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"Stent-Within-a-Stent Technique": Nothing New Under the Sun

Dear Editor: We read with interest the report by Metha and colleagues regarding the use of a stent within a stent for the treatment of dissecting vertebral artery aneurysms (1). It would seem to have been appropriate for these authors to cite our earlier report regarding the use of this technique (2, 3).

Writing and publishing scientific papers is facilitated by the availability of modern electronic search tools such as Medline or Pubmed, as well as by on-line libraries, through which major journals are easily accessible. Statements regarding "first time" and "to our knowledge," in our opinion, should be used only when full literature searches have been carried out.

Nonetheless, we congratulate the authors on their results and thank them for their contribution.

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Reply

We wish to offer our apology for not citing Dr. Benndorf and colleagues' *AJNR* article in our literature review (1). Our experience with stent-within-stent, telescoping stents, or double-stent techniques for dissecting vertebral artery aneurysms is similar to the conclusions made in the 2001 case report. It often takes years for an article to make its way from a simple idea to a hypothesis, then a theory scrutinized at various levels and through multiple reviews, and finally into print. In the meantime, other articles may be in the publishing process and may never make it into the next article's bibliography. It is an unfortunate reality that we all face.

This is such a rapidly evolving field that, as new devices become available, many centers independently and simultaneously achieve similar results. We are happy to contribute our case series to the growing body of literature and would like to thank Dr. Benndorf and colleagues for reminding us of his case report as well as others who have recently applied analogous stent-within-stent, telescoping, or double-stent techniques for dissecting-type aneurysms (2).

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Carotid Artery Stenosis: Competition between CT Angiography and MR Angiography

We read with interest the article by Alvarez-Linera et al (1) that evaluated the capacities of MR angiography, CT angiography, and digital subtraction angiography (DSA) to detect carotid artery stenosis. We agree that MR angiography is adequate to replace DSA in most patients. Nevertheless, it has been proved that CT angiography is highly accurate and can also replace DSA (2, 3). In contrast to DSA or MR angiography, CT angiography allows direct visualization of arterial wall and atheromatous plaque. Thus, the measurement of the stenosis is much easier. Alvarez-Linera (1) considered that calcified plaque could be a limitation of CT angiography. This limitation can be avoided with appropriate postprocessing. Removing calcification with sophisticated software is not a good technique, because the main risk is overestimation of the stenosis and it is time consuming. With multiplanar volume reconstruction, it is possible to visualize the entire bifurcation initially with a large-volume reconstruction. By reducing volume reconstruction, we clearly visualize the residual lumen at the maximal part of the stenosis, even when circumferential calcified plaques are present. If multiplanar volume reconstruction is not available, transverse oblique reconstruction can be used. Moreover, attenuation of intraluminal contrast and calcifications are not similar and CT angiography is able to differentiate mural calcifications and contrast material. Therefore, calcifications should not be considered limitations of CT angiography.

Concerning plaque morphology, detection of ulcerated plaques may prove to be important, because it has been suggested that the presence of plaque ulceration is a risk factor for embolism. There is, however, no clear consensus regarding the optimal imaging strategy for the analysis of carotid plaque morphology (4). The inability of DSA to depict plaque ulceration is well documented and cannot be a reference standard. The only way to evaluate CT angiography or MR angiography in the depiction of ulceration is the comparison with histologic correlation.

In contrast to the study of Alvarez-Linera (1), we believe that CT angiography is a highly accurate and precise technique for determining the percentage of stenosis. If it were not an ionizing technique by using iodinated contrast medium, CT angiography would be the first examination for carotid artery evaluation after Doppler sonography. Because of these disadvantages, at present CT angiography is proposed as an alternative to MR angiography for the demonstration of carotid disease.

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Reply

We appreciate Randoux et al's interest in our article. In our experience, spiral CT angiography has limitations in delineating the lumen of the artery with dense circumferential calcifications or with ill-defined patchy calcifications (1). In the first case, calcifications are the limiting factor on maximum intensity projection images because of the difficulty in differentiating mural calcifications and intramural contrast material. To minimize this limitation, analysis in conjunction with the transverse source images may be useful (2). Although transverse source images perpendicular to the vessel lumen, as well as multiplanar volume reconstruction images, were also analyzed in our study, dense circumferential calcification of the arterial wall caused artifacts that interfered with the evaluation of the degree of stenosis. The lack of definition between calcification and contrast material is determined in part by the mild hardening of the radiograph, which provokes artifacts, and above all by the gradual decrease of the plaque density on its surface, which may be similar to the contrast material density. Nevertheless, one limitation in our study was that we used a CT scanner with a single-detector row unit. For several months, we have been using a 16-detector-row multisection spiral CT scanner. Despite use of such a CT scanner, similar problems persist when there is an excess of calcium. Our preliminary results suggest that the presence of calcifications may be also a limitation even when multidetector row helical CT scanners are used. Furthermore, one should bear in mind the intrinsic disadvantages of spiral CT angiography, including the need for ionizing radiation, iodinated contrast material, and optimization of imaging delay time. Therefore, we think that elliptic centric MR angiography is the first noninvasive technique to replace conventional digital subtraction angiography. Spiral CT angiography may be considered the first alternative to evaluate carotid artery stenting, claustrophobic patients, or those with contraindications to MR.

