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EDITORIAL

PRO: laryngeal masks can be used for surgery in the prone position

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This article is part of a Pro and Con debate and is accompanied by the following articles:

- Kranke P. Penny wise, pound foolish? Trade-offs when using the laryngeal mask airway for spine surgery in the prone position. *Eur J Anaesthesiol* 2014; **31:**249–252.
- Staender S. CON: laryngeal masks must not be used for surgery in the prone position. *Eur J Anaesthesiol* 2014; **31**:256–258.
- Olsen KS, Petersen JT, Pedersen NA, Rovsing L. Self-positioning followed by induction of anaesthesia and insertion of a laryngeal mask airway versus endotracheal intubation and subsequent positioning for spinal surgery in the prone position. *Eur J Anaesthesiol* 2014; **31**:259–265.
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In this issue of the *European Journal of Anaesthesiology*, Karsten Skovgaard Olsen *et al.*[1] from Glostrup University Hospital in Denmark present an interesting randomised controlled trial of the laryngeal mask in the prone position during spinal surgery. In this study, the authors allocated 140 patients to a laryngeal mask group with preoperative self-positioning, versus endotracheal intubation with positioning after induction of anaesthesia. The main benefit found by the authors was a saving of 3 to 5 min for patients in the laryngeal mask group. Besides no adverse events, the authors also found a lower incidence of sore throat, hoarseness and pain, at least in the immediate postoperative period. This was not the primary outcome of the study, however, and power analysis was based on the time difference between the groups. What the present study[1] showed was the ease of this technique associated with minimal complications and, additionally, a time-benefit in the laryngeal mask group.

It must be acknowledged that using a laryngeal mask in the prone position is not a standard technique and may be considered unsafe. As this approach is not routine worldwide, it is naturally controversial,[2] and there is a clear need to analyse the conclusions of this study critically and to interpret it appropriately. Before we pass judgement on Olsen *et al.* with regard to the ethics of their approach, there are several questions that should be answered as a common thread.

Is it unethical to perform such studies? No, it is not, provided the study has satisfied the necessary ethical requirements. This is also obligatory for publication in the *European Journal of Anaesthesiology*. As the authors stated in the material and methods section of their paper,[3] approval of the Capital Region of Denmark Regional Committee on Biomedical Research Ethics was obtained. This was an independent committee that critically assessed their proposals and judged, from an ethical point of view, whether the study should go ahead and whether any of its criteria should be modified. To validate the authors' sample size calculation and statistical power, and assess patient safety, risk and possible adverse events are major tasks of the committee. Its experts made their decision based on their combined experience and previously published data on this particular topic. Accordingly, the study was considered to be in accordance with ethical requirements. In addition, written and oral informed consent was obtained from all patients prior to inclusion. It is testimony to the integrity of the authors that they initiated the study and completed it without any external (industry) funding.

Is this topic completely new? No, it is not. When searching PubMed with the terms 'laryngeal mask' AND 'prone position', there are 39 articles available. The first citation on the use of the laryngeal mask in the prone position

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dates from 1990[4] and was published only a few years after laryngeal masks became available. Subsequently, many other publications on this approach have become available, and a search will reveal that they deal with diverse patient groups and different subject numbers. As evidence for this, I cite Brimacombe *et al.*[2] who analysed this technique in 245 patients and found it feasible in the hands of experienced users. Another audit by Sharma *et al.*[5] reported the successful use of the LMA-Supreme in 205 orthopaedic patients. There are additional reports of laryngeal mask airways in children, and even neonates, for anaesthesia in the prone position.[6,7] The reports extend to a variety of procedures including paediatric radiotherapy, minor back surgery, pilonidal sinus surgery and duodenoscopy.[2]

Is accidental extubation in the prone position really a major problem? Yes, it is. One of the most often referred to contraindications for using a laryngeal mask in the prone position is the impossibility of endotracheal intubation after accidental displacement. However, unintended extubation does not solely occur when using a laryngeal mask for ventilation; it occurs in patients of all decades with tracheal tubes *in situ* also.[6–9] When it happens in the prone position, it is a life-threatening complication.[7,9] Endotracheal re-intubation in the prone position is certainly not something for the faint hearted, the inexperienced or the uncertain. The lack of reports on this topic supports a point of view that it may well be impossible.[10]

