

# Generic Contrast Agents

Our portfolio is growing to serve you better. Now you have a *choice*.



[VIEW CATALOG](#)

# AJNR

## Concerning "Nonaneurysmal Perimesencephalic Hemorrhage Is Associated with Deep Cerebral Venous Drainage Anomalies: A Systematic Literature Review and Meta-Analysis"

X. Wu, R. Liu and A. Malhotra

This information is current as of May 30, 2025.

*AJNR Am J Neuroradiol* 2017, 38 (2) E14

doi: <https://doi.org/10.3174/ajnr.A4984>

<http://www.ajnr.org/content/38/2/E14>

## Concerning “Nonaneurysmal Perimesencephalic Hemorrhage Is Associated with Deep Cerebral Venous Drainage Anomalies: A Systematic Literature Review and Meta-Analysis”

We would like to thank Rouchaud et al<sup>1</sup> for their study entitled “Nonaneurysmal Perimesencephalic Hemorrhage Is Associated with Deep Cerebral Venous Drainage Anomalies: A Systematic Literature Review and Meta-Analysis.” This is a timely effort to investigate the underlying mechanisms of bleeding in nonaneurysmal perimesencephalic subarachnoid hemorrhage (pSAH) because no known causes for this condition have been established yet. However, we raise a few concerns regarding this article.

Deep cerebral venous anomalies may be more common in patients with pSAH, but the meta-analysis does not prove their guilt beyond association. Higher rates of a primitive venous system may be seen in patients with pSAH, but it is not clear how the authors concluded that it has the potential to facilitate the diagnosis of pSAH. Are the authors advocating performing digital subtraction angiography to assess the venous anatomy in patients with SAH in the distribution typical for SAH? As per the literature, patients with nonaneurysmal SAH may have a normal bilateral basal vein of Rosenthal (BVR) drainage pattern (18.3%), and an abnormal venous drainage pattern can be seen in patients with aneurysmal SAH (15.3%).<sup>1</sup> It is unclear how detecting the venous anatomy would change management or prognosis in patients with nonaneurysmal pSAH. The available current literature indicates that negative findings on CT angiography are conclusive in most cases in excluding an aneurysm as the source of SAH in patients with a typical distribution pattern of pSAH, and these patients generally have good outcomes.<sup>2</sup> Recurrent pSAH is rarely reported, and primitive venous drainage has been noted in recurrent pSAH as well. However, even the few reported cases of recurrent pSAH have been reported to have a good outcome with no clear explanation for the etiology of the bleed.<sup>3</sup>

Not all studies have found an association between variant venous anatomy and pSAH.<sup>4</sup> Variants in venous anatomy are also much more common than the incidence of pSAH. Although in-

tracranial venous congestion caused by straining in patients with anomalous venous drainage has been hypothesized to cause a tear in the vein fixed to a dural sinus, Song et al<sup>5</sup> found physical actions, including breath-holding during coughing, shouting, and ejaculation, in only 30% of instances of nonaneurysmal SAH in their series.

Performing conventional angiography after negative findings on CTA may not be cost-effective and is not without risks.<sup>6</sup> We request that the authors elaborate on how a primitive BVR pattern might affirm the diagnosis of nonaneurysmal perimesencephalic hemorrhage and the utility of looking for it, in the absence of better evidence and based solely on association.

### REFERENCES

1. Rouchaud A, Lehman VT, Murad MH, et al. **Nonaneurysmal perimesencephalic hemorrhage is associated with deep cerebral venous drainage anomalies: a systematic literature review and meta-analysis.** *AJNR Am J Neuroradiol* 2016;37:1657–63 [CrossRef Medline](#)
2. Kalra VB, Wu X, Matouk CC, et al. **Use of follow-up imaging in isolated perimesencephalic subarachnoid hemorrhage: a meta-analysis.** *Stroke* 2015;46:401–06 [CrossRef Medline](#)
3. Malhotra A, Wu X, Borse R, et al. **Should patients be counseled about possible recurrence of perimesencephalic subarachnoid hemorrhage?** *World Neurosurg* 2016 Aug 10. [Epub ahead of print] [CrossRef Medline](#)
4. Daenekindt T, Wilms G, Thijs V, et al. **Variants of the basal vein of Rosenthal and perimesencephalic nonaneurysmal hemorrhage.** *Surg Neurol* 2008;69:526–29; discussion 529 [CrossRef Medline](#)
5. Song JH, Yeon JY, Kim KH, et al. **Angiographic analysis of venous drainage and a variant basal vein of Rosenthal in spontaneous idiopathic subarachnoid hemorrhage.** *J Clin Neurosci* 2010;17:1386–90 [CrossRef Medline](#)
6. Kalra VB, Wu X, Forman HP, et al. **Cost-effectiveness of angiographic imaging in isolated perimesencephalic subarachnoid hemorrhage.** *Stroke* 2014;45:3576–82 [CrossRef Medline](#)

 X. Wu

 R. Liu

 A. Malhotra

Department of Radiology and Biomedical Imaging  
Yale School of Medicine  
New Haven, Connecticut

<http://dx.doi.org/10.3174/ajnr.A4984>