Safety and efficacy of external cephalic version for women with a previous cesarean delivery

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1. Introduction

Breech presentation at term occurs in 3–4% of all pregnancies [1,2]. The Term Breech Trial [3] virtually eliminated the vaginal breech delivery in developed countries. Consequently, breech presentation became the third most common reason for cesarean delivery (CD), and in most hospitals, almost all breech-presenting fetuses are currently delivered by cesarean [4,5].

Before the publication of the Term Breech Trial results [3], the recommended options for women with breech presentation and previous CD were a trial of labor and vaginal delivery [6], or CD [7]. A third option that was often not mentioned as an equal option at the time and is gaining favor is external cephalic version (ECV) with the goal of vaginal delivery [8,9].

Prior CD is considered a relative contraindication for a trial of ECV despite no clear evidence for serious complications or risks [10]. Even though, since the 1990s there have been encouraging reports of the efficacy and safety of ECV in women with a previous CD and a breech-presenting fetus [11–14], still today an ACOG publication states that ‘scant evidence exists regarding ECV in women with previous CD’ [15]. Information on safety and outcomes of a given treatment such as ECV is important for patients to make informed, evidence based decisions.

It is our aim in this study to evaluate for ECV the success and risk rates in women with one previous CD and a breech-presenting fetus at term. We also present the outcome of these pregnancies in comparison to women that had an ECV without a previous CD.

2. Materials and methods

The study population consisted of all women at our institution with a singleton pregnancy and one previous CD who had an attempted ECV at or after 37 weeks of gestation between January 1997 and June 2005. A literature review was also performed as a Medline search (1966–2006).

Results: ECV was attempted for 42 women with a breech-presenting fetus and previous CD. The success rate of ECV was 74.0%, and 84% of women with successful ECV delivered vaginally. All fetal and maternal outcomes were favorable. Only four Medline reports met our inclusion criteria, representing a total of 124 patients and a mean ECV success rate of 76.6%. Thus we assessed 166 cases of attempted ECV and find an average ECV success rate of 76.5% and favorable fetal and maternal outcomes.

Conclusions: Women with a breech-presenting fetus at term and previous CD, who desire a trial of labor, should be counseled regarding the accumulating evidence about the efficacy and apparently safety of this procedure and may be offered an ECV attempt.
were performed in the delivery room by an experienced senior obstetrician with the aid of sonography, followed by a biophysical profile and non-stress fetal heart rate testing. Tocolysis by intravenous Ritodrine (until 2003 – a dose of 50 μg/500 ml in a continuous drip) or oral Nifedipine (from 2003 onward – a single oral dose of 20 mg) was used unless the patient had a contraindication for these medications.

Following the ECV procedure (both successful and unsuccessful) and after a reassuring FHR was recorded, the patient was discharged for routine obstetric care until resumption of spontaneous labor. No woman had a second trial of ECV.

Before the attempted ECV, the following maternal demographic and obstetric parameters were collected: parity, weight, height, placental location, fetal weight estimation, type of non-cephalic presentation, and AFI. The study group was compared to our multiparous ECV population from the same time period. This study was approved by the institutional IRB.

A Medline search for studies published between January 1966 and March 2008 was performed using the search terms “cephalic”, “version”, and, “cesarean.” References in the returned publications were also screened. Studies providing unclear or insufficient data were discarded. Inclusion criteria were: a singleton breech presentation, and normal fetal anatomy.

### 3. Results

Of the 603 ECV attempts during the study period, 42 women had previous CD. Maternal characteristics of the study population are presented in Table 1.

#### 3.1. Success rate

The success rate of ECV in the study group was 73.8% (31/42). The success rate of ECV in multiparae in our general ECV population was 72.3% (251/347). Fifteen women without previous CD were discarded. Inclusion criteria were: a singleton breech pregnancy, external version not earlier than 36 weeks of gestation, and a successful labor. No woman had a second trial of ECV.

The success rate in women with at least one prior vaginal delivery and women who had only one previous CD before the present pregnancy was 74% (20/27) and 73.3% (11/15), respectively. In a univariate model, no factor was found to be significantly associated with ECV failure (Table 1). Posterior placenta was the only parameter that differed significantly between women with successful and failed ECV.

