Vertebral artery dissection secondary to prolonged telecommunication

Maria Elena Farrugia

INTRODUCTION

A patient presented with intermittent neurological symptoms suggestive of ischaemia in the posterior circulation territory. Magnetic resonance imaging (MRI) confirmed dissection of the right vertebral artery. This may have been secondary to repetitive kinking of the vessel in the cervical spine or secondary to prolonged lateral flexion of the neck.

DISCUSSION

Arterial dissection is characterized by splitting of the media or subadventitial layer leading to formation of an aneurysmal wall with or without narrowing of the arterial lumen. Blood enters via an intimal tear — the portal of entry — and propagates into this pseudolumen, occluding flow in the true lumen of the vessel. The dissecting blood may re-enter the lumen distally to create a second channel or rerupture through the vessel wall. In the cervicocephalic location, supporting structures buttress the dilatation and often prevent additional aneurysmal formation.

Dissection of the cervicocephalic vessels (internal carotid or vertebral arteries) is an important cause of stroke in the younger population. Vertebral artery dissection is commonly related to trauma but may also occur in abrupt turning of the head, simple neck hyperextension or even following chiropractic manipulation as Hufnagel et al (1999) have described.

Desfontaines and Despland (1995) followed up 60 cases and suggested that spontaneous dissection of the vertebral artery may be related to an underlying connective tissue disorder or fibromuscular dysplasia, an inflammatory process, such as Behçet's syndrome or vasculitis of the vasa vasorum (Boukobza et al, 1998), or it may even be associated with an infection-mediated process of the arterial wall (Grau et al, 1997). It may be associated with an arteriopathy secondary to genetic predisposition to vascular fragility or related to defective type I or III collagen, as occurs in Ehlers–Danlos syndrome or in mild phenotypic variants of osteogenesis imperfecta (Mayer et al, 1996).

It transpired that this patient spent a significant period of time during the day at work with his neck bent over in a right lateral flexed position holding the phone between his mandible and shoulder while simultaneously working at the computer. This is the first reported case of a spontaneous dissection of the vertebral arteries associated with prolonged use of a telephone.

This patient has therefore sustained a brainstem insult secondary to vertebral artery dissection. His signs suggest a lesion in the right pontine territory as inferred by his left pyramidal weakness (i.e. a lesion rostral to the decussation of the pyramids) and a complete contralateral sensory deficit inferring a site rostral to the medulla.

Transmission of pain to the cranium is conveyed via the trigeminal system. Once the fibres leave the gasserian ganglion, they enter the pons to descend in the ipsilateral spinal tract of the trigeminal nerve to the upper cervical cord. Pathology at this site leads to ipsilateral sensory loss of the face. These axons then synapse in the nucleus of the spinal tract of the trigeminal nerve to become second-order neurons, crossing to the opposite side of the brainstem to continue their ascent to the thalamus and later to the parietal lobe via the posterior limb of the internal capsule. The patient under discussion probably sustained an event at the level where the sensory fibres from the face are travelling as second-order neurons.

Patients with vertebral artery dissection often present with headache and ipsilateral neck pain as well as other neurological deficits suggestive of posterior circulation territory embarrassment. They may present with transient ischaemic episodes or an established stroke.

The diagnosis is often made on clinical grounds and further supported by neuroimaging. MRI and magnetic resonance angiography are the investiga-

CASE REPORT

A 35-year-old man presented with acute onset diplopia associated with a sense of dysequilibrium and nausea. At the onset, he complained of right-sided neck pain. Over 24 hours, he developed further symptoms with left sensory disturbances and pyramidal weakness. On examination, he was mildly ataxic. He had diplopia on right lateral gaze. There was evidence of reduced perception of pain in a left hemisensory distribution that also included the left side of his face with a mild left pyramidal weakness and hyperreflexia. The plantar responses were flexor.

He worked as a solicitor, was a non-smoker and drank minimal alcohol. There was no history of recent trauma to the neck, previous road traffic accidents or a history of manipulation to the neck. There was no family history of relevance.

The following investigations were either normal or negative: full blood count, plasma viscosity, C-reactive protein, blood glucose, antinuclear antibody, a prothrombotic screen, 24-hour electrocardiogram and echocardiography. His cholesterol level was 6.67 mmol/litre. Axial T2-weighted magnetic resonance imaging (MRI) of the neck showed a high signal crescent in the wall of the right vertebral artery with a corresponding decrease in the size of the lumen consistent with an arterial dissection (*Figure 1*). These findings were supported by partial occlusion of the lumen of the right vertebral artery on magnetic resonance angiography (*Figure 2*). MRI of the brain was normal. Treatment with anticoagulation was commenced as well as a statin preparation. His symptoms resolved within the next 2 weeks.

