



Ultrasound optic nerve sheath diameter evaluation in patients undergoing robot-assisted laparoscopic pelvic surgery

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Abstract

Following the interesting reading of the article “A randomised trial to compare the increase in intracranial pressure as correlated with the optic nerve sheath diameter during propofol versus sevoflurane-maintained anesthesia in robot-assisted laparoscopic pelvic surgery”, the authors comment some aspects about ocular ultrasonography to measure optic nerve sheath diameter as a tool to detect potential intracranial hypertension, pointing out the utility of Standardized A Scan technique for this purpose.

Keywords Blooming effect · Intracranial pressure · Optic nerve sheath diameter · Ultrasound

Dear Sirs,

We read with great interest the noteworthy paper by Sujata et al. published on your journal, concerning the comparison between two different anesthetics in causing increased intracranial pressure during robot-assisted laparoscopic pelvic surgery [1]. We strongly believe this is a very interesting article, especially for the challenging use of ultrasonography to evaluate optic nerve sheath diameter (ONSD), but we would like to comment on some aspects about this technique.

In their study, the authors used B mode ultrasound to measure ONSD in patients undergoing robot-assisted laparoscopic pelvic surgery with two different anesthetics, propofol and sevoflurane, to detect potential increased intracranial pressure. Nevertheless, the untrustworthiness of this ultrasound method for such purpose has been widely demonstrated, due to the blooming effect [2–9]. B mode has been utilized for more than 50 years to identify several orbital and ocular diseases [10–12], but for measurements of small structures, such as ONSD, it has proven to be quite unreliable because of this effect. In fact, with decreasing the gain, the ONSD appears bigger, so the absence of a standard gain setting when performing this kind of examination means we

cannot standardize the author’s results with those of others already published.

This effect may be ignored with large structures, but not when resolution below 0.5 mm is supposed, as for ONSD assessment.

For this reason, we recommend the use of Standardized A Scan technique, a blooming effect-free ultrasound method that displays easily noticeable high spikes from the interface between arachnoid and subarachnoid fluid, making these measurements objective and exacter [13, 14].

Furthermore, a scan examination also permits the “30 degrees test”, which can differentiate between ONSD increase caused by raised intracranial pressure, and ONSD increase associated with other diseases, such as optic nerve meningioma or optic neuritis [15–18].

Lastly, we would like to suggest performing ONSD ultrasound evaluation with open eyelids, utilizing methylcellulose and anesthetic drops, to clearly visualize the eye and making the probe orientation much more precise, avoiding errors in detecting gaze direction [19, 20].

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Compliance with ethical standards

Conflict of interest Maddalena De Bernardo, Livio Vitiello and Nicola Rosa declare that they have no conflict of interest.

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Research involving human participants and/or animals This article does not contain any studies with human participants or animals performed by any of the authors.

Informed consent Not applicable.

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