CORRESPONDENCE

Ocular ultrasonography in patients with subarachnoid hemorrhage and Terson syndrome

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To the Editor,

We read the interesting case series by Palermo *et al.* concerning ocular ultrasonography in two patients with subarachnoid hemorrhage and Terson syndrome.¹ We would like to comment on some aspects of B-scan ultrasonography to evaluate the optic nerve sheath diameter (ONSD). This ultrasound method is gaining in popularity for its accessibility, low-cost, and safety profile, with wide clinical utility in different medical fields.

However, it has been shown to be quite inaccurate in assessing small structures, such as the ONSD, because it does not permit the operator to obtain objective and exact measurements because of, among other factors, the *blooming effect*. This effect implies a reduction in the size of a structure just by increasing the gain of the B-scan ultrasonography, whereas the same structure will appear larger when the gain is reduced.^{2,3}

In this case, as can be observed in Fig. 1 of the cited report,¹ the three pictures seem to have been measured at three different time points during the follow up. In fact, it appears that the optic nerve was not caught at its insertion, as the elevation of the optic disc is not evident in the picture, as it should be in case of papilledema.

For these reasons, clinicians should consider using the standardized A-scan technique, which is a blooming effect-free ultrasonography modality that requires an 8 MHz

unfocused transducer to obtain spikes instead of dots. This technique could *potentially* provide more accurate ONSD measurements.⁴ Furthermore, when coupled with the 30° test, which consists of measuring the maximal optic nerve diameter first in straight gaze (“0 degrees”) and then in abduction (“30 degrees”), this ultrasound method can show an increase in subarachnoidal fluid when the ONSD decreases greater than 5% during maximal eye abduction. This can also differentiate an increase in ONSD due to intracranial hypertension from a solid thickening of pial and arachnoidal sheaths related to optic neuritis, optic nerve glioma, meningioma, or leukemic infiltration.⁵ Unfortunately, this is a more difficult exam, which requires some additional training.

In conclusion, we would like to suggest the use of A-scan in further studies regarding the ultrasonographic assessment of the ONSD, with the hopes that this method would offer more replicable and objective results.

Conflict of interest None.

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This letter is accompanied by a reply. Please see *Can J Anesth* 2020; 67: this issue.

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