SPECIALBULLETIN

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Chiropractic Neck Adjustment: Reducing the Risk of VAD-related Stroke

Dissections of the carotid or vertebral artery are rare occurrences. The incidence has been estimated at approximately 1.6 cases per 100,000 persons for carotid dissection, and at 0.75 to 1.0 cases per 100,000 persons for vertebral. Arterial dissection associated with chiropractic adjustment is even less frequent, with incidence possibly as low as 1 per 5.85 million cervical spine adjustments. However, stroke due to vertebral artery dissection (VAD) is known to have occurred following chiropractic adjustment of patients presenting with head and neck pain. Because the early symptoms of VAD are often clinically indistinguishable from common mechanical neck pain, prompt and accurate diagnosis can be a challenge.*

Neck adjustment is contraindicated in the presence of VAD, so awareness of relevant risk factors is essential to protect patients and minimize stroke-related liability. This resource is intended to help practitioners identify an evolving VAD before treatment is rendered, and initiate effective emergency interventions in the event of a dissection. The recommendations outlined within this resource are based upon current medical literature, including literature from the American Chiropractic Association. They are not intended to represent all of the diagnostic and management options available to providers in a given factual situation.

VAD CAUSES

Although some media reports have suggested a direct link between chiropractic treatment and vertebral artery injury, it is unlikely that a skillfully performed neck adjustment can produce sufficient strain to damage a healthy artery. The actual etiology of VAD appears to involve a combination of genetic predisposition, environmental factors (such as tobacco or oral contraceptive use), and stresses on the cervical spine from exercise or occupational activities involving prolonged neck extension or rotation.

When a patient presents with an already-diseased vertebral artery, adjustment of the neck may result in additional stress, leading to tearing of the inner artery wall, disturbance of blood flow and formation of a thrombus in the artery wall. A stroke results when the thrombus occludes the artery, forms an embolus that lodges within smaller blood vessels, or further ruptures the middle artery wall, producing a pseudolumen that occludes the true lumen. Therefore, chiropractors should screen patients prior to neck adjustment for factors that may indicate vertebral artery abnormalities.

SCREENING FOR RISK FACTORS

Certain inheritable connective tissue disorders are associated with an increased risk of arterial dissection. The presence of any of the following conditions should be prominently noted on the patient care record:

- *Ehlers-Danlos syndrome type III, IV or VI,* a disorder characterized by weakening of the blood vessel linings
- *Marfan's syndrome,* a general disorder with a variety of skeletal, ocular and cardiovascular manifestations
- *osteogenesis imperfecta type I,* an inheritable disorder associated with abnormal fragility of the skeleton, easy bruising, loose joints, spinal curvature and low muscle tone
- *autosomal dominant polycystic kidney disease,* characterized by the presence of multiple cysts in both kidneys and a generalized abnormality in collagen
- *fibromuscular dystrophy,* a disease that can cause stenosis of the renal and carotid arteries, leading to hypertension, stroke, arterial aneurysm and dissection

During any assessment, chiropractors should be vigilant about identifying and documenting the following additional stroke risk factors:

A history of…

- migraine headaches
- bowel rupture
- frequent urinary tract infections
- cigarette smoking
- oral contraceptive use
- circulatory compromise, e.g., mitral valve prolapse, aortic dilatation or transient ischemic attacks
- emphysema

A clinical finding of…

- elevated serum homocysteine levels
- hypertension
- hematuria
- bruises
- prolonged wound healing
- blunt trauma to arterial structures
- respiratory tract infection

* Lauretti, W. "What Are the Risks of Chiropractic Neck Adjustments?" 2003. American Chiropractic Association, 2003. Available at http://www.acatoday.org/pdf/chiro-risks.pdf. For the most recent estimates of dissection incidence, see Cassidy, J. et al, as cited in Resources.

ASSESSMENT RED FLAGS

It should be emphasized that any patient who presents with a severe headache or dizziness may already be dissecting. Practitioners must pay special attention to patients who describe their headache as the worst they have ever experienced, as this is a classic warning sign of VAD.

The prime candidate for an evolving dissection is female, 35 to 50 years old, with a history of acute headache following a sudden turn of the neck. However, not all VAD sufferers fit this pattern. The following findings also are red flags for VAD, and must be taken seriously when presented, regardless of the patient's age or sex:

- sudden onset of pain in the side of the neck, on the side of the head or at the base of the skull
- pain of a new type, different from any previously felt
- severe dizziness, nausea or vomiting
- inability to raise both arms simultaneously
- fainting
- visual disturbances
- difficulty swallowing or speaking
- unsteadiness of gait
- loss of sensation or movement on one side of the body

A generalized complaint of dizziness upon assessment presents a diagnostic challenge. Dizziness may be due to a musculoskeletal lesion of the cervical spine, which often responds well to an appropriate adjustment. However, it also may signal early ischemia. Therefore, the patient should be queried about associated symptoms in order to rule out any stroke-related pathology. Among other issues, determine whether the condition

- is aggravated by minor neck rotation or extension
- prevents the patient from standing steadily with eyes closed
- interferes with speech and the ability to repeat tongue-twisting phrases such as "simple Simon says"
- has worsened following recent cervical adjustments

The signs of an evolving VAD can be subtle, especially if the thrombus has failed to block the blood supply to the brain. Vigilance is necessary, as in many cases, the latency period between onset of neck pain and development of neurological symptoms ranges from three days to a few weeks.

EMERGENCY MEASURES

The seriousness of a stroke due to VAD depends, to a significant extent, on the promptness of intervention. If a dissection may have occurred, the following general emergency measures should be swiftly implemented:

- *Desist from adjusting the patient's neck* or performing any other procedure.
- *Place the patient on a flat surface,* positioned on his/her side.
- *Call 911 and inform the operator that a suspected stroke is in progress.* Relay the patient's age, the time of onset and any relevant medical history.
- *Refrain from giving the patient anything by mouth,* as possible swallowing difficulties may result in aspiration.
- *Explain the situation clearly to the patient,* emphasizing the need for medical follow-through.
- *Do not allow the patient to leave the premises* before paramedics arrive.

If symptoms do not warrant emergency intervention, consult with a medical doctor or neurological specialist regarding the need for an immediate MRI, MRA or other diagnostic evaluation before discharging the patient from care. Thorough documentation of all interventions in the patient care record is essential in such cases, both to enhance continuity of care and as a legally protective measure in the event of litigation.

RESOURCES

American Chiropractic Association Guide for Insurance Professionals, March 2008. Available at **www.acatoday.org/pdf/FieldguideMarch1408.pdf**.

Cassidy, J. et al. "Risk of Vertebrobasilar Stroke and Chiropractic Care." *Spine*, February 15, 2008. Volume 33:4S, pp. S176–S183. Available at **http://www.acatoday.org/pdf/Stroke_Risk_Spine.pdf**.

Lauretti, W. "Chiropractic and Stroke: Risk Factors for Vertebral Artery Dissection and Stroke." American Chiropractic Association's *ACA News*, July 2008. Available at **http://www.acatoday.org/content_css.cfm?CID=2946**.

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For more information, please call CBS Malpractice RPG at 866-851-4636.