Current Research in MRI

Case Report

Mild Encephalitis/Encephalopathy with Reversible Splenial Lesion: Two Case Reports

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One of the cases was sent for evaluation to be presented as a poster in the congress of the Turkish Neuroradiology Society.

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Abstract

Mild encephalitis/encephalopathy with reversible splenial lesion is a clinical and radiological diagnosis and is defined as reversible diffusion restriction in the corpus callosum splenium. It is generally reported to be related with viral infections. We present 2 adult patients with reversible diffusion restriction in the corpus splenium and mild encephalitis. Mild encephalitis/encephalopathy with reversible splenial lesion has a good prognosis, but the differential diagnosis should be made from ischemia, posterior reversible encephalopathy syndrome, lymphoma, diffuse axonal damage, and extrapontine myelinolysis.

Keywords: Diffusion restriction, MRI, reversible, splenium

INTRODUCTION

Mild encephalitis/encephalopathy with reversible splenial lesion (MERS) is a clinic–radiologic diagnosis with a good prognosis, presenting with encephalitis findings characterized by reversible lesion of the splenium of the carpus callosum.[1] Although it is generally reported to be related with viral infections, it may also be related with metabolic conditions and drug use.[2] Reversible magnetic resonance imaging (MRI) findings including diffusion restriction and T2-weighted-Fluid-Attenuated Inversion Recovery (FLAIR) hyperintensity are observed in the splenium of the corpus callosum. Although this entity is reported to be more common in children, many adult patients have been reported in recent years.[3]

We aimed to present 2 adult patients with a clinical and radiological diagnosis of MERS.

CASE PRESENTATIONS

Case 1

A 40-year-old female patient who had been suffering from malaise and fever for a week was admitted to our hospital with slurred speech and confusion. The patient with no comorbidities was started to be investigated with a prediagnosis of encephalitis. Cranial MRI obtained from the patient showed diffusion restriction in the splenium of the corpus callosum. In the same localization, T2 was hyperintense and T1 was isointense and did not show contrast enhancement. C-reactive protein was 338 mg/L, and cerebrospinal fluid values were normal after the lumbar puncture. The clinical and radiological images were evaluated together, and the patient was diagnosed with MERS. After 3 days, the patient's complaints decreased, and regression was observed in the findings of the same localization on the control MRI. After 14 days, the lesion completely disappeared (Figure 1). The patient was discharged with complete recovery after a total of 15 days.

Case 2

A 35-year-old male patient presented to the emergency department with complaints of confusion, nausea, vomiting, and urinary incontinence. He had no known disease other than asthma. The patient's complaints increased and delirium was added. In the cerebrospinal fluid (CSF) examination performed with the preliminary diagnosis of encephalitis, protein and glucose were high and 170 erythrocyte cells were detected. Meanwhile, brain MRI revealed a lesion in the splenium of the corpus callosum, slightly hyperintense in the T2-weighted sequence and slightly hyperintense in the FLAIR sequence, isointense in the T1-weighted sequence, without contrast enhancement, and restricted in the diffusion-weighted image (Figure 2). No hemorrhage was observed in the susceptibility weighted imaging sequence, and the magnetic resonance venography was completely normal. The patient's clinical and radiological images were evaluated together, and MERS was diagnosed and treatment was started. After 4 days, the patient's complaints decreased, and diffusion restriction in splenium almost completely regressed in the control imaging. The patient was discharged with complete recovery after a total of 14 days.

