CASE REPORT

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Lateral medullary syndrome post-chiropractic manipulation in a 25-year old female with headache

Matthew Kynan Burrage, Clare Therese Costello

ABSTRACT

Introduction: Cervical chiropractic manipulation for the treatment of back and neck pain is becoming increasingly commonplace, especially amongst younger adults. It may also give rise to serious complications, such as dissection of cervical arteries with resultant stroke syndromes. This case report reviews the literature surrounding this issue and highlights the importance of correctly diagnosing cerebrovascular pathology in young adults. **Case Report:** We describe a case of a 25-year-old female with delayed onset of focal neurology and lateral medullary syndrome post-chiropractic cervical manipulation. Magnetic resonance angiogram and computed tomography angiogram confirm lateral medullary infarction and bilateral vertebral artery dissection. **Conclusion:** Currently, chiropractic manipulation and complications are a relatively topical issue and some of the potential serious complications are discussed in this case. Certain posterior circulation stroke symptoms belong to distinct clinical syndromes and it is important to be aware of these when assessing patients with possible posterior circulation ischemia. This is especially important in younger populations, where misdiagnosis as migraine may be a common pitfall. Headache and focal neurology

following chiropractic cervical manipulation should be managed and investigated with a high index of suspicion for vertebral artery dissection.

Keywords: Lateral medullary syndrome, Chiropractor, Vertebral dissection

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INTRODUCTION

Lateral medullary syndrome, a posterior circulation stroke syndrome with a distinct set of clinical findings, is a recognized consequence of vertebral artery dissection. Cervical artery dissection (including vertebral artery dissection) is a documented complication of chiropractic cervical spinal manipulation. This report presents a case of a young female who presented with bilateral vertebral artery dissection post-chiropractic manipulation. The incidence and clinical outcomes of vertebral artery dissection, and the pathophysiology and clinical findings present in lateral medullary syndrome, will be discussed.

CASE REPORT

A 25-year-old female presented to the emergency department in October 2011 with occipital headache of four-week duration and new onset dizziness, paresthesia, dysphagia, and 'pulling to the left', which developed whilst jogging that morning. History revealed visits to a chiropractor with posterior headache and neck pain, four weeks and one week prior to this presentation.

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Cervical manipulation was performed on both occasions. Worsening left occipital and cervical pain developed following the second visit, with associated nausea and vomiting.

Neurological examination revealed an ataxic gait with falling to the left. Facial inspection revealed a left ptosis and miosis, consistent with partial left-sided Horner's syndrome. Nystagmus was present with rapid horizontal phase towards the right. Left-sided facial weakness and bulbar involvement was evident with a flattened left nasolabial fold, decreased left palatal movement, and uvula deviation to the right. Decreased pin-prick sensation and loss of temperature discrimination was detected over the left maxilla and throughout the right upper and lower limbs. Posterior columns were intact.

Left-sided cranial nerve signs, ipsilateral Horner's syndrome, and contralateral spinothalamic involvement suggested lateral medullary syndrome. A provisional diagnosis of a left medullary lesion secondary to vertebral artery dissection was made given the lack of typical stroke risk factors and the history of recent spinal manipulation. Differentials included embolic phenomena and tumor given the patient's age.

Magnetic resonance imaging (MRI) scan revealed a DWI-enhancing lesion in the left lateral medulla (Figure 1). Subsequent magnetic resonance angiography (MRA) was suspicious for left vertebral artery dissection. A follow-up MRI scan at 4th-week post-incident revealed a new, asymptomatic, lesion in the right cerebellum. Repeat MRA (Figure 2A) and CTA (Figure 2B) of the

vertebral arteries revealed bilateral vertebral artery dissection with bilateral posterior inferior cerebellar artery (PICA) territory infarcts. The patient was managed conservatively with aspirin and atorvastatin, progressing well with rehabilitation.

Figure 2: (A) Magnetic resonance imaging demonstrates bilateral vertebral artery irregular luminal narrowing consistent with bilateral vertebral artery dissection. This is more easily appreciated on the left (arrows). (B) Computed tomography angiogram of neck demonstrating irregular luminal narrowing and a focal dilatation of the right vertebral artery consistent with vertebral artery dissection and a dissecting aneurysm (arrow). Left vertebral artery dissection also present.

Figure 1: Left lateral medullary infarct caused by bilateral vertebral artery dissection. Diffusion weighted image on magnetic resonance imaging demonstrates a rounded focus of restricted diffusion consistent with a left lateral medullary infarct (arrow).

DISCUSSION

Lateral medullary syndrome (or Wallenberg syndrome) is a recognised complication of posterior circulation infarction, usually the result of ipsilateral vertebral artery or PICA occlusion [1]. Clinical features are related to vestibulocerebellar, sensory, bulbar and autonomic nuclei involvement (Table 1). Spinothalamic tract involvement leads to impaired pain and temperature sensation over the contralateral side of the body (due to fiber decussation in the spinal cord), while Horner's

Table 1: Features of lateral medullary syndrome [2].

General Symptoms	Ipsilateral Signs	Contralateral Signs
Dizziness *	Loss of pain and temperature sensation in face *	Loss of pain and temperature sensation in trunk and limbs *
Vertigo	Horner's syndrome (ptosis, miosis, anhidrosis) *	Uvula deviation *
Falling / veering to one side	Paralysis of palate *	Nystagmus (rapid horizontal phase) *
(ipsilateral) *	Laryngeal and pharyngeal paralysis	
Difficulty sitting upright without support	Nystagmus (rotational component)	
Dysphagia *		
Diplopia *		

syndrome (ipsilateral ptosis and miosis) is related to descending sympathetic tract impairment [1].

Cervical artery dissection (internal carotid or vertebral artery dissection (VAD) has an annual incidence of 2.6–3.0 per 100,000 people [2]. It is the primary cause of 2% of ischemic strokes but accounts for 10–25% in young adults [2].

There have been case reports associating chiropractic manipulation with unilateral and bilateral VAD and epidemiological links have been established [3, 4]. Spinal manipulation therapy is an independent risk factor for VAD and accelerates embolization in existing lesions [4]. The vertebral artery is particularly susceptible to cervical manipulation due to its mobility within the vertebral foramina, its proximity to the vertebral bodies, and its sharp directional change [3].

The aim of early diagnosis and treatment of VAD is to prevent progression to ischemic stroke and other thrombotic complications. Currently, there are no published multi-cohort trials evaluating anti-coagulation versus anti-platelet agents for treatment of VAD. A recent meta-analysis for internal carotid artery dissection revealed no significant difference in outcome between anticoagulants and anti-platelets [5]. Prognosis is usually favorable for VAD, with low recurrence rates, good functional recovery and high rates of recanalization [3].

CONCLUSION

Chiropractic spinal manipulation is a recognised cause of vertebral artery dissection (VAD) presenting symptoms may vary from ipsilateral occipital headache to signs of cerebral ischemia such as lateral medullary syndrome. Patients presenting with headache and focal neurology following spinal manipulation should be managed with a high index of suspicion.

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Author Contributions

Matthew Kynan Burrage – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

Clare Therese Costello – Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

Guarantor

The corresponding author is the guarantor of submission.

Conflict of Interest

Authors declare no conflict of interest.

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