

THE SCIENTIFIC LITERATURE  
THE SAFEGUARD FOR PATIENT CARE  
THE EVIDENCE FOR GOVERNMENTS TO ACT

Providers of health care depend on research published in reputable scientific Journals. World wide thousands of such Journals exist, some excellent, others less so. When a therapy is found to be effective, practitioners may decide to use it. When a therapy is found to have dangerous side effects, practitioners limit its use or even abandoned it. This happens every day.

Philosophies and belief systems about specific health care therapies remain apart from evidence and science. They must ignore the known anatomical and physiological basic functioning of the human body and research and evidence. Chiropractic believes that the functioning of the nervous system of the human body is determined by what takes place in the spaces between the vertebral bones. It believes that the most important “subluxation” is in the highest neck area. This is why that area is manipulated in almost every patient, starting right with newborn babies. This is why it is done at almost every visit no matter what the complaint. It is not a treatment, it is a philosophy.

Occipital highest neck manipulation is the most essential part of chiropractic philosophy going back to 1930 when B.J. Palmer announced his “hole in one” theory. Manipulate the occipital area (the hole where the brain becomes the spinal cord) and disease will be prevented and treated. While physicians abandon or limit therapies when dangerous side effects become known, this has never happened with chiropractic highest neck manipulation. It cannot happen from within chiropractic because it has become the signature most fundamental belief and philosophy of chiropractic.

This is why chiropractic can never accept any restrictions whatsoever on the practice of occipital highest neck manipulation. This is why all the evidence must be ignored.. Of all the terrible and unnecessary tragedies due to so called “alternative medicine” none is more prevalent and devastating that that of stroke and death due to chiropractic highest neck manipulation. Upper cervical subluxations theory is taught in every school of chiropractic, endorsed by every Regulatory body and protected by non-scientific studies sometimes done by quasi respected individuals.

It has to be stopped.

**UPDATED SEPTEMBER 2008**  
**SIGNIFICANCE OF PUBLISHED STUDIES AND CASE REPORTS**

**HIGHEST NECK MANIPULATION**  
**OCCIPUT TO CERVICAL ONE (ATLAS) AND CERVICAL ONE TO CERVICAL TWO (AXIS)**

Published reports in the scientific literature allow us to stand on the very tip of the one-percent of the full iceberg. Since the last update just three months ago, seventy one new cases of stroke and death due to chiropractic highest neck manipulation have been reported. Thus, we remain largely unaware of the reality below. Most scientists never take the time and effort required to report what they have found. Medical Journals refuse the great majority of submissions. Thus the overall picture of the true incidence and seriousness of an issue is simply reflected by the medical database resource.

Yet the scientific literature does provide some insights. How many well respected scientific journals have addressed the issue? How consistent year in and year out have reports been made? How many different countries have reported on the issue? What is the degree of specialization of those scientists publishing these studies? What is the range of problems reported?

Critiques are made with the demand that “studies” be double blinded or truly retrospective or fully case controlled in order to be reliable. In this issue the direct link between highest neck manipulations is clear and starts with the basic anatomy of the vertebral arteries and the carotid arteries as they pass in the area of the highest neck. Add to this is the direct clinical experiences of clinical neurologists who diagnose these cases and confirm their opinion with sophisticated radiology examination.

One new report in particular, done by a chiropractor turned neurologist, makes the cause and effect perfectly clear. Published in Spine Volume (27)1 January 2002 pp. 49-55 by Haldeman, this was a review of 64 previously unpublished cases. They were based on legal files. **The onset of symptoms was within 2 days of the manipulation in 94% of the cases, and within 30 minutes in 75% of the cases. This time sequence of cause and effect is clear.** Yet, in another paper this same author, true to his chiropractic training and despite his subsequent training as a neurologist, supports the notion that seeing a chiropractor is no more a risk for arterial dissection than seeing a medical doctor.

If highest neck manipulation were a prescribed medication it would have been banned years ago as being of too little benefit, most neck pain is not in the highest neck area and being far too dangerous. However, highest neck manipulation is the most fundamental chiropractic philosophical belief, starting with newborn babies and being done time and time again on almost every visit. The diagnosis is “subluxations” which do not in fact exist.

In regard to the issue of highest neck manipulation, occipital to cervical one (atlas vertebrae) and cervical one to cervical two (axis vertebrae) studies have been reported in numerous scientific journals including, The Journal of Forensic Science, The Journal of Clinical Pathology, The Journal of the American Medical Association, the Journal of the Canadian Medical Association, the British Medical Journal, the journals “Neurology: “Stroke”, “Lancet”, “Pediatrics”, The new England Journal of Medicine, The American Journal of Emergency Medicine, etc. etc.

The range of interest of these Journals include neurology, neuroradiology, pathology, forensic sciences, legal publications, family medicine, rehabilitation medicine, ophthalmology, audiology etc. etc. Numerous prestigious hospitals and Universities across the world have reported cases including the Mayo Clinic, Johns Hopkins Hospital, the Claude Bernard Hospital, the Veterans Administration Medical center in California, etc. etc.

The issue has been reported from Canada, the United States, Denmark, Germany, Italy, Australia, Japan, England, Canada, China, South Africa, Ireland, New Zealand, Switzerland, etc. etc. indeed worldwide.

The issue has also been reported on since the very inception of modern medical index medicus over 70 years ago. The quality of the reports, moving from observations and commentaries to retrospective analysis, statistical studies and to prospective studies has been consistent.

The medical consequences of neck manipulation run the range from simple spells of nausea to the Locked-In Syndrome to death. It happens in all ages, from babies to people in their 80’s. It most commonly happens in young adults in the prime of their lives.

**The wide range of neurological and pathological findings in the countless cases reported can make a pathologist shudder. The posterior circulation supplies the very “stem” of our neurological system and any tampering with it must be done as an absolute last resort.**

The neuropathological findings run the range of little or no findings to those showing clear adventitial dissection and indeed rupture of the entire artery. As stated by neurologist Wouter I. Schievink M.D. “Intimal tears are notoriously difficult to identify at the time of microscopic examination of postmortem or surgical specimens”. (NEJM Vol. 344. No. 12).

## OVER SEVENTY YEARS OF LITERATURE REPORTS OF STROKE AND DEATH

400 B.C. Hippocrates Neck manipulation may make “much mischief.” Problems due to neck manipulation have been known for over 2000 years.

1867 Paget, James. “Bone-setter” “Cases that Bone-setters cure” Problems reported by bonesetters over 125 years ago. “Chaos of this kind is of frequent occurrence.”

1927: DeKleyn & Nierwenhuys Cadaver studies. Vertebral artery compromised on the contra-lateral side when the head is rotated.

1934 Foster versus Thornton. Malpractice J.A.M.A. 1934;103(16):1260 Practitioner: Chiropractor. Patient: female patient. Cerebral hemorrhage. DEATH.

1947 Pratt-Thomas HR, Berger KE. J.A.M.A. 1947; 133 (9):600-3. DEATH 24 hours after neck manipulation

1952 Bakewell v Kahle. J.A.M.A. 1952; 148 (8): 699

1952 Ford FR. Bulletin. Johns Hopkins Hospital. 1952; 91:168-73

1952 Kunkle EC, Muller JC. Ann Int Med 1952; 36:1329-35 WALLANBERG SYNDROME.

1955 York v. Daniels. J.A.M.A. 1955; 159 (8):809. DEATH

1956 Ford FR, Clark D. Bulletin. Johns Hopkins Hospital: 1956; 98: 37-42. DEATH. Wallenberg

1956 Schwarz GA, Geiger JK, Arch Intern Med 1956; 97: 3 524. WALLEBERG SYNDROME

1957 Attali P. Rev Rheum 1957; 24: 652. Practitioner: Chiropractor Patient: female patient age 43 BARRE-LIEOU SYNDROME

1957 Boudin G. Barbizet J. Bulletin Mem Soc Med Hop Paris 1957; 73:526-6 Practitioner: Chiropractor Patient: female patient 32 years Syndrome grave do tronc cerebral apres manipulations cervicales. BRAINSTEM DAMAGE

1959 Green D Joynt RJ J.A.M.A. 1959; 170 (5):522-4 Practitioner: Chiropractor. Patient: female patient age 31. Vascular accidents to the brain stem associated with neck manipulations. BRAINSTEM

1959 Green D Joynt RJ J.A.M.A. 1959; 170 (5):522-4 Practitioner: Chiropractor Male patient age 55. Vascular accidents to the brain stem associated with neck manipulations. BRAINSTEM

1959 Boshes LD J.A.M.A 1959; 171: 1602. Practitioner: Chiropractor Patient: female age 24 vascular accidents associated with neck manipulation. Upper arm paralysis, slurred speech, and visual defects.

1959 Boshes LD J.A.M.A 1959; 171: 1602. Practitioner: Chiropractor Patient: female patient, mother of above patient. Slurred speech and visual defects.

