Trident sign in Osmotic Demyelination Syndrome

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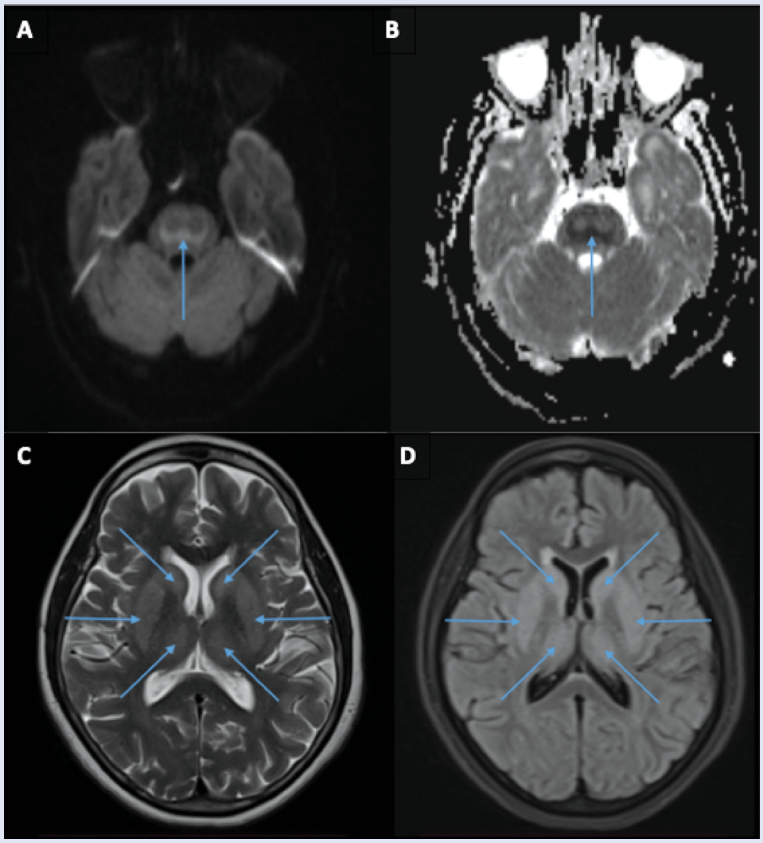

Figure. MRI Brain showing central pontine and extrapontine myelinolysis. Panel A: DWI sequence with high signal intensity and Panel B: Corresponding ADC image showing low signal intensity suggestive of diffusion restriction at the level of pons, typical of "trident sign" (Arrows). Panel C: T2 weighted sequence and Panel D: FLAIR sequence showing symmetrical high signal intensities in bilateral head of caudate nuclei, lentiform nuclei and thalamus (Arrows) suggestive of extrapontine myelinolysis.

Keywords: *Central Pontine Myelinolysis, hyponatremia, Omega sign, Osmotic Demyelination Syndrome, trident sign.*

A 55-year-old female with recently diagnosed type 2 diabetes presented to a local hospital with complaints of dizziness, generalized weakness and diffuse headache for 5 days. During her six-day hospital stay, she developed altered sensorium and multiple episodes of non-projectile vomiting for which she was referred to our center. Her condition deteriorated with drop in Glasgow Coma Scale (GCS) for which she was intubated and shifted to intensive care unit (ICU). Upon ICU arrival, her GCS was E3VTM1 with bilateral upper and lower limb weakness. Review of her treatment records revealed rapid correction of hyponatremia from 110mEq/L to 132mEq/L within 24 hours. Initial workup included non-contrast CT head and lumbar puncture, which was normal. Subsequent MRI head revealed marked DWI high signal intensity with corresponding ADC image low signal intensity suggestive of diffusion restriction at the level of pons, typical of "trident sign". The T2 and FLAIR high signal intensity in bilateral basal ganglia was suggestive of extrapontine myelinolysis, as shown in the figure. During her 2-month ICU stay, her condition gradually improved with GCS of E3VTM5. She required surgical tracheostomy for airway and secretion control. She was eventually transferred to ward with a modified Rankin scale (mRS) score of 5.

Osmotic Demyelination Syndrome (ODS), previously known as central pontine myelinolysis is a critical neurological condition characterized by encephalopathy and damage to brain's white matter, especially in the pontine region. ODS is caused by demyelination due to osmotic changes most commonly triggered by rapid correction of hyponatremia.[1] Patients with ODS usually presents with dysphagia, dysarthria, paraparesis or quadriparesis, behavioral and movement disorders, seizures, confusion, disorientation and in severe cases, locked in syndrome and coma.[2] MRI is the preferred imaging modality revealing hyperintensities in central pons, which is characteristic of ODS.[3] Trident sign, also known as Omega sign is characterized by central pontine hyperintensity which resembles a three-pronged spear used in ancient Greece or in Hindu Mythology, the "Trishula". It represents predominant involvement of pontine fibers with sparing of cortical spinal tracts.[4,5]

ODS remains a preventable complication of rapid hyponatremia correction. Early recognition through MRI findings and intensive supportive care are crucial for managing this serious condition.[3]

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