Competing Interests

The authors declare no competing interests.

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Distribution of Ventilation in Pneumoperitoneum: Comment

To the Editor:

We read with great interest a very informative and well-conducted study by Shono *et al.* titled "Positive End-expiratory Pressure and Distribution of Ventilation in Pneumoperitoneum Combined with Steep Trendelenburg Position" published in the Journal.[1] The study has objectively shown that application of positive end-expiratory pressure (PEEP) of 15 cm H_2O resulted in more homogeneous ventilation and favorable pulmonary physiologic effects during robot-assisted laparoscopic prostatectomy, but did not improve postoperative lung function. Whereas that authors have focused on the beneficial pulmonary effects of high PEEP values, the article would benefit readers considerably if the authors could address its potential ill effects on some other organ systems.

In this regard we wish to highlight our concern regarding application of high PEEP on intracranial pressure (ICP) in patients given a steep Trendelenberg position. It is known that ICP rises rapidly with pneumoperitoneum and this increase is more pronounced due to the effects of gravity in patients assuming the head-down Trendelenburg position.[2,3] Increased intraabdominal pressure displaces the diaphragm cranially, narrowing the inferior vena cava and decreasing venous return which, in turn, increases the ICP.[3] The high intrathoracic pressures due to positive pressure ventilation and high intraabdominal pressure due to pneumoperitoneum cause a triple compartment syndrome because of an increase in ICP. In susceptible populations such as patients with head injuries or patients who have undiagnosed intracranial pathology, neurologic deterioration could be a concern. Clinically, even minor adverse effects of raised ICP may present in different ways.[4] In a study by Cooke *et al.,* headache and nausea were found to be significantly higher after laparoscopic abdominal surgery, possibly due to raised ICP.[4]

Shono *et al.* have reported that phenylephrine requirement in the high PEEP group was significantly greater than in the normal PEEP group. For maintenance of cerebral perfusion pressure, a higher mean arterial pressure should have been targeted in view of the raised ICP. The authors have reported a raised arterial carbon dioxide of 49 ± 5 mm Hg which may also have detrimental effect on the ICP. Adjusting the respiratory rate to normalize the end tidal carbon dioxide could have been considered in the study design. In susceptible individuals, surgeries lasting 484 ± 81 min with a persistently high ICP resulting from a high PEEP of 15 cm H_2O could result in a greater incidence of complications. These complications should be investigated before we can recommend universal application of a high PEEP in all patients. Prospective authors planning similar studies could consider adding incidence of adverse effects on ICP or intraocular pressure as one of their secondary objectives; otherwise, they could include these concerns as limitations of their study.

Competing Interests

The authors declare no competing interests.

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This letter was sent to the author of the original article referenced above, who declined to respond.—Evan D. Kharasch, M.D., Ph.D., Editor-in-Chief.

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Suture-catheters Compared with Traditional Catheters: Comment

To the Editor:

We read with interest the first human randomized, controlled trial of the "Suture-method *versus* Through-the-needle Catheters for Continuous Popliteal-sciatic Nerve Blocks" by Finneran *et al.*[1] The technique was developed and first demonstrated in cadavers by Rothe *et al.* for popliteal sciatic block in prone position.[2,3] The method relies on the curvature of the needle and enough space available for it to reliably exit and not in close proximity to the surgical field or other vital structures.

Unfortunately, a successful new catheter system needs to have a design that fits all the nerve block locations and all patient sizes, and this one suffers from numerous drawbacks (pertaining to infection risk, challenging nerve locations, *etc.*), which the authors have already pointed out in great detail.[1–3]

However, the ultrasound visualization of a curved needle has not been addressed. The authors mention that curved needles are better visualized than straight needles, which in our opinion is an inaccurate statement. The current ultrasound systems utilized for placement of nerve blocks are able to provide two-dimensional cross-sectional images of the tissues. As a result, so long as the needle is inside this imaging plane, it will be visible.[4] However, various factors such as lateral forces exerted on straight needle tip leading to curvature may lead to an unpredictable needle trajectory which cannot always be assumed to be straight or even in a single two-dimensional plane.[4] The needle might then be viewed in bits such that the tip at the end of the high-contrast shaft may be obscured by shadows or poor reflection back to the probe.

Complex needle segmenting/needle enhancing algorithms are available to visualize straight needles, and more advanced algorithms exist which can enable curved needles visualization with two-dimensional ultrasounds but not available routinely.[5] These algorithms, even if available, often fail if the curvature is excessive.[5,6] Similarly, the echogenic catheter mostly curved may pose similar challenges to visualize and reposition. Rothe *et al.* describe that manipulating the curved needle facilitates the tip to move in an arc somehow facilitating needle visualization, but they provide no evidence of this being true.[3] It's no wonder, then, that Finneran *et al.* struggle to visualize the needle clearly at meager depth of possibly just a few (2 to 4) centimeters as evident in their figure 3.[1]

We commend the authors for successfully demonstrating the utility of a somewhat simpler nerve catheter system; however, this system is far from perfect in design, ergonomics, or ease of placement.

Competing Interests

The authors declare no competing interests.

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