Case report

Head injury: A rare cause of paraplegia

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1. Introduction

Motor deficits are common following severe traumatic brain injury, occurring in up to 78.4% of patients.6 The presence of a bilateral lower limb paresis is usually suggestive of a lower cord lesion and cerebral causes are rare. However, the proximity of the two lower limb motor regions in the brain provides the potential for bilateral symptoms. We report the first case of traumatic non-spinal non-haemorrhagic paraplegia. Four head CT scans and a whole spine MRI scan over a period of 10 days displayed no identifiable cause for the paraplegia. A cranial MRI eventually revealed bilateral para-central lobule contusions to be the cause. A literature review was conducted to identify potential non-spinal causes of traumatic paraparesis.

2. Case report

A 24-year-old male was brought in to the emergency department of a regional hospital. He had sustained multiple injuries following a fall through a roof from a height of approximately 6 m. He was localising to pain with a Glasgow Coma Score (GCS) of 9 and was noted to have multiple head lacerations. A CT of the head and whole spine revealed a thin right convexity acute subdural haematoma with associated subarachnoid haemorrhage and multiple skull fractures involving the parietal, occipital and left frontal bones. There were also stable fractures the C7, T1, T5 and T6 vertebrae with no malalignment.

The following day the patient’s GCS was 14. Grade 1/5 power was noted bilaterally in his lower limbs with mild impairment in sensation over the right shin, increased tone in right calf and ankle clonus bilaterally. A repeat CT showed an increase in the depth of the subdural haematoma from 4 mm to 12 mm and a 4 mm midline shift to the left.

An MRI of the whole spine revealed no cause for the leg weakness. A further head CT (on day 5) revealed a small left parasagittal contusion (Fig. 1).

Ten days after the fall, an MRI of the head demonstrated extensive contusions in the right frontal lobe and both paracentral lobules (Figs. 2 and 3) with further contusions in the splenium of the corpus callosum.

The patient was managed conservatively in hospital with physiotherapy until his discharge two weeks post-admission, by which time he was mobile and had regained almost full power in both lower limbs.

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Fig. 1. Axial CT. A linear left frontal and depressed right parietal fracture is present. There is a right-sided subgaleal haematoma, right extra-axial blood and a small left parasagittal contusion (arrow).
3. Discussion

Although non-spinal causes of paraplegia are rare they remain an important part of the differential diagnosis. Failure to consider them results in a potential mismanagement. In this case the patient was subjected to extended C-spine immobilisation resulting in the development of sores around the neck. We reviewed the literature on traumatic, non-spinal causes of paraplegia.

Interhemispheric subdural haematoma (ISDH) has been occasionally reported in adult patients. A review in 1995 found a total of just 67 cases had been reported with approximately 91% associated with head trauma. Very rarely ISDH can occur bilaterally with the potential to cause bilateral paraparesis.

Cerebral contusions, however, are more elusive on CT scans, often undetectable until they have ‘matured’. In 2006 Lagares et al. showed MRI was significantly more sensitive than CT at identifying lesions in the cerebral white matter, corpus callosum and brainstem. The power of MRI in detecting soft tissue damage was clearly demonstrated by this case. Fig. 1 shows a very small left frontal contusion whilst Figs. 2 and 3 clearly indicate significant soft tissue damage.

Spastic hemiplegia or paraplegia has been associated with ‘gliding contusions’. These are haemorrhagic lesions in the parasagittal white matter thought to be the result of the sheering forces of rapid acceleration or deceleration of the head.

In a retrospective imaging study of 19 patients with diffuse axonal injury Masuzawa found hemiplegia or quadriplegia was present in 15 patients. Retrospective imaging analysis in the 15 patients showed small haemorrhagic spots in the parasagittal white matter in the acute phase CT or chronic phase MRI. Only three patients had bilateral signs all of whom were fully quadriplegic. The paper suggested that contusions alone were not associated with the loss of motor function.

To our knowledge this is the first reported case of paraplegia caused by bilateral cerebral contusions. Our case highlights the importance of non-spinal causes of paraplegia and the benefits of MRI scans over CT scans in identifying more subtle soft tissue lesions of the parasagittal white matter.

References