

Evaluation of Intracranial Pressure During Neural Laser Discectomy

TO THE EDITOR:

We read with great interest the article by Beyaz et al. concerning the evaluation of the optic nerve sheath diameter (ONSD) during epiduroscopic neural laser discectomy procedures (1).

This is a very interesting paper, but we would like to make some comments.

We are wondering why the authors excluded from the study patients with cataract or macular degenerations. These diseases have no influence on the ONSD measurements.

As the authors correctly stated, changes in intracranial pressure have a direct effect on the peri-optic subarachnoid space diameter, whereas the pathogenesis of optic disc edema in raised intracranial pressure is a mechanical phenomenon. Papilledema "is primarily due to a rise of CSFP in the optic nerve sheath, which produces axoplasmic flow stasis in the optic nerve fibers in the surface nerve fiber layer and prelaminar region of the optic nerve head. Axoplasmic flow stasis then results in swelling of the nerve fibers, and consequently of the optic disc" (2).

For this reason, as proven by several studies, the measurement of the ONSD by echography is considered a more reliable test for non-invasive diagnosis of increased intracranial pressure compared to papilledema.

This explains why in the previous study performed by Beyaz et al. with OCT they could not find an increase

in the optic disc diameter or in the peripapillary retinal nerve fiber layer thickness (3).

Unfortunately this research, as most of the published studies, has been performed with a B scan technique that is affected by several limitations due to the presence of artifacts that even taking into account the advice to image the central retinal artery with color Doppler (4) cannot be avoided.

The lack of standardization with the B scan technique could explain why the cut-off value observed in this study was considerably higher than previous reported studies.

The best way to prevent these artifacts is to use the so called standardized A scan technique (5,6).

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REFERENCES

1. Beyaz SG, Kaya Ülgen AM, Sahin F, Kocayigit H, Issi ZT. Evaluation of increased intracranial pressure with the optic nerve sheath diameter by ultrasound in epiduroscopic neural laser discectomy procedures. *Pain Physician* 2021; 24:E595-E600.
2. Hayreh, SS. Pathogenesis of optic disc edema in raised intracranial pressure. *Prog Retin Eye Res* 2016; 50:108-144.
3. Beyaz SG, Ülgen AM, Çakir B. The effects of the amount of fluid used in epiduroscopic laser neural discectomy procedures on intraocular pressure and an evaluation of the ocular findings. *Pain Med* 2020; 21:1357-1361.
4. Copetti R, Cattarossi L. Optic nerve ultrasound: Artifacts and real images. *Intensive Care Med* 2009; 35:1488-1489.
5. De Bernardo M, Vitiello L, Rosa N. Ultrasound optic nerve sheath diameter evaluation in patients undergoing robot-assisted laparoscopic pelvic surgery. *Journal of Robotic Surgery* 2019; 13:709-7101.
6. De Bernardo M, Vitiello L, Rosa N. Optic nerve evaluation in idiopathic intracranial hypertension. *American Journal of Neuroradiology* 2019; 40:E36.