



## Usefulness of Standardized A-Scan technique in distinguishing papilledema from pseudopapilledema

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Dear Editor:

We read the article entitled “The efficacy of orbital ultrasonography and magnetic resonance imaging findings with direct measurement of intracranial pressure in distinguishing papilledema from pseudopapilledema” published in your journal, in which challenging aspects about ocular ultrasonography are discussed [1]. However, we would like to point out some features concerning optic nerve sheath diameter (ONSD) evaluation with echography.

In this retrospective observational study, the authors performed all the measurements with B-mode orbital ultrasonography, which is mainly utilized to detect several ocular diseases. Unluckily, this investigation is less sensitive in measuring the orbital structures, as it is affected by the blooming effect [2, 3]. This effect is related to the absence of a standard gain setting in performing this kind of examination and it implies that, when ONSD is measured with a lower gain setting, this will result in larger measurements than the ones obtained with an increased gain setting. This effect could be considered less significant when we handle large lesions, but it could be

deceptive if we deal with a difference inferior to 0.5 mm, as it happens when ONSD is appraised.

For this reason, in case of further studies, we would like to advise using the Standardized A-Scan technique. This technique, introduced in the early 1970s by KC Ossoinig and widely utilized all over the world in the ophthalmic field, uses an 8-MHz non-focused A-Scan probe with a special S-shaped amplification. This method is blooming effect free and makes these measurements more precise and objective, because it shows easily discernible high reflective spikes from the interface between arachnoid and subarachnoidal fluid [4].

Moreover, we should consider that an increase in ONSD does not certainly prove the presence of an increased intracranial pressure but it could be also caused by other diseases, such as an optic neuritis or an optic nerve meningioma. This problem could be overcome utilizing the A-Scan “30 degree test,” which consists in a measurement of the optic nerve with the patient looking straight and to the lateral side. In this way, intracranial hypertension caused by increased subarachnoidal fluid, that produces distension of the ONSD, will be proved if this test will show a decrease in the maximal diameter of at least 5% [5].

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## 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. Ozturk Z, Atalay T, Arhan E, Aydin K, Serdaroglu A, Hirfanoglu T, Havalı C, Akbas Y, Yalinbas D (2017) The efficacy of orbital ultrasonography and magnetic resonance imaging findings with direct measurement of intracranial pressure in distinguishing papilledema from pseudopapilledema. *Childs Nerv Syst* 33:1501–1507. <https://doi.org/10.1007/s00381-017-3454-6>
2. De Bernardo M, Marotta G, Rosa N (2018) Sonography of the optic nerve sheath diameter. *J Ultrasound Med* 37:1845. <https://doi.org/10.1002/jum.14486>
3. De Bernardo M, Rosa N (2018) Transorbital sonography to evaluate optic nerve in hypertensive encephalopathy. *J Stroke Cerebrovasc Dis* 27:1124. <https://doi.org/10.1016/j.jstrokecerebrovasdis.2017.11.035>
4. De Bernardo M, Rosa N (2018) Measuring optic nerve sheath diameter as a proxy for intracranial pressure. *JAMA Ophthalmol* 136:1309–1310. <https://doi.org/10.1001/jamaophthalmol.2018.3429>
5. De Bernardo M, Rosa N (2018) Transbulbar B-mode sonography in multiple sclerosis: clinical and biological relevance. *Ultrasound Med Biol* 44:508. <https://doi.org/10.1016/j.ultrasmedbio.2017.10.002>

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