

Brachiocephalic artery dissection

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Section: Neuroradiology

Area of Interest: Arteries / Aorta Vascular

Procedure: Contrast agent-intravenous

Imaging Technique: CT-Angiography

Special Focus: Dissection Case Type: Clinical Cases

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Patient: 87 years, female

Clinical History:

An 87-year-old female patient presented to the Emergency Department with sudden onset dysarthria and left-sided facial droop which resolved. CT head was unremarkable. In the Transient Ischaemic Attack Clinic she revealed her right hand occasionally felt cold. BP was 117/60 in the right arm and 142/66 in the left.

Imaging Findings:

The patient did not have an MRI scan of the brain.

A Doppler scan of the her neck showed bi-phasic flow in the right vertebral artery and a damped subclavian artery waveform, which can represent early evidence of subclavian steal related to a non-occlusive more proximal narrowing. The waveform of the right common carotid artery was slightly damped compared with the left but there was no evidence of significant extracranial carotid artery disease bilaterally on duplex.

A subsequent CT angiogram showed an isolated dissection of the brachiocephalic artery at the origin (Fig. 1-3). Mixed plaque in the aortic arch and mural calcification of the internal carotid arteries was noted with no associated significant stenosis.

Discussion:

This case demonstrates a rare example of spontaneous isolated brachiocephalic artery dissection, an unusual but important differential diagnosis in patients presenting with stroke. Supra-aortic dissection is known to be a significant cause of ischaemic stroke in patients under the age of 50 but more commonly involves the internal carotid artery and can involve the vertebral or common carotid arteries [1].

To our knowledge, only 6 other cases of spontaneous isolated brachiocephalic artery dissection have previously been reported in the literature [1, 2-5], with 2 of these patients having underlying Ehlers-Danlos syndrome. A further 2 cases of spontaneous brachiocephalic artery dissection have been reported, but these also had common carotid extension [6, 7]. Isolated brachiocephalic artery dissection following penetrating or blunt trauma has also been reported [2, 8-13].

Little is known about the specific aetiology of spontaneous isolated brachiocephalic artery dissection. In the natural history of cervical artery dissection, if atherosclerosis is excluded, it has been reported that 58.2% are spontaneous, 41.8% are associated with trauma and 7.3% have underlying fibromuscular dysplasia, the latter being seen more in females than males [14]. In our case there was no history of trauma, atherosclerosis, hypertension or known connective tissue disorder.

Our patient had transient dysarthria associated with facial droop and her right hand felt cold intermittently. It is likely that the ischaemic symptoms were the result of emboli arising from the dissection site and the upper limb symptoms related to narrowing of the brachiocephalic artery causing haemodynamic insufficiency.

Importantly, our patient's non-contrast CT head was unremarkable, demonstrating the need for further clinical

assessment to exclude other causes of her presentation. This led to additional imaging to confirm the diagnosis, highlighting the role of Doppler sonography and CT angiography as important non-invasive tools for vascular evaluation when managing patients with symptoms of acute cerebral ischaemia.

Treatment is broadly categorised into anticoagulation and antiplatelet therapy versus surgical or endovascular repair and may include blood pressure control, depending on the individual case. In our case, the patient was treated with antiplatelets and at the time of writing had no further symptoms or follow-up imaging.

Differential Diagnosis List: Isolated spontaneous brachiocephalic artery dissection, Atherosclerosis, None

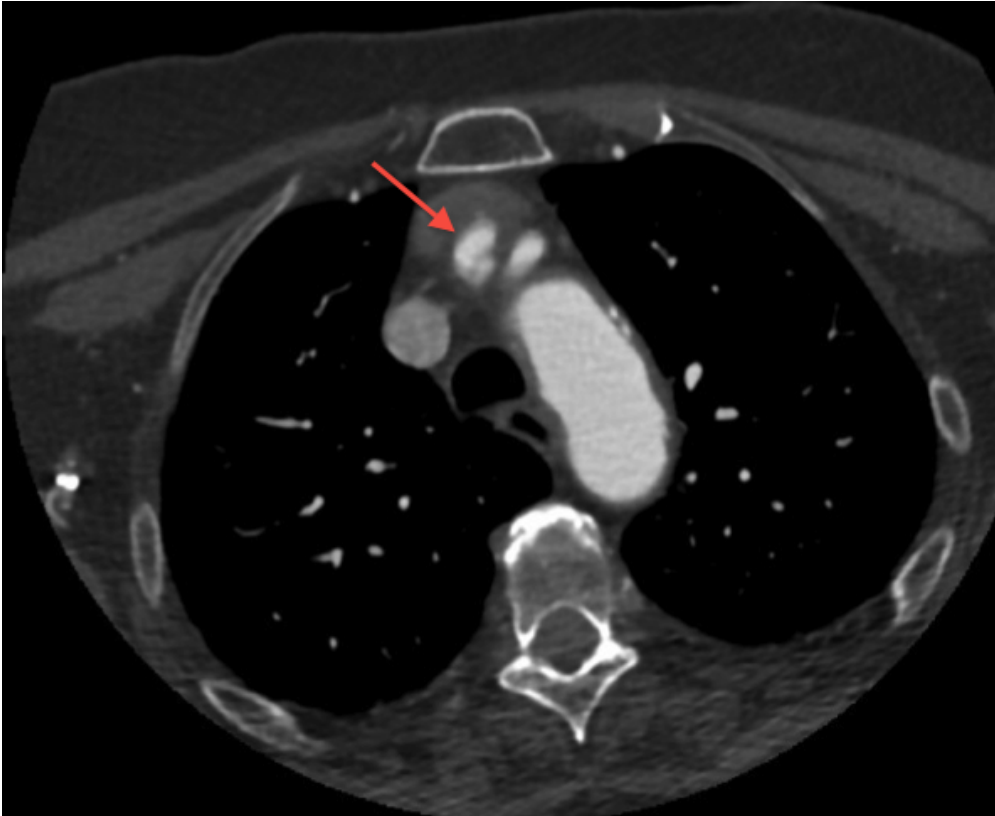
Final Diagnosis: Isolated spontaneous brachiocephalic artery dissection

