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The Case | Acute paraplegia with anuric ARF

K Sampathkumar[1], YS Sooraj[1], RP Ajeshkumar[1], AR Mahaldar[1] and R Muthiah[1]

[1]*Department of Nephrology, Meenakshi Mission Hospital and Research Centre, Madurai, Tamil Nadu, India*
Correspondence: *K Sampathkumar, Department of Nephrology, Meenakshi Mission Hospital and Research Centre, Lake Area, Melur Road, Madurai, Tamil Nadu 625107, India. E-mail: drksampath@gmail.com*

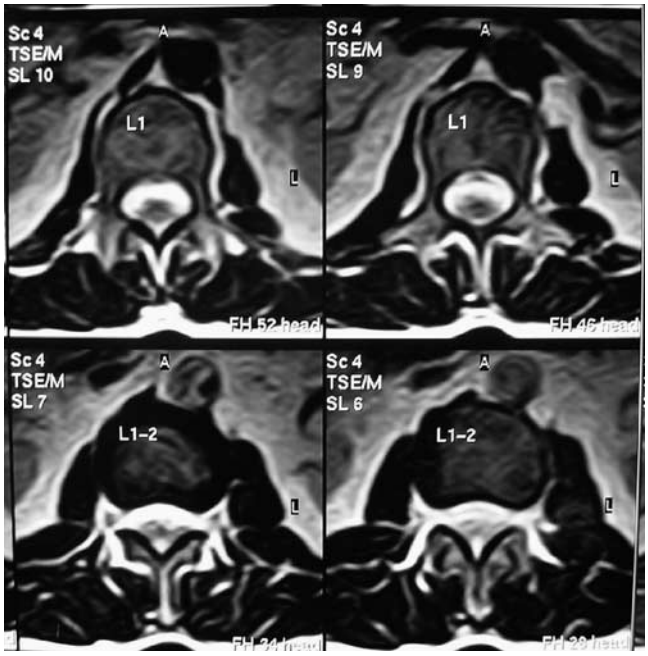

Figure 1 | MRI spine of the patient at the time of presentation.

A 58-year-old man, a chronic smoker, was referred to our department as a case of acute renal failure (ARF) with paraplegia. He had developed sudden onset of severe backache with weakness and paresthesia of both legs 2 days before admission. There was no history of fever, cough, or skin rash. He initially presented to a neurosurgeon, who found him to have flaccid areflexic paraplegia, and absent lower limb sensations. His blood pressure at that time was 140/100 mm Hg. He ordered a magnetic resonance imaging (MRI), which showed abnormal signal intensities in the L1 vertebral body but with a normal spinal cord. He was diagnosed as a case of transverse myelitis and 1 g intravenous methyl prednisolone was started. On the following day, he was noted to be anuric. Laboratory investigations revealed raised renal parameters (blood urea = 89 mg/dl, serum creatinine = 4 mg/dl, and potassium = 7.3 mEq/l). He was referred to the nephrology service. Physical examination in the emergency room revealed a conscious, oriented, and afebrile patient. His pulse rate was 90/min and blood pressure was 150/90 mm Hg in the right upper limb. Bilateral lower limb peripheral arterial pulses were absent. He had grade zero power, absent deep tendon reflexes, and absent sensations in both his lower limbs. Plantar reflexes were not elicitable. Other system examinations were non-contributory. His MRI images are shown in Figure 1.

What is the cause of his acute paraplegia with ARF?