1959 Boshes LD J.A.M.A 1959; 171: 1602. Practitioner: Chiropractor Patient: male patient, father of above patient. Slurred speech and visual defects.

1960 Bouchet MM. Pailler P. Surdite. Surdite Brutale ET Chiropractic Ann Otolaryngology (Paris) 1960; 77:951-3 Practitioner: Chiropractor Patient: female DEAFNESS

1960 Hardom CA, Williamson P, Steefman A Neurology 1960; 10:855-8 Physicians. Male patient, age 30, vertebral artery insufficiency produced by cervical osteoarthritic spurs. Speech defects, sweating spell, fainting spells.

1960 Martin H. Guiral J. France O.R.L. 1960; 9:177-8 Chiropractor. Male patient age 40. Surdite brusque au cours d'une manipulation vertebrales. Deafness and ringing in the ears.

1962 Masson M, Cambier. Presse Medicale 1962; 70(43):1990-3 Muscle therapist. Female patient age 33. WALLENBERG SYNDROME.

1962 Smith RA. Estridge MN J.A.M.A. 1962; 182(5):528-31 Chiropractor. Female patient age 33. Neurological complications of head and neck manipulations. DEATH. 3 days after neck manipulation, cerebellar and brainstem damage.

1963 Pribek RA. Wics Med J 1963; 62(3):141-3 Chiropractor. Male patient age 63. Brainstem vascular accident following neck manipulation. Brainstem Damage.

1963 Roche L, Collin M, De Rougemont, Ann Med Leg 1963; 43:232-5 Physicians. Sex and age of patient not reported. Traumatic lesions to the vertebral artery. DEATH 2 days after neck manipulation.

1963 Brain L, British Med Journal, 1963; 1 (Mar 23): 771-7 Unknown practitioner. Female patient age 68. Neck traction caused visual loss.

1965 Godlewski S. Assises Med 1965; 23(2):81-92 Chiropractor. Female patient age 66. Diagnostic des trombooses vertebra-basilaire. Quadriplegia.

1966 Janzen-Hamburg R. Arch Klin Chir 1966; 316-461-9 Chiropractor. Sex and age of patient unknown. WALLENBERG SYNDROME

1967 Nick J. Contamin F, Niolle MH. Bulleting Mem Soc Med Hop Paris 1967; 118(5):435-40. Chiropractor. Female patient age 48. Incidents ET accidents neurologiques dus aux manipulations cervicales. Double Vision.

1967 Nick J. Contamin F, Niolle MH. Bulleting Mem Soc Med Hop Paris 1967; 118(5):435-40. Practitioner unknown. Female patient age 60. Neurological accidents following neck manipulation. Double Vision and Dizzy Spells.

1971 Heyden S. Mat Med Nordm 1971; 23:24-32. Chiropractor. Female patient age 29. Vertebral artery thrombosis. Mixture of neurological deficits.

1971 Wood MJ, Lang EK, Faludi HK, Woolhandler GJ. J Louisiana Med Soc. 1971; 123(12): 413-4. Chiropractor. Male patient age 34. Traumatic vertebral artery thrombosis. Mixture of neurological deficits.

1972 Kanshepolsky J, Danielson H, Flynn RE. Bull LA Neurol Soc 1972; 37: 62-6. Chiropractor. Female patient age 39. Vertebral artery insufficiency and cerebellar infraction due to manipulation of the neck. Infraction of right cerebellum.

1972 Lorenz R., Vogelsang HG, Deutsche Med Wochenschrift 1972; 97:36-43 Chiropractors. Female patient age 39. Basilar artery thrombosis following chiropractic neck manipulation. DEATH. 58 days after neck manipulation.

1973 Kommerell G. Hoyt WF. Arch Neurol 1973; 28:313-8 Chiropractor. Female patient age 52. Lateropulsion of saccadic eye movements. Visual eye motor loss. Left WALLEMBERG SYNDROME.

1973 Nagler W. Arch Phys Med Rehab 1973; 54:237-40 Practitioner unknown. Male patients age 55. Vertebral artery obstruction by hyperextension of the neck. Report of three cases. Total limb spasticity. Needs a walker.

1973 Schmitt HP, Tamaska L., Z. Rechtsmedizin. 1973; 73:301-8. Naturopath. Female patient age 35. Vertebral and basilar artery rupture. DEATH 3 hours after neck manipulation.

1974 Kramer KH, Wallenberg Manuelle Medizin 1974; 2:121-4 Physician. Female patient age 35. Thrombosis of the right vertebral artery. WALLEMBERG SYNDROME.

1974 Lyness SS. Wagman AD. Surg Neurol 1974; 2: 121-4. Osteopath. Female patient age 20. Neurological deficit following cervical manipulation. Locked In Syndrome. Tetraplegic.

1974 Mehalic T. Farhat SM. Surg Neuro 1974; 2: 125-9. Chiropractor. Male patient age 40. Slow speech. Unsteady gait. Eye nystagmus

1974 Mehalic T. Farhat SM. Surg Neuro 1974; 2: 125-9. Chiropractor. Male patient age 30. Vertebral artery trauma. Ataxia. Slow speech. Nystagmus of eyes.

1974 Kosoy J, Glassman AL. Tex Med 1974; 70: 66-71. Physician. Male patient age 36. Audio vestibular findings with cervical spine trauma. Brainstem stroke.

1974 Miller RG, Burton R. J.A.M.A. 1974; 229 (2): 189-90. Chiropractor. Female patient age 52. Stroke following chiropractic manipulation of the spine. WALLEMBERG SYNDROME.

1974 Miller RG, Burton R. J.A.M.A. 1974; 229 (2): 189-90. Chiropractor. Male patient age 53. Thrombosis of the cerebral artery. Severe handicap. Intellectual deficits. Visual defects.

1975 Bladin PF, Merory J. Proc Aust Assoc Neuro 1975; 12:35-41. Chiropractor. Female patient age 31. Mechanisms in cerebral lesions in trauma to high cervical portion of the vertebral artery rotation injury. Minor deficits after treatment.

1975 Davidson KC, Weiford EC, Dixon GD. Radiology 1975; 115: 651-2. Chiropractor. Female patient age 42. Traumatic vertebral artery Pseudo aneurysm following chiropractic manipulation. Hearing loss. Facial paresis.

1975 Kipp W. Todlicher Eberhard Karls Universtita 1975; 39. Practitioner unknown. Female patient age 34. DEATH 3 days after neck manipulation.

1976 Goodbody RA. J Clin Pathol 1976; 29 (1): 86-7. Osteopath. Male patient age 23. Fatal post-traumatic vertebrobasilar ischemia. DEATH 2 days after neck manipulation.

1976 Hensell V. Med Welt 1976; 27 (14): 656-8. Physician. Female patient age 52. Neurologische Schaden nach Repositions massnahmen an der Wirbelsaule. DEATH 2 hours after neck manipulation.

1976 Mueller S. Sahs AL. Neurology. (Minneapolis) 1976; 26: 547-60. Practitioner unknown. Female patient age 43. Brain stem dysfunction related to cervical manipulation. Recovered after minor deficits.

1976 Mueller S. Sahs AL. Neurology. (Minneapolis) 1976; 26: 547-60. Practitioner unknown. Female patient age 28. Anterior dislocation of C-2. Assorted neurological defects.

1976 Mueller S. Sahs AL. Neurology. (Minneapolis) 1976; 26: 547-60. Practitioner unknown. Male patient age 38. Posterior inferior cerebellar artery thrombosis. Residual dystaxia and dysarthria and headaches.

1976 Mueller S, Sahs AL. Neurology (Minneapolis) 1976; 26: 547-60. Practitioner unknown. Male patient age 38. Posterior inferior cerebellar artery thrombosis. Residual dystaxia and dysarthria and headaches.

1976 Schmitt HP. Schweitzer Archiv fur Neurologie Neurochirurgie und Psychiatrie 1976; 119: 363-9. Physician. Male patient age 51. Left vertebral artery thrombosis. DEATH 4 weeks after neck manipulation.

1977 Beatty RA. Journal of Trauma 1977; 17 (3): 248-9. Chiropractor. Male patient age 37. Dissecting hematoma of the internal carotid artery following chiropractic cervical manipulation. No deficits after surgery.

1977 Easton JK, Sherman DG. Stroke 1977; 8 (5): 594-7. Chiropractor. Female patient age 48. Cervical manipulation and stroke. Ataxia. Dysarthria.

1977 Easton JK, Sherman DG. Stroke 1977; 8 (5): 594-7. Chiropractor. Female patient age 44. Cervical manipulation and stroke. WALLENBERG SYNDROME.

1977 Zauel D, Carlow T. Journal Ann Neurology 1977; 1 (3): 308. Chiropractor. Female patient age 47. Internuscular ophthalmoplegia following cervical manipulation. Facial hemi paresis. Visual deficits.

