Vertebral Artery Injury and Cerebellar Stroke While Swimming: Case Report

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SUMMARY A twenty-five year old woman suffered the acute onset of dysequilibrium followed by headache, nausea, vomiting, vertigo, and slurred speech while swimming. Brain imaging revealed a right cerebellar infarct. Intravenous digital subtraction angiography showed a hypoplastic right vertebral artery and focal narrowing of the dominant left vertebral at the level of the C1-C2 junction. The patient was treated with aspirin and dipyridamole and immobilized for two weeks. She achieved almost complete recovery. Repeat angiography showed resolution of the left vertebral artery defect. Other cases of posterior circulation infarction associated with head turning during sports and ordinary activities are reviewed.

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direction that was superimposed on a prolonged rotation to the left.

This is the first case in which DSA has been used to document vertebral artery injury associated with head rotation. We chose DSA because vertebral arteriography in patients with recent infarction carries a greater risk of central nervous system complications relative to non-vertebral arteriography and because DSA is associated with a low risk of procedure-related CNS complications. DSA images the posterior circulation well and should prove useful in demonstrating lesions at all levels of vertebral artery injury associated with head rotation — C1-C2, C6, and the occipitoatlantal joint.

This is also the first case in which resolution of such a lesion following treatment with anti-platelet agents and immobilization has been angiographically documented. We administered aspirin and dipyridamole rather than heparin because focal neurologic symptoms and signs had not progressed over the twenty-four hours prior to admission. While clinical data are limited and therapeutic approaches must be individualized, in selected cases anti-platelet therapy may be beneficial.

Figure 1. CT of head without contrast (GE8800 scanner) with 5 mm sections through the posterior fossa. Arrow indicates infarct in right cerebellum.

Figure 2. NMR scan (0.5 Tesla Superconducting Technicare scanner) using spin echo SE 30/500 shows area of decreased signal in right cerebellum (arrow) consistent with infarction.

Figure 3. DSA showing focal narrowing of the left vertebral artery at the level of the C1-C2 junction (arrow). The right vertebral artery is hypoplastic.
**TABLE 1  Sports and Ordinary Activities Associated with Posterior Circulation Infarction During or Following Head Rotation**

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Age/Sex</th>
<th>CNS Findings</th>
<th>Vascular Pathology</th>
<th>Documentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gymnastics (5)</td>
<td>18/M</td>
<td>spinal cord infarction, lower cervical</td>
<td>anterior spinal artery occlusion</td>
<td>neurological examination and arteriography</td>
</tr>
<tr>
<td>Calisthenics (5)</td>
<td>55/M</td>
<td>spinal cord infarction, lower cervical</td>
<td>anterior spinal artery occlusion</td>
<td>neurological examination and arteriography</td>
</tr>
<tr>
<td>Calisthenics (6)</td>
<td>15/M</td>
<td>spinal cord infarction, lower cervical</td>
<td>anterior spinal artery thrombosis</td>
<td>autopsy</td>
</tr>
<tr>
<td>Yoga (5)</td>
<td>28/F</td>
<td>left cerebellar infarct</td>
<td>left vertebral artery narrowed at C1-C2</td>
<td>neurological examination and arteriography</td>
</tr>
<tr>
<td>Yoga (7)</td>
<td>25/M</td>
<td>left dorsolateral medullary syndrome, onset 2 hrs after exercise</td>
<td>left vertebral artery obstruction at C1-C2</td>
<td>neurological examination and arteriography</td>
</tr>
<tr>
<td>Archery (8)</td>
<td>39/M</td>
<td>right dorsolateral medullary syndrome, evolving over minutes</td>
<td>right vertebral artery spasm aneurysm distal to spasm</td>
<td>neurological examination and arteriography</td>
</tr>
<tr>
<td>Driving (9)</td>
<td>38/F</td>
<td>pontine, cerebellar, and occipital in-</td>
<td>right vertebral artery narrowing with thrombosis at the occipito-atlantal junction</td>
<td>autopsy</td>
</tr>
<tr>
<td>Driving (9) (in reverse)</td>
<td>58/M</td>
<td>right pontine infarction</td>
<td>left vertebral artery hypoplasia</td>
<td>neurological examination and arteriography</td>
</tr>
<tr>
<td>Painting (10)</td>
<td>43/M</td>
<td>right lateral medullary syndrome evolving over 18 hours</td>
<td>right vertebral artery occlusion at C1-C2 and left vertebral artery stenosis at foramen magnum</td>
<td>neurological examination and arteriography</td>
</tr>
</tbody>
</table>

**References**

2. Robertson JT: Neck manipulation as a cause of stroke; author’s rebuttal in Letters To The Editor, Stroke 13: 260-261, 1982

**Figure 4.** DSA showing resolution of the left vertebral artery defect (arrow) illustrated in Figure 3.
17. Wishart D: Complications in vertebral angiography as compared to non-vertebral cerebral angiography in 447 studies. AJR 113: 527-537, 1971
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