

## In reply to "Bias in the interpretation of the transcranial color-coded duplex sonography register"<sup>☆</sup>



### En respuesta a «Factores de confusión en el análisis del registro de ecografía dúplex transcraneal codificado color»

Dear Editor,

We wish to thank the interest shown by Rochetti and Egea-Guerrero<sup>1</sup> toward our paper "Desaparición del flujo diastólico cerebral tras una complicación inesperada"<sup>2</sup> (Disappearance of diastolic flow after unexpected complication) and their interesting comments made since this allows us to have much more information on the clinical case that, due to the limited space of the section "Images in Medicina Intensiva" we could not provide. We wish to expose the case in detail and analyze the comments made by these authors.

Female patient admitted to the ICU diagnosed with left parietal-occipital transtentorial tumor (postoperative biopsy: atypical meningioma) with peripheral edema and signs of intratumor subacute hemorrhage. Four days later the patient presents impaired cognitive level (GCS 3) and right mydriasis that requires intubation, invasive mechanical ventilation (IMV), and venous catheter (VC) canalization through the subclavian. The cranial CT scan rules out re-bleeding and confirms the presence of extensive perilesional edema and mass effect on neighboring structures. We keep osmotherapy and timely moderate hyperventilation. Then we proceed to implant an ICP sensor that reveals pressure values of 65 mmHg, which is not consistent with the findings from the CT scan, but still verified through calibration on two occasions. The anomalous flow pattern (lack of diastolic flow) seen at the color-coded duplex sonography (CCDS) and the progressive decline of the BIS value down to 0 confirm the clinical urgency. A chest X-ray is performed (which was pending after the insertion of the catheter and delayed for priority reasons) showing tension pneumothorax that is immediately drained to eventually reverse the parameters of poor prognosis described.

As Rochetti and Egea-Guerrero<sup>1</sup> say, for the correct interpretation of the brain blood flow parameters seen at the CCDS, the patient's hemodynamic and respiratory situation (concept of self-regulation and brain vasoreactivity) plays a key role here.<sup>3-5</sup> Although it is true that the patient showed neurological instability (both pre- and post-implantation of the VC) with limited episodes of reduced GCS, and hemodynamic instability (with fluctuating HR and BP), she was scrutinized, at all time, through state-of-the-art monitoring

modalities with optimization of fluid therapy and vasoactive drugs. While both CCDSs were being conducted, the patient remained normotensive and normoventilated. It is obvious that had we seen hemodynamic or respiratory changes, hyperthermia, anemia, or any other significant alterations affecting the brain blood flow, these changes would have been described and detailed in our paper. Due to the aforementioned space constraints, such information was taken for granted and, therefore, overlooked.

The respiratory auscultation that followed the insertion of the VC was conducted according to the protocol from our unit but, in this case, it did not reveal unilateral hypoventilation, altered HR, or significant hypoxia. We should not forget, however, that the patient had just been intubated and connected to IMV.

With this letter we wish to show how a non-invasive imaging modality like the CCDS can help us detect and/or confirm urgent situations (if rearranged to look for origin, severity, and therapeutic possibilities) and assess the responses to the therapy administered. Similarly, it is important to raise all intensivists' awareness on the CCDS imaging modality since it is always available and help us interpret the situation of neurocritical patients.<sup>6</sup>

## References

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