Vertebro-basilar Dolichoectasia with Fusiform Aneurysm : Evaluation by CT Angiography

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Introduction

Vertebro-basilar dolichoectasia is a rare cause of cerebello-pontine angle mass lesions [1]. These lesions are due to atherosclerotic and degenerative changes affecting the media of the arteries leading to fusiform enlargement. Usually seen in patients more than 50 years of age, it may cause brain stem infarction, compression or cranial nerve palsies. CT angiography is a non-invasive and accurate modality of imaging these vascular lesions. We report a case of vertebro-basilar dolichoectasia with fusiform aneurysm and intraluminal thrombus, diagnosed using 3-D CT angiography.

Case Report

A 75 year old patient reported with complaints of giddiness and unstable gait of three months duration. General physical examination revealed a normotensive elderly male, with stable vital parameters. Neurological examination revealed evidence of nystagmus in the left eye with limb and truncal ataxia also on the left side. There were no motor or sensory deficits and all cranial nerves were normal. A clinical diagnosis of vertebro basilar insufficiency was made and the patient was investigated. Biochemical and metabolic parameters were normal. A CT scan of the brain was done which revealed the following : Non-contrast CT showed an elongated, tubular, tortuous iso to hyperdense extra axial mass lesion in the left cerebello-pontine angle causing compression of the left cerebellar hemisphere, rotation of the brainstem to the right and minimal compression of the fourth ventricle (Fig 1). Bone windows revealed normal appearance of the internal auditory canals. These findings were consistent with a left cerebello-pontine angle mass lesion. Contrast enhanced CT revealed intense enhancement of the peripheral part of the lesion while the central area showed no enhancement, consistent with left vertebro-basilar dolichoectasia with intraluminal thrombus (Fig-2).

A 3-D CT angiography was performed on a Philips Tomoscan AV Spiral CT scanner with a 1-second gantry rotation period. A table speed of 3mm/second with 2mm collimation was used. A total of 100 ml of non-ionic contrast media was injected at a rate of 4 ml/second using a power injector. 3-D reconstruction of images using MIP and SSD protocols was done. CT angiography revealed tortuous, elongated left vertebral and basilar arteries with the basilar artery displaced across the midline to the right (Fig 3). Based on the CT findings a final diagnosis of vertebro-basilar dolichoectasia with fusiform aneuyrsm and intraluminal thrombus was made.

Discussion

Vertebro-basilar dolichoectasia accounts for about 3-5% of all cerebello-pontine angle mass lesions [1]. These lesions are exaggerated arterial ectasias due to severe atherosclerosis. Damage to media leads focal areas of fusiform or even saccular enlargement of these ectatic vessels with intraluminal clots [2,3].

Vertebrobasilar ischaemic disease encompasses a vast spectrum of clinical manifestations from subclinical to lethal brainstem infarctions, depending on which particular branch or branches of the vertebro-

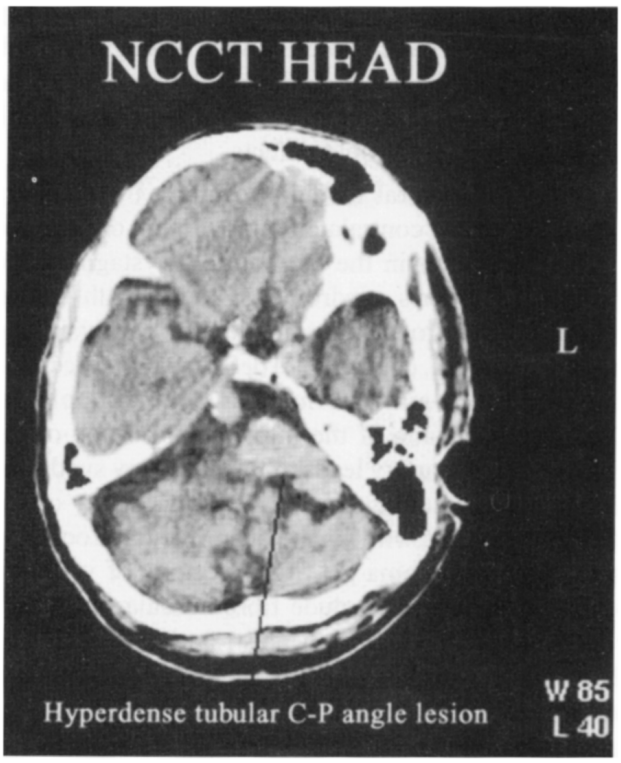

Fig. 1 :NCCT showing hyperdense tubular extra-axial lesion in the left cerebello-pontine angle.

