their own reported experience when they conclude that axial views alone are almost always sufficient.

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Reply

The numerous publications on spinal CT in journals and book chapters by Glenn and his associates have strongly advocated multiplanar reconstruction in all CT spine studies. Their contributions, although not accepted by many, have been very important, since the reformatted images have helped enormously to clarify perplexing or unusual findings on the axial section.

Armed with this clarification and abetted by experience, a careful and perceptive interpreter of axial images can correctly evaluate canal stenosis, foraminal compromises, herniations, and spondylolysis without use of the reformatted multiplanar images. This is the current practice in many centers. Certainly the reformatted images can supply a more facile appreciation of special relationships; but these are merely "stacked-up" axial slices and, as such, can reveal no pathology that is not present on the axial images, granted the reader is experienced. In CT of the brain or abdomen, reformatting is rarely performed, since spatial relationships are easily inferred from the axial slices.

We certainly do not argue against producing reformatted images in any CT study; apparently many feel lost without them. However, we do not find them necessary as a routine procedure. For the present, however, angled axial slices at each interspace give us the highest information return without resorting to the much more numerous continuous nonangled slices that good reformatting demands.

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Percutaneous Transluminal Angioplasty of the Carotid Artery

In the March 1986 issue of the *AJNR*, the article by Tsai et al. [1] would be more convincing with better quality illustrations. In the case of the stenosis at the origin of the left common carotid artery (Fig. 1), the post-PTA (percutaneous transluminal angioplasty) study was performed with the angioplasty catheter tip at least 2.5 cm distal to the stenosis. (Note: All figure references are to those in [1].) The authors relied on proximal reflux to demonstrate the origin of the left common carotid artery, thus the post-PTA image does not convincingly show any significant improvement. Arch aortography is the method of choice to document the results in such cases. In case 2 (Fig. 2, showing stenosis at the origin of the left common carotid artery), the post-PTA arch injection is collimated in such a way that the arch does not appear to be the same one as in the preangioplasty study; that is, the shape of the innominate artery, the elongation of the aortic arch, and the appearance of the left subclavian artery appear different, even taking into consideration the slight variation in the degree of obliquity of the left anterior oblique projection. The position of the angioplasty catheter in Figure 2B does not seem to agree with the marked elongation of the aortic arch seen in Figure 2A. The stenotic segment of the left common carotid artery in Figure 2A is covered by two linear artifacts. In the caption for Figure 4B (stenosis of the proximal left subclavian artery), the authors state, "Postangioplasty angiogram. Full dilatation of stenotic subclavian artery." Actually in Figure 4B, the locations of both stenoses of the proximal left subclavian artery are not included in the illustration. In the same caption the authors suggest that the collaterals to the left vertebral artery through the cervical trunk are results of the angioplasty. From Figure 4A, there is virtually no doubt that the distal left vertebral artery was opacified through the collaterals, but again the illustration is collimated in such a way that the level of the distal left vertebral artery cannot be seen. The images of Figures 4A and 4B are significantly different in the exposure time after the initiation of the injection into the proximal left subclavian artery; it is well known that the retrograde flow through such narrowed left vertebral artery can be very slow. In the same case, in Figures 4C and 4D (stenosis of the left common carotid artery with complete occlusion of the left internal carotid artery), the authors state: "Full dilatation of distal common carotid artery" (Fig. 4D). This is not the case, because in Figure 4D there is still convincing stenosis at the level of the previous angioplasty. Figures 4C and 4D are in completely different projections, one in lateral and one in anteroposterior, and thus difficult to compare, since the apparent degree of stenosis can vary with different projections. The authors must use the same projection and filming for the postangioplasty study as for the preangioplasty study to make valid comparisons. Figure 5 (case of the weblike stenosis within the right common carotid bifurcation) has the same problem. The bifurcation on the preangioplasty lateral projection (Fig. 5B) is at the level of C4 and on the postangioplasty figure (Fig. 5C) it is much lower. The shape of the distal right common carotid artery as well as the projections of the branches of the external carotid artery are different on the pre- and postangioplasty studies. Figure 10 (case of stenosis at the origin of the external carotid artery) gives the impression of being more stenotic after than before angioplasty.

In case 9 (segmental stenosis of the distal left internal carotid artery with an aneurysm at the cavernous segment of the same internal carotid artery), the authors performed angioplasty on the distal internal carotid artery, but do not mention what type and size of balloon they used, a fact that would be important for the experience of others. In case 8, the authors state: "Anticoagulant with heparin, Persantine, and aspirin were initiated after angiography." The phrasing of the sentence is not correct and Persantine is a vasodilating drug and not used for anticoagulation purposes.

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REFERENCE

1. Tsai FY, Matovich V, Hieshima G, et al. Percutaneous transluminal angioplasty of the carotid artery. *AJNR* **1986**;7:349–358

Reply

The primary purpose of our paper was to present our opinion and recount our experience that a stenotic carotid artery may be treated by percutaneous transluminal angioplasty. I do not agree that the quality of images and illustrations degraded our goal. Case 2 (Fig. 2A) is shown with the patient's arm and chest elevated by pads for

