Vertebral percutaneous transluminal angioplasty.

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Letters

Vertebral Percutaneous Transluminal Angioplasty

We would like to make some remarks concerning the indication of vertebral percutaneous transluminal angioplasty (PTA) in response to the article "Transfemoral Angioplasty of the Vertebral and Basilar Artery" by Higashida et al. [1]. We agree with the authors that PTA of the vertebral artery seems to be a reliable therapeutic alternative to surgical treatment of proximal vertebral artery stenoses. Nevertheless, the indication of vertebral PTA requires consideration of several points.

First, the association between ischemic brainstem symptoms and the pathomorphological changes resulting from extracranial vertebral arterial lesions is weak. Through long-term observation of patients with unilateral vertebral artery stenosis, Moufarrij et al. [2] found a low incidence of brainstem ischemia. As a result of these findings, we think [3, 4] that even significant stenosis of one of the ostia of the vertebral artery does not justify PTA if blood supply via the contralateral vertebral artery is sufficient.

Higashida et al., however, failed to provide an exact description of the preinterventional angiographic findings underlying vertebrobasilar insufficiency, especially concerning the contralateral vertebral artery. We do not agree with Motarjeme et al. [5], who advocated PTA of the vertebral artery in unilateral vertebral artery stenosis. A positive effect of PTA can be expected only if the clinical signs and symptoms can be related to a critical reduction of flow within the posterior circulation. This reduction may be present in bilateral vertebral lesions such as occlusion, high-grade stenosis, hypoplasia, or aplasia.

Second, the proximal segment of the vertebral artery is a possible site for arteriosclerotic stenoses, but not for ulcerating lesions. The detailed pathoanatomic investigations of Schwartz and Mitchell [6] and Korbicka [7] showed that fibrous circular lesions with a smooth surface were seen mainly in proximal vertebral artery stenosis. This finding explains why proximal vertebral artery stenoses are rarely the source of emboli in the posterior circulation.

Third, we have performed PTA of the proximal vertebral artery in 13 patients under the previously described conditions in which patients had signs and symptoms indicating vertebrobasilar insufficiency. PTA was performed only if an extreme reduction of the diameter of both vertebral arteries was present. During an observation period of 2 to 25 months (average 15 months) after PTA, the patients' neurologic and vascular conditions were examined. Eight of the 13 showed marked improvement of clinical signs and symptoms. The procedure was not clinically successful in five patients despite an obviously imparied vertebrobasilar flow in two of them. In two of the five, however, the CT scan showed signs of cerebral small vessel disease [3]. The clinical signs and symptoms observed in these patients perhaps may be attributed to a lesion of the small brainstem arteries. Clinical differentiation between hemodynamically induced basilar insufficiency and brainstem signs and symptoms due to small vessel disease is difficult, if not impossible.

Even cases involving impaired hemodynamics in the posterior circulation have a certain failure rate. Experience with these nonresponding patients confirms our belief that careful selection of patients for angioplasty is necessary.

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Reply

Selection of patients who should undergo a procedure to increase perfusion to the vertebrobasilar circulation is difficult. Signs and symptoms are often not specific, and many patients will respond to medical management. Careful reading of our article reiterates this exact point. Our current recommendation is that all patients should be managed at first by medical therapy, including anticoagulant and antiplatelet medications [1–3]. Only if patients fail to respond to drug therapy should angioplasty or surgery be considered.

We further point out that most patients who have stenosis or occlusion of one vertebral artery remain asymptomatic. Only if patients with documented poor blood flow, either by angiographic and/or Doppler flow studies, continue to be symptomatic will we consider percutaneous transluminal angioplasty (PTA). We therefore examine flow of both vertebral vessels and perform angioplasty only if near occlusion exists concomitantly with occlusion, hypoplasia, or high-grade stenosis of the contralateral vertebral artery. We agree that restriction of flow in one vertebral artery does not warrant the potential risks from PTA unless the contralateral vertebral artery is compromised also.

Atheromatous lesions involving the proximal vertebral artery are usually not ulcerated [4]. In our series, only two (12%) of 17 patients had clinical signs and symptoms of thromboembolic disease to the posterior circulation. These two patients had no other identifiable source for emboli, and after angioplasty of the vertebral artery was performed, no other embolic events occurred.

Differentiation between small and large vessel vascular disease as a cause of ischemia is difficult. The role that small vessel disease has in patients who have signs and symptoms of ischemia of the posterior circulation is critical. MR imaging of the brainstem and posterior fossa is much more sensitive than CT in assessing these changes [5]. Positron emission tomography also may be useful in assessing flow and metabolic needs of this area [6]. However, if large vessel disease is present in a symptomatic patient who has vertebrobasilar insufficiency, we think that PTA is warranted to increase hemodynamic perfusion to the posterior fossa, rather than assuming that perforating brainstem arteries are entirely responsible for symptoms.

In summary, PTA should be reserved for those patients who do not respond to conventional medical therapy and who have critical stenosis involving both vertebral arteries, thus compromising flow to the posterior circulation. Long-term follow-up and comparison studies with surgical and medical results still need to be assessed closely to ensure the efficacy and safety of this procedure.

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