1978 Gorman RF. Med J Aust 1978; 2: 169-70. Physician. Male patient age 38. Cardiac arrest after cervical spine mobilization. RECOVERED.

1978 Nyberg-Hanser R, Loken AC, Tenstad O. Journal Neurology 1978; 218: 97-105. Physician. Female patient age 38. Brainstem lesion with coma for five years following manipulation of the cervical spine. DEATH after five years in a coma.

1978 Parkin PJ, Wallis WE, Wilson JL. NZ Med J 1978; 88: 441-3. Physiotherapist. Female patient age 23. Left vertebral artery occlusion following manipulation of the neck. BABINSKI-NAGORETTE SYNDROME.

1978 Zimmermann AW, Kumar AJ, Gadoth N, Hodges FJ. Neurology 1978; 28: 185-8. Pediatric case. Chiropractor. Male patient age 7. Traumatic vertebrobasilar occlusive disease in childhood. Symptoms of brainstem ischemia persisted for four months before culminating in cerebellar infarction.

1980 Krueger BR, Okazaki H. Mayo Clinic Proceedings. 55:322-232. 1980. Chiropractor. Sex unknown. Age 31-35. Vertebral artery. Vertebral-basilar distribution infarction following chiropractic cervical manipulation. STROKE.

1980 Krueger BR, Okazaki H. Mayo Clinic Proceedings.55:322-232. 1980. Chiropractor. Sex unknown. Age 36-40. Vertebral artery. Vertebral-basilar distribution infarction following chiropractic cervical manipulation. STROKE.

1980 Krueger BR, Okazaki H. Mayo Clinic Proceedings.55:322-232. 1980. Chiropractor. Sex unknown. Age 36-40. Vertebral artery. Vertebral-basilar distribution infarction following chiropractic cervical manipulation. STROKE.

1980 Krueger BR, Okazaki H. Mayo Clinic Proceedings.55:322-232. 1980. Chiropractor. Sex unknown. Age 41-45. Vertebral artery. Vertebral-basilar distribution infarction following chiropractic cervical manipulation. STROKE.

1980 Krueger BR, Okazaki H. Mayo Clinic Proceedings.55:322-232. 1980. Chiropractor. Sex unknown. Age 41-45. Vertebral artery. Vertebral-basilar distribution infarction following chiropractic cervical manipulation. STROKE.

1980 Krueger BR, Okazaki H. Mayo Clinic Proceedings.55:322-232. 1980. Chiropractor. Sex unknown. Age 46-50. Vertebral artery. Vertebral-basilar distribution infarction following chiropractic cervical manipulation. STROKE.

1980 Krueger BR, Okazaki H. Mayo Clinic Proceedings.55:322-232. 1980. Chiropractor. Female patient age 29. Vertebro-basilar. Vertebral-basilar distribution infarction following chiropractic cervical manipulation. STROKE.

1980 Krueger BR, Okazaki H. Mayo Clinic Proceedings.55:322-232. 1980. Chiropractor. Male patient age 25. Cerebellar and brainstem infarction due to vertebral and basilar artery thrombosis. Vertebral-basilar distribution infarction following chiropractic cervical manipulation. DEATH 2 days after neck manipulation.

1980 Krueger BR, Okazaki H. Mayo Clinic Proceedings.55:322-232. 1980. Chiropractor. Female patient age 39. Vertebro-basilar infarction. Vertebral-basilar distribution infarction following chiropractic cervical manipulation. BILATERAL HEMIANOPSIA.

1980 Krueger BR, Okazaki H. Mayo Clinic Proceedings.55:322-232. 1980. Chiropractor. Male patient age 53. Bilateral posterior cerebral artery obstruction. Vertebral-basilar distribution infarction following chiropractic cervical manipulation. STROKE. MEMORY DEFICITS.

1980 Krueger BR, Okazaki H. Mayo Clinic Proceedings.55:322-232. 1980. Practitioner unknown. Female patient age 56. Vertebro-basilar insufficiency. Vertebral-basilar distribution infarction following chiropractic cervical manipulation. MILD NEUROLOGICAL SIGNS.

1980 Schellhas KP, Latchaw RE, Wendling LR, Gold LHA. J.A.M.A. 1980; 244 (13): 1450-3. Chiropractor.

Female patient age 36. Basilar artery occlusion. Vertebrobasilar injuries following cervical manipulation. SPASTIC QUADRIPLEGIA. LOCK-IN SYNDROME.

1980 Schellhas KP, Latchaw RE, Wendling LR, Gold LHA. J.A.M.A. 1980; 244 (13): 1450-3. Chiropractor.

Female patient age 31. Vertebrobasilar injuries following cervical manipulation. WALLANBERG SYNDROME.

1980 Schellhas KP, Latchaw RE, Wendling LR, Gold LHA. J.A.M.A. 1980; 244 (13): 1450-3. Chiropractor.

Female patient age 32. Vertebrobasilar injuries following cervical manipulation. WALLANBERG SYNDROME.

1980 Schellhas KP, Latchaw RE, Wendling LR, Gold LHA. J.A.M.A. 1980; 244 (13): 1450-3. Self. Male patient age 21. Vertebrobasilar injuries following cervical manipulation. WALLANBERG SYNDROME.

1981 Ladermann JP. Ann Swiss Chiropractors Association. 1981; 7: 161-208. Chiropractor. Female patient age 34. After neck manipulation had vomiting, facial paresis and mild respiratory paralysis. Accidents of spinal manipulation. RESIDUAL DEFECTS.

1981 Sherman DG, Hart RG, Easton JD. Stroke 1981; 12 (1): 2-6. Chiropractor. Female patient age 39. Posterior cerebral artery thrombosis. Abrupt change in head position and cerebral infarction. (Note: The first three cases were previously reported in Easton 1977). VISUAL DEFECTS. RIGHT SUPERIOR HOMONYMOUS HEMIANOPIA.

1981 Sherman DG, Hart RG, Easton JD. Stroke 1981; 12 (1): 2-6. Chiropractor. Male patient age 35. Stenosis of left vertebral artery at C-1-2. Abrupt change in head position and cerebral infarction. (Note: The first three cases were previously reported in Easton 1977). MINOR RESIDUAL DEFECTS.

1981 Sherman DG, Hart RG, Easton JD. Stroke 1981; 12 (1): 2-6. Chiropractor. Female patient age 60. Microscopic perforation of the extra-cranial vertebral artery at the C-1 level. Upper cervical spinal cord subarachnoid hemorrhage. Abrupt change in head position and cerebral infarction. (Note: The first three cases were previously reported in Easton 1977). DEATH 4 days later. Unconscious almost immediately.

1981 Sherman DG, Hart RG, Easton JD. Stroke 1981; 12 (1): 2-6. (Note: The first three cases were previously reported in Easton 1977). Chiropractor. Male patient age 24. Right vertebral artery thrombosis. Abrupt change in head position and cerebral infarction. HORNER'S SYNDROME AND SENSORY DEFECIT.

1981 Frachon M. Les accidents neurologiques des manipulations cervicales. Thesis (Doctor of Medicine) - Faculty of Medicine, Claude-Bernard University, Lyon. 1981 (11 June). Practitioner unknown. Female patient age 39. Transient vertebral artery spasm. RECOVERED?

1981 Frachon M. Les accidents neurologiques des manipulations cervicales. Thesis (Doctor of Medicine) - Faculty of Medicine, Claude-Bernard University, Lyon. 1981 (11 June). Practitioner unknown. Female patient age 33. Left vertebral artery damage. WALLANBERG SYNDROME.

1981 Frachon M. Les accidents neurologiques des manipulations cervicales. Thesis (Doctor of Medicine) - Faculty of Medicine, Claude-Bernard University, Lyon. 1981 (11 June). Chiropractor. Female patient age 39. Vertebral artery stenosis. RECOVERED?

1982 Dahl A, Bjark P, Anke I. Tidsskr Nor Laegeforen 1983; 102 (3): 155-7. Chiropractor. Female patient age 35. Cerebrovaskulaere komplikasjoner til manipulasjonsbehandling av nakken. ATAXIA. UNSTEADY GAIT.

1982 Meyermann R. Manuelle Medizin 1982; 20: 105-14. Physician. Female patient age 36. Möglichkeiten einerchadigung der arteria vertebralis. Thrombosis of the basilar artery. DEATH a few hours later.

1982 Simmons KC, Soo YS, Walker G, Harvey P. Med J Australia 1982; 1: 187-8. Practitioner unknown. Male patient age 41. Right vertebral artery causing brainstem ischemia. Trauma to the vertebral artery related to neck manipulation.

LIMB CLUMSINESS. OCULAR MOBILITY DEFICITS.

