

## External Cephalic Version: A Dying Art Worth Reviving

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### About the Author



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### Abstract

**Purpose** Breech presentation is the most common abnormal presentation occurring in 3–4% of all deliveries. Incidence of caesarean section for breech presentation has

increased markedly in the last few decades. Attempting external cephalic version (ECV) reduces the chance of non-cephalic presentation at term, thus reducing the rate of caesarean sections.

**Methods** Prospective study was conducted in secondary healthcare centre, in rural set-up from August 2013 to August 2015. A total of 52 patients were enrolled into the study.

**Results** ECV was successful in 32 out of 52 patients with overall success of 61.5%. Out of the 32 successful ECVs, 24 patients delivered vaginally (75%) ( $p$  value 0.00), 6

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patients delivered by caesarean section, and 2 patients were lost to follow-up. Transverse lie had 100% success rate for ECV ( $p$  value 0.005). Gravidity, placental position, gestational age and use of tocolytics did not influence the success rate of ECV. Most common problem observed during the procedure was abdominal discomfort.

**Conclusion** ECV is a safe procedure with high percentage of patients delivering vaginally after successful version. Hence, acquiring skills in ECV should be considered mandatory in the postgraduate training of future obstetricians.

**Keyword** Breech presentation · Transverse lie · External cephalic version (ECV)

## Introduction

Breech presentation is the most common abnormal presentation occurring in 3–4% of all deliveries [1]. With the passage of time, the art of assisted breech delivery has suffered significant setback. Most of the cases of unfavourable presentation like breech are subjected to caesarean section in the current obstetric practice. Advances in anaesthesia, safe blood transfusion and newer antibiotics have led to marked liberalization of the indications for caesarean section. Ever since the publication of term breech trial, the incidence of caesarean section for breech presentation has increased markedly [2]. The trial concluded that elective caesarean section might be considered safer for the foetus. Caesarean section is associated with an increased risk of maternal morbidity, both in the index and subsequent pregnancies [3]. Also caesarean section has financial burden to the patient and the country. It is therefore rational to correct breech presentation in late pregnancy by performing external cephalic version [ECV]. Low cost, ease of procedure and no need for patient preparation are the advantages of ECV. Attempting cephalic version at term reduces the chance of non-cephalic births (54%) and caesarean section (33%) [4]. External cephalic version over the last decade has gained popularity due to the following reasons:

- Fewer residents are being adequately trained in breech vaginal delivery.
- ECV is a safe procedure.
- Medico-legally, breech vaginal delivery is considered a liability.
- Elective caesarean delivery for breech has greater economic burden on healthcare providers.

## Objectives

Primary outcome is to study the success rate of ECV in a peripheral community healthcare setting. Perinatal

outcome and factors influencing the success rate are considered as secondary outcomes. Also, the mode of delivery in women who had successful ECV was analysed.

## Inclusion Criteria

We have included all pregnant women, primigravida or multigravida, with breech presentation or transverse lie between 36 and 42 weeks of gestation or in very early labour. A reactive NST before the procedure was mandatory.

## Exclusion Criteria

After counselling, if a woman with breech presentation was not willing for ECV, she was given the options of elective caesarean section or vaginal breech delivery after discussing their pros and cons. Women with leaking or bleeding per vagina or those with amniotic fluid index (AFI) less than 5cms were excluded from the study. ECV was not tried in cases of foetal growth restriction with compromised Doppler parameters and in dead or anomalous foetus. Women with multiple gestation or prior uterine surgery were also excluded.

## Materials and Methods

It was a prospective study conducted in secondary health-care centre, in rural set-up, with round-the-clock operation theatre facilities. The study was conducted from August 2013 to August 2015. A total of 52 patients who fulfilled the above criteria were included in the study. After obtaining an informed written consent, an ultrasound scan was performed to assess foetal growth, AFI, placenta position, position of the foetus and type of breech. Foetal presentation after ECV was confirmed by ultrasound. Non-stress test (NST) was performed before and after the procedure, and the foetus was monitored intermittently. Before starting the procedure, women were asked to empty bladder and lie on a cot in a relaxed supine position with flexed knees. Either a single dose of subcutaneous terbutaline 0.25 mg, 15 min before the attempt, or oral nifedipine 30 mg, half an hour prior to the attempt, was used as tocolytic in selective women where manipulation might pose difficulty due to tight abdominal wall. If nifedipine was used, maternal PR and BP were recorded every 15 min for 2 h. Forward roll was attempted first in all patients; if unsuccessful, backward roll was attempted. After ECV, the patient was kept under observation for 1–2 h. The procedure was deemed to be discontinued if the foetal heartbeat was not considered optimal at any point during the procedure, in cases where a woman reported undue discomfort

or baby would not budge after 2 or 3 attempts. In a few cases of engaged breech, the woman is made to lie down with her hips lifted up with supports, for half an hour to disengage the presenting part and then ECV attempted. After the procedure, the patient was asked to come for her regular visits as advised, until delivery. The patients with failed ECV were offered another ECV at a later date if they were willing or planned for an elective caesarean section. There were no patients with rhesus-negative blood group in the present study.

