yes	No		
37 weeks of gestation	11 50.0%	11 50.0%	22 100.0%	0.157
38 weeks of gestation	17 60.7%	11 39.3%	28 100.0%	
39 weeks of gestation	23 74.2%	8 25.8%	31 100.0%	
40 weeks of gestation	15 78.9%	4 21.1%	19 100.0%	
Total	66 66.0%	34 34.0%	100 100.0%	

15 patients of para-II had efficacy (spontaneous vaginal delivery) while 9 patients had no efficacy, 19 patients of para-III had efficacy (spontaneous vaginal delivery) while 9 patients had no efficacy, 21 patients of para-IV had efficacy (spontaneous vaginal delivery) while 11 patients had no efficacy and 11 patients of para-V had efficacy (spontaneous vaginal delivery) while 5 patients had no efficacy with insignificant p value of 0.973.

DISCUSSION

Breech presentation is a relatively less occurring condition (3-5% of all births), it is an important indication for caesarean section. External cephalic version is a procedure that externally rotates the fetus from a breech presentation to a vertex presentation. External version has made resurgence in the past 15 years because of a strong safety record and a success rate of about 65 percent. It increases risks and complications both for mother and fetus. Planned caesarean section is supported than planned vaginal birth for the fetus in breech presentation at term. ECV is one of the most effective procedures in modern obstetrics. It involves the manipulation of fetus externally to change the presentation of fetus from the breech into the cephalic presentation. A successful maneuver may will be cost imperative by avoiding operative deliveries and decreasing maternal morbidity.^{11,12}

In our study, out of 100 patients, 66 (66%) patients had efficacy (spontaneous vaginal delivery) after successful external cephalic version while 34 (34%) patients had no efficacy (spontaneous vaginal delivery) after successful external cephalic version. These results are comparable to the results of other study done locally and internationally.

A study conducted by Rauf B et al¹³ reported the findings of 40 patients were offered ECV. All singleton breech presentations with an otherwise normal antenatal course between 36-41 weeks of gestation were included in the study. Overall success rate was 67.5% with only 30% being primi-gravida ($p < 0.05$). Multi-gravida showed higher success rate of 80%. Following successful ECV, spontaneous vaginal delivery was attained in 77.7% ($n=21$), while caesarean section was performed due to various indications in about 6 cases ($p < 0.05$). Following failed version, 61.5% ($n=8$) had elective C/S and only 5 delivered vaginally. Route of delivery did not affect the perinatal outcome except for congenital abnormalities. Following successful ECV, there was only one stillbirth. Overall live births associated with successful version was 96.2% ($p < 0.05$), while in failed version, there were no fetal deaths.

In another study conducted by Arif W et al⁸ showed that forty women were included in the study. External cephalic version was successful in 60% patients. The majority (70.83%) of this group achieved the vaginal delivery. The rate of caesarean section was 29.16%.

The most common indication for caesarean section was fetal distress and failure to progress. There was no fetal or maternal adverse outcome except one in which membranes ruptured during the procedure. The majority of women were satisfied with external cephalic version.

In another study conducted by Rueangchainikhom W et al¹⁴ showed that all parturients who had completed 36 or more gestational weeks with singleton non-vertex fetus were included in the study. The participated 140 participants were singleton, pregnant women with non-vertex presentation. The success rate was 71.43% for ECV. Birth weight had a significant impact on the success rate of ECV. However, parity, maternal weight, gestational age, and placental site had no significant impact on ECV success rate. All fetuses in the present study were subsequently delivered without significant morbidity and no cases of perinatal mortality were recorded.

A study conducted by Ben-Arie A et al¹⁵ showed that two hundred and forty-nine parturients identified as having a breech presenting fetus after the 36th gestational week over a 3-year period, after excluding contraindicated cases, were offered a trial of ECV. ECV was done by one operator, using the minimally effective force necessary. Successful ECV was achieved in 196 attempts (78.7%). No side effects were reported in neither fetus nor mother. 78% eventually had a vaginal vertex delivery from the successfully turned fetuses. Introduction of the ECV protocol effected a significant decrease in breech presentation at term, from 3.9 to 2.4% ($P < 0.01$), which can be translated into a decrease of 5.5% in the overall cesarean section rate.