SEE NEXT PAGE FOR ANSWERS

The Diagnosis | Occlusive aortic thrombus with ischemia of spinal cord and kidneys

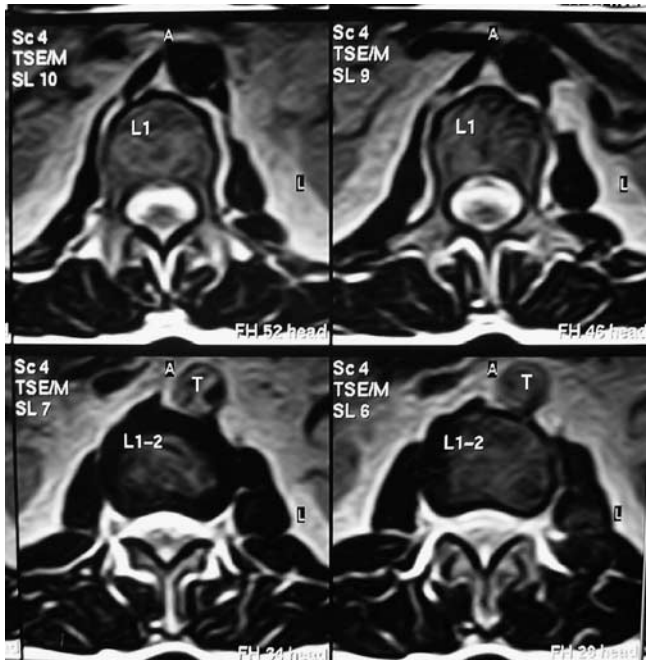

Figure 2 | MRI spine of the patient showing presence of a thrombus (T) in the aorta (A) at the L1–L2 level.
Note that the aorta (A) is patent at L1.

Aortic thrombus at the level of L1–L2 (Figure 2) with consequent ischemia of the spinal cord due to occlusion of the radicular arterial supply and ARF due to bilateral renal arterial occlusion.

The patient underwent emergency hemodialysis, but he died within 6 h of admission before surgical intervention could be attempted.

DISCUSSION

Whenever a combination of acute paraplegia and ARF occurs, a vascular etiology should be strongly considered. Anatomically, the upper levels of spinal cord have a richer blood supply than lower levels. The anterior and posterior spinal arteries arise from the vertebral arteries and run longitudinally down from the medulla of the brain stem to the spinal cord. The lower levels of the cord are dependent on segmental arteries, which branch from intercostal and lumbar arteries of aorta. The large segmental artery of Adamkiewicz arises between T8 and L2 level.[1] Hence, occlusion of the abdominal aorta at this level gives rise to a combination of paraplegia and ARF as the renal arteries also arise at the level of L1–L2.

The uncommon combination of paraplegia and ARF can occur due to aortic occlusion caused by dissecting aneurysm or atheroembolism.[2] Clinical presentations of aortic occlusion have included limb ischemia, acute abdomen, spinal cord compression-like symptoms, sudden onset of hypertension, and ARF.[3] Atheroembolic occlusion of aorta can develop due to *in situ* thrombus or from a cardiac source.[3] The former is more likely in this patient. Acute paraplegia with ARF has also been described in pelvic hematoma,[4] rhabdomyolysis, and heroin overdose.[5]

Clinical examination should include palpation of peripheral pulses and blood pressure measurements in all four limbs. The heart should be examined for arrhythmias and murmurs. The investigative strategy in such a clinical scenario should start with Doppler study of the abdominal aorta as a noninvasive tool to diagnose aortic thrombus, aneurysm, or dissection. Further workup should include gadolinium enhanced magnetic resonance angiography of the aorta.

Aortic occlusion is a difficult diagnosis to make and is frequently missed. In their study, Meagher *et al.*[6] have described eight patients with acute aortic occlusion, the majority of whom were diagnosed late. All patients had varying degrees of paralysis on presentation, which misled a variety of clinicians although other findings of acute ischemia were always present. Even after diagnosis had been established, the need for urgent revascularization was not always recognized, the mean time from diagnosis to revascularization

being 13 h.[6] Aortic occlusion carries a high mortality even after prompt intervention. The mortality ranges from 52 to 62.5%.[3,6]

In our case, the combination of absent lower extremity pulses and a review of the MRI study led to the diagnosis of aortic occlusion. This case underscores the importance of a careful vascular exam in patients presenting with ARF and paraplegia.

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