

# EXTERNAL CEPHALIC VERSION AS AN OPPORTUNITY TO REDUCE THE PERCENTAGE OF ELECTIVE CAESAREAN SECTIONS

Jadwiga Surówka<sup>1A,B,C,D,E,F</sup>, Marek Klimek<sup>2A,B,C,D,E,F</sup>

<sup>1</sup>Doctoral School of Medical and Health Sciences, Jagiellonian University Medical College, Krakow, Poland

<sup>2</sup>Department of Maternal and Child Health, Institute of Nursing and Midwifery, Faculty of Health Sciences, Jagiellonian University Medical College, Krakow, Poland

## Authors' contribution:

A. Study design/planning • B. Data collection/entry • C. Data analysis/statistics • D. Data interpretation • E. Preparation of manuscript • F. Literature analysis/search • G. Funds collection

## Address for correspondence:

Jadwiga Surówka  
Doctoral School of Medical and Health Sciences  
Jagiellonian University Medical College  
Krakow, Poland  
e-mail: [jadwiga.surowka@doctoral.uj.edu.pl](mailto:jadwiga.surowka@doctoral.uj.edu.pl)

SUBMITTED: 12.12.2022

ACCEPTED: 23.01.2023

DOI: <https://doi.org/10.5114/ppiel.2023.129132>

## ABSTRACT

Non-cephalic foetal positions account for about 3-4% of all timed deliveries. According to the recommendations of the Polish Society of Gynaecologists and Obstetricians on caesarean section, in the case of a non-cephalic position of the foetus in a singleton pregnancy, the pregnant woman should be offered external cephalic version (ECV). ECV aims to achieve the head position of the foetus, using manual rotation performed through the abdominal shell, under constant ultrasound guidance. Before the procedure is performed, the pregnant woman undergoes the appropriate qualification, and factors that can affect the success or failure of the ECV attempt are analysed. As the literature indicates, to date, not all factors predisposing to the success or failure of the procedure have been recognised and unequivocally confirmed. Successful rotation and achievement of the foetal head position give pregnant women a chance to undergo vaginal delivery, potentially influencing a lower rate of elective caesarean sections.

**Key words:** external cephalic version, breech presentation, labour.

## INTRODUCTION

The American College of Obstetricians and Gynecologists in 2020 addressed external cephalic version (ECV) as a technique that has gained renewed popularity in obstetrics and offers the opportunity to reduce the exponentially increasing number of caesarean sections in the United States [1]. According to the recommendations of the Polish Society of Gynaecologists and Obstetricians on caesarean section, in the case of a non-cephalic presentation in a singleton pregnancy, the pregnant woman should receive an external cephalic version [2].

In Poland, despite increasing access in recent years to places where ECV is attempted, pregnant women are often forced to travel between provinces, travelling many kilometres to attempt foetal turnover. The aforementioned opportunities are provided mainly by large cities. After a successful procedure and obtaining the head position of the foetus, the pregnant woman then delivers at a local facility, in the place where they live, not necessarily in the facility where the procedure was performed.

In the United States the overall ECV success rate is about 53%, but the success rate varies among different ethnic groups [3]. ECV success rates after previous caesarean section range from 50% to 100%, and

subsequent vaginal delivery rates range from 50% to about 75% [4].

## NON-CEPHALIC FOETAL PRESENTATION

The non-cephalic foetal position accounts for about 3-4% of all term births and is more common in primiparous women [5]. Due to the abnormal foetal position and the high risk of perinatal complications, the non-cephalic presentation of the foetus in primiparous women is a relative indication for a caesarean section [2].

The non-cephalic presentation is more common in preterm births. Before the 28<sup>th</sup> week of pregnancy, the non-cephalic presentation occurs in 25% of pregnant women. After a few more weeks, at the 32<sup>nd</sup> week of pregnancy, the occurrence of non-cephalic presentation is found only in the case of 7% of pregnancies. Furthermore, the earlier occurrence of the non-cephalic presentation predisposes to a recurrence of the inappropriate foetal position in subsequent pregnancies. Studies also indicate that a previous caesarean section doubles the incidence of foetal malposition in a subsequent pregnancy [5].