1983 Gutmann G. Manuelle Medizin 1983; 21: 2-14. Physician. Female patient age 35. Dissecting aneurysm of the vertebral artery. Verletzungen der arteria vertebralis durch manuelle therapie. DEATH.

1983 Gutmann G. Manuelle Medizin 1983; 21: 2-14. Physician. Female patient age 25. Vertebral artery insufficiency. Verletzungen der arteria vertebralis durch manuelle therapie. SPASTIC TETRAPLEGIA

1983 Gutmann G. Manuelle Medizin 1983; 21: 2-14. Naturopath. Male patient age unknown. Vertebral artery thrombosis. Verletzungen der arteria vertebralis durch manuelle therapie. BLINDNESS THEN SEVERE TUNNEL VISION.

1983 Gutmann G. Manuelle Medizin 1983; 21: 2-14. Naturopath. Male patient age 36. cerebellar ischemia. Verletzungen der arteria vertebralis durch manuelle therapie. VERTIGO. NAUSEA. VOMITING

1983 Gutmann G. Manuelle Medizin 1983; 21: 2-14. Physician. Male patient age unknown. Verletzungen der arteria vertebralis durch manuelle therapie. BRAINSTEM ISCHAEMIA

1983 Gutmann G. Manuelle Medizin 1983; 21: 2-14. Physician. Female patient age 36. Vertebral artery insufficiency. Verletzungen der arteria vertebralis durch manuelle therapie. VISUAL DISTURBANCES. MEMORY PROBLEMS.

1983 Gutmann G. Manuelle Medizin 1983; 21: 2-14. Physician. Patient: female. Young age. Verletzungen der arteria vertebralis durch manuelle therapie. VERTEBRAL ARTERY SPASM.

1983 Braun IF, Pinto RS, DeFilipp GJ et al. Southern Med J 1983; 76 (9): 1199-1201. Chiropractor. Male patient age 47.

Brain stem infarction due to chiropractic manipulation of the cervical spine. PONS INFARCTION.

1983 Horn SW. Annals Emergency Medicine 1983; 12 (10): 648-50. Chiropractor. Male patient age 34. The Locked-In syndrome following chiropractic manipulation of the cervical spine. TETRAPLEGIC MUTE. CAN ONLY COMMUNICATE BY EYE BLINKING.

1983 Pamela F, Beaugerie L, Couturier M et al. Presse Medicale 1983; 12 (24): 1548. Practitioner unknown. Female patient age 52. Basilar artery thrombosis. Locked in syndrome. Syndrome de differentiation motrice par thrombose du tronc basilaire apres manipulation vertebrale. DEATH six weeks later.

1983 Ali Cherif A, Delpuech F, Habib M, Salamon G, Khalil R. Annales de Medecine Physique 1983; 25: 459-65. Chiropractor. Male patient age 51. Basilar artery thrombosis. Thrombose vertebro-basilaire apres manipulation du rachis cervical. A propos de deux cas. DEATH after 11 days of coma.

1983 Ali Cherif A, Delpuech F, Habib M, Salamon G, Khalil R. *Annales de Medecine Physique* 1983; 25: 459-65. Practitioner unknown. Male patient age 65. Vertebral artery thrombosis. Thrombose vertebro-basilaire apres manipulation du rachis cervical. A propos de deux cas. VARIOUS NEUROLOGICAL DEFICITS.

1984 Cellerier P, Georget AM. *J Radio1* 1984; 65 (3): 191-6. Chiropractor. Male patient age 35. Dissections of the vertebral artery. Dissection des arteres vertebrales apres manipulation du rachis cervical. A propos d'un cas. WALLEMBERG SYNDROME

1984 Daneshmend TK, Hewer RL, Bradshaw JR. *Br Med J* 1984; 288: 189. Osteopath. Male patient age 31. Acute brainstem and cerebellar infarction. Acute brain stem stroke during neck manipulation. RESIDUAL PALSY

1984 Fritz VU, Maloon A, Tuch P. *South African Med J* 1984; 66: 844-6. Osteopath. Female patient age 60. Neck manipulation causing stroke. ATAXIA. NAUSEA. RIGHT ARM WEAKNESS.

1984 Fritz VU, Maloon A, Tuch P. *South African Medical Journal* 1984; 66: 844-6. Chiropractor. Female patient age 31. Neck manipulation causing stroke. PONTINE BRAINSTEM INFARCT.

1984 Fritz VU, Maloon A, Tuch P. Neck manipulation causing stroke. *South African Medical Journal* 1984; 66: 844-6. Physiotherapist. Male patient age 63. Brainstem infarct. HEMIPARESIS. DIZZY SPELLS.

1984 Lindy DR. *Br Osteopathic J* 1984; 16 (2): 84-5. Osteopath. Male patient age 43. Vertebral artery. Patient collapse following cervical manipulation: A case report. RECOVERED?

1984 Nielsen AA. *Ugeskr Lager* 1984 (22 Oct); 3267-70. Chiropractor. Male patient age 34. Dissecting aneurysm of the vertebral artery. Cerebrovaskulaere insulter forarsaget af manipulation af columna cervicalis. DEATH ABOUT 3 HOURS AFTER NECK MANIPULATION.

1984 Nielsen AA. *Ugeskr Lager* 1984 (22 Oct); 3267-70. Physician. Female patient age 41. Vertebral artery. Cerebrovaskulaere insulter forarsaget af manipulation af columna cervicalis. RESIDUAL NEUROLOGICAL DEFICITS.

1984 Zak SM, Carmody RF. *Arizona Medical* 1984; 41 (5): 333-7. Chiropractor. Male patient age 53. Posterior inferior and superior cerebellar artery thrombosis. Cerebellar infarction from chiropractic neck manipulation: Case report and review of the literature. DEATH 27 days after neck manipulation.

1985 Bayerl JR, Buchmuller HR, Pohlmann-Eden B. *Nervenarzt* 1985; 56 (4): 194-9. Physician. Male patient age 32. Nebenwirkungen und Kontraindikationen der manuellen therapie im bereich der halswirbelsaule. VOMITING. DOUBLE VISION. SPEECH DEFECTS.

1985 Bayerl JR, Buchmuller HR, Pohlmann-Eden B. *Nervenarzt* 1985; 56 (4): 194-9. Physiotherapist. Female patient age 33. Nebenwirkungen und Kontraindikationen der manuellen therapie im bereich der halswirbelsaule. BLURRED VISION

1985 Bayerl JR, Buchmuller HR, Pohlmann-Eden B. *Nervenarzt* 1985; 56 (4): 194-9. Practitioner unknown. Female patient age 33. Nebenwirkungen und Kontraindikationen der manuellen therapie im bereich der halswirbelsaule. NYSTAGMUS. SHORT TERM BLINDNESS.

1985 Bayerl JR, Buchmuller HR, Pohlmann-Eden B. *Nervenarzt* 1985; 56 (4): 194-9. Physician. Female patient age 43. Nebenwirkungen und Kontraindikationen der manuellen therapie im bereich der halswirbelsaule. VISUAL AND SPEECH DEFICITS.

1985 Bayerl JR, Buchmuller HR, Pohlmann-Eden B. *Nervenarzt* 1985; 56 (4): 194-9. Physician. Female patient age 27. Nebenwirkungen und Kontraindikationen der manuellen therapie im bereich der halswirbelsaule. NAUSEA

1985 Katirji MB, Reinmuth OM, Latchaw RE. *Arch Neurol* 1985; 42: 242-8. Practitioner unknown. Female patient age 26. Stroke due to vertebral artery injury. ATAXIA. HYPALGESIA.

1985 Katirji MB, Reinmuth OM, Latchaw RE *Arch Neurol* 1985; 42: 242-8. Chiropractor. Male patient age 51. Stroke due to vertebral artery injury. WALLEMBERG SYNDROME.

1985 Modde PJ. *Chiropractic Malpractice*. Columbia, Maryland: Hanrow Press 1985: 269-70, 273-5, 311-8, 322-3, 329-31, 334-7. Chiropractor. Female patient age 32. SLURRED SPEECH. FACIAL PARALYSIS.

1985 Modde PJ. *Chiropractic Malpractice*. Columbia, Maryland: Hanrow Press 1985: 269-70, 273-5, 311-8, 322-3, 329-31, 334-7. Chiropractor. Male patient age 41. BRAINSTEM INFARCTION. VERTIGO.

1985 Modde PJ. *Chiropractic Malpractice*. Columbia, Maryland: Hanrow Press 1985: 269-70, 273-5, 311-8, 322-3, 329-31, 334-7. Chiropractor. Female patient age 29. Immediate following neck manipulation, headaches, dizziness. PROGRESSIVE PARALYSIS. VISUAL DEFECTS.

1985 Modde PJ. *Chiropractic Malpractice*. Columbia, Maryland: Hanrow Press 1985: 269-70, 273-5, 311-8, 322-3, 329-31, 334-7. Chiropractor. Male patient age 31. Nausea. Unable to stand. BRAINSTEM STROKE. DIZZY SPELLS.

