

Running, Ischaemic Stroke and Carotid Artery Dissection.

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Learning point for clinicians: Internal carotid artery dissection may occur in young healthy adults following exercise. It is important to have a low degree of suspicion for such cases, particularly in younger patients without typical cerebrovascular risk factors, as delay in diagnosis and appropriate management may result in excess morbidity and mortality.

Case

A previously healthy 60-year-old right-handed male presented to the Emergency Department with sudden-onset expressive dysphasia, diplopia, right arm numbness, and loss of fine motor control with involuntary movements in his right arm following the completion of his first half marathon. The race itself had been uneventful, though the patient had taken only minimal fluid intake despite warm conditions. After completing the race he experienced mild disorientation with the presenting symptoms developing 15 minutes later.

His past medical and family histories were unremarkable. He was a former social smoker and had a moderate alcohol intake.

On admission, he was oriented to time, place and person. The pulse rate was 76 beats per minute in a regular rhythm with a blood pressure of 139/79mmHg. Neurological examination revealed a right-sided pronator drift, alexia and agraphia. He was noted to have impaired mental arithmetic and spelling. However, his tone, power, sensation, coordination and gait were unremarkable. His blood glucose, biochemical and haematological blood tests were within normal limits. The electrocardiogram showed sinus rhythm and the chest radiograph showed clear lung fields.

Computed tomography (CT) of his brain showed reduced attenuation in the superior left parietal lobe consistent with an acute infarct. Magnetic resonance imaging (MRI) of his head, including diffusion-weighted imaging, showed extensive areas of acute infarction in the left cerebral hemisphere involving

the frontal, parietal and occipital lobes. Magnetic resonance angiography (MRA) using axial fat-suppressed T1-weighted imaging demonstrated bilateral dissection of the internal carotid arteries (figure 1).

The patient was started on longterm aspirin (75mg daily) and atorvastatin (80mg daily) with advice against participating in activities associated with carotid dissection. The residual deficits two days post-presentation were mild loss of fine motor control in the right hand, cognitive impairment (Montreal Cognitive Assessment 20/30) and visuospatial impairment. He also struggled to read fluently. He was discharged home with community speech and language therapy and stroke outpatient follow-up.

Discussion

Internal carotid artery dissection (ICAD) is a rare condition. It accounts for 1-2% of all ischaemic strokes but disproportionately 10-25% of strokes in adults aged below 50 years without typical cardiovascular risk factors¹. Unilateral ICAD secondary to running presenting with Horner's syndrome has been described², though here we present a case of acute ischaemic stroke secondary to bilateral ICAD caused by exercise and exacerbated by dehydration.

The aetiology of ICAD is multi-factorial; it may occur spontaneously or secondary to trivial head and neck trauma involving hyperextension or rotation of the neck, or due to a range of sporting activities³.

ICAD represents an important differential diagnosis in individuals presenting with acute cerebral ischaemia, either as a transient ischaemic attack (TIA) or established infarct. Clinical presentation is variable, occurring immediately to days after the event. Previous reports have described presentations of unilateral neck pain and headaches which can often be mistaken for migraines. The combination of headache and neck pain may prove a harbinger of cerebrovascular events, preceding a stroke by minutes to several days in nearly 80% of patients³. It is therefore vital that such cases are assessed thoroughly with a low index of suspicion for dissection.

The gold standard imaging modality for diagnosing ICAD is axial MRA with T1-weighted fat suppression^{1,4}. Medical management of ICAD continues to be the subject of debate, though the recent CADISS trial showed antiplatelet and anticoagulation to have comparable rates of recurrent stroke and death⁵. Management of cardiovascular risk factors is also essential.

If diagnosed and managed promptly, the longterm prognosis of ICAD is good, with a rate of recurrent dissection of 2% in the first month, then 1% per year thereafter⁶.

