

Response Letter

We appreciate the time and efforts of the reviewers and Editor in providing insightful comments and suggestions, which are very helpful for improving the manuscript. Point-by-point responses to the reviewers' comments are presented below separately. We have made the necessary revisions according to the reviewers' comments. The revisions have also been highlighted in the revised manuscripts.

Reviewers' Comments:

Reviewer #1

Comments to the Author

Scientific Quality: Grade B (Very good)

Language Quality: Grade B (Minor language polishing)

Conclusion: Minor revision

Specific Comments to Authors: This is an interesting article that needs some improvements. These are my comments: -Abstract: Background It is stated that "Compared to traditional ultrasound Doppler imaging, uPDI has the advantages of being noninvasive, convenient, highly sensitive, and able to show microvessels in high resolution images". This statement is incorrect. In fact, traditional ultrasound Doppler imaging also is noninvasive and convenient. These two words must be deleted. -What does it mean "fine vessels"? Do you mean small vessels or microvessels? If so, please change. - Treatment: spell out the "OR" abbreviation. -The description of the ultrasound system and how uPDI images are obtained does not belong to the discussion. It should be moved into the presentation of the case in a separate section.

Reply:

We thank the reviewer for the suggestion. We have made efforts to improve the writing quality of this manuscript. The modifications have been highlighted in the revised manuscript.

We have revised the manuscript as follows:

- 1. We have rewritten the sentence “Compared to traditional ultrasound Doppler imaging, uPDI has the advantages of being noninvasive, convenient, highly sensitive, and able to show microvessels in high resolution images” as “uPDI significantly improves Doppler sensitivity and can detect microvessels, which are usually invisible using traditional ultrasound Doppler imaging.” We agree that the original sentence was inappropriate and overstated the advantages of uPDI.*
- 2. We agree with the reviewer’s assessment, we have replaced the term “fine vessels” with “microvessels” throughout the article, as suggested by the reviewer.*
- 3. We have spell out the abbreviation “OR” as “Operating room” to avoid confusion with other meanings of OR.*
- 4. We think this is an excellent suggestion, we have moved the description of the ultrasound system and how uPDI images are obtained from the introduction section to the “Imaging examinations” section, as this is more relevant to the methods and results of our study.*

Reviewer #2

Comments to the Author

Scientific Quality: Grade B (Very good)

Language Quality: Grade B (Minor language polishing)

Conclusion: Minor revision

Specific Comments to Authors: In this case note, ultrafast power Doppler imaging (uPDI) -a new noninvasive and highly sensitive microvascular imaging technology - was used for the first time to observe the microvessels involved in cortical laminar necrosis and luxury perfusion in the brain in a pediatric 4-year-old girl who had severe hypoperfusion after brain herniation and underwent decompression craniectomy due to refractory intracranial hypertension after giant intracranial mesenchymal chondrosarcoma surgery. The authors suggests that uPDI is, potentially, a more intuitive and noninvasive method for evaluating the effects of severe intracranial hypertension and cerebral microvessels and uPDI images can accurately identify anatomical and hemodynamic characteristics. This case report is potentially interesting, but the manuscript can be improved according to the following suggestions:

- 1. It should be noted in the Discussion, that ultrafast power Doppler imaging could also be potentially used in adult patients with malignant middle cerebral artery infarction a devastating type of ischemic stroke (Rev Invest Clin 2015: 67: 64-70). It is recommended that this reference be included and commented upon.*
- 2. Please add this bibliographic reference (World J Clin Cases. 2013 Nov 16;1(8):256-9. doi: 10.12998/wjcc.v1.i8.256. PMID: 24340278; PMCID: PMC3856303) related to*

cortical laminar necrosis in the text. 3. It would be interesting if the authors included in the text some of the limitations of this case note. 4. A brief concluding comment on possible lines of future research on the topic presented would be appreciated.

Reply:

We thank the reviewer for this important comment.

We have revised the manuscript as follows:

1. We think this is an excellent suggestion, we have added a new comment to the article and cite relevant literature to indicate that Ultrafast Power Doppler Imaging could also be potentially used in adult patients with malignant middle cerebral artery infarction, a devastating type of ischemic stroke. The new sentence is “It should be noted that, uPDI has the potential to be used for adult patients with malignant middle cerebral artery infarction (a devastating type of ischemic stroke) intraoperatively or with a decompression window.”

2. We have cited the article (World J Clin Cases. 2013 Nov 16;1(8):256-9. doi: 10.12998/wjcc.v1.i8.256. PMID: 24340278; PMCID: PMC3856303) related to cortical laminar necrosis in the text, as suggested by the reviewer. We have added it to the discussion section of page 8 of the article as reference .

3. We have added the limitations of this case to the discussion section: “Due to the strong attenuation and aberration effect of ultrasound caused by skull, the uPDI technique can only be used intraoperatively or for patients who have decompression window to image the cerebral microvessels, which is a nonnegligible limitation.”

4. We think this is an excellent suggestion , we have added a brief summary of possible directions for future research on this topic at the end of the article: “It also has the potential value to reveal the sequential changes and mechanisms of brain injury in neurocritical patients in future clinical research.”