Learning from errors

Spinal stroke in older people secondary to dural arteriovenous fistula

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Summary

A 61-year-old diabetic male developed weakness of both lower limbs while walking, 1 month go. When he was examined in hospital a hour later, it was found that he had total absence of movements in both legs, sensory loss of all modalities till umbilicus and had urinary retention. MRI spine demonstrated an intramedullary longitudinal T2 hyperintensity extending from upper thoracic cord till conus medullaris. A provisional diagnosis of transverse myelitis was made and started on corticosteroids. Partial improvement was noted over a 3 week period, after which he developed urinary infection, hyponatremia and sudden worsening of weakness. Repeat MRI spine with contrast raised the possibility of dural arteriovenous malformation leading to extensive spinal cord infarction, which was confirmed by MR angiogram.

BACKGROUND

Dural arteriovenous malformations (AVM) are not often considered in the differentials of acute spinal stroke in

older people. An MRI showing extensive oedema of the spinal cord involving the thoracic and lumbar segments would point more towards inflammatory aetiology than

Figure 1 MRI spine T2 weighted image showing extensive spinal infarction.

Figure 2 Reconstructed image of MR angiogram with single prominent vein and multiple engorged venous communications in the coronal venous plexus.

acute ischemia. Acute spinal venous infarction following a long standing dural AVM can manifest as extensive infarction of the spinal cord, though it is fortunately rare.

CASE PRESENTATION

A 61-year-old male with type 2 diabetes mellitus for 15 years and no other co-morbidity developed weakness of both legs while walking. He collapsed and was unable to weight bear after that. On arrival at the local emergency department a hour later, it was found that he had weakness of both legs, with grade 0/5 power in both legs. Deep and superficial reflexes were absent over the abdomen and both legs. He had loss of pinprick, temperature and vibration sensation till T8 dermatome and was noted to be in acute urinary retention.

INVESTIGATIONS

MRI whole spine without contrast done at the time of presentation revealed intramedullary longitudinal T2 hyperintense lesion extensively involving the spinal cord from upper thoracic level to conus medullaris. Vertebral haemangiomas were noted in mid thoracic and lumbar vertebral bodies.

Blood sugars, electrolytes and lipids were normal. No features of systemic illness were noted. Chest x-ray and ultrasound of the abdomen showed no obvious solid tumours or infective pathology. Serum electrophoresis showed no monoclonal spike.

Cerebrospinal fluid (CSF) study showed mildly raised protein 114 mg/dl, normal glucose and no cells. CSF was negative for viral antigen screening, tuberculosis PCR, oligoclonal proteins and bacterial culture.

DIFFERENTIAL DIAGNOSIS

The differential diagnosis considered included transverse myelitis, paraneoplastic process or infiltrating neoplasms. However, CSF analysis showed only mildly elevated protein, with no cellular reaction and normal glucose.

TREATMENT

Patient was given injection dexamethasone in tapering doses for 3 weeks. On the fourth week, he was referred to us with fever, rigors and confusion. He had urinary infection and hyponatremia due to syndrome of inappropriate antidiuretic hormone hypersecretion (SIADH). After initiating antibiotics and sodium correction, repeat MRI of spine with contrast was done. A screening MRI brain was done in view of SIADH, but was essentially normal. The repeat MRI spine showed diffuse spinal cord T2 hyperintensity extending from lower cervical cord to conus medullaris. This lesion did not enhance with contrast. Irregular contrast enhancement was found in the meninges around D2, D3 area (figure 1). MR angiogram was performed which showed dural AVM at D2, D3 level with dilatation of the spinal venous plexus and an enlarged arterialised vein extending longitudinally throughout thoracic and lumbar spinal segments (figure 2).

OUTCOME AND FOLLOW-UP

The above findings were conclusive of a spinal stroke. The patient remained paraplegic with grade 0/5 power and areflexia of both lower limbs. The risks of surgical or vascular intervention and the chances of minimal neurological recovery were discussed in detail with the patient. A delay of 1 month had already occurred after the onset of stroke and the chances of meaningful neurological recovery deemed to be minimal. Since the patient had presented 1 month after the onset of stroke, at which time the benefits of occluding the AV fistula by endovascular treatment is not fully established. On communicating the options to patient, he himself chose not to undergo any interventions and his choice was to try traditional medical options. The decision to go for conservative treatment was based on patient choice and he was transferred to a continuing care facility.

DISCUSSION

AVM of the spine are found in three locations. These are dural AV fistulas, extramedullary intradural AVMs and AVMs intrinsic to spinal cord.

Among these, dural AV fistulas manifest between the ages of 40 to 60 years. In case of dural AV fistula, there is direct communication between the spinal artery and coronal venous plexus, leading to high venous pressures and dilatation of venous plexus. High venous pressures can

impair venous drainage of spinal cord and can manifest as gradually progressive myelopathy. Intraspinal AVMs are known to present as acute intraspinal bleed, manifesting as multiple spinal strokes, often at an earlier age.^{1 2}

This patient presented as acute weakness, which is unusual in dural AVMs unless there is thrombotic occlusion of the feeding artery or the draining veins. This may be a probable explanation for the acute presentation in this unusual case. In a study by Atkinson *et al*,³ six out of 49 patients with dural AV fistula presented as paraplegia.

Learning points

- ▶ Venous infarction of spinal cord can manifest as acute spinal stroke
- ▶ Diffuse infarction extending from lower cervical to lumbar spinal segment can occur in case of dural AV fistulas.
- ▶ MR angiogram is a useful tool for screening AVM in suspected spinal strokes.

Competing interests None.

Patient consent Obtained.

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