Foetal non-cephalic presentations can be associated with anatomical abnormalities of the bony pelvis, uterus, and the appearance of foetal malfor-

mations, among other factors. The main factors contributing to abnormal foetal positioning on the part of the pregnant woman include a compressed pelvis, a unicornuate uterus, a bicornuate uterus or one with a partial septum, and uterine myomas. Abnormalities in the structure and location of the placenta should also be taken into account, especially the previa of the placenta and its variants. Pathologies associated with foetal malformations, mainly hydrocephalus and other abnormalities of the foetal craniofacial structure, make it difficult to achieve a cephalic position. Any abnormalities that lead to reduced foetal mobility in utero predispose to a non-cephalic presentation. Twin pregnancies are also a factor in reduced foetal mobility in utero. Mature neonates born in a non-cephalic presentation have poorer perinatal outcomes compared to neonates positioned head-down, regardless of how the pregnancy was completed [6].

The non-cephalic presentation of the foetus can be divided based on the location of the anterior part. We distinguish between the complete breech presentation and the incomplete breech presentation. In the complete breech presentation, the buttocks and feet are anterior, and the legs are flexed at all joints. In the frank breech position, only the buttocks are anterior, the legs are flexed at the hip joints, and positioned along the foetal belly. Other existing varieties of positioning, with the non-cephalic presentation, such as footling breech, kneeling breech position or incomplete position, are formed only at a certain stage of advancement of labour from the non-cephalic presentation. Abnormal non-head foetal positions also include transverse and oblique positions. Together, they account for about 1% among all foetal positions in the uterus. Inscribed in them are also slight deviations from the longitudinal position. The aforementioned situation occurs when the head of the foetus shifts slightly toward the plate of one of the hip bones. The factors leading to the occurrence of the oblique and transverse positions are similar to those of the non-cephalic presentation. If the transverse position occurs in a primigravida, it can be identified with the appearance of birth incommensurability. The oblique and transverse positions represent a transition stage in the rotation of the foetus from the non-cephalic presentation to the head position. The transverse position is a position that carries special obstetric risks for the mother and foetus, the most unfavourable in obstetrics. No viable foetus can be born spontaneously from this position [7].

## EXTERNAL CEPHALIC VERSION

External cephalic version aims to obtain the foetal head-down position, using manual rotation performed through the abdominal shell, under constant ultrasound guidance. ECV is performed by an exper-

perienced obstetrician. It is a recommended procedure for pregnant women who have a foetus in a non-cephalic presentation after the 36<sup>th</sup> week of pregnancy. Attempting ECV and achieving a head position of the foetus gives pregnant women the opportunity to attempt a natural delivery [8].

The practise of ECV dates back to the time of Hippocrates (460-377 BC).

It is also known that Aristotle (384-322 BC) described foetal rotation, recommending that it be advised to pregnant women of the time. Soranus of Ephesus (98-138 AD), a Greek physician and philosopher, one of the forerunners of obstetrics and gynaecology, also mentioned ECV in his works as a method to reduce complications associated with vaginal delivery. Over the following centuries, the practise of rotation gradually gained popularity, and by the 1970s it had become an integral part of routine obstetric practice. Subsequently, due to reports describing significant perinatal mortality associated with turnover performed during pregnancy, the technique lost its value. However, in the 1990s, with increased access to ultrasound and the development of multispecialty monitoring of foetal well-being, ECV was recognised as safe and had a high success rate [9].

## QUALIFICATION OF A PREGNANT WOMAN FOR ECV

Once a foetal position other than head position is diagnosed in a singleton pregnancy, the pregnant woman should be offered an ECV. The basic criterion is the willingness of the pregnant woman to attempt an ECV and the obtaining of informed consent, the pregnant woman having been acquainted with the factors that may reduce the chance of a successful rotation, as well as the complications that may arise. Then a preliminary assessment of the conditions for performing the rotation is necessary, and the final qualification, always carried out in the department on the day the procedure, is performed. No referral from the doctor in charge of the pregnancy is needed to undergo qualification before ECV. In primiparous women, ECV can be performed after the 36<sup>th</sup> week of pregnancy. In multiparous women, it is recommended that the rotation be performed, no earlier than after the 37<sup>th</sup> week of pregnancy. Previous studies have shown that performing a rotation between the 34<sup>th</sup> and 36<sup>th</sup> weeks of pregnancy, despite its high efficacy, increased the incidence of preterm labour [8, 9].