### 3.2. Labor and delivery

Thirty women, who had successful ECV, underwent a trial of labor. One woman of the successful ECV group had an elective CD. The CD rate following successful ECV in patients who presented in active labor with cephalic presentation was 13.3% (4/30), as compared to 9.7% (36/368) in our general ECV population. The rate of CD in our population with a trial of labor after CD was 11%. Sixty-four percent (27/42) of all women who underwent a trial of ECV delivered vaginally. Eighty-four percent (26/31) of all women with successful ECV, were delivered vaginally and 91% (10/11) with failed ECV delivered by CD. There was one case of a vaginal breech delivery. No fetus had a spontaneous version to cephalic presentation. Indications for CD in the successful ECV group were arrest of dilatation (3/4) and non-reassuring FHR (1/4). There was no case of asymptomatic scar dehiscence or rupture.

Of the 162 publications from the Medline search, only four reports met the inclusion criteria [8–10,14]. These reports included 11–56 cases. A total of 124 cases from these publications were included. The mean success rate for ECV was 76.6%, and ranged between 65.8% and 100%. Among successfully turned fetuses, the rate of vaginal delivery was 54.5–76% (Table 2).

#### 3.3. Neonatal outcomes

All newborns had 5 min Apgar scores > 7, and no newborn was admitted to NICU.

### Table 1

Comparison of maternal characteristics: study population (one previous CD) and multipara (no previous CD) undergoing ECV (univariate model).

<table>
<thead>
<tr>
<th>Parity (mean ± S.D.)*</th>
<th>Multipara no previous CD N = 298</th>
<th>ECV post-CD N = 42</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.38 ± 1.74</td>
<td>2.9 ± 2.03</td>
<td>0.823</td>
<td></td>
</tr>
<tr>
<td>BMI (mean ± S.D.) (missing data)*</td>
<td>27.3 ± 4.1 (22)</td>
<td>27.8 ± 3.7</td>
<td>0.895</td>
</tr>
<tr>
<td>Polymidramnios</td>
<td>0.36</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appropriate</td>
<td>5 (1.7%)</td>
<td>0 (0%)</td>
<td>0.36</td>
</tr>
<tr>
<td>Polyhydramnios</td>
<td>259 (90.2%)</td>
<td>37 (92.5%)</td>
<td></td>
</tr>
<tr>
<td>Missing data</td>
<td>23 (8%)</td>
<td>3 (7.5%)</td>
<td></td>
</tr>
<tr>
<td>Placental location (no.)*</td>
<td>11 (2%)</td>
<td>2 (0.5%)</td>
<td></td>
</tr>
<tr>
<td>Anterior</td>
<td>98 (36.8%)</td>
<td>9 (35%)</td>
<td>0.322</td>
</tr>
<tr>
<td>Posterior</td>
<td>89 (33.5%)</td>
<td>9 (35%)</td>
<td></td>
</tr>
<tr>
<td>Fundal</td>
<td>59 (22.2%)</td>
<td>8 (30%)</td>
<td>0.119</td>
</tr>
<tr>
<td>Corner</td>
<td>20 (7.5%)</td>
<td>0 (0%)</td>
<td></td>
</tr>
<tr>
<td>Missing data</td>
<td>30 (10.2%)</td>
<td>16 (5.1%)</td>
<td></td>
</tr>
<tr>
<td>Type of breech (no.)*</td>
<td>0.119</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frank</td>
<td>106 (38.7%)</td>
<td>11 (30%)</td>
<td></td>
</tr>
<tr>
<td>Complete</td>
<td>160 (58.4%)</td>
<td>26 (68.5%)</td>
<td></td>
</tr>
<tr>
<td>Incomplete</td>
<td>8 (2.9%)</td>
<td>1 (2.9%)</td>
<td></td>
</tr>
<tr>
<td>Missing data</td>
<td>24 (8.2%)</td>
<td>4 (1.9%)</td>
<td></td>
</tr>
<tr>
<td>Sonographic EFW (mean ± S.D.) (missing data)**</td>
<td>3069 ± 435 g (30)</td>
<td>3044 ± 437 g (3)</td>
<td>0.63</td>
</tr>
<tr>
<td>Clinical EFW (mean ± S.D.) (missing data)**</td>
<td>3116 ± 440 g (12)</td>
<td>3037 ± 407 (2)</td>
<td>0.522</td>
</tr>
<tr>
<td>Lag to delivery (days) (mean ± S.D.) (missing data)**</td>
<td>9.3 ± 8.65 (24)</td>
<td>9.1 ± 7.1 (6)</td>
<td>0.412</td>
</tr>
</tbody>
</table>

BMI, body mass index; AFI, amniotic fluid index; EFW, estimated fetal weight.