1985 Modde PJ. *Chiropractic Malpractice*. Columbia, Maryland: Hanrow Press 1985: 269-70, 273-5, 311-8, 322-3, 329-31, 334-7. Chiropractor. Female patient age 26. Left vertebral artery thrombosis and moderate right vertebral artery thrombosis. DEATH 24 hours after neck manipulation.

1985 Dvorak J, Orelli F. *Med* 1982; 71: 64-9. *Manual Med* 1985; 2: 1-4. Chiropractor. Female patient age 35. Loss of consciousness. TRANSIENT TETRAPLEGIA.

1986 Brownson RJ, Zollinger WK, Madiera T, Fell D. *Laryngoscope*. 1986; 96 (2): 166-70. Osteopath. Patient: female age 29. Brainstem ischemia. Sudden sensor neural hearing loss following manipulation of the cervical spine. SENSORINEURAL HEARING LOSS.

1986 Brownson RJ, Zollinger WK, Madiera T, Fell D. *Laryngoscope* 1986; 96 (2): 166-70. Chiropractor. Male age 45. Brainstem ischemia. Sudden sensor neural hearing loss following manipulation of the cervical spine. SENSORINEURAL HEARING LOSS

1986 Brownson RJ, Zollinger WK, Madiera T, Fell D. *Laryngoscope* 1986; 96 (2): 166-70. Chiropractor. Male age 45. Brainstem ischemia. Sudden sensor neural hearing loss following manipulation of the cervical spine.

1986 Miglets AS. Discussion IN: Brownson RJ, Zollinger WK, Madiera T, Fell D. Laryngoscope 1986; 96 (2): 166-70. Physician. Female age 26. Brainstem ischemia. Sudden sensor neural hearing loss following manipulation of the cervical spine. HEARING LOSS.

1986 Gittinger JW. J Clinical Neuro Ophthalmology 1986; 6 (1): 11-13. Chiropractor. Male age 44. Occipital infarction following chiropractic cervical manipulation. HOMONYMOUS HEMIANOPIA.

1987 Terrett AGJ. J Aust Chiro Assoc 1987; 17 (1): 15-24. Chiropractor. Male age 42. REPORT ON 107 CASES Vascular accidents from cervical spine manipulation. Action against chiropractor: Blood flow to brain disturbed says expert. Visit to chiropractor ended working life. Patient wins claim against chiropractor. Border Morning Mail (Albury, Australia) 24 Nov 1983. WALLEMBERG SYNDROME

1987 Terrett AGJ. J Aust Chiro Assoc 1987; 17 (1): 15-24. Chiropractor. Patient: female 29. Dissection of the vertebral artery. REPORT ON 107 CASES Vascular accidents from cervical spine manipulation: WALLEMBERG SYNDROME

1987 Terrett AGJ. J Aust Chiro Assoc 1987; 17 (1): 15-24. Practitioner: Physician. Male age 43. Brainstem and cerebellar infarction. REPORT ON 107 CASES. Vascular accidents from cervical spine manipulation. DEATH 3 days after neck manipulation.

1987 Terrett AGJ. J Aust Chiro Assoc 1987; 17 (1): 15-24. Practitioner: Physician. Male age 31. Vertebrobasilar thrombosis. REPORT ON 107 CASES. Vascular accidents from cervical spine manipulation. DEATH 3 days after neck manipulation.

1987 Bolton SP. J Aust Chiro Assoc 1987; 17 (2): 75. Osteopath. Male age 39. Cerebellopontine infarction following bilateral dissection of the vertebral arteries. Vascular accidents. DEATH 18 hours after neck manipulation.

1987 Fast A, Zinicola DF, Marin EL. Spine 1987; 12 (9): 840-2. Practitioner: Chiropractor Patient: female age 27 Subintimal tear of the left vertebral artery. Vertebral artery damage complicating cervical manipulation. NEUROLOGICAL MODERATE DEFICITS.

1987 Janzen JM, Amatuzio J, Peterson GF Complication of cervical manipulation: J Forensic Science 1987; 32 (4): 1089-94. Practitioner: Chiropractor Male age 51 A case report of fatal brainstem infarct with review of the mechanisms and predisposing factors. Symptoms 30 minutes after manipulation 51 male DEATH Important example of how anomalies can cause DEATH. No way to know beforehand. Hypoplastic left vertebral artery. Adventitial hemorrhage of the extra-cranial segment of the right vertebral artery

1987 (M.P.) Sherman MR, Smialek JE, Zane WE. Archives of Pathology and Laboratory Medicine. 111:851-853(9)1987  
Practitioner: Chiropractor 37 male Pathogenesis of vertebral artery Occlusion following cervical spine manipulation.  
DEATH 52 hours after neck manipulation. NOTE: Patient was a regular chiropractic visitor. He had asymmetrical vertebral arteries. He had old and recent dissections C-1-2. He had no knowledge that he already had old dissections in his arteries.

1987 Povlsen UJ, Kjaer L, Arlien-Soborg P. Acta Neurol Scand 1987; 76 (6): 486-8. Locked-In syndrome following cervical manipulation. Practitioner: Chiropractor Patient: female age 36 Infarction of the pons. LOCKED IN SYNDROME. TETRAPLEGIC.

1987 Carmody E, Buckley P, Hutchison M. Irish Medical Journal. 1987; 80(9): 259-60 Practitioner: Unknown Male age 38 Basilar artery occlusions following neck manipulation. NEUROLOGICAL DEFICITS

1987 Bell versus Griffiths. Hunter J (Judl- ent). Supreme Court, Common Law Division, Sydney, 14 Sep 1994 Osteopath  
Male age 32 BLIND. LOCKED IN SYNDROME.

1987 Mas JL, Bousser MG, Hasboun D, Laplane D. Stroke 1987; 18 (6): 1037-48 Practitioner: Unknown Patient: female age 27 Thrombosis of right vertebral artery. Extra cranial vertebral artery dissections. A REVIEW OF 13 CASES. RECOVERED?

1987 Mas JL, Bousser MG, Hasboun D, Laplane D. Stroke 1987; 18 (6): 1037-48 Practitioner: Unknown Patient: female age 47 Thrombosis of left vertebral artery. Extra cranial vertebral artery dissections. A REVIEW OF 13 CASES. RECOVERED?

1987 Chen TW, Chen ST Chung Hua I Hsueh Tsa Chih (Chinese Medical journal) 198-1; 40 (6) 557-(i2. Muscle therapist.  
Male age 28 Brainstem stroke induced by chiropractic neck manipulation - a case report. RECOVERED?

1987 Dunne DW, Conacher GN, Khangure M. Journal of Neurology, Neurosurgery and Psychiatry. 50:349-353. 1987 Naturopath Male age 43 Bilateral dissection of the extra-cranial vertebral arteries. Brainstem infarction DEATH 3 days after.  
There was "a possible old small" dissection of the extra-cranial artery. Another example where existing dissections are not known to the patient.

1987 FAMILY STATEMENT ONTARIO CANADA Practitioner: Chiropractor Patient: female age 30-34 Bilateral carotid artery dissection. DEATH after several months in coma.

1988 Murthy JMK, Naidu KV Neurol Neurosurg Psychiatry, 1988; 51 (9): 1237-8. Barber Male age 40 years. Aneurysm of the left internal carotid artery. Aneurysm of the cervical internal carotid artery following chiropractic manipulation. NEUROLOGICAL DEFICITS.

1988 Phillips SJ, Maloney WJ, Gray J. Can Journal Neurological Science 1989; 16 (3) 348-51. Pure motor stroke due vertebral artery dissection.

1989 Ponge T, Cottin S, Ponge. Rev Rhum 1989; 56 (7):545-8. Accident vasculaire vert6bro-basilaire apres manipulation du rachis cervical.

1989 Mas JL, Henin D, Bousser MG, Chain F, Hauw JJ Neurology 1989; 39: 512-515, 1989. 35 Patient: female comatose within 15 minutes. Dissecting aneurysm of the vertebral artery. DEATH after 16 hours. Recent superimposed on old dissection of the extra cranial segment of the right vertebral artery. (You can have an old dissection and never know it.

1989 Levine SR, Quint DJ, Pressin MS, Boulos RS, Welch Clinical and radiologic features. Neurology. 1989 (Apr) 39: 515-22. Practitioner: Unknown Male age 36 Infarction in superior cerebellar artery territory. Intramural clot in the vertebrobasilar circulation. STROKE. RECOVERED?

1990 TerrettAGJ. J New Zealand Register of Osteopaths I 990; 4: 42-5. Osteopath Male age 31 years. Vertebral artery thrombosis. SEVERE NEUROLOGICAL DEFICITS.

