Case Report

Spontaneous vertebral artery dissection: Posterior circulation stroke

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Abstract

Spontaneous vertebral artery dissection (VAD) is relatively rare but an important cause of posterior circulation stroke. A 46-year-old male complaining of sudden onset headache, neck pain with right-sided neuro deficit in the form of hemiparesis was evaluated by contrast magnetic resonance imaging and dual-energy computed tomography (CT) and brain neck angiography which revealed a short segment extracranial left-sided VAD, associated with acute infarct in the left occipital region. The patient was managed conservatively and followed up for 6 months. Follow-up CT angiography after a period of 6 months revealed the near complete resolution of the arterial dissection in left vertebral artery.

Key words: Computed tomography angiography, dissection, dual energy, posterior circulation

INTRODUCTION

Vertebral artery dissection (VAD) is an important cause of posterior circulation stroke in young and middle-aged patients. They are classified as "spontaneous" or "traumatic." We present a case of a middle-aged male, who came with the complaint of sudden onset headache, left-sided neck pain, and right-sided weakness which on neuroimaging revealed an extracranial left VAD.

CASE REPORT

A 46 years, nonhypertensive, non-diabetic, male presented with sudden onset headache, left-sided neck pain followed by difficulty in walking and right-sided weakness. No other significant history was found.

On clinical examination, there was grade II, power in the right upper and lower limb.

Contrast magnetic resonance imaging (MRI) angiography with diffusion weighted sequence was performed which revealed acute infarcts in left occipital lobe [Figure 1a and b] along with left VAD involving cervical segment [Figure 2]. Computed tomography (CT) brain and neck angiography with intravenous contrast was performed on Siemens Somatom definition flash 128 slice

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dual source, dual energy CT scanner which revealed linear, short segment (2.6 cm) dissection of the left vertebral artery at the level of C5-C6 vertebrae with associated aneurysmal dilatation [Figures 3 and 4]. Patient underwent digital subtraction angiography (DSA) which revealed, elevated intimal flap in the left vertebral artery with the development of false lumen showing stagnant contrast, suggestive of dissection, commonly referred as double barrel lumen [Figure 5].

Since the extracranial vertebral artery was involved, conservative management was planned and the patient was started on oral anticoagulants and heparin.

Follow-up CT angiography after 6 months showed near complete regression of the left VAD [Figure 6].

**DISCUSSION**

VAD is an uncommon disorder with estimated annual incidence of approximately 1-1.5 cases/10,000.\(^1\) However, it is an important cause of posterior circulation ischemia in young and middle-aged patients, female preponderance,\(^2\) and accounts for nearly one-fifth of such cases.

Dissection occurs, when blood under pressure finds its way into the vessel wall either leading to luminal narrowing and/or occlusion if the tear is sub-intimal, or formation of a pseudoaneurysm with potential risk of bleeding, if the dissection is sub-adventitial.

Headache and neck pain (on the side of arterial dissection) are important warning symptoms of dissection. Pain often precedes neurological features.\(^3\) Although conventional catheter angiography has been the criterion standard for the diagnosis of arterial dissection, CT scanning, and magnetic resonance angiography are increasingly been used because of the inherently noninvasive nature of these modalities.\(^4\)

Various MRI angiography techniques have been used; these include three-dimensional time of flight, phase contrast techniques, a T1 or, occasionally, with a T2-weighted, fat suppression technique. Fat suppression is important to differentiate the periarterial fat from the hyperintense intramural hematoma.
Computed tomography angiography (CTA) has practical advantages such as the rapid acquisition of information in uncooperative patients, and in whom MRI is contraindicated. Dual energy technique provides an additional edge in vertebral arteries by enabling effective bone removal as most of the extracranial vertebral artery is covered by vertebral foramina.

DSA remains the criterion standard for the diagnosis of cervicocephalic arterial dissection. The most common finding seen in approximately 65% of patients with sub-intimal arterial dissection is a relatively smooth or slightly irregular, tapered, or spiraled luminal narrowing of the dissected segment. Other angiographic findings include the double-barrel sign, which is most specific. The double-barrel sign demonstrates a patent false lumen or the accumulation of blood beneath an intimal flap.[5]

Management depends on the site of involvement. Which states anticoagulation with heparin followed by oral warfarin therapy for extradural VAD dissection and balloon/coil embolization or a surgical aneurysm clipping in cases of an intracranial involvement.[6]

**CONCLUSION**

Imaging modality such as dual energy CTA and MRI can reliably and safely demonstrate the direct and indirect features of spontaneous VAD. The routine use of dual energy CTA and MRI in stroke increases the detection of VAD, therefore, promotes early diagnosis of VAD, facilitating prompt initiation of appropriate management.

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**Conflicts of interest**

There are no conflicts of interest.

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