There is no widely available unequivocal consensus among specialists on guidelines for qualifying women for ECV. When proceeding to qualify a pregnant woman to attempt an ECV, basic measurements of height, weight, and body mass index (BMI) should be taken. Then the anatomical normalcy of the bony pelvis and uterus should be confirmed. Previous gynaecological

and non-gynaecological abdominal procedures are an important aspect. With special attention, the condition of the uterus and abdominal shells should be evaluated after previous possible caesarean sections. A history of caesarean section in obstetrics is not an absolute contraindication to ECV. During ultrasound evaluation, the non-head position of the foetus should be confirmed and its exact location in the uterus determined. The estimated weight of the foetus should also be determined. The absence of foetal malformations that may be a contraindication to ECV or natural childbirth should be confirmed. Then the location of the placenta should be determined and its capacity assessed. The volume of amniotic fluid should be measured. Ultrasound examination should also note the presence of the a loop of umbilical cord [10].

In view of the risk of complications, as well as the occurrence of a situation that requires an emergency caesarean section, to prepare the pregnant woman for an attempt at ECV, it is necessary to proceed in a similar way as in preparing for surgery. The pregnant woman should have the determination of the result of the blood group, doubly confirmed. In preparation for an attempted turnover, it is recommended that red blood cell concentrate be reserved and, for pregnant women with a confirmed serological conflict, an anti-RhD immunoglobulin preparation be prepared. Peripheral venous access should be provided in case of emergency intravenous drug administration. Randomised clinical trials have shown that the administration of tocolytic drugs prior to surgery increases the chance of successful turnover. The pregnant woman should continue fasting for 8 hours before the scheduled rotation. A cardiotocographic examination should be performed before ECV. The cardiotocography record should be reactive, certifying foetal well-being [10]. ECV at term is not associated with serious complications [11].

### TECHNIQUE FOR PERFORMING ECV

When the rotation after the ultrasound has been performed immediately prior to the start of the procedure and the non-head foetal position has been determined, the pregnant woman should be placed in the preferred position. Most often, the pregnant woman is in a supine position, completely flat, with her lower limbs straight. A pillow support can be used on one side to move the uterus away from the spine and achieve a slight tilt to the side. Some operators perform the rotation placing the pregnant woman in a supine position, with the lower extremities slightly bent at the knee joints and a pillow under the lumbosacral spine.

It may be helpful to instruct the patient to remain calm, breathe slowly and deeply, and try to keep her abdominal arteries as relaxed as possible. A generous

amount of ultrasound gel should be applied to the pregnant woman's abdomen, spread over the entire surface, to avoid skin abrasions, reduce discomfort, and allow an additional ultrasound examination to be performed at any time. At first, the operator proceeds to push the buttocks out of the pelvis. The foetal head should be gently stabilized at any point, so that when pressure is applied to pull the buttocks out of the pelvic rim, the head does not dip under the pregnant woman's ribs, where it can later be difficult to locate and grasp. Then, by controlled pressure on the abdomen, the operator pushes the buttocks upward while simultaneously guiding the foetal head downward. With the thumb of one hand, the operator slowly moves the foetus to an oblique position, selecting the part of the foetus closest to the anterior wall of the uterus as the pressure point, usually pushing on the foetal thigh or buttocks, giving them an upward diagonal direction of force. Moving the foetus to the intermediate position can be helped by a gentle swinging motion, a rocking effect. After obtaining the foetal prone position, which is the transition stage of performing ECV, if the displacement from the non-cephalic presentation has not progressed smoothly, consider observing the foetal heart rate with the head of the ultrasound machine. Moving on to the next stage, only gentle pressure should be applied to the delicate head for insertion into the mother's pelvic rim. If the head approaches the anterior uterine wall directly, the path of least resistance should be used. When inserting the head into the pelvis, one hand of the operator should hold the foetal occiput, and at the same time the operator should control the movement so that the buttocks are not inappropriately displaced beyond the bottom of the uterus. If the foetal head appears to dip too deeply, away from the operator's hand, toward the mother's sacral recess, more force may be required to complete the rotation. If the rotation fails the first time and the operator believes that there is still a chance to safely move the foetus in the womb, 3 or 4 attempts can be made. If the rotation is successful but the foetus's legs remain upright, cast on the belly, this should not be a cause for concern. Within 24 hours of performing the rotation, the foetus usually flexes its legs, allowing the head to go lower and prepare for delivery, in the process of adapting to the birth canal [9, 10].