1990 Terrett AGJ. J New Zealand Register of Osteopaths 1990; 4: 42-5. Osteopath Male. Age unknown. Thrombosis left posterior cerebral artery SEVERE NEUROLOGICAL DEFICITS.

1990 Frumkin LR, Baloh RW. Neurology 1990; 40 (4):611-5. Practitioner: Chiropractor Patient: female age 40 years. Wallenberg's syndrome following neck manipulation. WALLENBERG SYNDROME

1990 Frumkin LR, Baloh RW. Neurology 1990; 40 (4):611-5. Practitioner: Chiropractor Male age 33 years Wallenberg's syndrome following neck manipulation. WALLENBERG SYNDROME

1990 Frumkin LR, Baloh RW. Neurology 1990; 40 (4):611-5. Practitioner: Chiropractor Patient: female age 40 Wallenberg's syndrome following neck manipulation. WALLENBERG SYNDROME

1990 Frumkin LR, Baloh RW. Neurology 1990; 40 (4):611-5. Practitioner: Chiropractor Male age 28 Wallenberg's syndrome following neck manipulation WALLENBERG SYNDROME

1990 Raskind R, North CM. Angiology 1990; 41 (6):445-52. Practitioner: Chiropractor Patient: female age 43 Cerebellar hemorrhage. Vertebral artery injuries following chiropractic cervical spine manipulation. DEATH

1990 Raskind R, North CM. Angiology 1990; 41 (6):445-52. Practitioner: Chiropractor Male age 42 Subintimal tear of the left vertebral artery. Abnormal right vertebral artery as well. Vertebral artery injuries following chiropractic cervical spine manipulation NEUROLOGICAL DEFICITS.

1990 Raskind R, North CM. Angiology 1990; 41 (6):445-52. Practitioner: Chiropractor Patient: female age 40 Bilateral subintimal dissection. Vertebral artery injuries following chiropractic cervical spine manipulation. BRAINSTEM. NEUROLOGICAL DEFICITS.

1990 Krieger D, Leibold M, Bruckmann H. Deutsche Med Wochenschr 1990; 115 (15):580-3 Practitioner: Chiropractor Patient: female age 37 years Dissektionen der arteria vertebralis nach zervikalen chiropraktischen manipulationen. LOCKED IN SYNDROME. SOME RESOLUTION.

1990 Krieger D, Leibold M, Bruckmann H. Deutsche Med Wochenschr 1990; 115 (15):580-3 Practitioner: Unknown Patient: female age 39 Bilateral vertebral artery dissections. Basilar artery embolism. Dissektionen der arteria vertebralis nach zervikalen chiropraktischen manipulationen. HEMIPARESIS.

1990 Maln J, Olsson T, Fagerlund Lakartidningen 1990 (Nov 14); 87 (46):3877-9 Practitioner: Unknown Male age 28 Thalamus infarct in the area of the basilar artery. Cervikal manipulation kan ge hjarninfarkt. UNKNOWN

1990 Maln J, Olsson T, Fagerlund Lakartidningen 1990 (Nov 14); 87 (46):3877-9 Practitioner: Unknown Patient: female age 27 Occipital lobe infarction. Cervikal manipulation kan ge hjarninfarkt. RIGHT HEMIANOPIA

1991 Frisoni GB, Anzola GP Stroke 1991; 22 (11):1452-60 Practitioner: Physician Male age 41 Vertebrobasilar ischaemia after neck motion. BRAINSTEM AND CEREBELLAR NEUROLOGICAL DEFECTS.

1991 Frisoni GB, Anzola GP. Stroke 1991; 22 (11):1452-60. Practitioner: Physiotherapist. Patient: female age 39. Vertebrobasilar ischaemia after neck motion. Vertebral artery dissection at C-1. NEUROLOGICAL DEFICITS.

1991 Frisoni GB, Anzola GP. Stroke 1991; 22 (11):1452-60. Practitioner: Physiotherapist. Patient: female age 49. Vertebrobasilar ischaemia after neck motion. CEREBELLAR HEMORRHAGE.

1991 Rothrock JF, Hesselink JR, Teacher TM. Neurology 1991; 41 (10):1696-7. Self Male age 35. Vertebral artery occlusion and stroke from cervical self manipulation. Left vertebral artery thrombosis. MILD STROKE.

1991 Cook JW, Sanstead JK. Neurology 1991; 41 (10):1695-6. Self. Patient: female age 35. WALLEMBERG SYNDROME following self induced manipulation. Right inferior cerebellum, right lateral medulla, right cerebellar peduncle. RESIDUAL NEUROLOGICAL DEFICIT.

1991 Braune HJ, Mutik MH, Huffmann G. Deutsche Med Wochenschr 1991; 116 (27):1047-50. Practitioner: Physician. Male age 59. Right middle cerebral artery. Hirninfarkt im Stromgebiet der Arteria cerebri media nach Chirotherapie der Halswirbelsäule. MODERATE NEUROLOGICAL DEFICIT.

1991 Nakamura CT, Lau JM, Polk NO, Popper JS. Journal Vascular Surgery 1991; 14 (1):1224. Practitioner: Chiropractor. Patient: female age 34. Vertebral artery dissection caused by chiropractic manipulation. MILD NEUROLOGICAL DEFICITS.

1991 Weinstein SM, Cantu RC. Med Sci Sports Exerc 1991; 23 (10):1119-21. Practitioner: Chiropractor. Male age 29. Cerebral stroke in a semi-pro football player. A case report. Thrombosis vertebral artery. NEUROLOGICAL DEFICITS.

1991 Saltzberg v Hawkins. Los Angeles County Superior Court Case No. 697925. Kakita J and jury. Judgement 13 Nov 1991. \$1.3 million award against MD. Practitioner: Physician. Patient: female age 31. Bilateral dissection left and right vertebral arteries. PERMANENT NEUROLOGICAL DEFICIT.

1992 Sullivan EC. Journal Chiropractic Research & Clinical Investigation 1992; 8 (1): 12-16. Practitioner: Chiropractor. Patient: female age 41. Brain stem stroke syndromes from cervical adjustments: Report on five cases. DEATH eight hours after neck manipulation.

1992 Sullivan EC. Journal Chiropractic Research & Clinical Investigation 1992; 8 (1): 12-16. Practitioner: Chiropractor. Male age 44. Left vertebral artery. Brain stem stroke syndromes from cervical adjustments: Report on five cases. BRAINSTEM AND CEREBELLAR INFARCTION.

1992 Sullivan EC. Journal Chiropractic Research & Clinical Investigation 1992; 8 (1): 12-16. Practitioner: Chiropractor. Patient: female age 41. Brain stem stroke syndromes from cervical adjustments: Report on five cases. WALLEMBERG SYNDROME THALAMUS INFARCT.

1992 Sullivan EC. Journal Chiropractic Research & Clinical Investigation 1992; 8 (1): 12-16. Practitioner: Chiropractor. Male age 36 years. Brain stem stroke syndromes from cervical adjustments: Report on five cases. BRAINSTEM STROKE.

1992 Sullivan EC. Journal Chiropractic Research & Clinical investigation 1992; 8 (1): 12-16. Practitioner: Chiropractor. Patient: female age 37. Subintimal dissection of the right vertebral artery. Brain stem stroke syndromes from cervical adjustments: Report on five cases. NEUROLOGICAL DEFICITS

1992 Shafir. J. Pediatrics 1992; 120:226-9 Practitioner: Chiropractor Male infant. Rupture of spinal cord astrocytoma.  
QUADRIPLEGIA.

1992 McCarty Sue Ky. Practitioner: Chiropractor Patient: female age 39 Bilateral vertebral artery dissection. HEMIPLEGIC

1992 Friedman DP, Flanders AE. Am J Neuro-radiology 1992 (Jan/Feb); 13:283-6. Practitioner: Chiropractor Male age 35  
Dissection of both vertebral arteries with cerebellar infarction. Unusual dissection of the proximal vertebral artery: Description of three cases. NEUROLOGICAL DEFICITS.

1992 Kponkton A, Hamonet C, Montagne A, Devaifty JP. Presse Med 1992; 21: 2050-2. Practitioner unknown. Female age 29. Complications de la manipulation cervicate. Une observation de "locked-in syndrome." TETRAPLEGIA.

1993 Johnson DW. Med J Aust 1993; 158 (4):290. Self. Male age 26. Vertebral artery spasm. Cervical self-manipulation and stroke. LEFT FACIAL PARESIS.

1993 Hamaan G, Felber S, Lancet 1993; 341: 764-5. Lay person. Patient: female age 30. Left vertebral artery dissection. Cervicocephalic artery dissections due to chiropractic manipulations. NEUROLOGICAL DEFICITS.

1993 Hamaan G, Felber S, Lancet 1993; 341: 764-5. Practitioner: Physician. Male age 38. Left vertebral artery dissection. Cervicocephalic artery dissections due to chiropractic manipulations. NEUROLOGICAL DEFICITS.

