

# Kielland's Forceps: A Necessary Revolution?

## Ethical Dilemmas in Obstetrics and Gynaecology

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The Kielland's forceps has been controversial since its inception. The unparalleled range of movement offered by its unique design made it for a time the instrument of choice for occipito-transverse arrest in the second stage of labour. In recent decades use of the Kielland's forceps declined significantly following a series of damning case reports linking its use to significantly poorer neonatal outcomes, and now many obstetric trainees are not trained in Kielland's deliveries. However, these case reports have never been replicated, and modern evidence now suggests that the not only is the Kielland's forceps equivalent in neonatal and maternal outcomes to other forms of vaginal delivery for transverse arrest, but also that is significantly less likely to fail preventing the substantially poorer outcomes associated with sequential instrumentation, or emergency Caesarean section. The potential reintroduction of structured training in Kielland's delivery raises ethical concerns regarding training related risk, and whether the profession has accurately quantified the potential risks involved. However, modern evidence broadly supports a positive balance of risk and favours the widescale reintroduction of the Kielland's forceps.

### Introduction

The Kielland's forceps has been controversial since its inception. The unparalleled range of movement offered by its unique design made it for a time the instrument of choice for occipito-transverse arrest in the second stage of labour. In recent decades use of the Kielland's forceps declined significantly following a series of damning case reports linking its use to significantly poorer neonatal outcomes, and now many obstetric trainees are not trained in Kielland's deliveries. However, these case reports have never been replicated, and modern evidence now suggests that the not only is the Kielland's forceps equivalent in neonatal and maternal outcomes to other forms of vaginal delivery for transverse arrest, but also that is significantly less likely to fail preventing the substantially poorer outcomes associated with sequential instrumentation, or emergency Caesarean section. The potential reintroduction of structured training in Kielland's delivery raises ethical concerns regarding training related risk, and whether the profession has accurately quantified the potential risks involved. However, modern evidence broadly supports a positive balance of risk and favours the widescale reintroduction of the Kielland's forceps.

### The Evidence for Kielland's Forceps

The Kielland's forceps has divided professional opinion since it was first presented by Christian Kielland in 1916 (Dunn, 2004). Indeed, Kielland's own hospital, the Kristiania in Oslo, did not begin widespread use of his forceps until 1930 (Hem, 2001). The innovative design of his forceps, a relatively straight profile with a gentle backwards pelvic curve and a unique sliding lock, allows rotation alongside correction of foetal asynclism, and made the Kielland's forceps the instrument of choice for arrested descent in occipito-transverse positions (Dunn, 2004). However, a series of case reports cast grave doubts over the neonatal mortality associated with Kielland's forceps use, and many training centres have since discontinued teaching the technique, with as many as 31% of UK units not supporting Kielland's delivery (Al Wattar, Mahmud, Janjua, Parry-Smith, & Ismail, 2017; Chiswick & James, 1979). Now, mounting evidence of the Kielland's forceps' safety in expert hands, and concern over the increasing recourse to emergency Caesarean section (C.S.) in cases of transverse arrest have prompted discussion of the reintroduction of the Kielland's forceps to general obstetric practice (Nash, Nathan, & Mascarenhas, 2015). This article explores the evidence supporting and opposing the use of the Kielland's forceps, with review of the ethical obstacles in its reintroduction.

### The Evidence Against Kielland's Forceps

Malposition of the foetal head occurs in 4.4% of live births, and is now the most common indication for second stage C.S. (Tempest, Hart, Walkinshaw, & Hapangama, 2013). However, emergency second stage C.S. are associated with a maternal and neonatal complication rate of between 32.6%-57% (McKelvey,

Ashe, McKenna, & Roberts, 2010). Alternatives to emergency C.S. in cases of malposition include the rotational ventouse, the Kielland's forceps, and manual rotation. There are few studies that have compared these three modes of vaginal delivery in cases of foetal malposition, and no significant differences were observed in either neonatal or maternal morbidity between the techniques (Bahl, Van de Venne, Macleod, Strachan, & Murphy, 2013). However multiple studies have observed that neonatal and maternal outcomes are substantially worse both in emergency C.S. following failed instrumentation, or following sequential instrumentation (Burke, Field, Mujahid, & Morrison, 2012; Tempest et al., 2013).

Attention then must be turned to the failure rate of each method. The failure rate of manual rotation is reported as 4.8%, however the technique is poorly generalisable and subject to strict entry criteria (Bahl et al., 2013). Failure rates of Kielland's forceps delivery are reported to be between 3.7%-10.4%, whereas rotational ventouse failure rates range from 22.4%-43.7% (Nash et al., 2015). Rotational ventouse techniques have become the favoured technique of operative vaginal delivery for foetal malposition, yet they are between 2 and 12 times more likely to fail, requiring sequential intervention which significantly increases morbidity.