Dr Maria Elena Farrugia is Specialist Registrar in Neurology, Department of Neurology, Ninewells Hospital and Medical School, Dundee DD1 9SY

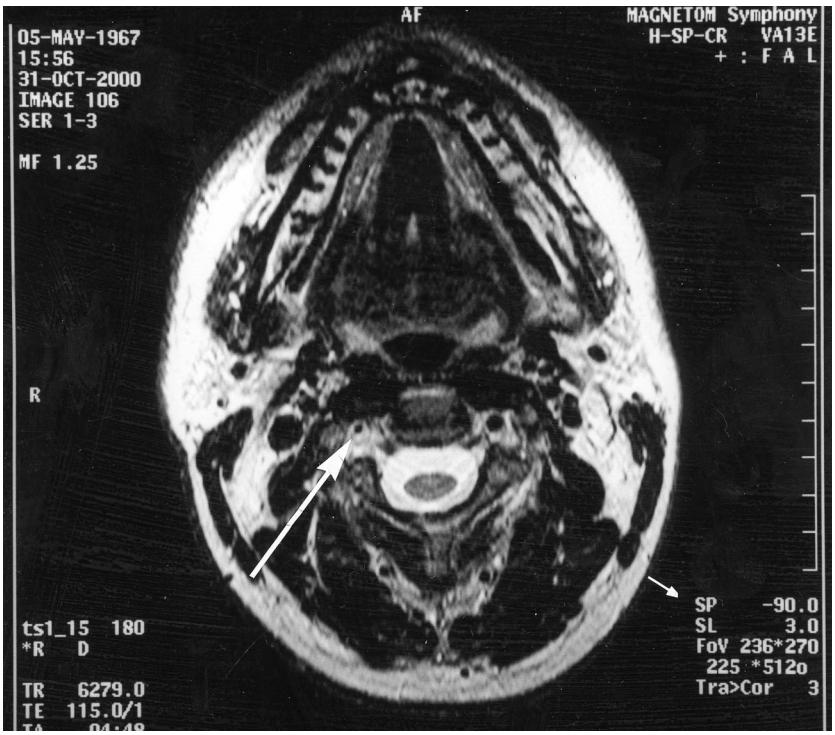
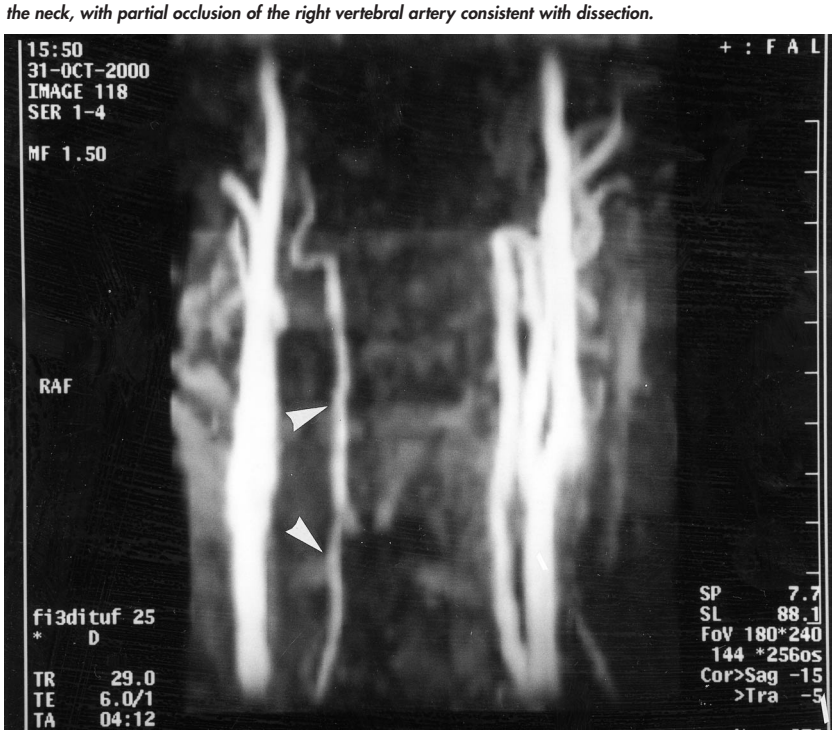


Figure 1. Axial T2-weighted magnetic resonance imaging sequences of the neck showing a high signal crescent in the right vertebral artery wall with a corresponding decrease in the lumen consistent with arterial dissection.

tions of choice and have been revolutionary as powerful non-invasive diagnostic imaging techniques to establish the diagnosis of cervicocephalic artery dissection. The thrombus in the arterial wall gives a high signal on axial T2-weighted images in the early stage, while the intramural dissecting haematoma appears as a crescentic or rounded high signal.

Figure 2. Magnetic resonance angiography showing the vertebral and carotid artery systems as they run in the neck, with partial occlusion of the right vertebral artery consistent with dissection.



It is uncertain whether stroke secondary to dissection is related to embolization from an accompanying thrombus or simply related to haemodynamic embarrassment from occlusion by the dissection site and associated thrombus.

Management with immediate anticoagulation is appropriate if intracranial dissection is excluded and may prevent thromboembolic phenomena rostral to the occluded site (Khurana et al, 1996). Whether aspirin alone or full anticoagulation is superior is unclear.

CONCLUSION

Asymptomatic vertebral artery injury is incurred even in minor trauma to the lower cervical spine. Malalignment of the cervical spine often leads to significant compression of the vertebral vasculature with disruption of flow. It is most likely that this patient suffered minor but significant and repetitive trauma to the cervical portion of his right vertebral artery while spending long periods with his neck flexed over a telephone receiver. This posture must have caused repetitive kinking of the vessel with mural damage and subsequent damage. It is a posture commonly adopted by the general population, and the case described confirms that this should be avoided. HM

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