

## Review

# The art of performing a safe forceps delivery: a skill to revitalise



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## ABSTRACT

The number of forceps deliveries is globally falling possibly due to Obstetricians gaining more experience and competence in the use of Ventouse deliveries. The declining use of traction forceps can increase the rate of second stage caesarean sections, which may have a long-term impact on the overall rate of vaginal births, despite the efforts of improving uptake of vaginal births after caesarean sections. The failures in forceps deliveries are commonly related to inaccurate assessment of the foetal position and station, which can be addressed by gaining sound clinical experience and applying intra-partum scanning to determine the fetal head position in the second stage, and should be part of the core curriculum in obstetric training. The alternate techniques of rotation, like digital and manual rotation, should be taught and encouraged in cases where rotation is required, which will significantly increase the success rate of instrumental deliveries.

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## Introduction

The rate of instrumental deliveries is decreasing, particularly the use of forceps delivery, which is more or less out of practice in some of the European countries like Romania. Rates of instrumental vaginal delivery vary widely, from 0.5% in Romania to 16.4% in Ireland, with a median value of 7.5% in Europe [1]. There are more

vacuum deliveries being performed in Europe and other countries by the obstetricians [2]. Historically Vacuum extraction has been more popular in northern European countries compared with the use of traction forceps in English speaking countries like UK and US [3]. With the advent of new generation vacuum devices like Silastic cup and Omni cup the use of traction forceps has gradually reduced [4]. The French College of Gynaecologists and Obstetricians favours the use of vacuum in comparison to traction forceps delivery [5] while the guidance from Royal College of Obstetricians and Gynaecologists, also shows inclination towards the use of vacuum due to decreased risk of maternal perineal and fetal injuries [6]. As a result, there is a decreased use of traction forceps deliveries with

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a simultaneous increase in vacuum deliveries. However, the use of vacuum is associated with an increased number of failed instrumental deliveries and sequential use of instruments, which may prove counterproductive in reducing second stage caesarean section rates. Women are also more likely to achieve a spontaneous vaginal delivery in a subsequent pregnancy (>80%) after a forceps delivery than after a caesarean section [7].

The knowledge and skills of an operator directly determine the success or failure of instrumental deliveries, besides the maternal and infant morbidities. Therefore given the decrease in the rate of forceps deliveries [8,9], there is a danger that this essential skill may be lost or poorly developed in future Obstetricians.

There is a need to re-visit and refresh the art of performing traction forceps delivery with emphasis on understanding the principles of performing a safe forceps delivery. The aim of this article therefore is to reinforce the correct knowledge of the principles of forceps delivery and use of other useful interventions such as manual rotation and second stage scanning to improve safety profile of forceps deliveries.

### Background anatomy and labour

It is imperative to understand the basic anatomy of the maternal pelvis and fetal skull, as well as understand the normal process of labour, in order to perform safe forceps delivery. The anatomical configuration of the spine and pelvis influences the outcome and is valuable in the decision making of performing a safe instrumental delivery.

The maternal pelvis should be clinically adequate and assessed for its shape and deformity. The simple measurements including mid-pelvis interspinous diameter of 10 cm or more and outlet antero-posterior diameter of more than or equal to 11 cm, bi-tuberous diameter of >8 cms and sub-pubic angle of >90 degree can be used as a guide to cephalo-pelvic disproportion [10].

During the established labour, the fetal head descends, undergoes a series of movements to negotiate the changing shape of the maternal bony pelvis from inlet to outlet. The fetal head usually engages in the occipito-transverse (OT) position to fit in the widest diameter of the pelvic inlet, and with continuing labour descends down, usually rotating to an occipito-anterior position at the outlet. It crowns when the widest part of fetal head crosses the outlet and delivers by extension.

If the fetal head is high at the pelvic inlet and above the ischial spines, it is likely to be in the OT position and instrumental delivery is contraindicated. An oblique head position may imply that head is in mid-cavity and a rotational instrumental delivery may be considered if the station of head is confirmed at spines after the assessment. However, if the head is in direct OA or OP position below the narrowest diameter (inter-spinous diameter) of the maternal pelvis, a traction forceps delivery can be performed by reproducing the natural steps of descent and extension (Figs. 1–6).

### Improving out-come of traction forceps

**1. Correct identification of fetal head position:** Clinical examination is highly subjective and inaccurate, with a rate of error ranging from 30 to 70% [11]. Fetal head malposition is associated with a higher risk of operative delivery and maternal and perinatal morbidity [12] and although clinical assessment for fetal position and station remains the core knowledge of second stage management, it is not uncommon to get these wrong. Incorrect assessment can lead to a significant adverse impact on second stage management. This can be minimised by the use of trans-abdominal ultrasound to confirm fetal head position during the second stage, and hence assess suitability of

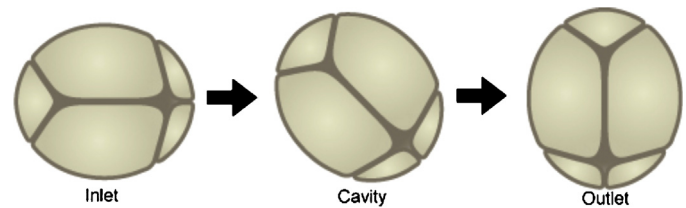


Fig. 1. Rotation of the head through the pelvic cavity.

performing a safe forceps delivery. Although use of ultrasound for fetal head position in the second stage has not yet earned recognition and more research will be required to assess its use on the outcome, it can be useful in the management of delivery by forceps. There are good reasons to support the use of ultrasound as the gold standard in the assessment of fetal position, particularly when the result of the clinical examination is uncertain, and possibly prior to any instrumental delivery [13]. However, it will be logical to use ultrasound in conjunction with other guiding factors to avoid inappropriate attempts at the delivery.

### Method

This can be done by placing the ultrasound probe horizontally on the maternal abdomen to determine the position of fetal spine. The transducer is then moved down to the maternal supra-pubic area to visualise the fetal head. The landmarks depicting fetal occiput position are the midline cerebral echo, fetal thalami and cerebellum for occipito-transverse and anterior positions, and the fetal orbits for occipito-posterior positions [14].

### 2. Correct the known or unknown mal-rotation

Rotation of the fetal head upto 180° is possible either manually or with the use of a Rotational Kiwi or Kielland's forceps delivery. Digital or manual rotation has been found to significantly reduce the caesarean section rate in otherwise occipito-posterior labourers [15,16]

Digital or manual rotation performed before attempting a traction forceps delivery has been found safe and effective [17]. Digital rotation can be applied during or in between contractions, with the fingertips of the index and middle fingers along the suture line between the anterior parietal and occipital bone, with the direction of pressure on the parietal bone, towards the maternal pubis.

Manual rotation requires adequate analgesia, i.e. a working epidural or spinal. The entire hand including the thumb is introduced into posterior vagina behind the fetal occiput in an OP position. The head is then flexed anteriorly and slightly disimpacted before rotation, with the thumb over one parietal, and fingertips over other parietal bone. The rotation should be carried by either hand depending upon the position of sagittal suture in relation to symphysis pubis. The rotation should be done in the direction where a shorter amount of rotation is required. This is done only in between contractions and once the head is rotated to an OA position, it should then be held in position with the hand still in the vagina and the mother should be encouraged to push down for the head to descend. Alternately, the head can be stabilised in this position by applying the forceps and completing the delivery by traction forceps [17,18].

Correction of rotation can also be achieved with a Kiwi cup, and delivery completed either with the same or subsequently with forceps but the sequential instrumentation obviously leads to

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