



Optic nerve sheath diameter appraisal in pediatric neurosurgery practice

Livio Vitiello¹ · Maddalena De Bernardo¹ · Nicola Rosa¹

Received: 15 July 2019 / Accepted: 28 July 2019 / Published online: 2 August 2019
© Springer-Verlag GmbH Germany, part of Springer Nature 2019

Dear Editor:

Recently, due to its safety and ready availability, the use of ocular ultrasound has been spreading more and more in different medical fields, especially in Neurology and Neurosurgery, aiding physicians to diagnose several pathological conditions.

For this reason, we believe that the study carried out by Kerscher and colleagues, regarding the use of ophthalmic echography to appraise optic nerve sheath diameter (ONSD) in pediatric neurosurgery practice [1], is really remarkable and interesting.

Nevertheless, we would like to focus on some features about this useful ultrasound technique to detect potential intracranial hypertension, evaluating ONSD.

In the “Methods” section of their study, the authors stated that “a high frequency 12 MHz linear transducer was applied and the probe was placed on the closed upper eyelid on a thick layer of coupling gel” [1].

In our opinion, this statement could be really important, because it could define the significance and the consistency of the study data.

In fact, it seems that B-scan was performed to achieve the study aim. This is an ultrasound technique that should be considered quite untrustworthy to appraise ONSD, because it has no standard gain setting and this could give the blooming effect [2].

To overcome this and other B-scan pitfalls in assessing ONSD, we would like to suggest the use of standardized A-

scan technique. This ultrasound method is blooming effect free and it can show easily noticeable high spikes from the interface between arachnoid and subarachnoid fluid, providing more objective and accurate measurements [3].

Moreover, standardized A-scan is a more complete ultrasound technique that allows performing the “30 degrees test,” which can differentiate between ONSD increase due to raised intracranial pressure, and ONSD increase related to other optic nerve diseases [4].

At last, we would like to highlight that ocular ultrasonography could be performed with open eyelids, using methylcellulose and anesthetic drops, to clearly visualize the eye. In this way, errors in detecting gaze direction are minimized and could be avoided, without altering the data significance [5].

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical approval This article does not contain any studies with human participants or animals performed by any of the authors.

References

1. Kerscher SR, Schöni D, Hurth H, Neunhoeffler F, Haas-Lude K, Wolff M, Schuhmann MU (2019) The relation of optic nerve sheath diameter (ONSD) and intracranial pressure (ICP) in pediatric neurosurgery practice - part I: correlations, age-dependency and cut-off values. *Childs Nerv Syst.* <https://doi.org/10.1007/s00381-019-04266-1>
2. De Bernardo M, Rosa N (2018) Optic nerve sheath diameter measurement in patients with idiopathic normal-pressure hydrocephalus. *Eur J Neurol* 25:e24. <https://doi.org/10.1111/ene.13530>
3. De Bernardo M, Rosa N (2018) Comment on “Optic nerve sheath diameter ultrasound evaluation in intensive care unit: possible role and clinical aspects in neurological critical patients’ daily

✉ Maddalena De Bernardo
mdebernardo@unisa.it

¹ Department of Medicine, Surgery and Dentistry “Scuola Medica Salernitana”, University of Salerno, Via Allende, 84081, Baronissi, Salerno, Italy

- monitoring”. *Biomed Res Int* 2018:6154357. <https://doi.org/10.1155/2018/6154357>
4. De Bernardo M, Rosa N (2018) Comment on ‘Invasive and noninvasive means of measuring intracranial pressure: a review’. *Physiol Meas* 39:058001. <https://doi.org/10.1088/1361-6579/aac540>
 5. De Bernardo M, Vitiello L, Rosa N (2019) Intracranial pressure evaluation in acute liver failure. *Neurocrit Care* 30:495–496. <https://doi.org/10.1007/s12028-019-00680-0>

Publisher’s note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.