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Imaging in a Case of Cerebral Fat Embolism Syndrome

Harsh Jain[1] Jishnu Nair[2] Krishnamurthy Ganesh[2]

[1] Sri Ramachandra Institute of Higher Education and Research, Chennai, Tamil Nadu, India
[2] Department of Neurosurgery, Sri Ramachandra Institute of Higher Education and Research, Chennai, Tamil Nadu, India

Address for correspondence Harsh Jain, MBBS, Sri Ramachandra Institute of Higher Education and Research, Porur, Chennai 600116, Tamil Nadu, India (e-mail: harshjain@outlook.com).

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A 62-year-old male presented to our emergency room intubated, with posttraumatic seizures and compound left femur fracture after suffering a road traffic accident. Glasgow Coma Scale (GCS) prior to seizure onset was 15. The computed tomography (CT) scan and magnetic resonance imaging (MRI) of the brain on admission were normal and the patient was taken up for emergency wound exploration and fixation of femur fracture. Postoperatively, sensorium did not improve on weaning sedation and GCS was E2VtM4.

Initial noncontrast head CT showed no evidence of any infarcts or bleeds. Repeat MRI showed multiple punctate areas of diffusion restriction and corresponding punctate T2 hyperintensities in the subcortical white matter cerebellum and brainstem suggestive of cerebral fat embolism syndrome. These areas showed a diffusion restriction on diffusion-weighted imaging (DWI) sequences (►**Fig. 1**). Gradient recalled echo /susceptibility-weighted imaging (SWI) did not show microareas of blooming in the same distribution. Diffuse axonal injury was ruled out in our patient owing to normal MRI brain at admission.

Early DWI in a typical case of Cerebral Fat embolism Syndrome (CFS) shows "starfield" appearance as multiple foci of high signal scatter predominantly in the border zones and deep gray nuclei bilaterally, similar to that seen in our case. In the subacute phase, DWI shows confluent bilateral symmetric periventricular and subcortical white matter cytotoxic edema and diffusion restriction.

Microhemorrhages are seen as blooming foci in the white matte in T2 sequences but are better appreciated on SWI, they are pathogenic of CFs. Up to one-third of all fat embolism cases may show blooming on SWI, it was not seen in our case. MR spectroscopy shows

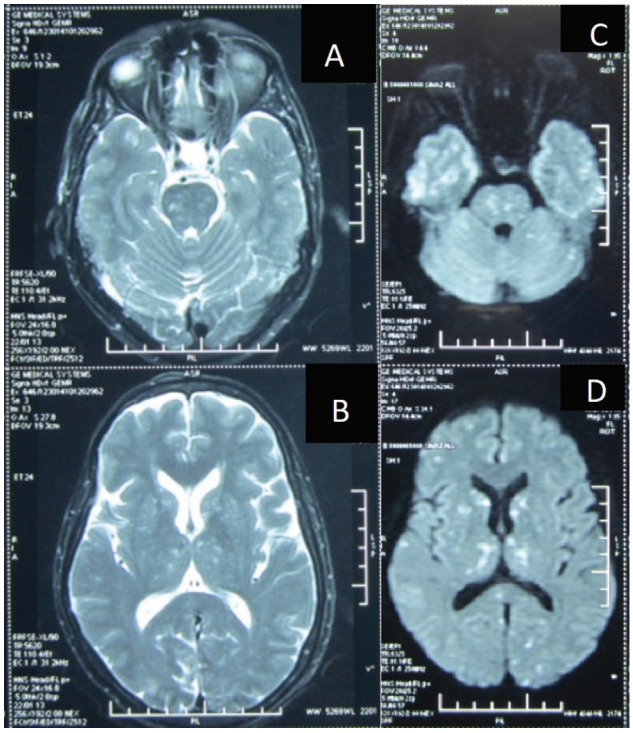

Fig. 1 (**A**) Magnetic resonance imaging brain axial image, T2-weighted, showing multiple areas of hyperintensities in the cerebellum and the brainstem, corresponding to the diffusion restriction in the diffusion-weighted imaging (DWI). (**B**) Magnetic resonance imaging brain axial image, T2-weighted, showing multiple areas of hyperintensities in the subcortical white matter, corresponding to the diffusion restriction in the DWI. (**C**) Magnetic resonance imaging brain axial image, diffusion-weighted sequence, showing multiple punctuate areas of diffusion restriction in the cerebellum and brainstem. (**D**) Magnetic resonance imaging brain axial image, diffusion-weighted sequence, showing multiple punctuate areas of diffusion restriction in the subcortical white matter, in a "starfield" pattern. The diffusion restriction is seen predominantly in the border zones and deep gray nuclei bilaterally.

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the presence of lipid peaks within the lesions, a finding related to the nature of the emboli or associated necrosis.[1–4]

Declaration of Patient Consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Ethics Approval Statement

Our institute does not require ethics clearance for individual case reports.

Authors' Contribution

H.J. and J.N. prepared the report. The patient was admitted under the care of K.G. H.J., J.N., and K.G. approved the final version of the report.

Conflict of Interest

None declared.

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