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Fig. 2 : CECT showing peripheral enhancement of the tubular lesion while the central part shows no enhancement

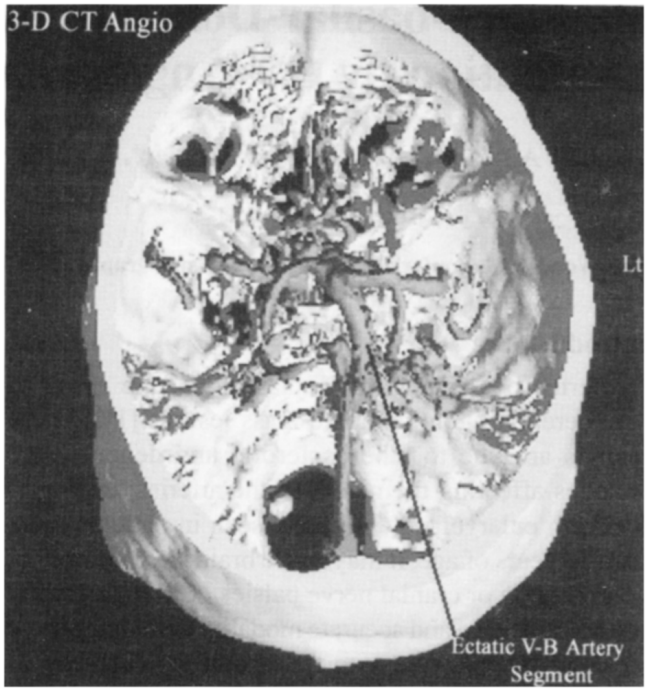

Fig. 3 : 3-D CT angiography showing dolichoectatic left vertebral and basilar artery with fusiform aneurysm.

basilar circulation have been compromised, extent of collateral circulation and the degree of occlusion [3]. Patients with ischaemia present with nystagmus, limb and truncal ataxia and contralateral deficit in pain and temperature perception, ipsilateral limb and trunk numbness and visual field defects.

Those with lateral medullary infarct (Wallenberg Syndrome), have contralateral impairment of pain and thermal sensation in the extremities, nystagmus and ipsilateral Horner's syndrome. Patients with medial medullary syndrome have ipsilateral paralysis and atrophy of tongue, contralateral deficit in proprioception and fine touch and internuclear ophthalmoplegia. Complete occlusion of the intracranial portion of the vertebro-basilar artery leads to Basilar artery syndrome which is a devastating disease with a mortality of 75-85% and presents with awake quadriplegia (Locked in state), stupor or coma [3]. Other causes of vertebro-basilar insufficiency include fibromuscular dysplasia, vertebral artery dissection and rotational occlusion (Bow hunters stroke) which is a mechanical occlusion of the vertebral artery at the C1-C2 level caused by lateral flexion [1].

Imaging studies are the primary tools to establish a diagnosis of the cause of vertebro-basilar insufficiency. They also help exclude differential diagnoses that would preclude such therapies as anticoagulants [4]. CT is usually the first imaging study done. It has a sensitivity of more than 95% in identifying intra or extra-axial haemorrhage, within the first 24 hours of onset. It will also reveal cerebello-pontine angle mass lesions. Hyperdense basilar artery indicates probable occlusion while dilated vertebral and / or basilar artery indicates a dolichoectatic vessel. Contrast enhanced CT will reveal strong enhancement of the patent part of the dolichoectatic artery while the thrombosed part will show no appreciable enhancement. Aneurysmal segments are also well demarcated. Spiral CT angiography with 3-D reconstruction will demonstrate the exact anatomy and site of the dolichoecatatic segment and aneurysm along with its relationship to the surrounding brain and skull. It will also reveal presence of any intra-luminal thrombus [1]. CT does have a low sensitivity for early ischaemia and usually has the disadvantage of significant artifacts caused by the bony structures surrounding the brainstem and cerebellum.

Magnetic resonance imaging (MRI) is a far superior modality than CT for brainstem and posterior fossa imaging. MRI is more sensitive to small ischemic areas in the cerebellum and brain stem that characterize branch occlusion of the vertebrobasilar circulation [4]. MR angiography detects occlusions and stenosis of the vertebrobasilar circulation with high level of accuracy but lacks in quantifying the degree of stenosis [5]. MR angiography can identify vertebral/basilar occlusion with sensitivity as high as 97% and specificity of 98%. The limitation of MR angiography is that it

overestimates the degree of stenosis. This occurs because the image of the vessel in MR angiography is a flow-related phenomenon, therefore severe stenosis with flow compromise results in poor visualization of the vessel [6]. In conclusion, it is emphasized that although MRI is an ideal modality for imaging the posterior fossa, vascular lesions can be accurately imaged using spiral CT angiography with 3-D reconstruction and the results are comparable [7].

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