*, by Fisher’s exact test; **, by Student t-test.
we studied 42 women with one previous CD and breech-presenting fetuses who went through an ECV attempt. The 74% success rate of ECV was comparable to that of the total population of multiparae in our center, and to the success rate described in the literature for such women. The positive association between posterior placenta and success rate of ECV has been reported previously [16].

Adding data from our institution to cases included from the literature, ECV was performed in 166 women with one previous CD, with an average success rate of 76.5% (Table 2). This success rate is comparable to the published success rate for ECV in the normal population. Consistently, in two studies that included a control group the success rate of ECV was essentially the same: Regalia et al. [14] report 68% vs. 63% and Flamm et al. [13] report 82% vs. 61%. The small differences between the groups in these reports are attributed to a larger proportion of cases of increased parity in the CD group with a previous CD.

In our series, one patient had a transiently abnormal fetal heart rate (FHR) (2.5%). One of 38 women (2.5%), suffered from vaginal bleeding that resolved spontaneously in the series of de-Meeus et al. [11]. In the series of Schachter et al. [12], one of 11 women (9%), had a transiently abnormal FHR. In the series of Flamm et al. [13], one of 56 women had an abnormal FHR that necessitated CD (1.8%). Integrating all of these reports, there were no serious maternal or fetal complications, and all fetal and maternal outcomes were favorable with a rate of emergency CD of only 0.6% (1/166 cases). In one report [13], the ECV success rate decreased when breech presentation was the primary indication for the previous CD. However, in all other reports, the vaginal delivery rate was higher in patients who had at least one previous vaginal delivery and a successful ECV attempt. Successful ECV after one CD should decrease both the immediate and the long-term risks of CD, as CD is associated with a small increase in short-term maternal morbidity [3,17,18]. Multiple CDs may increase the risk for complications during the peri-operative period, and each CD may increase the risk for abnormal placenta.

In previous studies on ECV either women with a prior CD were excluded [19], or this information was discarded. Furthermore, in the last 3 years, the safety of ECV has been evaluated for almost 10,000 attempts in two large reviews and a large single-center study [20–22]. However, safety of ECV was not analyzed with respect to prior CD. In one of the largest single-center studies of 805 cases, there were 31 women with previous CD who underwent a trial of ECV on an individual basis [22]. Neither the success rate nor the complication rate of ECV in this sub-group was reported. However, in their table describing all complication, there was no case of uterine rupture or scar dehiscence.

Complications reported in these articles were that 5.7% had transiently abnormal cardiotocography patterns, a range of 0.37–1.1% had persistent pathological non-stress test, and vaginal bleeding occurred in 0.3–0.47% of the cases. Our series directly addresses the uncommon situation of women with a previous CD and a breech-presenting fetus who wish to deliver vaginally.

The latest guidelines of both the American College of Obstetricians and Gynecologists (ACOG) and the British Royal College of Obstetricians and Gynecologists (RCOG) recommend the use of ECV to reduce the rate of breech presentations at term [23,24]. Moreover, a recent ACOG practice bulletin states that “Obstetrician should offer and perform ECV whenever possible.” ECV is recommended because it is a proven maneuver that reduces CD rate [10]. The reported success rate of ECV varies from 35% to 76% [15,25–29]. ECV reduces both the incidence of breech presentation at delivery and the CD rate [10]. An ACOG committee opinion of 2006 [23] recommends ECV whenever possible even though an ACOG practice bulletin of 2000 [15] states that “scar evidence exists regarding ECV in women with previous CD.” Well-designed studies to resolve this equivocation are impractical due to the small proportion of this circumstance within the general population of delivering women.

In modern obstetrics the options for women with a breech-presenting fetus and previous CD are repeat CD or a trial of labor after successful ECV. The results of ECV after previous CD are encouraging with a success rate of more than 75% with no obvious adverse events, and a probability of normal vaginal delivery of more than 85%. We may conclude that women with breech presentation at term who desire a trial of labor after CD should be counseled regarding the accumulating evidence about the efficacy and likelihood of safety of this procedure and they may offered an ECV attempt.

References