### Ethical Considerations

If used correctly, the Kielland's forceps has the capacity to reduce both maternal and neonatal morbidity through a technique that is no more dangerous than other modes of operative vaginal delivery already in use (Bahl et al., 2013). However, the major obstacle to its reintroduction and an area for great ethical concern is that the Kielland's forceps is not today in widespread use, that there is a generation of obstetricians untrained and unskilled in its use (Al Wattar et al., 2017). Articles have also raised doubts about whether we can accurately diagnose long term consequences of forceps delivery, and whether this uncertainty should limit support for reintroduction (Dietz, 2015).

Nearly all studies of the efficacy and safety of Kielland's forceps report their use by skilled practitioners, not by trainees. Inexperience with the forceps is associated with increased rate of all complications particularly OASI, which in one case series, occurred in 2.1% of consultant led deliveries, and 8.1% of trainee led (Josephs, Denison, Akolekar, Cooper, & Stock, 2010). Concerns were raised as early as 1999 that training programs did not provide sufficient skills to guarantee safe use of the Kielland's forceps (Robson & Pridmore, 1999). Is it ethically justifiable to expose patients to this increased risk of morbidity while a generation of obstetricians retrain?

The most compelling refutation of this concern is the very institution of medical education and training. We expose patients to doctors who are less experienced than their senior colleagues at all stages of their training. These doctors are more prone to misjudgements and errors, but we accept the risk that they may commit errors, for the benefit of having experienced doctors in the future (Lewis et al., 2014). There are few differences between the junior doctor, unskilled but training; and the senior obstetrician, unskilled but training. Both are striving to deliver better patient care, both are more at risk of making errors, but both act under supervision of training schemes which will reduce this risk. Why then would we not consider reintroducing the Kielland's forceps justified as another facet of medical education where risk is increased temporarily in pursuit of better outcomes in the future? The need for competent supervision demands a degree of urgency in reintroducing Kielland's training. As time progresses fewer experienced consultants will be available to supervise training, and while useful and effective, simulation training such as the RCOG's ROBuST program cannot replace oversight by an experienced clinician (RCOG, 2015).

It is accepted that forceps deliveries are associated with increased rates of pelvic floor injuries including OASI and levator ani avulsion injuries (Johanson et al., 1999). However, some authors have, controversially, raised concerns over whether clinical diagnosis of these conditions is sufficiently sensitive, and that reported figures may be a gross underestimation (Dietz, 2015). Although there is no Kielland's specific data, imaging studies have identified OASI in up to 60% of women after forceps delivery, and levator ani avulsion in 30-65% of women (Cassado Garriga et al., 2011; Kearney et al., 2010). Both conditions are associated with serious, significant, often recurrent, morbidity (Dietz, 2015). Thus, is it ethically justified to utilise a technique in which more than 50% of women may suffer serious complications?

These reports of increased complications are themselves fraught with uncertainty, reporting accurate diagnosis of a condition they themselves admit is difficult if not impossible to diagnose (Kearney et al., 2010). How then to proceed? Any strategy must focus on empowering patients, presenting them with both the risks and benefits, and allowing them, in concert with their obstetrician to come to an informed decision. The already poor public image of the Kielland's forceps, and of forceps in general, necessitates considered and careful discussion by skilled and empathetic clinicians to ally patient fears and to bring forth the true risks and benefits. (Murphy & Liebling, 2003). Patients should be aware that all medical procedures are carried out with some degree of uncertainty, however, proceeding is justified by the weight of evidence supporting the intervention's therapeutic benefit, and confidence that the balance of risk is favourable. Most modern evidence supports a positive balance of risk for Kielland's forceps delivery, and it would seem unethical to ignore its potential to greatly improve patient outcomes (Burke et al., 2012; Macleod et al., 2013).

It would therefore seem ethically imperative, that the use of Kielland's forceps be encouraged by training authorities and indeed UK trainees are enthusiastic to train in Kielland's delivery (Al Wattar et al., 2017). When used correctly, they are no more dangerous than any other form of operative vaginal delivery, and are far less likely to fail, preventing sequential instrumentation. Therefore, if we are truly to respect the doctrine of non-maleficence, then it becomes imperative that we support the reintroduction of Kielland's forceps in order to prevent sequential instrumentation and potentially devastating outcomes.

## Conclusion

The Kielland's forceps has been controversial since its inception. A series of damning case reports linked its use to significantly poorer neonatal and maternal outcomes, and resulted in the forceps nearly disappearing from obstetric practice (10). However, in recent years new analysis has supported the skilled use of the Kielland's forceps, as both equivalent in safety to other rotational techniques, and significantly less likely to fail, thus reducing sequential interventions. The reintroduction of the Kielland's however raises several ethical concerns: is it justifiable to accept potentially poorer outcomes during the training period in exchange for future more favourable outcomes? And, is it appropriate to proceed with the reintroduction of the forceps when there exists uncertainty regarding potentially significant complications? The uncertainty regarding complication and training related morbidity will always exist in healthcare. Moreover, advances in maternal and neonatal outcomes with skilled use of the Kielland's forceps makes its reintroduction ethically and clinically justified.

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