

Recurrent Stroke in Young: Rule Out a Cervical Rib!

To the Editor,

Cervical rib is an extra rib arising from the seventh cervical vertebra, present in less than 1% of the population.^[1] It is more common in females (M:F = 1:2) and only 10-20% patients develop symptoms.^[1] Entrapment of the subclavian vessels or lower trunk of brachial plexus by the cervical rib in the interscalene triangle causes thoracic outlet syndrome (TOS)^[2] that is categorised into arterial (subclavian artery, <1%), venous (subclavian vein, 4-6%), and neurogenic types (94-96%). We report on a young lady with recurrent strokes (anterior and posterior circulation) due to a right cervical rib.

A 21-year-old lady, with no previous comorbidities, developed sudden onset imbalance in May 2018 and was diagnosed to have bilateral cerebellar and right pontine ischemic stroke. Vascular imaging revealed distal basilar occlusion. She was started on dual antiplatelets (aspirin and clopidogrel) and made full recovery over the next two months. While on treatment, she presented with a right middle cerebral artery (MCA) territory

stroke in January 2020. She was treated with intravenous thrombolysis and mechanical thrombectomy at an outside hospital. Haematological and cardiac evaluations were normal. Her power improved to modified research council (MRC) grade 4/5, and she was discharged on dual antiplatelets.

Three months later, she presented to us with complaints of severe right hemicranial headache of 15 days duration, accompanied with vomiting but without any new or worsening neurological deficits. Examination revealed absent right radial pulse and 16 mm Hg difference in the systolic blood pressures between arms. She had residual left hemiparesis and left homonymous hemianopia. Magnetic resonance imaging (MRI) of brain revealed acute right MCA territory infarct with chronic right MCA and posterior circulation infarcts [Figure 1a-h]. CT angiography (CTA) head, neck, and upper limbs revealed nonvisualisation of right internal carotid and distal basilar artery with a right cervical rib with stenosis and post stenotic dilatation of right subclavian artery [Figure 2a & b]. Echocardiography, 24-hour Holter, pro-

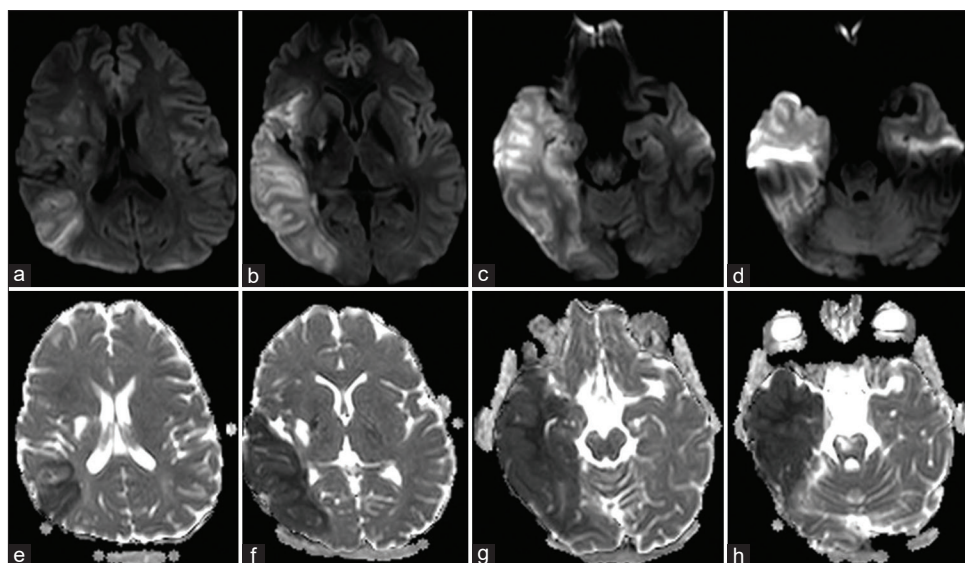


Figure 1: (a-h) MRI brain revealing acute infarct in right MCA territory involving right temporal lobe, insula, and basal ganglia



Figure 2: (a) CT angiography head and neck revealing non-visualisation of right ICA and distal basilar artery. (b) CT angiography of upper limbs, VRT image, with arms in abducted position, showing kinking and narrowing of distal subclavian artery (yellow arrow) at the level of right cervical rib (red arrow) with non-enhancement of distal vessels

coagulant “work up” (protein C, protein S, anti-thrombin III, factor V Leiden, MTHFR and prothrombin 20210 mutations, PNH by card), and vasculitis profile were normal. Nerve conduction studies revealed no evidence of neurogenic TOS.

The patient was diagnosed to have vascular complications from the cervical rib and treated with anticoagulation, with plan to undergo resection of the rib.

Approximately 15-20% of strokes occur in young, with cardioembolism and extracranial vessel dissection being the common causes.^[3] Cervical rib is an often ignored and underdiagnosed, yet a treatable cause of ischemic stroke.

TOS resulting from cervical rib usually presents with neurogenic symptoms and presentation with stroke is rare.^[4] Short and incomplete ribs likely cause neurogenic compression, while long

or complete ones present with arterial manifestations.^[5] Upper extremity thromboembolism is the most common presenting feature in arterial TOS.^[5] Our patient was asymptomatic for the same, though right radial pulsations were absent.

Cervical rib associated stroke occurs as a result of retrograde or anterograde artery-to-artery thromboembolism.^[4-6] Chronic trauma to the subclavian artery wall leads to stenosis at the compression site with post-stenotic dilatation and aneurysmal changes. These changes promote turbulent flow within the dilatation/aneurysm predisposing to thrombus formation. This can embolise both distally and proximally. The cervical rib may completely occlude the artery during overhead abduction of the arm, leading to retrograde flow from the subclavian into the common carotid and vertebral arteries resulting in retrograde thromboembolism. This is more common on the right side due to common origin from the brachiocephalic trunk.^[5] In literature, anterior circulation strokes are more common due to the larger calibre (therefore lesser resistance) of the common carotid artery; simultaneous involvement of both anterior and posterior circulations, as in our patient is exceedingly rare.

Cervical rib should be considered as a cause of stroke in young, especially amongst individuals with negative cardiac and vascular etiological work up. Early diagnosis and management can prevent recurrent strokes and their complications.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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