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A-scan ultrasonography as a supportive diagnostic tool in case of acute optic neuritis

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To the Editor,

Nowadays, there is an increasing interest in ocular ultrasonography to diagnose numerous diseases, especially those affecting the central nervous system.

Kwon et al. (2019) carried out a really interesting study dealing with the use of ultrasound as a possible diagnostic tool to detect optic neuritis. We would like to congratulate the authors for their impressive paper, but we would like to comment some aspects concerning optic nerve sheath diameter (ONSD) evaluation with this technique.

To appraise ONSD, the authors compared B-mode ultrasonography with Magnetic Resonance Imaging, visual evoked potential and optical coherence tomography. Even if for more than 50 years B-mode has been employed to identify several orbital and ocular diseases (Rosa et al., 2011), it should be rated quite unreliable for ONSD evaluation, due to several reasons (De Bernardo and Rosa, 2017; De Bernardo et al., 2018, 2019a, 2019b; Rosa and De Bernardo, 2017a;). For measuring small structures, such as ONSD, it has been demonstrated to be quite untrustworthy due, among the others, to the blooming effect caused by the lack of a standard gain setting in performing this examination, meaning that, decreasing the gain, the ONSD will appear larger.

However, this effect could be unnoticed when large structures need to be assessed, but this is not possible when resolution below 0.5 mm is assumed, as in case of ONSD appraisal.

Therefore, to overwhelm the mentioned pitfalls, we would like to advise the use of Standardized A Scan method, a blooming effect free ultrasound technique which shows easily noticeable high spikes from the interface between arachnoid and subarachnoidal fluid, making these measurements objective and more accurate (De Bernardo and Rosa, 2018a; Rosa and De Bernardo, 2017b).

Moreover, it is very important to point out that, with A-mode, we can perform the “30° test”. It allows to distinguish between ONSD increase caused by some optic nerve diseases, such as optic neuritis or optic nerve meningioma, or by increased subarachnoidal fluid because of raised intracranial pressure (De Bernardo et al., 2019c, 2019d; Iaconetta et al., 2017;). It consists in a measurement of the optic nerve with the patient looking to the lateral side. If we obtain a decrease in the maximal ONSD of at least 5%, this will prove that the enlargement of the ONSD is related to increased subarachnoidal fluid, as in case of intracranial hypertension, excluding other potential optic nerve diseases (De Bernardo and Rosa, 2018b, 2018c, 2018d).

Concerning the measurement technique, we would like to highlight that the B or A scan probe should be used with open lids, as it is routinely performed in ophthalmology utilizing methylcellulose and anesthetic drops. In this way, we can clearly visualize the eye, making the probe orientation much more reliable, avoiding errors in detecting gaze direction (Tenuta et al., 2017).

Lastly, in case of optic nerve evaluations with echography, we would like to suggest to use the terms “transbulbar” or “orbital”. Indeed, the term “trans” is a Latin word that means “beyond” or “through” and the word “transorbital” could be deceptive (De Bernardo and Rosa, 2018e), although we are aware that this term is often used in literature and it is usually accepted (De Bernardo and Rosa, 2018f).

Declaration of Competing Interest

None

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