1993 Hamaan G, Felber S, Lancet 1993; 341: 764-5. Practitioner: Physician. Patient: female age 31. Left and right vertebral artery dissections. Cervicocephalic artery dissections due to chiropractic manipulations. NEUROLOGICAL DEFICITS.

1993 Hamaan G, Felber S, Lancet 1993; 341: 764-5. Practitioner: Physician. Patient: female age 31. Bilateral vertebral artery dissection. Cervicocephalic artery dissections due to chiropractic manipulations. RECOVERED?

1993 Sinel M, Smith D. Arch Phys Med Rehabilitation 1993; 74: 543-6. Practitioner: Unknown. Patient: female age 32.  
Intimal tearing of the vertebral artery. Thalamic infarction secondary to cervical manipulation.  
QUADRIPARESIS. SPEECH DEFECT. NYSTAGMUS

1993 Vibert D, Rohr Le Floch J, Gauthier G. Journal Oto-Rhino-laryngology 1993; 55: 140-2. Practitioner: Chiropractor. Patient: female age 33. Vertebral artery dissection. Vertigo as manifestation of vertebral artery dissection after chiropractic neck manipulations. RECOVERED?

1993 Soragna D, Montalbetti L, and Acta Neurol (Napoli) 1993 (Apr); 15 (2):145-50. Practitioner: Chiropractor. Male age 34. Cerebellar infarction. Chiropractic complications Another case report. RECOVERED?

1993 Braus DF, Mainka R. Manual Medizin 1993; 31:92-6. Practitioner: Unknown. Patient: female age 26. Schlaganfall nach manueller therapie: Rationale diagnostik. WALLEMBERG SYNDROME

1993 Braus DF, Mainka R. Manual Medizin 1993; 31:92-6. Practitioner: Physician. Male age 60. Schlaganfall nach manueller therapie: Rationale diagnostik. VISUAL DEFECITS. ARM PARESIS.

1993 Sturzenegger M. Schweiz Med Wochenschr 1993 (Jul 13); 123 (27-28):1389-99. Practitioner: Physician. Male age 41. Dissektion der arteria vertebralis nach manipulation der halswirbelsiule. WALLEMBERG SYNDROME. DOUBLE VISION. ATAXIA.

1993 Frazier Tina California Practitioner: Chiropractor. Patient: female age 36. Brainstem stroke. DOUBLE VISION

1993 Sturzenegger M.S chweiz Med Wochenschr 1993 (Jul 13); 123 (27-28):1389-99. Practitioner: Physician. Male age 40. Dissektion der arteria vertebralis nach manipulation der halswirbelsiule. WALLEMBERG SYNDROME.

1993 Badenbaugh K. Practitioner: Chiropractor. Age 24. Vertebral artery dissection. Brain stem infarction. DEATH.

1993 Michaeli A. Aust Physio 1993 (Dec); 39 (4): 309-15. Practitioner: Physiotherapist. Male age 75. Reported occurrence and nature of complications following manipulative physiotherapy in South Africa. APHASIA. STROKE.

1993 Blazer Art. California Practitioner: Chiropractor Male age 39 QUADRAPLEGIC

1993 Verdict and settlement. Law office Kenneth I. Kolpan. Massachusetts. Practitioner: Chiropractor. Patient: Female age 32. Unconscious. C-1 left vertebral artery thrombosis. Intima dissection.

1994 Carmichael JR Transient global amnesia following rotational manipulation of the upper cervical spine. Practitioner: Chiropractor. Patient: female age 29. Proceedings of the 1994 international Conference On Spinal Manipulation. Foundation for Chiropractic Education and Research. SHORT TERM MEMORY LOSS.

1994 Murase S, Ohe N, Nokura H. No Shinkei Geka 1994; 22 (7):671-6. Self. Male 23. Vertebral artery injury following mild neck trauma. THROMBUS OF VERTEBRAL ARTERIES.

1994 Bridges R. J Chiropr 1994; 31 (I D): 44-7. Practitioner: Chiropractor. 26 Patient: female. Trial or settlement. Circumstances that prompt the decision. QUADRAPLEGIC. LOCKED IN SYNDROME.

1994 Lofberg M, Hurskainen K, Duodecim 1994;110 (12):1155-9. Practitioner: Unknown. Male age 35. Vertebral artery stenosis. Dissection of a vertebral artery as a complication of neck manipulation. SEVERE NEUROLOGICAL DEFICITS.

1994 Teasell RW, Marchuk Y. *Critical Reviews in Physical & Rehabilitation Medicine* 1994; 6(1):121-9. Practitioner: Chiropractor. Patient: female age 32. Bilateral vertebral artery dissections. Vertebro-basilar artery, stroke as a complication of cervical manipulation. NEUROLOGICAL DEFICITS.

1994 Neck911 Data R.D. Ontario CANADA Practitioner: Chiropractor. Patient: female age 30. QUADRAPLEGIC.

1995 Rosa A, Klein J, Penisson-Besnier I, Dubas E. *Rev Neurol (Paris)* 1995; 151 (12): 739-43. Practitioner: Unknown. Male age 48. Left cerebral bleed. Hematome cerebelleux apres manipulations cervicales chez on homnie de 48 ans. DEATH 1 month later.

1995 Autopsy report. QUEBEC, CANADA. Practitioner: Chiropractor. Patient: female age 30-35. Thrombosis of right vertebral artery. Dissection. Abnormal left vertebral artery. DEATH. Shows the importance of underlying left vertebral PICA termination.

1995 Soper JR, Parker GD, Hallman JM. *Am J Neuroradiol* 1995 (Apr); 16 (4 Suppl): 95 2-4. Practitioner: Physician. Patient: female age 26. Bilateral vertebral artery dissection. Vertebral artery dissection diagnosed with CT. NEUROLOGICAL DEFICIT.

1995 Wang JL, Lin JJ. *Chung Hua I Hsueh Tsa Chih (Taipei)* 1995 (Jun); 55 (6):496-500. Practitioner: Chiropractor. Male age 32. Right vertebral artery dissection. Vertebral artery dissection complicated by cervical manipulation: A case report. CEREBELLAR ATAXIA.

1995 Peters M, Bohl J, Thonike I. *Neurology* 1995; 45: 2284-6. Practitioner: Chiropractor. Patient: female age 29. Right hemispheric infarction. Dissection of the internal carotid artery after chiropractic manipulation of the neck. DEATH 3 months later.

1995 Sternbach G, Cohen M, Goldschmidt D. *Angiology* 1995 (Sep); 46 (9): 843-6. Practitioner: Chiropractor. Patient: female age 32. Thrombosis C-2 to intra-cranial area of vertebral artery. Vertebral artery injury presenting with signs of middle cerebral artery occlusions case report. RECOVERED?

1996 Watanabe M, Murayama T, Mano T. *Rinsho Shinkeigaku* 1996 (Jan); 36 (1):43-6. Practitioner: Unknown. Male age 39. Lateral medial medulla. Medial medullary infarction following neck manipulation. RECOVERED?

1996 Alimi Y, Tonolli, and DiMauro J *Mal Vase* 1996; 21 (5): 320-3. Practitioner: Unknown. Patient: female age 48. Right vertebral artery dissection. Manipulations des vertebres cervicales et traumatisme de l'artere vertebrale. NEUROLOGICAL DEFICIT.

1996 Practitioner: Chiropractor. Male age 48. Right vertebral artery dissection. RECOVERED?

1996 Yanez GF. *Neurology* 1996 (Mar); 46 (3):884-5, (Discussion 886-7). Friend. Patient: female age 30. Right superior cerebellar infarct. Chiropractic complications. STROKE.

1996 Deck J, Pollanen M. *Neuropathology Autopsy report*. Lana Dale Lewis, Ontario, Canada. Practitioner: Chiropractor. Patient: female age 45. DEATH sixteen days after neck manipulation. see internet [www.canoe.ca/ChiroYork](http://www.canoe.ca/ChiroYork) CORONER'S INQUEST.

1996 Klougart N, Leboeuf-Yde C, Rasmussen LR. *J. Manip Physiol Ther* 1996 (Nov-Dec); 19 (9): 563-9. SUMMARY: "Among the respondents the reported incidence of CVI between 1981 and 1988 was about

one for every 120,000 cervical manipulation treatments. “Spinal manipulation to the upper neck was about four times more commonly associated with cerebral vascular insufficiency than treatment to the lower neck. Treatment to the upper neck and the rate of cerebrovascular incidents.

1996 Klougart N, Leboeuf-Yde C, Rasmussen LR. J. Manip Physiol Ther 1996 (Nov-Dec); 19 (9): 563-9. Practitioner: Chiropractor. Patient: female age 40. Vertebral artery spasms. Treatment to the upper neck and the rate of cerebrovascular incidents. RECOVERED?

