



Old habits: Can better training make operative vaginal delivery safer

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ABSTRACT

There has been a decline in operative vaginal delivery worldwide. Vacuum delivery has largely replaced forceps, but the teaching and exposure of this procedure is still on the decline. There is a need for enhanced teaching and exposure of residents in training. Operative vaginal delivery is a dying life saving procedure that needs to be reviewed with clear explanation so as to change the negative perception towards its use and help to avoid unnecessary caesarean section.

KEYWORDS
Forceps, Vacuum, Operative Vaginal Delivery
INTRODUCTION

After centuries of use in obstetrics, have forceps and vacuum deliveries become a dying art? Science of Obstetrics is more of an art, and this art is being increasingly forgotten today. Young obstetricians are shying away from practicing this art in favour of Caesarean Section. Caesarean section in the second stage of labour, previously an uncommon phenomenon, is increasingly performed to operative vaginal delivery or as a result of a failed attempt at operative vaginal delivery. It has been reported that the caesarean section rate has increased in United States. In 2011 one in three women who gave birth in the United States did so by caesarean delivery. A study by the Indian Council of Medical Research (ICMR) in 33 tertiary care institutions noted that the average caesarean section rate increased from 21.8% in 1993–1994 to 25.4% in 1998–1999 including 42.4% primigravidas resulting into a proportionate increase in repeat caesarean section¹. Despite recommendations from both the American College of Obstetrics & Gynaecology³ and Royal College of Obstetrics & Gynaecology² to improve training in operative vaginal delivery in order to control ever escalating rates of caesarean section, fear of litigation because of morbidity associated with operative vaginal delivery has restricted the use of midcavity and rotational procedures and reduced the number of obstetricians sufficiently competent to teach trainees. Safe and competent management of women in labor requires obstetricians to be confident in both forceps and vacuum delivery. If current trends continue, we will be lamenting the skills of operative vaginal delivery as a vanished art.

Historical perspective: Obstetrical forceps are used worldwide since over four centuries. Egyptian, Greek and Persian writing and pictures with forceps indicates that originally forceps was used for extraction following fetal demise to save the mother's life. Peter Chamberlin of England (Circa 1600) invented the precursor of the modern forceps which was used for live fetus. Modifications have led to more than 700 different types and shapes of forceps⁴. In 1745, William Smielle described the accurate application to occiput, rather than the previously performed pelvic application, regardless of the position of the head. In 1845, Sir James Simpson developed forceps that was designed to appropriately fit both cephalic and pelvic curvatures. In 1920, Joseph De Lee further modified the instrument and advocated prophylactic forceps delivery. ACOG has classified forceps deliveries according to station and rotation of fetal head as Outlet, Low and Midcavity forceps—each

of which are appropriate to specific situations and require differing levels of skill.

Vacuum extraction was first described in 1705 by Dr James Yonge, an English surgeon, several decades before the invention of obstetrical forceps. However, it did not gain widespread use until the 1950s, when it was popularized in a series of studies by the Swedish obstetrician Dr. Tage Malmstrom and was modified by Bird in 1969. The first soft cups were available by 1980s⁵. By the 1970s, the vacuum extractor had almost replaced forceps in northern European countries. By 1992, however, the number of vacuum assisted deliveries surpassed the number of forceps deliveries in the United States, and by the year 2000 approximately 66% of operative vaginal deliveries were by vacuum. Current trainees are far more likely than consultants to prefer vacuum to forceps in all clinical circumstances and are more likely to proceed directly to caesarean section for midcavity or rotational procedures.

Indications for use: The indications for operative vaginal delivery have changed little over years. They should be considered as an alternative to caesarean section when the situation, so called 'Failure to Progress' in the lower pelvic strait occurs. It remains a valid option when problems arise during second stage of labour. The most common indications are fetal compromise and failure to deliver spontaneously with maximum maternal efforts. Forceps is considered superior to vacuum in certain situations like aftercoming head of breech, preterm assisted delivery, assisted delivery of face presentation, operative vaginal delivery with suspected coagulopathy or thrombocytopenia in a fetus or cord prolapsed in second stage of labour. These situations call for expedited delivery by forceps in trained hands and therefore, emphasise the need for training in both types of instrument.