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Mid-Anterior Surface of the Callosal Splenium: Subependymal or Subpial?

We read with interest the recent article by Pekala et al in the *AJNR* (1). They described that focal high signal intensity on FLAIR images may be seen in the anterior "subependymal" region of the splenium after radiation therapy or with aging. We would like to point out the following anatomic information that is related to some of the statements made in the article.

The corpus callosum is the largest transverse commissure connecting the cerebral hemispheres. Posteriorly, the corpus callosum is attached with the fornix and hippocampal commissure. On each side, its inferior surface roofs the lateral ventricle, covered by the ependyma (2).

The velum interpositum is located in the roof of the third ventricle below the body of the fornix. The upper and lower walls of the velum interpositum are formed by two membranous layers of tela choroidea in the roof of the third ventricle. The layer that is attached to the lower surface of the fornix and hippocampal commissure forms the upper wall. The lower wall is attached to the superior surface of the pineal body and tectum posteriorly (3).

The double layers of pia mater, the tela choroidea, cover the ependymal roof of the third ventricle. The anterior aspect of the tela choroidea is closed at the foramen of Monro, where the pia mater folds on itself. The posterior ends remain open, and between the two ends is cistern of velum interpositum (also known as cistern of the transverse fissure or cistern of the roof of the third ventricle), which abuts on the midanterior surface of the splenium and communicates with the quadrigeminal cistern (4) (Fig 1).

In conclusion, the midanterior surface of the callosal splenium abuts on the subarachnoid cistern (cistern of velum interpositum), but not on the ventricles. The correct nomenclature is the anterior "subpial" region of the callosal splenium.

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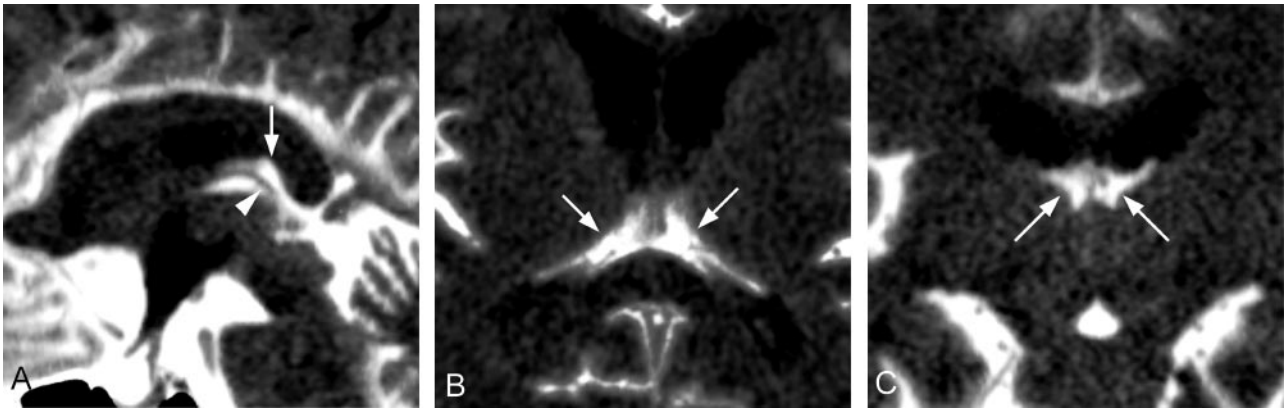

FIG 1. Sagittal (*A*), axial (*B*), and coronal (*C*) MDCT cisternograms showing filling of contrast material in the subarachnoid cisterns and fourth ventricle but not yet in the third and lateral ventricles. Cistern of velum interpositum (*arrows*) communicates with the quadrigeminal cistern around the internal cerebral veins (*arrowhead*). The midanterior surface of the callosal splenium abuts on the cistern of velum interpositum, not on the ventricle.

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