In another study conducted by Lojacono A et al¹⁶ showed that 89 women with fetal breech presentation underwent external cephalic version. The gestational age was 36.8 \pm 0.8 weeks. The following variables have been taken into consideration: breech variety, placental location, fetal back position, parity, amount of amniotic fluid and gestational age. The success rate of the procedure was 42.7% ($n=38$). No maternal or fetal complication or side effects occurred, both during and after the manoeuvre, except a transient fetal bradycardia that resolved spontaneously. Only one spontaneous reversion of the fetus occurred before delivery. Of all the women that underwent a successful version, 84.2% ($n=32$) had a non-complicated vaginal delivery. Five women (15.8%) had a caesarean section. There was no significant interaction between the variables assessed.

Giusti M, et al¹⁷ conducted study on 67 patients (age 29.5 \pm 3.8) with fetal breech presentation at gestational age 35.8 \pm 1.9 weeks. Every patient underwent ECV. The same physician had performed every ECV attempt using the forward roll technique. ECV succeeded in 77.6% ($n = 52$) and failed in 22.4% ($n = 15$) of cases. No maternal or fetal complications,

side effects and spontaneous breech version occurred and in 74.6% of cases (n = 50) a vaginal delivery was performed. In 25.4% of cases (n = 17) a caesarean section was performed (15 breech presentation, 1 fetal distress in labour and 1 cervical dystocia). Among variables examined related to successful ECV, it has been observed that the amount of amniotic fluid ($\chi^2 = 15.33$; $p < 0.0000$), the kind of tocolysis ($\chi^2 = 10.04$; $p < 0.007$) and the umbilical cord rounds ($\chi^2 = 3.98$; $p < 0.045$) were distributed in a significantly different way, whereas gestational age ($p < 0.045$) was significantly higher in unsuccessful ECV.

A study conducted by Policiano C et al¹⁸ showed that attempts of ECV were successful in 62 (46%) of 134 women, and 44 women whose fetuses remained in a cephalic presentation until delivery. The rates of intrapartum cesarean delivery and operative vaginal delivery did not differ significantly between cases and controls (intrapartum cesarean delivery, 9 [20%] vs 16 [18%], $P=0.75$; operative vaginal delivery, 14 [32%] vs 19 [22%], $P=0.20$). The indications for cesarean delivery after successful ECV did not differ; in both groups, cesarean delivery was mainly performed for labor arrest disorders (cases, 6 [67%] vs controls, 13 [81%]; $P=0.63$).

In another study conducted by Jabeen S, et al¹⁹ showed that most of the patients in this study were multiparous. Success rate of ECV in this study was 50%. Out of this successful group 88% persisted as cephalic and 12% experienced reversion of their fetuses to breech. Normal vaginal delivery rate was 80% in the successful ECV group. Remaining cases underwent emergency caesarean section either due to spontaneous reversion to breech or fetal distress of cephalic fetuses in labour. Unsuccessful ECV group constitute 50% of cases. Elective caesarean delivery rate was high i.e. 96% in this group. Only one had vaginal breech delivery. The remaining underwent emergency caesarean section for various indications including footling breech, delayed progress in first stage of labour or at patient's request. Multiparity was the factor associated with greater success. No relationship could be found of the birth weight of fetus with the success of procedure in this study. No complication was observed during and after ECV.

CONCLUSION

External cephalic version is a safe procedure with a high success rate. The major benefits of external cephalic version are reduced maternal morbidity and mortality from surgery. All the pregnant women with uncomplicated breech presentation should be offered external cephalic version when they are approaching term. This will provide an alternate management option without causing any harm to them and their fetuses. This will also help in reducing the number of caesarean sections for breech presentation.

Author's Contribution:

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