Letter to the Editor

Systematic use of standardized A-scan technique in neurosurgical intensive care unit

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We read with great interest the article by Bibesh Pokhrel and Amit Thapa regarding the use of point-of-care ultrasound (POC-US) for prompt diagnosis and management of patients (1). While we commend the authors on their valuable contribution, we would like to provide additional insights.

The authors utilized a B-scan ultrasound linear array probe for measuring the Optic Nerve Sheath Diameter (ONSD). However, we would like to highlight some concerns regarding their methodology. The authors placed the probe with gel over the upper eyelid and utilized a clear covering (e.g., Tegaderm) to avoid direct contact of the gel with the eyelid. This approach may lead to sound attenuation, potentially compromising the reliability of the results. To address this issue, previous studies have suggested performing the examination with open eyelids, utilizing anesthetic drops and methylcellulose instead of the usual gel (2-4). Additionally, assessing the eye's primary position with closed eyelids can be challenging (5). Measuring the ONSD in the primary position is crucial, as altering the eye's position may affect the cerebrospinal fluid surrounding the optic nerve, resulting in inaccurate ONSD measurements (6).

Furthermore, we would like to suggest avoiding the measurement of ONSD with the sound beam parallel to the optic nerve axis. This approach scatters the sound, making it difficult to distinguish the borders of the ONSD. When measuring a structure, it is best to have the sound beam perpendicular to the borders being measured. This is especially important when small differences, such as less than 0.5 mm, are significant, as in the differential diagnosis of optic nerve lesions. The variation in reported thresholds in different studies may also be attributed to this effect (7).

In contrast, the standardized A-scan technique, which employs an 8 MHz non-focused probe and a special S-shaped amplification, allows for better assessment of perpendicularity to the structure being examined. This technique results in more accurate ONSD measurements due to the prominent high-reflective arachnoid spikes (8). Although the A-scan technique is more challenging to be acquired, it can be easily performed with the assistance of an ophthalmologist who is experienced in orbit and eye ultrasound (9). With this technique, measurements can be conducted with the eye open and in the primary position,

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and the optic nerve diameter is measured as the distance between two spikes, each aligned with the arachnoid that envelops the optic nerve.

In conclusion, while the B-scan technique can be useful in detecting certain lesions, such as optic nerve drusen (10), it may not be very sensitive for measurements. Therefore, we suggest performing all examinations with open eyelids and with the eye in the primary position after administering anesthetic eye drops when the detection of a lesion is planned. However, in the case of measurements, the standardized A-scan technique may yield more reliable results.

Appendix 1: Response to "Systematic use of standardized A-scan technique in neurosurgical intensive care unit".

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Footnote

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