1996 Klougart N, Leboeuf-Yde C, Rasmussen LR. J. Manip Physiol Ther 1996 (Nov-Dec); 19 (9): 563-9. Practitioner: Chiropractor. Patient: female age 54. Dizzy spells. Treatment to the upper neck and the rate of cerebrovascular incidents. SIMPLE DIZZY SPELLS.

1996 Klougart N, Leboeuf-Yde C, Rasmussen LR. J. Manip Physiol Ther 1996 (Nov-Dec); 19 (9): 563-9. Practitioner: Chiropractor. Patient: female age 48. Vertebral-basilar signs. Treatment to the upper neck and the rate of cerebrovascular incidents. POOR BALANCE. DIZZY SPELLS.

1996 Klougart N, Leboeuf-Yde C, Rasmussen LR. J. Manip Physiol Ther 1996 (Nov-Dec); 19 (9): 563-9. Practitioner: Chiropractor. Patient: female age 53. Vertebro-basilar signs. Treatment to the upper neck and the rate of cerebrovascular incidents. NAUSEA. DIZZY SPELLS.

1996 Klougart N, Leboeuf-Yde C, Rasmussen LR. J. Manip Physiol Ther 1996 (Nov-Dec); 19 (9): 563-9. Practitioner: Chiropractor. Male age 61. Vertebro-basilar signs. Treatment to the upper neck and the rate of cerebrovascular incidents. NAUSEA. POOR BALANCE.

1996 Klougart N, Leboeuf-Yde C, Rasmussen LR. J. Manip Physiol Ther 1996 (Nov-Dec); 19 (9): 563-9. Practitioner: Chiropractor. Patient: female age 74. Vertebro-basilar signs. Treatment to the upper neck and the rate of cerebrovascular incidents. RECOVERED.

1996 Klougart N, Leboeuf-Yde C, Rasmussen LR. J. Manip Physiol Ther 1996 (Nov-Dec); 19 (9): 563-9. Practitioner: Chiropractor. Patient: female age 19. Vertebro-basilar signs. Treatment to the upper neck and the rate of cerebrovascular incidents. LOSS OF CONSCIOUSNESS. VISUAL PROBLEMS.

1996 Klougart N, Leboeuf-Yde C, Rasmussen LR. J. Manip Physiol Ther 1996 (Nov-Dec); 19 (9): 563-9. Practitioner: Chiropractor. Patient: female age 39. Vertebro-basilar signs. Treatment to the upper neck and the rate of cerebrovascular incidents. LOSS OF CONSCIOUSNESS. VISUAL PROBLEMS.

1996 Klougart N, Leboeuf-Yde C, Rasmussen LR. J. Manip Physiol Ther 1996 (Nov-Dec); 19 (9): 563-9. Practitioner: Chiropractor. Male age 20. Treatment to the upper neck and the rate of cerebrovascular incidents. ATAXIA. VISUAL PROBLEMS.

1996 Klougart N, Leboeuf-Yde C, Rasmussen LR. J. Manip Physiol Ther 1996 (Nov-Dec); 19 (9): 563-9. Practitioner: Chiropractor. Patient: female age 30. Treatment to the upper neck and the rate of cerebrovascular incidents. MILD STROKE SIGNS. RECOVERED.

1996 Klougart N, Leboeuf-Yde C, Rasmussen LR. J. Manip Physiol Ther 1996 (Nov-Dec); 19 (9): 563-9. Practitioner: Chiropractor. Male age 40. Vertebro-basilar signs. Treatment to the upper neck and the rate of cerebrovascular incidents. ATAXIA. FATIGUE.

1996 Klougart N, Leboeuf-Yde C, Rasmussen LR. J. Manip Physiol Ther 1996 (Nov-Dec); 19 (9): 563-9. Practitioner: Chiropractor. Male age 20. Vertebro-basilar signs. Treatment to the upper neck and the rate of cerebrovascular incidents. LOSS OF CONSCIOUSNESS

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**J Neurol. 2006 Jun;253(6):724-30. Epub 2006 Mar 6.** Vertebral artery dissections after chiropractic neck manipulation in Germany over three years. **Reuter U, Hämling M, Kavuk I, Einhäupl KM, Schielke E.** Charité-Universitätsmedizin Berlin, Department of Neurology, Schumannstrasse 20-21, 10098 Berlin, Germany. [uwe.reuter@charite.de](mailto:uwe.reuter@charite.de)

Vertebral artery dissection (VAD) has been observed in association with chirotherapy of the neck. However, most publications describe only single case reports or a small number of cases. We analyzed data from neurological departments at university hospitals in Germany over a three year period of time of subjects with vertebral artery dissections associated with chiropractic neck manipulation. We conducted a country-wide survey at neurological departments of all medical schools to identify patients with VAD after chirotherapy followed by a standardized questionnaire for each patient. 36 patients (mean age 40 + 11 years) with VAD were identified in 13 neurological departments. Clinical symptoms consistent with VAD started in 55% of patients within 12 hours after neck manipulation. Diagnosis of VAD was established in most cases using digital subtraction angiography (DSA), magnetic resonance angiography (MRA) or duplex sonography. 90% of patients admitted to hospital showed focal neurological deficits and among these 11 % had a reduced level of consciousness. 50% of subjects were discharged after 20 +/- 14 hospital days with focal neurological deficits, 1 patient died and 1 was in a persistent vegetative state. Risk factors associated with artery dissections (e. g. fibromuscular dysplasia) were present in only 25% of subjects. In summary, we describe the clinical pattern of 36 patients with vertebral artery dissections and prior chiropractic neck manipulation.

2006: Vertebral artery dissection and cerebellar infarction following chiropractic manipulation .  
*Emergency Medicine Journal* 2006;**23**:e01; doi:10.1136/emj.2004.015636  
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## ABSTRACT

Vertebral artery dissection (VAD) associated with chiropractic cervical manipulation is a rare but potentially disabling condition. In this report, we present a young patient manifesting with repeated vertigo. Owing to the initial misdiagnosis, the patient later developed cerebellar stroke with inability to stand or walk. Vertigo and disequilibrium are the usual presenting symptoms of this condition, which can result from inner ear or vestibular nerve dysfunction, vertebrobasilar insufficiency, and even lethal cerebellar infarction or haemorrhage; these last two, although rarely seen in young adults, can be caused by traumatic or spontaneous arterial injury, including injury secondary to chiropractic cervical manipulation. A number of cases of VAD associated with chiropractic cervical manipulation have been reported, but rarely in the emergency medicine literature. We present a case of this rare occurrence, and discuss the diagnostic pitfalls.

2007: *Eur Neurol* 2007;**58**:248-250 Occlusion of Vertebral Artery, Cerebellar Infarction and Obstructive Hydrocephalus following cervical Spine Manipulation. D. Cerimagic J. Glavic A. Lovrencic-Huzjan V. Demarin. Department of Neurology, University General Hospital. Zagreb, Croatia. 46 year old male.

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*J Neurosci Nurs*. 2008 Jun;**40**(3):169-72.

Seventh cervical rib associated with subclavian artery occlusion and multiple

infarcts: case report. Wise R. Department of Neurosurgery, University of Cincinnati College of Medicine, Cincinnati, OH, USA. [editor@mayfieldclinic.com](mailto:editor@mayfieldclinic.com)

A cervical rib, or supernumerary (extra) rib arising from the 7th cervical vertebra, is a congenital abnormality that occurs in less than 1% of the population. Clinically, it can cause obscure nervous or vascular symptoms and be difficult to diagnose. In this rare case, a 37-year-old woman developed a subclavian artery occlusion after undergoing a chiropractic manipulation for neck, shoulder, and arm pain. The occlusion led to multiple cerebellar infarcts, frontal subarachnoid hemorrhage, myocardial infarction, and right-hand vascular compromise. The patient was subsequently diagnosed with a 7th cervical rib, which likely caused compression of the subclavian artery after a hyperextension injury sustained during the chiropractic procedure  
Ned Tijdschr Geneeskd. 2008 Nov 8;152(45):2464-9.

[Bilateral vertebral artery dissection during chiropractic treatment]

[Article in Dutch]

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A previously healthy 42-year-old man was brought to the emergency department after he became unwell during chiropractic treatment. During cervical manipulation he had experienced nausea, dizziness, and loss of vision. He arrived at the clinic initially totally blind and with dysarthria. Imaging showed a bilateral vertebral artery dissection, and an MRI scan carried out the next day showed extensive ischaemia in the vertebrobasilar territory.

Complications from chiropractic treatment are rare but can be severe or, in some cases, even fatal, especially if treatment involves the cervical area. There is no controlled evidence showing that chiropractic treatment is beneficial and therefore we would not recommend it. Before treatment is commenced, patients should be informed of the risks of cervical chiropractic manipulation.

Publication Types:  
English Abstract

