

Trials and tribulations of operative vaginal delivery

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The notion that operative vaginal delivery has declined in the wake of escalating caesarean section rates is not evidence based. In England, despite a progressive increase in caesarean deliveries over the past 20 years, reaching 23% of births in 2004, the instrumental delivery rate has remained relatively stable at 10–11% of all births.¹ Similar trends are evident throughout the UK and North America.² In Australia, in 2004, more than 29% of women across the nation had their babies delivered by caesarean section; yet, the instrumental delivery rate has remained steady at 11% for the past 10 years.³ The increase in caesarean deliveries, therefore, cannot be explained by a shift from instrumental-assisted births. During the same period, operative vaginal delivery has undergone a dramatic change in practice manifested by a decline in the number of forceps deliveries and a concomitant increase in vacuum extractions. In most reports, the vacuum extractor has now become the preferred instrument for assisted delivery.^{1,3}

The Royal College of Obstetricians and Gynaecologists (RCOG) has issued evidence-based guidelines to increase safety of operative vaginal delivery for mothers and babies and to reduce the likelihood of litigation for medical practitioners and health institutions.⁴ One of the key recommendations of the guideline (section 5.2) is that 'operative vaginal births that have a higher rate of failure should be considered a trial and conducted in the operating theatre where immediate recourse to caesarean section can be undertaken'. The rationale behind this recommendation is that fetal injuries have been attributed to the time delay between failed operative vaginal delivery and caesarean section. The benefits should be obvious yet, as the guideline admits, evidence to support this practice is limited.

Olagundoye and MacKenzie in this issue of the journal (pages 603–8) report the findings of their evaluation of the impact of a trial of instrumental delivery in the operating theatre in terms of the decision-to-delivery intervals (DDI),

mode of delivery and neonatal condition at birth.⁵ They concluded that on average, the DDI for instrumental procedures in the operating theatre were some two to three times longer than for deliveries undertaken in the labour ward room. Either way, their data showed no significant differences in short-term neonatal or maternal outcomes and do not provide support for the recommendation in the RCOG guideline.

The DDI have been studied extensively in relation to emergency caesarean section, where delivery within 30 minutes has generally been accepted as the benchmark. Nevertheless, this recommendation is not achieved in up to 50% of emergency caesarean sections and is therefore an unrealistic target for clinical practice.⁶ Furthermore, large national and multicentre studies have reported no differences in neonatal or maternal outcomes for emergency caesarean sections when the delivery interval was less than 30 minutes compared with the intervals of longer than 30 minutes and up to 75 minutes.^{7,8} For forceps delivery and vacuum extraction, the DDI and its effects on neonatal outcome are less clear. A prospective analysis of 90 forceps and 135 vacuum deliveries reported that in cases of fetal distress, the mean DDI for forceps delivery (23 minutes) was significantly shorter than that for vacuum extraction (29 minutes).⁹ In the Portsmouth study, the mean interval from time of application of the forceps to delivery was shorter than that for vacuum extraction, but the interval from the decision to delivery was the same for both instruments.¹⁰ This is plausible when considering the number of steps involved in performing an operative vaginal delivery prior to application of the device.¹¹

The preoccupation with DDI has diverted the focus from problems related to instrumental delivery that need urgent attention. Of particular importance are the high failure rates reported for vacuum extraction and the potential for injury associated with a failed instrumental delivery.¹² In the analysis by Olagundoye and MacKenzie, 30 (22%) of the vacuum extractions were unsuccessful at the initial attempt, whereas

only four (4%) of the forceps failed. Of the vacuum deliveries that failed, 23 (77%) were completed with forceps, except in 2 cases where a second vacuum attempt was made, and 7 others proceeded directly to caesarean section. Judging by recent reports from other teaching institutions in the UK, failure rates for vacuum extraction of 20% or higher are not uncommon.^{13,14} Clearly, the DDI will be influenced by the number of failed procedures that are followed by additional methods to complete the delivery.

