

Case Reports involving the association between cervical manipulative therapy and vertebral artery dissection

ABSTRACT

The relationship between high velocity low amplitude chiropractic cervical manipulative therapy (“CMT”) and vertebral artery dissections has been the subject of discussion and debate for decades. Whether the two are causally related or only temporally related remains a central question. These case reports support the latter conclusion since the clinical signs preceded the CMT and the subsequent stroke occurred within 7 to 14 days of those symptoms - the generally accepted time from dissection to stroke.

INTRODUCTION

A vertebral artery dissection (“VAD”) is an injury primarily affecting a young population.^{1 2 3} Emboli released from the resulting thrombus may cause an ischemic stroke. Studies have concluded that in most cases the time from dissection to stroke is between seven to 14 days.^{4 5} However, one to 30 days have been cited as within the risk period.⁶ Thromboembolic stroke presents the patient with potentially devastating and permanent sequelae. It is estimated that dissection of the cerebral arteries accounts for approximately 20% to 25% of strokes in younger patients.^{7 8}

The most common clinical symptoms of a VAD are neck pain and headache.^{9 10 11 12 13} These symptoms mimic multiple musculoskeletal disorders.¹⁴ These lead patients to seek chiropractic treatments to address these new symptoms.

Case reports with examples of ischemic strokes following CMT are abundant.^{15 16} It has been proposed that this well-recognized association is due to the anatomical positioning of the vertebral arteries and the movement during CMT.¹⁷ It is hypothesized that this movement or “trivial trauma” can cause a dissection.

Another hypothesis is that the CMT administered after the dissection loosens emboli from the existing thrombus, resulting in an ischemic stroke.^{18 19}

CASE REPORTS

CASE NUMBER	DESCRIPTION OF PAIN AT INCEPTION	CMT	STROKE
1	neck pain	4	7
2	dizziness, right sided neck pain and stiffness and pain in the right temple area	11	11
3	upper cervical spine pain and tightness and headaches	4	4
4	headache and neck pain with pain radiating to left eye	14	16
5	neck pain and headache/migraine and shoulder pain	27	29
6	neck pain	8	8
7	neck, back pain, stiffness and vertigo	6	6
8	headaches and vertigo	12	14
9	shooting neck pain on left side only and stiff neck and upper back	19	19
10	pain right neck and right side of face	7	7
LEGEND CMT = number of days from inception of pain to CMT STROKE = number of days from inception of pain to diagnosis of thromboembolic stroke from cerebral artery dissection			

DISCUSSION

Although a host of trivial traumas associated with ischemic strokes have been identified,²⁰ CMT has been subjected to the most research. Despite biomechanical testing,^{21 22} population studies,^{23 24} and meta-analysis²⁵, the debate continues. Although reputable medical societies have conceded that causation has not been proven,²⁶ healthcare providers in emergency departments and hospitals throughout the country continue to attribute VAD to CMT. This position seems to be encouraged by the most recent pronouncement of the American Heart Association.²⁷

Vascular clinical tests, including the “George’s Tests” were proposed to identify insufficiencies of the posterior or vertebrobasilar circulation, and thereby avoid performing CMT on patients who were afflicted with a VAD or at risk of a VAD. Unfortunately, these tests attempting to identify vertebrobasilar insufficiency have proven to be unreliable.²⁸ Although the neurologic signs of ischemic stroke are well known, it is generally accepted that there do not exist clinical tests to determine the presence of a VAD prior to CMT.²⁹

What additional studies may further test these competing hypotheses and afford guidance to chiropractors?

If most VADs present as neck pain and headache, and, if most ischemic strokes following dissection occur within the first two weeks after the onset of symptoms, with the risk ending after 30 days, then charting the time from onset of symptoms to stroke in each case may be helpful. If all strokes occur within that one month window with most primarily within 7 to 14 days from the inception of clinical symptoms, then this would support CMT as not being causally related.

CONCLUSION

Case reports are the weakest form of scientific evidence. Consequently, these reports are not offered as proof but rather an invitation to further retrospective analysis. If CMT does not cause VAD, a high percentage of ischemic strokes would occur in the initial seven-to-14-day period and no strokes would occur beyond the

30th day from the start of the classic signs of a dissection. On the other hand, if CMT does cause VAD, CMT would trigger immediate new pain or a significant increase of pain upon causing a dissection. Then the one-to-30-day period would start again, and ischemic strokes primarily within the first seven-to-14-day period would occur. So, there would be a distribution of the occurrence of strokes throughout the time of care, as opposed to within a short period from the commencement of care.

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