

the aneurysm maximum diameter and neck size. Therefore, we suggest that the AV/CV ratio may be a useful measurement for predicting the success of intraaneurysmal embolization, particularly for wide-necked aneurysms, based on whether coils can be placed in a stable position within the aneurysm dome. Confirmation requires further examination by a comprehensive study.

### References

- 1) Cloft HJ, Joseph GJ, Tong FC, Goldstein JH, Dion JE: Use of three-dimensional Guglielmi detachable coils in the treatment of wide-necked cerebral aneurysms. *AJNR Am J Neuroradiol* 21: 1312-1314, 2000
- 2) Debrun GM, Aletich VA, Kehrli P, Misra M, Ausman JI, Charbel F: Selection of cerebral aneurysm for treatment using Guglielmi detachable coils: the preliminary University of Illinois at Chicago experience. *Neurosurgery* 43: 1281-1295, 1998
- 3) Fernandez Zubillaga A, Guglielmi G, Vinuela F, Duckwiler GR: Endovascular occlusion of intracranial aneurysms with electrically detachable coils: correlation of aneurysm neck size and treatment results. *AJNR Am J Neuroradiol* 15: 815-820, 1994
- 4) Hochmuth A, Spetzger U, Schumacher M: Comparison of three-dimensional rotational angiography with digital subtraction angiography in the assessment of ruptured cerebral aneurysms. *AJNR Am J Neuroradiol* 23: 1199-1205, 2002
- 5) Hope JKA, Byrne JV, Molyneux AJ: Factors influencing successful angiographic occlusion of aneurysms treated by coil embolization. *AJNR Am J Neuroradiol* 20: 391-399, 1999
- 6) Kiyosue H, Tanoue S, Okahara M, Hori Y, Nakamura T, Nagatomi H, Mori H: Anatomic features predictive of complete aneurysm occlusion can be determined with three-dimensional digital subtraction angiography. *AJNR Am J Neuroradiol* 23: 1206-1213, 2002
- 7) Malek AM, Higashida RT, Phatouros CC, Dowd CF, Halbach VV: Treatment of an intracranial aneurysm using a new three-dimensional-shape Guglielmi detachable coil: technical case report. *Neurosurgery* 44: 1142-1145, 1999
- 8) Martin D, Rodesch G, Alvarez H, Lasjaunias P: Preliminary results of embolization of nonsurgical intracranial aneurysms with GD coils: 1st year of their use. *Neuroradiology* 38: 142-150, 1996
- 9) Moret J, Cognard C, Weill A, Castaings L, Rey A: The "remodeling technique" in the treatment of wide neck intracranial aneurysms. *Interventional Neuroradiology* 3: 21-35, 1997
- 10) Parlea L, Fahrig R, Holdsworth DW, Lownie SP: An analysis of the geometry of saccular intracranial aneurysms. *AJNR Am J Neuroradiol* 20: 1079-1089, 1999
- 11) Takahashi A, Ezura M, Yoshimoto T: Broad neck basilar tip aneurysm treated by neck plastic intraaneurysmal GDC embolization with protective balloon. *Interventional Neuroradiology* 3: 167-170, 1997

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### Commentary

The authors present an interesting analysis of a novel aneurysm morphology index as a predictor of the feasibility of endosaccular coil embolization of unruptured broad necked internal carotid artery aneurysms. The aneurysm volume/virtual column volume (AC/CV) ratio seemed to be a good predictor of technical success of endosaccular coil embolization in a small cohort of cases. Of course the number of cases is small and the aneurysm selection quite narrow, mostly smaller lesions, and complete data on the aneurysms was not provided to compare with previously suggested indices in the literature. Positive predictive values and negative predictive values are not analyzed statistically. Hopefully these more rigorous analyses will be done as the authors acquire larger experience in a more diverse aneurysm cohort. Technical success as measured by volume embolization ratio (VER) >20% is an arbitrary criterion, without any proven correlation with clinically successful results, i.e. prevention of growth, coil compaction, retreatment and/or bleeding. Techniques of balloon assisted embolization, and stent enforced coiling are now more commonly used for such broad necked aneurysms especially at the internal carotid artery, and the relevance of the AC/CV ratio in those techniques is not known. We continue to caution against the use of endosaccular coiling of unruptured aneurysm cases where clipping is relatively straightforward (ophthalmic, posterior communicating segment, etc.), since any coiling of unruptured aneurysms is associated with prospective bleed rates which approximate or are worse than the natural history (1-2% post coiling hemorrhages in most published series), a rate much higher than reported in any clipping series.

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Matsumoto et al. present a new predictor for dense packing during coil embolization for intracranial aneurysms with the help of 3D angiography. 3D angiography provides a new insight in the diagnosis and treatment of intracranial aneurysms, and aneurysm volume/virtual column volume is one of such benefits provided by this tool. We expect other valuable parameters to be derived from this predictor.

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