Figure 1:

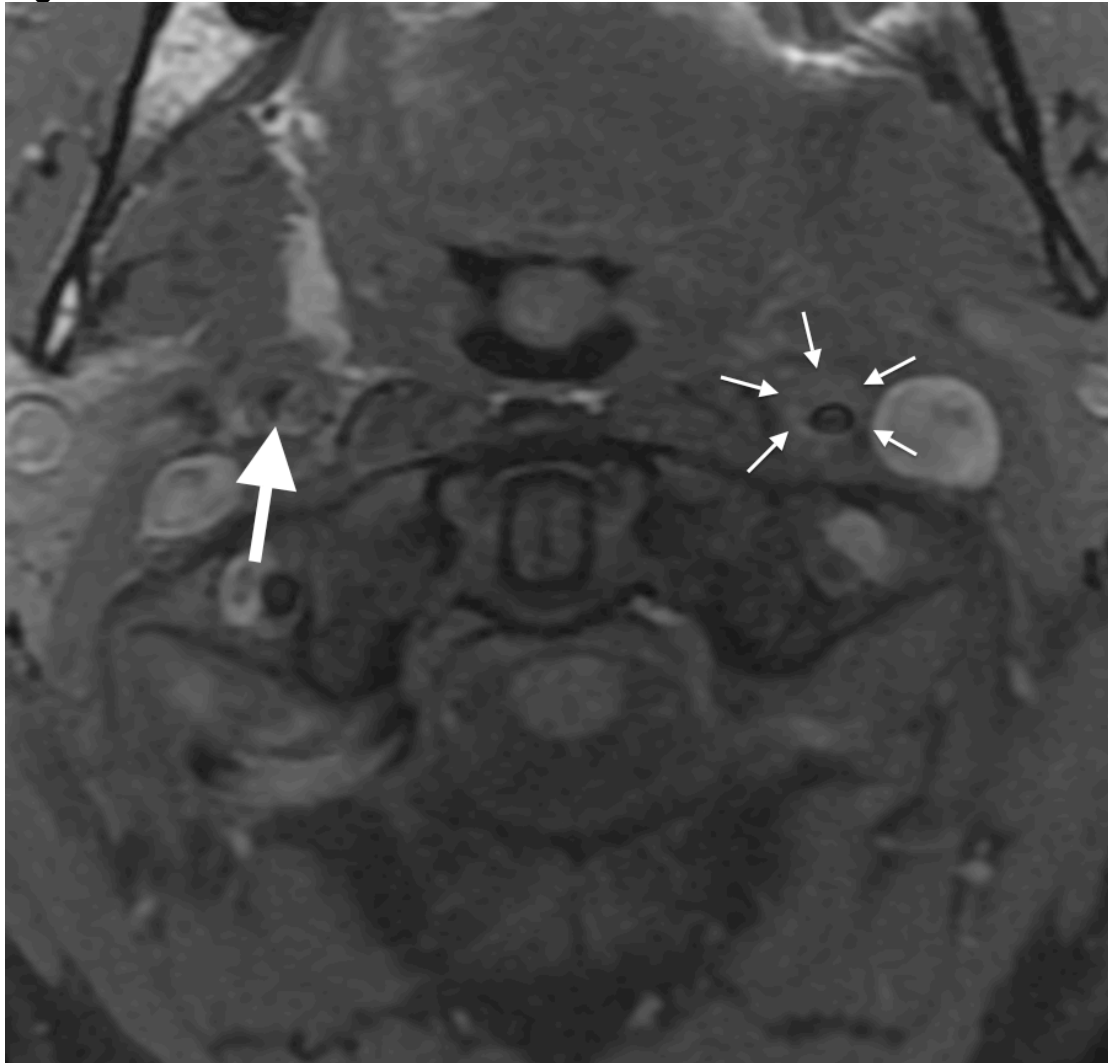


Figure 1. Axial fat-suppressed T1-weighted MR shows bilateral internal carotid artery dissections with narrowing the flow void of the right internal carotid artery (large arrows) and intramural haematoma (small arrows) surrounding the narrowed flow void of the left internal carotid artery.

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