### Statistical Data Analysis

The collected data were analysed with IBM SPSS statistics software 23.0 version. Descriptive statistics frequency analysis was used to describe the data, percentage analysis was used for categorical variables, and the mean and SD were used for continuous variables. To find the significant difference between the bivariate samples in independent groups, the unpaired sample t-test was used. To find the significance in categorical data, Chi-square test was used. In all the above statistical tools, the probability value of  $< 0.05$  was considered significant.

### Results

Total 52 patients were included in the study, 32 patients had successful ECV, with success rate of 61.5% (Fig. 1).

We observe that foetuses with transverse lie had 100% success rate after ECV ( $p = 0.005$ ) (Table 1).

Placenta position did not have any bearing on the success of ECV ( $p = 0.418$ ) (Table 1).

The success of ECV improves with the usage of tocolytics ( $p = 0.015$ ), but there was no significant difference between nifedine or terbutaline on the success of ECV (Table 1).

As shown in Table 1, gestational age did not influence the success of ECV ( $p = 0.178$ ).

Average weight in successful group was 2.85 kg and in failed group was 2.79 kg.

So, in our study, parity, gestational age, placental position or foetal weight doesn't influence significantly the success of ECV.

There were no major complications except for pain. No maternal or perinatal mortality has been reported.

Out of the 32 successful ECVs, 29 cases (90.6%) remained as cephalic presentation, one case reverted back to breech in which ECV was attempted at three different times and finally delivered vaginally as cephalic presentation, 2 patients were lost to follow up in the successful

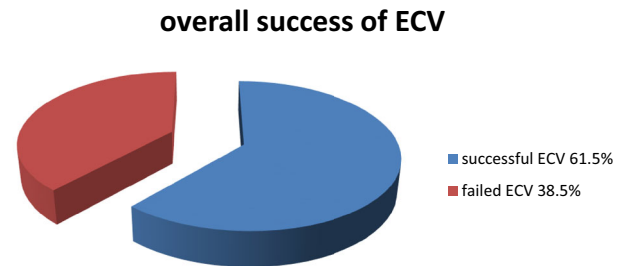


Fig. 1 Outcome of external cephalic version

group. Out of these 29 cases, 24 delivered vaginally, i.e. 75% patients in the successful group delivered vaginally.

Out of 20 patients in the failed group, 17 (85%) delivered by elective LSCS after counselling and 3 patients were lost to follow-up.

### Discussion

The result of our study shows that ECV at term reduces the incidence of non-cephalic presentation and hence the rate of caesarean section. In our study, success of ECV had been 61.5% very much similar to the result of Gottvall and Ginstman [5] wherein the overall success rate was 62%. The wide variation in the success of ECV can be attributed to the difference in the parity of the study groups. Out of 52 patients in our study, 32 patients (61.5%) were primigravida; ECV was successful in 17 patients (53%) in primigravida group and 15 patients (75%) in multigravida. Generally, ECV attempts are more successful in multigravida, due to lax abdominal wall [6, 7], thereby facilitating manipulation of the baby. But, in our study, though the success rate was more in multigravida, it was not statistically significant ( $p = 0.156$ ).

Another important factor that influences ECV is the lie of the foetus. Foetuses with transverse lie are easier to turn compared to breech babies, as evident in our study, with a success rate of 100% ( $p = 0.005$ ). Other studies have also reported high success rate with transverse lie [7, 8].

It is a common thought that flexed breech require less force and fewer attempts in comparison with extended breech, where splinting effect of extended legs might prevent the baby from turning. But in our study, the type of breech did not influence the success of ECV. ECV was successful in 19 patients (73%) of flexed breech and 6 patients (31%) of frank breech, which is not statistically significant. Similar results were shown in many studies [7, 9].

Another factor that most of the studies have related to the success of ECV is the position of the placenta. Kok et al. [7] had shown that in pregnancies with posterior

