

Cerebral Cavernous Malformation Associated Developmental Venous Anomaly Diagnosis

see [Cerebral Cavernous Malformation Diagnosis](#) — [Developmental Venous Anomaly Diagnosis](#)

□ Imaging Characteristics

- **CCM:**
 - “Popcorn” or “berry” appearance
 - Mixed-signal core with hemosiderin ring on T2* or SWI
- **DVA:**
 - Contrast-enhanced MRI shows “caput medusae” venous pattern
 - Draining vein often visible converging to a single point

Retrospective diagnostic accuracy studies

In a retrospective [diagnostic accuracy study](#), Rauschenbach et al. ¹⁾ attempts to assess whether non-contrast [Magnetic resonance imaging sequences](#) (SWI and [GRE-T2](#)) can replace contrast-enhanced [imaging](#) in detecting developmental venous anomalies (DVAs) associated with [cerebral cavernous malformations](#) (CCMs). However, what could have been a valuable [contribution](#) to contrast-free diagnostic imaging instead devolves into a methodologically flawed, statistically shallow, and clinically [irrelevant](#) piece that reinforces what every [experienced radiologist](#) already knows: you still need contrast.

⚠ Major Flaws and Limitations

1. [Retrospective](#) Design with Biased [Sampling](#)

The authors used a [retrospective](#) review of a handpicked institutional [database](#).

The sample of 200 [patients](#) was artificially balanced (50 with SWI, 50 with GRE, 50 with DVA, 50 without). This undermines [external validity](#) and introduces [selection bias](#), making the sensitivity/specificity estimates inapplicable to real-world practice, where DVAs are neither this prevalent nor this evenly distributed.

2. Gold Standard Fallacy

CE-T1 imaging is treated as the infallible [gold standard](#) for DVA detection. Yet DVAs are venous structures with diverse presentations, and the paper provides no [justification](#) or independent [validation](#) for CE-T1 being the absolute reference.

The decision to exclude phase imaging or multiplanar venographic correlation further weakens the reliability of conclusions.

3. Weak [Statistical Power](#) and [Overinterpretation](#)

The *sensitivity of GRE-T2 was just 19.1%**.

This is not just low—it is clinically unacceptable. Yet the

authors casually present this result as part of a valid comparison.

Kappa values (SWI: 0.51; GRE: 0.39) indicate mediocre to poor interrater agreement, yet the discussion glosses over this with vague comments about “observer agreement.”

4. Trivial Conclusions

The main takeaway is that CE-T1 remains necessary—something already known and accepted.

The paper's title teases a paradigm shift (“Can we skip the contrast?”), but the results merely reaffirm the status quo. This is **academic clickbait**.

□ Lack of Clinical Utility

The article claims relevance for “surgical planning,” yet provides no stratification by lesion location, surgical indication, or clinical outcome.

There is no cost-benefit analysis, no assessment of contrast risks vs diagnostic gain, and no proposal for improved protocols.

This is a non-impactful, low-yield study that offers nothing beyond a reminder that inferior sequences yield inferior results.

□ Conflict of Interest Not Disclosed

Given the clinical dependence on contrast agents, it's notable that no conflict of interest or funding statement is provided. In today's publishing landscape, such omissions are unacceptable—especially when the study outcome conveniently supports the continued use of a reimbursable imaging procedure.

□ Conclusion

This **study** is an uninspired, methodologically weak, and clinically **redundant publication** that does not answer its own provocative **title question**. Instead of challenging **current practice** or providing innovative **alternatives**, it simply confirms the obvious: contrast-enhanced imaging detects venous anomalies better than non-contrast scans.

□ **Verdict**: Skip the **article**, not the **contrast**.

1)

Rauschenbach L, Santos AN, Rodemerk J, Gull HH, Dinger TF, Engel A, Schüssler M, Li Y, Darkwah Oppong M, Jabbarli R, Frank B, Forsting M, Wrede KH, Sure U, Dammann P. **Detection of cerebral cavernous malformation associated developmental venous anomalies in gradient-echo and susceptibility-weighted magnetic resonance imaging: can we skip the contrast?** *Neuroradiology*. 2025 Jun 13. doi: 10.1007/s00234-025-03666-2. Epub ahead of print. PMID: 40512378.

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