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Figure 1

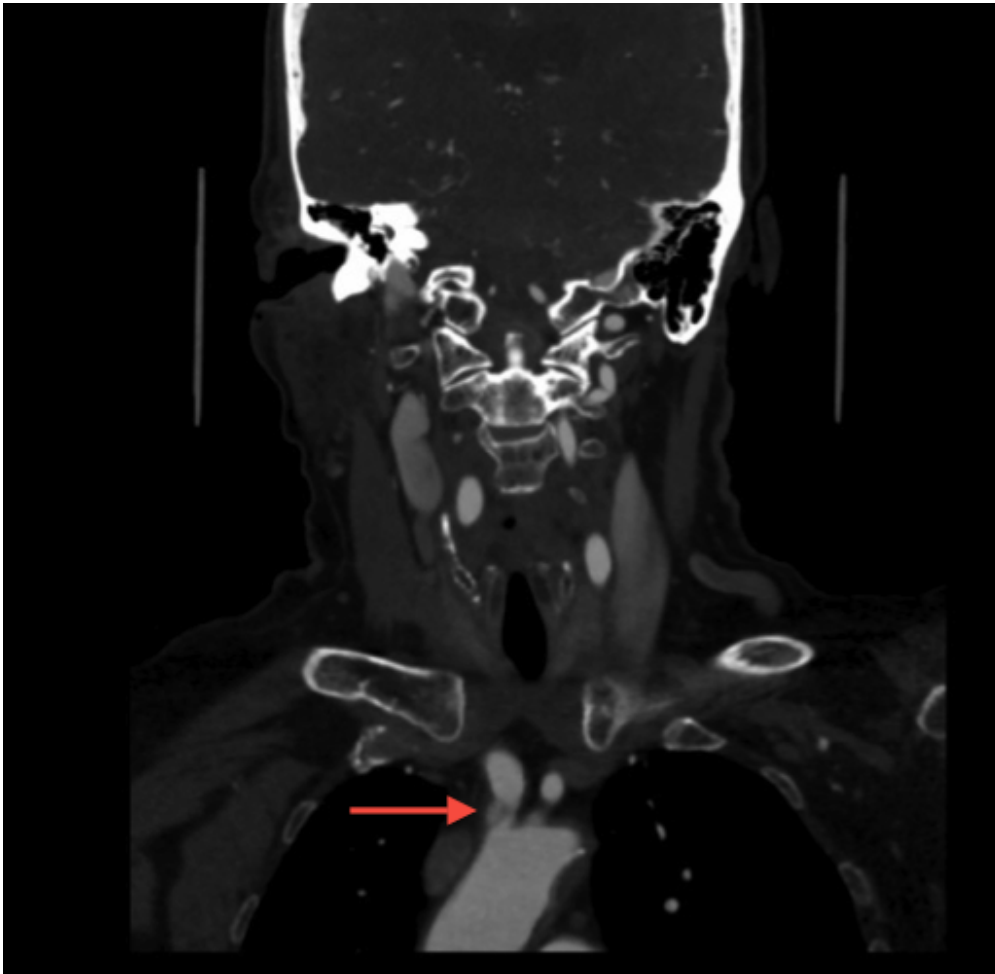
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Description: Axial CT angiogram demonstrating isolated brachiocephalic artery dissection with double lumen and dissection flap (arrow). **Origin:** Gan C, Department of Radiology, University Hospital of Wales, Cardiff

Figure 2

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Description: Coronal view of CT angiogram shows isolated brachiocephalic artery dissection (arrow).

Origin: Gan C, Department of Radiology, University Hospital of Wales, Cardiff

Figure 3

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Description: Sagittal view of CT angiogram with isolated brachiocephalic artery dissection (arrow).

Origin: Gan C, Department of Radiology, University Hospital of Wales, Cardiff