**Table 1** ECV outcome studied against various variables

|                                | Total nos.  | ECV success |             | Statistical value, significance |
|--------------------------------|-------------|-------------|-------------|---------------------------------|
|                                |             | Yes         | No          |                                 |
| <b>Gravidity</b>               |             |             |             |                                 |
| Primigravida                   | 32 (61.5%)  | 17 (53.13%) | 15 (46.87%) | $\chi^2 = 3.7, df = 2$          |
| Multigravida                   | 20 (38.5%)  | 15 (75.00%) | 5 (25.00%)  | $p > 0.156$ , non-significant   |
| <b>Position of foetus</b>      |             |             |             |                                 |
| Transverse lie                 | 7 (13.40%)  | 7 (100.00%) | 0 (0%)      | $\chi^2 = 13.043, df = 3$       |
| Extended breech                | 19 (36.50%) | 6 (31.57%)  | 13 (68.42%) | $p = 0.005$ , significant       |
| Flexed breech                  | 26 (50.00%) | 19 (73.08%) | 7 (26.92%)  |                                 |
| <b>Placental position</b>      |             |             |             |                                 |
| Anterior                       | 16 (30.77%) | 8 (50.00%)  | 8 (50.00%)  | $\chi^2 = 3.910, df = 4$        |
| Posterior                      | 29 (55.77%) | 19 (65.52%) | 10 (34.48%) | $p = 0.418$ , non-significant   |
| Fundal                         | 6 (11.54%)  | 5 (83.33%)  | 1 (16.67%)  |                                 |
| Right lateral                  | 1 (1.92%)   | 0 (0.00%)   | 1 (100.00%) |                                 |
| <b>Tocolytics</b>              |             |             |             |                                 |
| No tocolytics                  | 14 (26.92%) | 13 (92.86%) | 1 (7.14%)   | $\chi^2 = 8.417, df = 2$        |
| Nifedipine                     | 14 (26.92%) | 6 (42.86%)  | 8 (57.14%)  | $p = 0.015$ , significant       |
| Terbutaline                    | 24 (46.16%) | 13 (54.17%) | 11 (45.83%) |                                 |
| <b>Gestational age (weeks)</b> |             |             |             |                                 |
| 36–36.6                        | 8 (15.39%)  | 6 (75.00%)  | 2 (25.00%)  | $\chi^2 = 6.299, df = 4$        |
| 37–37.6                        | 25 (48.07%) | 12 (48.00%) | 13 (52.00%) | $p = 0.178$ , non-significant   |
| 38–38.6                        | 13 (25.00%) | 8 (61.54%)  | 5 (38.46%)  |                                 |
| 39–39.6                        | 4 (7.69%)   | 4 (100.00%) | 0 (0.00%)   |                                 |
| 40–40.6                        | 2 (3.85%)   | 2 (100.00%) | 0 (0.00%)   |                                 |

placentation, ECV was more successful. In our study, 29 patients (55.7%) had posterior placenta and ECV was successful in 19 patients (65.5%); this was not statistically significant ( $p = 0.418$ ). Even in the case of transverse lie that had ECV success rate of 100% in the present study, placental position did not have any bearing with the success rate. Out of 7 patients with transverse lie, 4 had posterior placenta, 2 had anterior placenta, and 1 had fundal placenta.

In our study, the administration of tocolytics statistically improved the success rate ( $p = 0.015$ ). 13 (40.6%) out of 32 successful ECV cases did not require tocolytics. There was no statistical difference in the success rate with terbutaline or nifedipine as tocolytics. There have been studies which have concluded that, there is no need of using tocolytics as there is no statistical significance in the success rate of ECV with tocolytics [10].

Complications associated with ECV, such as pre-term labour, premature/pre-labour rupture of membranes, abruption, non-reassuring foetal heart trace, are very rare. Collins et al. [11] reported 0.5% risk of emergency caesarean section after ECV. We did not have any complications, and there was not a single incident where we had to rush to theatre for foetal distress. Even though the

complications with the procedure are rare, it is always advisable to perform ECV in a setting where emergency management is feasible.

Most common problem observed was pain or abdominal discomfort during or after the procedure, which was well tolerated and subsided after a few minutes without the need for analgesics. Only one patient was admitted due to pain but was discharged after conservative management.

The details of the mode of delivery are shown in Table 2. Almost all successful versions remained in cephalic position except one that required re-version 3 times before a stabilizing induction was done. One failed version turned spontaneously to transverse lie. Out of 32 successful cases, 24 delivered vaginally (75%) which is statistically significant ( $p = 0.000$ ), and 2 patients were lost to follow-up. Had they been taken into account, probably the percentage of normal deliveries would have been still higher, even up to 80%. Similar vaginal delivery rate was seen in few studies [6, 12]. All 17 patients in the failed group were delivered by caesarean section, and 3 patients in the failed group were lost to follow-up.

One limitation of the study is that sample size was small. ECV was not done by the same person in all the patients, but the procedure was considered as failed only after it has

**Table 2** Mode of delivery in the present study

| Mode of delivery  | ECV         |            | Statistical value, significance |
|-------------------|-------------|------------|---------------------------------|
|                   | Yes         | No         |                                 |
| Vaginal delivery  | 24 (46.16%) | 24 (100%)  | $\chi^2 = 30.094, df = 4$       |
| Caesarean         | 23 (44.23%) | 6 (26.09%) | $p = 0.00, \text{significant}$  |
| Lost to follow-up | 5 (9.61%)   | 2 (40.00%) | 3 (60.00%)                      |

been tried by a consultant. There were some missing data like BMI which did not enable us to calculate the prediction of success probability.

## Conclusion

ECV at term reduces non-cephalic presentation by 61.5% and is considered a safe procedure. A high percentage of patients in successful group have delivered vaginally, thereby reiterating its routine implementation in pregnancies with non-cephalic presentations. It should be emphasized that all term patients with non-cephalic presentation, having no contraindications for ECV, should be offered and counselled about ECV. The art of performing ECV and acquiring skills in ECV should be considered mandatory in the postgraduate training of future obstetricians.

## Compliance with Ethical Standards

**Conflict of interest** The authors declare that there is no conflict of interest in the present study.

**Ethical Approval** All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards.

**Human and Animals Rights** No animals were involved in the present study. In cases, humans were involved.

**Informed Consent** Informed consent was obtained from all the eligible women for participating in the study.

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