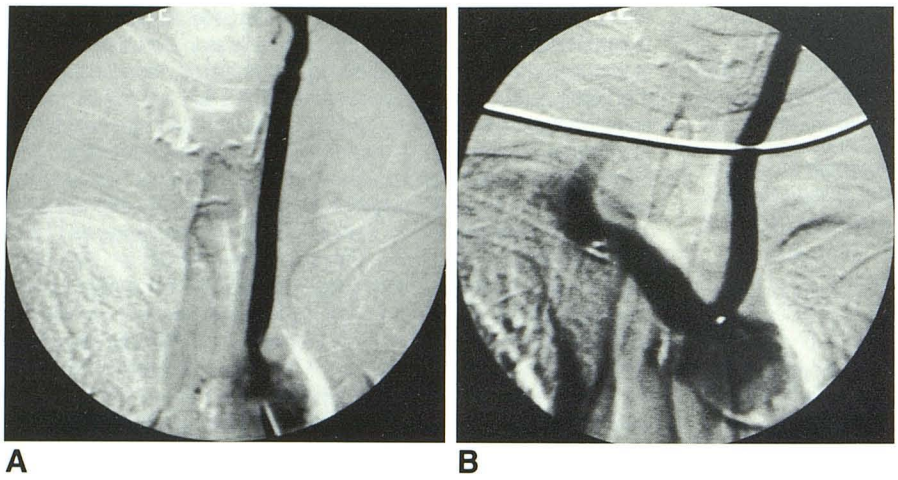

Fig. 1.—*A*, Stenosis of proximal common carotid and bifurcation.
***B*, Postangioplastic angiography showed full dilatation of proximal common carotid artery. (Note: The artery became more tortuous than before angioplasty, as seen in *A*.)**

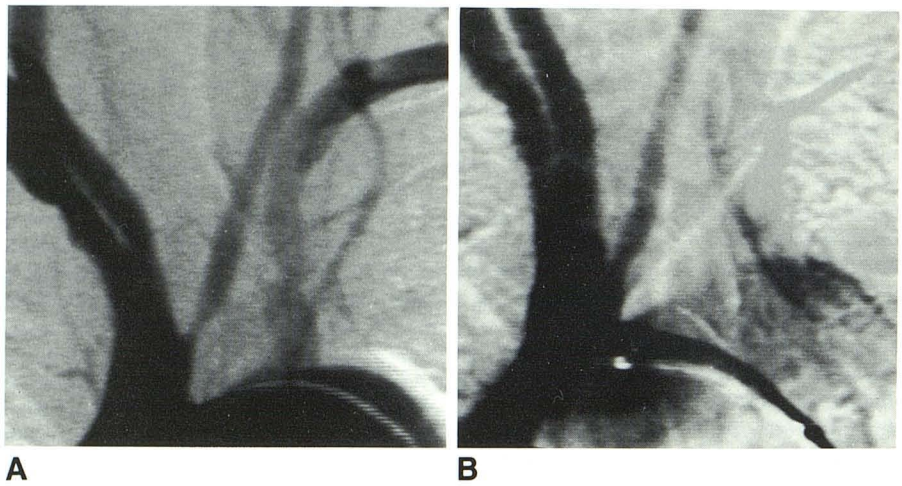

Fig. 2.—*A*, Arch angiography showed severe stenosis of origin of left common carotid artery and mild stenosis of left subclavian artery.
***B*, Postangioplastic angiography well demonstrated dilatation of origin of left proximal common carotid artery. Arch and right innominate artery appeared somewhat different from that shown in *A* because of different angulation.**

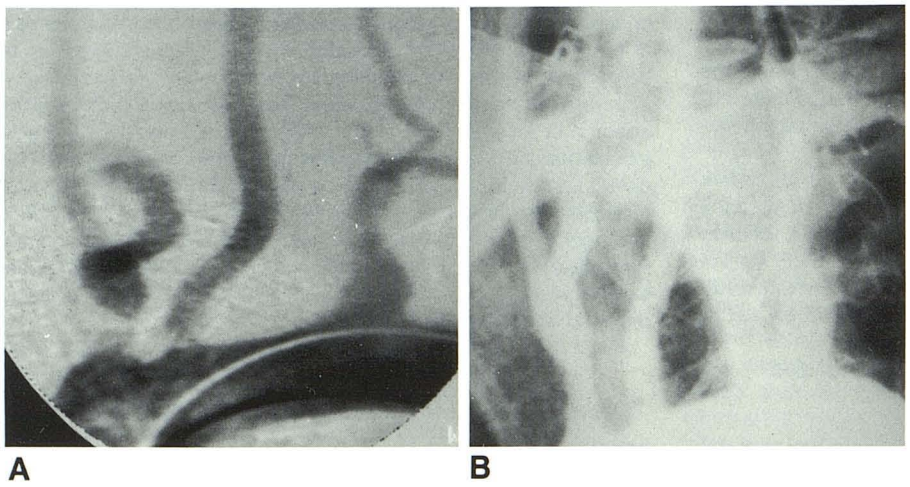

Fig. 3.—*A*, Arch angiography showed tortuous and severe stenosis of origin of right innominate artery.
***B*, Postangiographic arch angiography showed good dilatation of right innominate artery. (Note: Artery looks straighter than in *A* because of different projection.)**

transaxillar catheter placement into the left subclavian artery. Figures 2B and 2C show the arm and chest in a neural supine position. In case 5, rotation and magnification were different between pre- and postangioplasty. Dr. Vitek questioned why the images do not look alike. I discussed this with Dr. Henry Pribram, and we could not find an explanation. Indeed, we found a few additional cases in which the images did not look alike and for which we have no explanation. Included here are those cases (see Figs. 1, 2, and 3). Notice that the arch and brachiocephalic arteries show some differences. In Figure 1, the straight carotid artery became tortuous after angioplasty.

I agree with Dr. Vitek that Persantine is a mild vascular-dilating drug; but it has as its primary action antiplatelet aggregation, which is why I use it as an anticoagulant along with heparin and aspirin.

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