Serial T2-weighted magnetic resonance imaging in thrombotic thrombocytopenic purpura. Upper row, Small infarcts in both cerebellar hemispheres and in right thalamus. Lower row, Unchanged small cerebellar infarcts, resolution of thalamic lesion, and a new occipital infarct on the left.

have been hypothesized, and these large multimers of von Willebrand molecules have been shown to clump platelets in vitro.

The neurological manifestations of TTP are diverse, but in most instances an acute confusional state, seizures, transient hemiparesis, and stupor predominate. The clinicopathologic correlation in patients with decreased levels of consciousness alone is problematic but may be related to widespread vascular involvement in the cortex. CT or MRI findings in TTP have been mostly linked to transient focal neurological deficits, but coma and fluctuating level of consciousness have been correlated with multiple areas of decreased attenuation in white matter. Recently, a few reports of patients with TTP who undergo MRI have suggested that although recovery may be complete, small to minute cerebral infarcts can be demonstrated.

Our patient is of particular interest because his clinical course, documented by serial MRI scans, provides presumptive evidence that ischemic infarcts may go unnoticed. The diagnostic value of MRI in TTP has not been systematically evaluated, and in two recently investigated patients with decreased level of consciousness alone and relapsing TTP at our institution, MRI investigation was normal (E.F.M.W., unpublished data, 1994). The observation of unrelenting cerebral infarction may influence the decision of whether to use antiplatelet drugs or high doses of corticosteroids as adjuncts to plasma exchange.

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References

Segmental Narrowing of the Supraclinoid Carotid Artery in Young Patients With Ischemic Stroke
To the Editor:

An image of narrowing of the supraclinoid part of the internal carotid artery is occasionally seen on angiography in young patients with ischemic stroke. Because this angiographic feature is not specific, diagnosis usually remains uncertain except in fatal cases with pathological examination. We describe four young patients with cerebral infarction and stenosis of the supraclinoid carotid artery. The regressive nature of the angiographic abnormality made the diagnosis of dissection likely in three of the patients. In comparison with previously reported cases of spontaneous dissection of the intracranial carotid artery, these patients are noteworthy because of their favorable outcome.

Subjects were selected from a series of 141 patients aged 15 to 45 years, consecutively admitted to our department following ischemic stroke. Cerebral angiography, performed in 123 patients (87%), was obtained by transfemoral selective carotid opacification and repeated in all selected patients to assess the evolution of the arterial lesion. Clinical outcome was classified according to the Rankin scale.

Clinical and angiographic data are summarized in the Table. The mean age of the patients was 22.5 years. All patients presented with first-ever ischemic stroke. The cerebral infarction was limited to the territory of the anterior choroidal artery in three patients. There was no evidence of subarachnoid hemorrhage, drug addiction, or infection. Cerebrospinal fluid was analyzed in two cases and showed no abnormality. All patients were treated with anticoagulants alone or anticoagulants and then aspirin. Final disability was either absent or slight on the Rankin scale.
Clinical and Angiographic Findings in Four Young Adults With First-Ever Ischemic Stroke

<table>
<thead>
<tr>
<th>Case/Sex/ Age, y</th>
<th>History</th>
<th>Site of Infarction</th>
<th>Site of Arterial Stenosis</th>
<th>Control Angiography (Delay, mo)</th>
<th>Treatment (Duration, mo)</th>
<th>Outcome (Rankin Scale)</th>
<th>Follow-up, mo</th>
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</thead>
<tbody>
<tr>
<td>1/M/28</td>
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<td>AChA</td>
<td>C1, A1</td>
<td>Normal (13)</td>
<td>AC (30)</td>
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<td>C1</td>
<td>Unchanged (3)</td>
<td>AC (4), aspirin</td>
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<td>73</td>
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<tr>
<td>3/F/22</td>
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<td>AChA</td>
<td>C1</td>
<td>Partial regression (11)</td>
<td>AC (4), aspirin</td>
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<td>33</td>
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<tr>
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<td>AChA</td>
<td>C1</td>
<td>Normal (5)</td>
<td>AC (6)</td>
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<td>18</td>
</tr>
</tbody>
</table>

AChA indicates anterior choroidal artery; C1, supraclinoid segment of the internal carotid artery; A1, first segment of the anterior cerebral artery; AC, anticoagulant; OC, oral contraceptives; and MCA, middle cerebral artery.

On angiography the stenosis involved only the supraclinoid carotid artery in three patients. It extended to the proximal anterior cerebral artery in one. The control angiogram, obtained after a mean delay of 8 months, demonstrated partial or complete resolution of the stenosis in three patients (Figure).

The prevalence of segmental stenosis of the supraclinoid carotid artery was higher in this unselected series than in previously reported series of young patients with ischemic stroke. Although the underlying arterial lesion cannot be determined by angiography alone, the regressive nature of the stenosis in three patients was consistent with either vasospasm, arteritis, or dissection. Dissection was more likely in these three patients because there was no evidence of any of the diseases known to cause either spasm or arteritis.4

Intracranial carotid dissection involves the supraclinoid segment and, rarely, the siphon. The dissection usually extends to the first segment of the middle cerebral artery and, less often, to the first segment of the anterior cerebral artery. In most previously reported cases, intracranial carotid dissection caused massive hemispheric infarction and death within a few days.3,5,6 The less severe outcome in our patients might be explained by the lack of involvement of the middle cerebral artery.

All patients were treated with anticoagulants. Anticoagulant treatment is justified by the possibility of intravascular thrombosis in association with the dissection.5,6 Contrary to vertebrobasilar system dissections,7 intracranial carotid dissection rarely causes subarachnoid hemorrhage.8 Because all patients improved, the present study suggests that anticoagulant treatment is not harmful and could even be beneficial.

Left, Stenosis of supraclinoid internal carotid artery (arrow) demonstrated on initial angiogram. Right, Normal appearance of arterial segment on control angiogram 13 months later.

References
Segmental narrowing of the supraclinoid carotid artery in young patients with ischemic stroke.

V Larrue, A Danielli, G Géraud, A Bès and P Arrue

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