Contraindications: Operative vaginal deliveries should not be attempted when there is an underlying fetal condition such as bone mineralizing disease, fetal vertex is not engaged in the pelvis, cervix is incompletely dilated, unruptured membranes, suspected cephalopelvic disproportion or if there is fetal malpresentation. Vacuum assisted vaginal delivery should not be performed prior to 34 weeks because of risk of intraventricular haemorrhage. Prior scalp sampling or multiple attempts at fetal scalp electrode placement are also relative contraindications to vacuum extraction because these procedures may increase the risk of cephalhematoma or external bleeding from

the scalp wound.

Morbidity of operative vaginal delivery: Operative vaginal delivery significantly increases the risk of anal sphincter injury compared with spontaneous vaginal delivery, particularly when an instrument application at high station, persistent occipitoposterior position and/or macrosomia is associated. Risks of vaginal tears, postpartum haemorrhage and urinary retention appeared to be increased compared to spontaneous vaginal delivery. There is no evidence that one type of forceps is less safe than another. Different vacuum extractors (soft, rigid and single use instruments) have similar maternal outcomes. A risk of anal incontinence in the first year postpartum is associated with operative vaginal delivery, particularly forceps. Operative vaginal delivery also appears to increase the risk of occult anal sphincter injury regardless of the instrument used, but does not appear to be associated with the risk of postpartum urinary incontinence and genital prolapse compared with spontaneous vaginal delivery. It does, however, increase the risks of perineal pain, postpartum dyspareunia and sexual disorders compared with spontaneous vaginal delivery, particularly in case of perineal tears.

The neonatal morbidity related to operative vaginal delivery needs to be evaluated where operative vaginal delivery is successfully achieved, where caesarean section is undertaken following a failed attempt at operative vaginal delivery and where delivery is by immediate caesarean section. In a systematic review comparing vacuum extraction with forceps delivery, Johanson and Menon reported that use of the vacuum extractor was associated with an increase in neonatal cephalhematoma and retinal haemorrhages.

Training: For many women, operative vaginal delivery is not planned and is used after a long and difficult labour. The complications that arise may have their origin in the indication for operative delivery or may result from the procedure itself. There is on-going debate on the relative merits and hazards of vacuum and forceps delivery. Five year follow up of a randomized controlled study comparing forceps and vacuum concluded that there is no specific evidence to suggest maternal or child benefits or side effects in both⁶. A systematic review of several randomised controlled trials reported that use of vacuum extractor was associated with significantly less maternal trauma and with more completed deliveries than forceps delivery⁷. However, this is potentially misleading as 20-30% failure rate has been reported in two recent randomised controlled trials. Evidence evaluating neonatal morbidity after instrumental delivery vaginal delivery is inconsistent⁸. A systematic review of 10 trials comparing vacuum extraction with forceps delivery found no significant differences in Apgar score at one and five minutes and few neonatal injuries in neonates, although the vacuum extractor was associated with an increase in cephalhematoma and retinal haemorrhage.

The vast majority of avoidable maternal and neonatal morbidity at operative vaginal delivery relates to inappropriate application of instrument and operator inexperience. Therefore, an essential prerequisite for operative vaginal delivery is a skilled operator⁹. The obstetrician must be able to assess bony pelvis and unequivocally determine the fetal position and station, as well as degree of flexion, caput, moulding and asynclitism. The instrument must then be correctly placed and an appropriate amount of traction applied in the right direction. In such circumstances, successful operative vaginal delivery rates are high and morbidity low. But these skills are not easy to acquire and certainly cannot be self taught. In addition, the trainee must know when to ask for help. Predictors of failed vaginal delivery include occipitoposterior position, high presenting part, inadequate analgesia and birthweight >4 kg and these criteria should alert the obstetrician to be cautious and seek senior support¹⁰.

The RCOG has recommended that obstetricians be confident and competent in the use of vacuum and forceps, and that operator should choose the instrument most appropriate to

the clinical circumstances and their level of skill. Clear and detailed guidelines are available and should be adapted within local practice-based protocols and followed up with regular audit and multidisciplinary review of adverse incidents. One of the key recommendations of the guideline is that operative vaginal births that have a higher rate of failure should be considered a trial and conducted in the operation theatre where immediate recourse to caesarean section can be undertaken so as to reduce injuries to fetus that are attributed to time delay. A UK study demonstrated substantial differences in the assessment of fetal position and station between consultants and specialist registrars and that a consultant was more likely to reverse a decision for caesarean section and to conduct an operative vaginal delivery safely¹¹. A review of failed vacuum extractions reported suboptimal application in 40% of the cases¹². Clearly, appropriate supervision and the availability of skilled obstetricians on the labour ward at all times will be an essential component of training initiatives.

