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CORRESPONDENCE

Optic nerve sheath responses to pressure variations

H. C. Hansen[1*] and K. Helmke[2]

Dear Editor,

We agree with Robba et al. [3] who recently reviewed ONSD evaluation for non-invasive ICP estimation in the Journal that most of the clinical data collected so far have shown that ONSD monitoring is a promising but not easy-to-interpret candidate for this purpose. Of course, this and the broad attention meanwhile received in the clinical scene is good news for the method we proposed 25 years ago having performed first ICU bedside measurements in our units and ex vivo studies. However, we would like to point out some earlier reported results and methodological aspects that were not mentioned in the text.

1. Close correlation ($r=0.78$) between CSF pressure and ONSD had been demonstrated in vivo during in lumbar infusion tests [2]. The response varied between subjects (0.019–0.071 mm/mm Hg), likewise when measured with intracranial monitoring. In our opinion, clinical settings should perform serial ONSD measurements and always aim for a trend analysis, at least when it comes to the classical question "rising ICP?".
2. We agree, that ONSD measurements should be taken at 3 mm behind the globe. The anatomical reason is the enhanced compliance of the anterior portion of the sheath, which had been systematically studied ex vivo ([1], see Fig. 1). Measurements at the more proximal end will not pick up much response. Therefore it is recommended by most authors to average three ONSD measurements taken on each side at 3 mm to check for reproducibility.

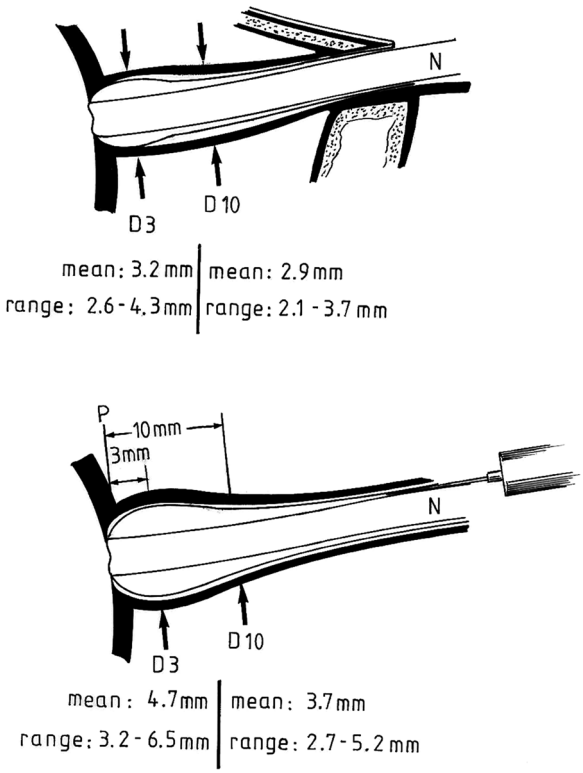

Fig. 1 ONSD measured in 51 human optic nerves (N) ex vivo before (upper part) and after (lower part) gelatine injections. The position of measurement at 3 mm behind the sclera (D3) shows markedly higher diameters than the position at 10 mm (D10)

*Correspondence: hansen@uke.de
[1] Dept. Neurology, Friedrich-Ebert-Krankenhaus Neumünster GmbH, Neumünster, Germany
Full author information is available at the end of the article

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In conclusion, we hope that ongoing improvement of ultrasound techniques will lead to more clinically useful information about pathological data and abnormality criteria. In our opinion, the compliance of all structures involved needs to be studied in more detail regarding elastic and plastic deformation to understand limitations and realistic clinical application of ONSD monitoring.

Author details
[1] Dept. Neurology, Friedrich-Ebert-Krankenhaus Neumünster GmbH, Neumünster, Germany. [2] Dept. Pediatric Radiology, University Hospital Eppendorf, Hamburg, Germany.

Compliance with ethical standards

Conflicts of interest
The author declares that they have no competing interests.

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