Of greater concern is the fact that serious neonatal and maternal injuries have been attributed to the use of multiple instruments in case reports and population-based studies.¹² Section 5.5 of the RCOG guideline states that sequential use of instruments should be avoided wherever possible and should not be attempted by inexperienced operators.⁴ It is noteworthy, therefore, that data collated from the study by Olagundoye and MacKenzie and three other recent reports from British institutions^{9,13,14} do not support the evidence of an association between multiple instrumental attempts and serious neonatal injury. In these studies, with a combined cohort of 1043 instrumental deliveries, 213 procedures (20%) failed initially. Of these, 159 (75%) had at least one further attempt at instrumental delivery without any report of serious neonatal injury.

What conclusions can be drawn from these apparent contradictions? In the first place, it appears that operative vaginal delivery will continue to play a significant and perhaps increasing role in obstetric practice for the foreseeable future. In addition, while clinical factors associated with adverse outcomes have been well documented, effective evidence-based strategies designed to counter the problems may not be available. Olagundoye and MacKenzie in their institution have evaluated the recommendation that high-risk instrumental deliveries should be undertaken in the operating theatre and found that, contrary to expectations, the practice did not result in improvements in neonatal outcome. They also confirmed that fetal malposition was associated with the highest rate of failed operative delivery. Of the 60 rotational procedures in the study, 16 were forceps and 44 vacuum extractions. Because only two of the Kielland forceps rotations were unsuccessful, the majority of the failed rotational procedures must have occurred in the vacuum group. Therefore, the failure rate for rotational vacuum delivery would have been higher than the overall rate of 22%. A contributing factor to the high failure rate may have been that all rotational forceps deliveries were supervised or managed by consultants or senior registrars, whereas vacuum-assisted deliveries were mostly performed by senior house officers or junior registrars.

In section 5.1 of the RCOG guideline,⁴ the importance of adequate training and demonstrated competence in operative vaginal delivery is emphasised; yet, the responsibility for instrumental delivery, and vacuum extraction in particular, is frequently relegated to the junior trainees.¹¹ Better training

in operative vaginal delivery has also been suggested as a means of curbing the rising caesarean section rates,¹⁵ but for this to be effective, operators will be required to improve their skills with rotational forceps and vacuum extraction. Successful rotation depends on correct application of the forceps or the vacuum cup to the fetal head, which in turn requires knowledge of position of the head. It has been shown by ultrasound techniques that clinical examination fails to diagnose occipitoposterior positions in up to 50% of cases.¹⁶ Consequently, when position is in doubt, it may be helpful to invoke ultrasonography as a method to determine accurately the position of the fetal head prior to instrumental delivery.¹⁷

The RCOG, in a Working Party Report,¹⁸ has acknowledged that the rapid changes occurring in obstetrics and gynaecology with the introduction of a variety of new skills combined with changes in work practices, training conditions and employment law have produced immense pressures on current models of service provision. Furthermore, there has been a change in emphasis in medical training towards more support and structured education. Nevertheless, the report has also recognised that a large component must remain as 'supervised experiential learning', that is, training under appropriate supervision. Clearly, operative vaginal delivery falls into this category. It is crucial, therefore, that the new role envisaged for consultants responsible for labour wards will provide the opportunity for greater supervised training of obstetric registrars. The key to avoiding adverse outcomes with operative vaginal delivery will be to ensure that the level of knowledge, skills and experience of the operators are adequately matched to the requirements of the clinical circumstances. Failure to do so will place unrealistic expectations on safety measures and guidelines.

Disclosure of Interests

The author is a practising obstetrician and although he is the designer of the Kiwi OmniCup does not receive royalty payments from the manufacturer nor is he involved in the production and marketing of the device. The manufacturer has, however, financially supported the author to conduct teaching seminars and workshops on vacuum delivery ■

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