### CONTRAINDICATIONS TO PERFORMING ECV

All contraindications to vaginal delivery by the mother as well as the baby are contraindications to ECV, including multiple pregnancies. This also applies to the additional qualification of a pregnant woman after a previous caesarean section (TOLAC, trial of labour after caesarean section) and contraindications to attempt vaginal delivery in such a situation

(vaginal birth after caesarean – VBAC). Immediately before attempting external foetal turnover, an ultrasound and cardiotocography examination should be performed. If foetal monitoring before attempting foetal repositioning cannot clearly certify foetal well-being, this is an absolute indication to abandon the attempted rotation [11].

As the literature indicates, there is no absolute contraindication to trying a rotation once the onset of labour has been established [6].

A ruptured foetal bladder and oozing foetal waters are also not absolute contraindications to ECV. Ruptured foetal membranes are considered a relative contraindication to trying a rotation because the decreasing volume of amniotic fluid makes the procedure difficult to perform. ECV, on the other hand, can be performed successfully in multiparous women, with a ruptured foetal bladder and a preserved normal amniotic fluid index (AFI). If the pregnant woman has experienced genital bleeding of unknown origin, the procedure should be delayed. If the cause of bleeding is believed to be related to placental abnormalities, turnover should not be attempted. Severe preeclampsia, and eclampsia are absolute contraindications to attempting ECV. Pregnancy hypertension or chronic hypertension are not an absolute contraindication to trying a rotation if the clinical condition stabilises and the pregnant woman is under constant supervision of specialists. It is recommended that rotation be avoided in pregnant women in whom prenatal tests have revealed serious foetal anomalies, such as complex heart defects and significant neural tube malformations. However, trying to move the foetus is not absolutely contraindicated in pregnant women in whom minor foetal abnormalities have been detected and the clinical situation allows natural childbirth in the conditions mentioned above [12].

## FACTORS AFFECTING THE SUCCESS OF ECV

Factors considered to predispose to the success or failure of external foetal turnover vary widely between studies and their relevance remains unclear. The authors of the studies point to the interaction of several factors that can positively influence the course of ECV. There is a greater tendency among multiparous women to complete the turnover attempt successfully compared to first-borns. The amount of amniotic fluid also appears to be an important factor. An AFI > 7 is associated with successful turnover, and significantly higher success rates are observed with an AFI > 10 [13]. However, it is not possible at this time to determine an overall AFI threshold associated with the failure of a foetal repositioning attempt [14, 15].

Placental location may also contribute to the success or failure of turnover. Studies indicate that ECV is highly effective in pregnant women with a placen-

ta located on the posterior wall of the uterus [13, 16]. A placenta located on the anterior wall of the uterus makes it difficult for the operator to grasp the foetal head for displacement. Exerting too much pressure when repositioning the foetus would carry a high risk of damaging the placental structures, possibly leading to premature placental detachment, which is defined in obstetrics as a condition of immediate danger to the life of the mother and foetus. The type of position and placement of the foetus in the uterus can facilitate or hinder the course of ECV. The buttock position, when the foetal legs are flexed at the hip joints and positioned along the abdomen, is associated with a lower success rate, compared to the complete non-cephalic presentation. This is mainly related to the more advanced insertion of the foetal buttocks into the pelvic innominate position [9, 17].

The effect of estimated foetal weight (estimated foetal weight – EFW) on the success statistics is not clear. In addition, several authors indicate a higher rotation success rate with high estimated foetal weight, compared to lower foetal parameters [11].

The effect of a pregnant woman's BMI, both before pregnancy and at the time of attempted turnover, on the success of foetal displacement remains unclear [18].

## SUMMARY

Poland is one of the countries with the highest rate of caesarean sections in Europe, at 44.4%. The median caesarean section rate for 2019 in Europe was 26.0%. Rates of caesarean section range from 16.4% in Norway to 53.1% in Cyprus [19].

Obstetrics is currently experiencing an increase in awareness of natural childbirth, which is having a positive impact on the drive to abandon the overmedicalisation of childbirth. The increased interest in natural births, as well as the growing interest in home births, has recently been compounded by the SARS-CoV-2 pandemic. ECV is not a contraindication to home birth according to the qualifications in force in Poland [20]. In addition to the available literature and international guidelines for home birth, we do not find ECV as a contraindication.

Attempting ECV of the foetus from the pelvic or transverse position gives pregnant multiparous women as well as primiparous women the opportunity to undergo vaginal delivery, potentially reducing the rate of elective caesarean sections.

### Disclosure

The authors declare no conflict of interest.

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