"Cruciate Paralysis at the Crossroads: A Curious Case of Selective Weakness and Sensory Reversal"

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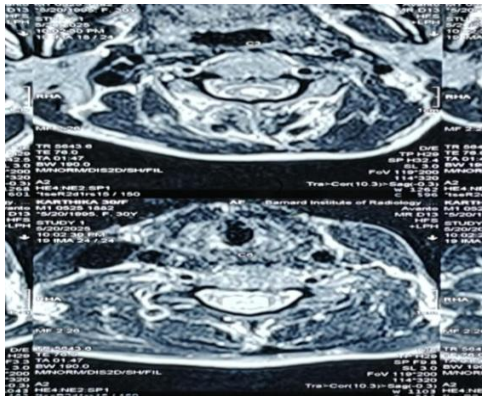
- INTRODUCTION & AIMS :
- Cruciate paralysis is a rare neurological condition resulting from lesions at the cervicomedullary junction affecting decussating corticospinal fibers, particularly those controlling the upper limbs.
- It leads to bilateral upper limb weakness with sparing of the lower limbs.
- Chiari malformation type I (CM-I), defined by herniation of cerebellar tonsils through the foramen magnum, can cause cervicomedullary compression and syringomyelia, contributing to such presentations.
- We report a rare case of CM-I with cruciate paralysis and reverse dissociated sensory loss.

- MATERIALS & METHODS : A case report with review of literature

- **RESULTS** : A 30 year old woman, with no prior comorbidities or significant family history, presented with 2 year history of asymmetric onset weakness in the right upper limb, followed by similar involvement of the left upper limb. The weakness began distally and progressed proximally. She reported thinning of both hands. Neurological examination revealed Bilateral upper limb weakness (distal > proximal), with muscle wasting and areflexia in upper limbs and exaggerated reflexes in lower limbs with right side plantar extensor response. Impaired vibration and joint position sense with preserved pain and temperature with Positive Romberg's sign suggestive of reverse dissociated sensory loss.Cranial nerves, cognition, cerebellar examination were normal



Investigations:

Normal Complete blood count, Liver and renal function tests

Vasculitis profile negative,

S VDRL negative

S. vitamin B12 – Normal

Nerve conduction studies : Normal

MRI cervical spine revealed:Cerebellar tonsillar descent (9 mm below basion-opisthion line) Cervicomedullary kinking at C1

Long-segment syrinx from C2 to D11 (T1 hypointense, T2 hyperintense).

DISCUSSION : Cruciate paralysis results from lesions involving the decussation of corticospinal fibers at the pyramidal decussation, typically affecting upper limb fibers that cross rostrally compared to lower limb fibers.

- Reverse dissociated sensory loss –impairment of dorsal column modalities (vibration and position) with sparing of spinothalamic sensations is consistent with posterior column involvement, likely due to the syrinx expanding within the dorsal cord.
- Chiari malformation is a congenital condition that may remain asymptomatic until adulthood. The development of syringomyelia often determines the clinical presentation.
- In this case, long-segment syringomyelia from C2 to D11 reflects advanced disease with central cord expansion.
- The study by Hopkins et al. (2016) is a systematic review of 37 reported cases of cruciate paralysis shows that most cases are traumatic (78.4%), but a small subset were non-traumatic — including Chiari malformation type I (CM-I), posterior fossa tumors, and vascular lesions.
- This case exemplifies the clinical hallmark of cruciate paralysis and underlines the significance of recognizing subtle neuroanatomical clues that point toward brainstem or high cervical involvement.

CONCLUSION : Recognition of this weakness pattern-bilateral upper limb weakness with relative sparing of lower limbs and reverse sensory dissociation—should prompt detailed cervicomedullary imaging. Early identification and neurosurgical consultation may prevent further neurological deterioration.

Reference:

Hopkins B, Khanna R, Dahdaleh NS. Revisiting cruciate paralysis: A case report and systematic review. J Craniovertebr Junction Spine. 2016;7(4):265-72.

Grote W, Quinsey C, Browne GJ. Cruciate paralysis: a rare and misleading presentation of Chiari I malformation. Emerg Med Australas. 2007;19(3):255–8.