Reviewer's report

Title: The role of noninvasive and invasive diagnostic imaging techniques for detection of extra-cranial venous system anomalies and developmental variants

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Reviewer: Greg Zaharchuk

Reviewer's report:

To authors

This review article summarizes some of the most commonly used modalities for evaluating the cerebral and cervical venous systems. It is well referenced and contains a good discussion of the various modalities. One thing I would suggest is that in addition to the images from each modality, to include a Table highlighting the different methods, their strengths and weaknesses, along with a key reference or two for each.

1. P 13 bottom: When discussing the MRV studies that did not show any differences between MS and controls, they might want to highlight one that did show such a difference (McTaggart et al., AJNR 2012, already reference #35).

2. P 15 top: The authors state that TOF MRV is less time-efficient than multislice imaging. This is not true. Since a short TR is required for inflow and background suppression, it is not possible to perform in a multislice experiment.

3. P 15 bottom: The statement about the axial orientation of the acquisition appears to be referencing the use of 2D TOF MRV extracranially; this should be made clear. TOF MRV of the head is typically acquired in the coronal plane.


5. P 17 bottom: Last word should read ‘maximum’, not ‘minimum’

6. P 19 top: Statement is made that ‘MRV often detects spurious stenoses that are not confirmed by CV.’ Actually, I think this is rather the exception than the rule, but if the authors persist, they should provide a reference to back this up.

7. P 20 top: Authors state that CTV has ability to do rotating 3D cine loops. Of course, this is not unique to CTV; MRV has this capability as well.

8. P 20 bottom: The same sentence ‘MRV often detects spurious stenoses that are not confirmed by CV’ is repeated from p 19. Perhaps an editing error?


10. P 24 general: When discussing the use/value of CV, the authors might want
to emphasize the ability to do pressure measurements, and whether these could or are useful for documenting severity of stenosis.

11. P 30 bottom: No need to reference the same long list of references twice (18, 26, 41…)

12. P 55 bottom: Figure 4 is repeated twice. I assume the second one should refer to Figure 5.

13. P56 middle: Figure 7b – I am not sure what this ‘volume rendering technique is’ but it looks maybe like a super zoomed-in view of the vein (?). I can’t imagine such an image is very useful to anyone. Might want to remove it.

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:

I declare that I have no competing interests