Neck Manipulation as a Cause of Stroke

THE ARTICLE by Sherman, Hart and Easton in this issue of STROKE (pp 2-6) and a recent publication by Krueger and Okazaki1 describe a complication of manipulative therapy to the vertebral arteries at the atlanto-axial level. The vertebral artery is relatively fixed in the transverse foramen between C1 and C2 and between the exit from the foramen C1 and the atlanto-occipital membrane. Since rotation of the head and neck is one of the primary functions of the C1-C2 junction, it is not surprising that this has been the site of the majority of vertebral injuries leading to dissecting aneurysms and/or vertebral occlusion. Tilting of the neck also occurs largely at the C1-C2 junction and when various maneuvers including rotation, tilting, extension, and traction are added during cervical manipulation, one or both arteries may be temporarily occluded or injured leading to temporary brainstem ischemia, vascular occlusion or dissection or with distal embolization. The presence of atherosclerosis or cervical osteophytes compressing the vertebral artery seems to increase the chance of vertebral artery injury, but many of the reported patients have been young individuals with normal anatomy.

Patients may experience immediate or delayed symptoms, and fatal strokes have occurred. However, more commonly, transient ischemia and/or brainstem nonfatal infarctions are the rule.

The exact incidence of vertebral artery injury during manipulative therapy is unknown, but a recent audience poll, at a meeting of the Stroke Council of the American Heart Association, suggested this is far more common than the literature would reflect. Indeed, a survey of the incidence of this complication would seem to be indicated by asking neurologists, neurosurgeons and vascular surgeons. An immediate opinion is that the complication may be unusual but is not rare, and an effort should be made to determine more exactly the incidence and methods of prevention of the complication.

Physicians should suspect the diagnosis in patients with brainstem or vertebral vascular ischemic symptoms who have had, for various reasons, neck manipulative therapy. This complication can be induced by patients undergoing repetitive rotatory neck activities; however, the odds are that most of the injuries are induced by manipulative therapy. If the patient is having only ischemic symptoms or evidence of a small brainstem non-progressive stroke, immediate anticoagulation with heparin is indicated. If the patient has a progressing stroke syndrome, immediate surgical therapy should be considered which may include reconstruction of the injured segment of the vertebral artery or an occipital artery bypass. Arteriography should be done as soon as possible to delineate the exact site of the injury. If a pseudaneurysm exists, anticoagulant therapy for several weeks will usually result in spontaneous healing of the dissection. If follow up arteriography reveals an increase in the size of the pseudaneurysm or symptoms of ischemia continue after anticoagulation therapy, then surgical repair or bypass may be indicated.

How can liaison be established with clinicians doing neck manipulations? Do they recognize this complication? How often do they see it? How often do other clinicians, including neurologists, see it? What other vertebral column injuries occur; e.g., disc rupture, with this therapy? The answer to the questions of incidence and prevention of this complication may best be sought by the Stroke Council of The American Heart Association. What better group can act to effect communication with the therapists?

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Reference
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*Stroke*. 1981;12:1
doi: 10.1161/01.STR.12.1.1

*Stroke* is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
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Print ISSN: 0039-2499. Online ISSN: 1524-4628

The online version of this article, along with updated information and services, is located on the World Wide Web at:
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