Neuroimaging Highlight

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Infarction of the Right Medullary Pyramid

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A 67-year-old man awoke in the morning with left-sided weakness, which lasted only ten minutes. The next day, however, while getting out of the bathtub, he noted left-sided weakness of sudden onset, which persisted. On admission, he was found to have left arm and leg weakness, which was most marked distally. Strength in left foot dorsiflexion was graded at 4-, while strength in the intrinsic left hand muscles and left wrist extensors was graded at 4+. Strength was within normal limits more proximally.

Facial movements were entirely normal, as was sensory examination over the face and body. Reflexes were symmetrical, but the left plantar response was upgoing.

The patient was alert, had no speech problems, and no headache.

Nonenhanced brain CT scan on admission was normal and further investigation showed only a mildly enlarged left atrium, with mild mitral regurgitation on transthoracic echocardiography, and normal sinus rhythm on Holter monitoring. Magnetic resonance imaging scan done three days after admission showed signal hyperintensity involving the right medullary pyramid on diffusion-weighted and FLAIR sequences, with a corresponding decrease in signal intensity on the aparent diffusion co-efficient map indicating restricted diffusion and acute ischemia. (Figure 1A-C). Magnetic resonance angiography showed occlusion of

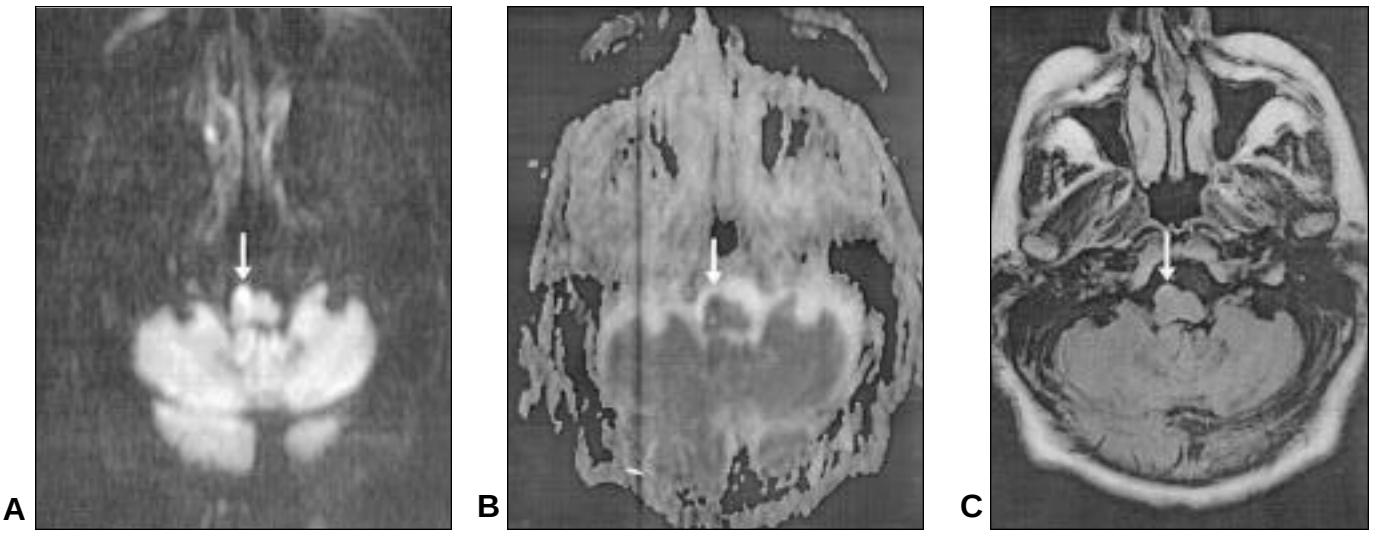

Figure 1: *Figure 1A shows the patient's axial diffusion image (b=1000). An area of signal hyperintensity (arrow) involves the right medullary pyramid. Figure 1B shows the corresponding ADC map with a decrease in signal intensity in the right medullary pyramid (arrow), indicating restricted diffusion and acute ischemia. Figure 1C as an axial FLAIR image which shows swelling and hyperintensity of the right medullary pyramid.*

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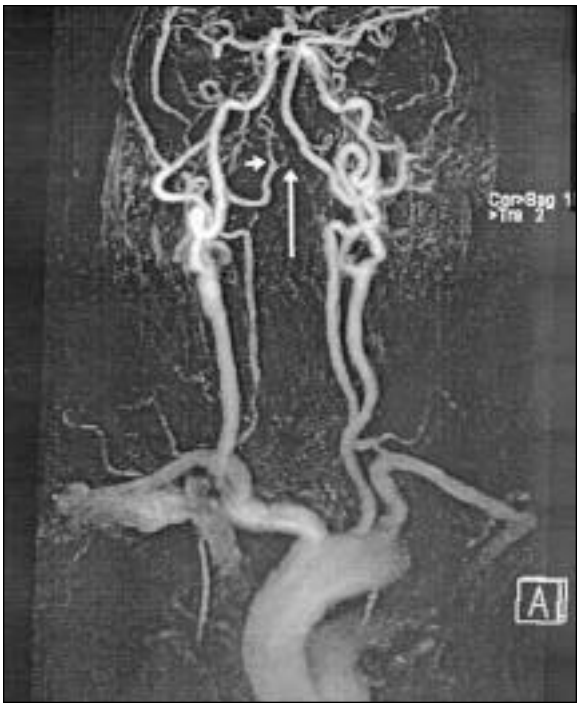

Figure 2: *Coronal enhanced magnetic resonance angiography shows proximal irregularity of the right vertebral artery in keeping with atherosclerosis. More distally, the posterior inferior cerebellar artery is patent (short arrow), but the vertebral artery is occluded distal to its origin (long arrow).*

the right vertebral artery distal to the posterior inferior cerebellar artery (Figure 2) branch. There was some irregularity of the artery more proximally, thought most likely to be due to atherosclerosis.

On presentation, our patient showed clinical features consistent with infarction of the right medullary pyramid. Although obvious left arm and leg weakness was present there was no facial weakness, consistent with a lesion at a level where corticobulbar fibres are no longer present with the corticospinal fibres. In addition, there were no sensory signs or symptoms, consistent with a lesion in a purely motor structure. To emphasise this latter point, Chokroverty et al[1] used the term "pure motor hemiplegia" to describe their patient with pyramidal infarction.

Although he appeared to have a relatively large infarct in the right medullary pyramid, his hemiparesis was relatively mild, consistent with previous reports involving lesions limited to the corticospinal tract in man[2] and in monkeys.[3,4] The distal emphasis of the weakness found in our patient has been noted previously in patients with infarction of the medullary pyramid.[5,6] Medullary pyramid lesions in monkeys have also been found to interfere primarily with distal limb movements, in particular the hand.[3]

The blood supply of the medullary pyramid is derived from small arterial branches of the ipsilateral vertebral artery.[5] Our patient's vertebral artery occlusion documented on magnetic resonance angiography likely occluded the ostium of one of these arterial branches. For a review of magnetic resonance imaging in medullary infarction, see Fox et al.[7]

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