Can accidental extubation be managed during routine clinical practice? Yes, it can. Just insert a laryngeal mask! This has been shown to be feasible and even easy in a variety of patient groups.[6–9] Both an endotracheal tube and a laryngeal mask can dislocate and the solution is always the same: use a laryngeal mask for emergency ventilation. It can be placed easily even in emergency situations in the prone position. The alternative option is to place the patient supine for urgent tracheal re-intubation, but this may be time-consuming, require additional personnel and might lead to surgical complications.[9] The proposal is that the laryngeal mask should be the standard for dealing with loss of airway in an emergency.

Are there any disadvantages with the conventional approach? Yes, there are. The conventional approach to surgery in the prone position is initially to induce anaesthesia in the supine position. After tracheal intubation, the patient is turned into the prone position and positioned carefully so that ventilation is not impeded, venous return is not compromised and all pressure points are protected. Although this is familiar practice for anaesthesiologists and is used for major procedures when muscle relaxation is required, it is time-consuming and has a high risk of accidental extubation during passive rotation of the patient.[11]

Does the laryngeal mask have real advantages? Yes, it has. Brimacombe's meta-analysis[3] found significant advantages for the laryngeal mask compared with the endotracheal tube. Besides an increased speed of placement and improved haemodynamic stability, a lower incidence of coughing, improved oxygen saturation and fewer sore throats were the main advantages associated with the laryngeal mask.[3] In another clinical trial, Weksler *et al.*[12] found that fewer hands were needed if self-positioning in the prone position prior to induction of general anaesthesia was adopted. Additionally, induction time was shorter.

Is placing a laryngeal mask in the prone position difficult? No, it is not, at least for the experienced anaesthesiologist. The success rate for placing a laryngeal mask in the prone patient at first attempt is reported to vary between 90.5 and 98%.[2,5] Any experienced anaesthesiologist who is not familiar with this technique can learn it easily.[11] This also applies to the obese (more than 40 $kg\,m^{-2}$) patient.[5]

So what can we learn from the present study? Olsen *et al.*[1] present very interesting data on the use of a laryngeal mask for surgery in the prone position. They found that their approach saved 3 to 5 min per patient. Although this does not represent a landmark finding, it may add to economic considerations in the operating room. The risk of this approach seems to be low as emergency airway management after unintended extubation also consists of using a laryngeal mask. The authors' results are in line with previous studies on this topic. Whereas most recent reports have considered this topic only in small groups having minor surgery, the present study provides some evidence that the laryngeal mask is possible even for spinal surgery. Although this extension of the inclusion criteria could be interpreted as an increased and undesirable risk to the individuals who consented, it might also be considered to be innovative and justifiable research.

Let us examine an example: there is a new technique to test, which requires the first human guinea pig. The gathered medical experts are sceptical that it will work. The procedure involves the administration of an untried substance that has an unquantifiable risk of toxicity, and there are risks of overdose and asphyxia. There are no previous reports to help matters. Is it ethical to continue? Is this innovation or scant disregard for safety? Those of you who take the conservative view should recall William T.G. Morton, who, in 1846, subjected his patient to the risk of an unknown substance (ether) to eliminate pain during surgery. He gave birth to the specialty of anaesthesiology. This was clearly associated with a risk – but was a true innovation as well.

In the author's mind, using a laryngeal mask in certain new situations is also a true innovation, but may also have a specific risk. Anaesthesia is a medical specialty with a reputation for the highest possible standards of safety,[13] something that must not be lightly given up. Time

pressure alone must not be allowed to justify reduced safety, but there also has to be room for innovation and research in this context, and the present study falls into this category. It is neither unethical nor risky in experienced hands to perform such studies. Risk apart, this work of Olsen *et al.* can surely be considered as innovation and research.

For the future, we can see this as a starting point for both further research and perhaps a move towards a more economic practice of anaesthesia. In a few years, using a laryngeal mask for prone surgery could make its way into standard practice. I am optimistic about that!

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