In the US in 1999, a survey of residency training directors reported that, although trainers taught outlet or low cavity forceps deliveries, they did not accept proficiency in mid-forceps deliveries from their trainees¹³. In an attempt to evaluate the diminishing opportunity for trainee obstetricians to develop skills and knowledge in the techniques of midforceps delivery, Healy and Laufe¹⁴ sent questionnaires to 144 US and Canadian members of the Association of Professors of Obstetrics and Gynaecology to survey residency training in the use of forceps. They analysed 105 programs delivering approximately 283,000 women in 1981. All programs used outlet forceps, but all but one used midforceps. Significantly, staff obstetricians were present and instructing in the delivery room only 50% of the time in the United States, but in Canada a staff obstetrician was the principal instructor. Further the mode of selection of forceps most commonly used for midforceps and outlet forceps was habit and past experience, rather than design and function. Ironically, the authors of the study pointed out, two major postgraduate obstetric texts devoted fewer than 2% of their pages to forceps delivery. More recently, Ramin and associates¹⁵ surveyed 295 US and Canadian residency programs; of these, 203 responded, representing 458,000 deliveries with results similar to Healy and Laufe. They did note, however, that institutions that performed midforceps deliveries did not have a decrease in their caesarean section rates. Dennen¹⁶ emphasized detailed lectures about forceps, practice with mannequins, and supervision first in easy cases and later in more complicated ones to ensure proper training in the use of forceps.

Is the abandonment of forceps (especially midforceps) deliveries desirable? The issue is clearly debated in two articles, one by Friedman¹⁷, who is against it, and the other by Hayashi¹⁸, who is for it. Interestingly, both the authorities quote many of the same articles to support their opposing point of view. Friedman makes a compelling argument for abandoning midforceps by proposing that failure to prove statistical significance for poor outcomes is not the same as proving that a significant difference does not exist. In contrast, Hayashi made the following statement: "Although the controversy surrounding midforceps delivery is real, it appears that the bulk of evidence would support the use of this technique when properly indicated and skillfully applied in the management of labor".

While there is a little controversy about the use of low or outlet forceps, which are accepted as safe methods for expediting delivery, a major controversy exists over the safety of midcavity forceps operations for both fetus and mother. The problem with studies of midforceps operation has always been and will continue to be one of determining whether or not the operation really is a midforceps one.

A vicious cycle of decreased opportunity, poorly supervised procedures, and even lack of detailed instruction in textbooks may lead to a generation of obstetricians who are lacking skills in forceps deliveries and therefore are unable to pass these skills on to the next generation. Residents reported per-

forming significantly fewer forceps than vacuum deliveries. This clearly demonstrates that current training results in substantial proportion of residents graduating who do not feel competent to perform forceps deliveries. Ultimately this lack of adequate personnel comfortable with performing forceps deliveries will lead to a continuing downward trend, and escalation in the already worrying trend towards second-stage caesarean section. When subsequent pregnancies are taken into consideration, this trend will diminish the overall number of women who achieve a spontaneous vaginal delivery.

CONCLUSION:

Operative vaginal delivery continues to pose a challenge for the obstetrician. There is a balance to achieve between maternal and neonatal wellbeing and early and long term morbidity. Obstetricians should aim to deliver by the safest and the most appropriate mode within their expertise. A management approach that can only offer caesarean section for

complications in the second stage of labour may prove limiting and short sighted. We are gaining increasing knowledge about the long term health implications of operative vaginal delivery for both mother and baby. The influence of obstetric management in such cases needs further evaluation in terms of maternal psychological morbidity, future fertility both voluntary and involuntary, and the delivery outcome and future pregnancies. Obstetric training needs to encompass the skills of clinical assessment, choice of instrument for special circumstances, technical competence, judgement of when to abandon a procedure in favour of caesarean section and clear communication with the women and within the multidisciplinary team. We need to be confident that, when we perform operative vaginal delivery, the benefits outweigh the risks, taking account of the clinical circumstances, the women's preferences and her overall reproductive outlook.

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