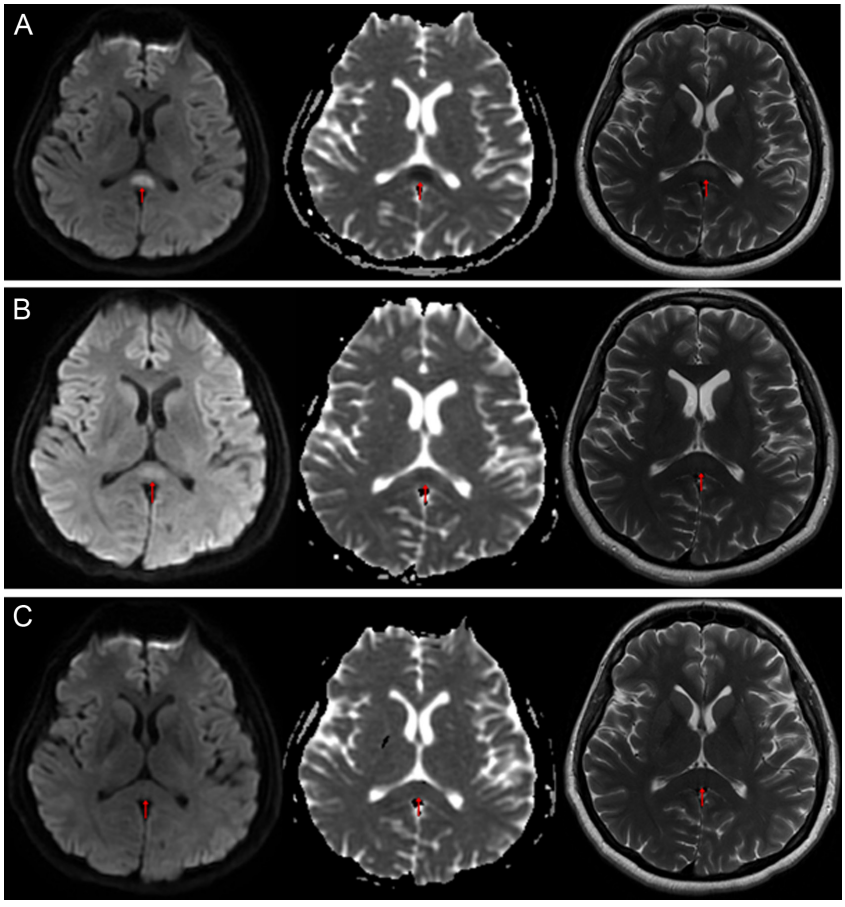

Figure 1. (A) Diffusion-weighted image hyperintense, apparent diffusion coefficient hypointense, and T2 mild hyperintense area in the splenium of the corpus callosum. (B) Decrease in findings in the same localization after 3 days. (C) Complete regression of findings in the same localization after 14 days.

DISCUSSION

This entity, which has been called cytotoxic lesion of the corpus callosum or reversible splenial lesion syndrome or MERS in recent years, may be secondary to many conditions such as infections, epileptic drug use, metabolic disorders, malignancies, cerebrovascular disease, and trauma.[4] The pathogenesis is still unclear but thought to be due to excitotoxicity caused by an increase in extracellular glutamate with water accumulation in cells due to cell–cytokine interaction.[5] It is discussed that hyponatremia detected in some patients may also play a role in the pathogenesis.[7] Corpus callosum involvement has been defined in 3 patterns—a small round lesion in the center of the splenium, a lesion centered in the splenium but extending to the adjacent white matter, and lesion centered posteriorly and extending anteriorly to the corpus callosum.[5]

MAIN POINTS

- Mild encephalitis/encephalopathy with reversible splenial lesion presents with transient diffusion restriction in the splenium of the corpus callosum.
- It is a clinical and radiological diagnosis.
- It usually occurs after viral infections.
- Differential diagnoses include ischemia, posterior reversible encephalopathy syndrome, human immunodeficiency virus-associated encephalopathy, diffuse axonal damage, multiple sclerosis, lymphoma, and epilepsy.
- Prognosis is good.

Mild encephalitis/encephalopathy with reversible splenial lesion is a clinical–radiologic entity characterized by mild signs of encephalopathy in addition to the involvement of the splenium of the corpus callosum.[6] Clinically, it progresses with confusion, headache, seizures, nausea, vomiting, urinary incontinence, and delirium.[6,7] Nakajima et al[8] also reported that it presented cerebellar ataxia. The cause is frequently viruses such as influenza, rotavirus, mumps, herpes, and varicella, but it is rarely seen after bacterial infections.[8] In addition, several cases developing after coronavirus disease (COVID) have been reported in the literature in recent years.[9,10] Kubo et al[9] reported that 11 of the 30 related to COVID cases published were from Turkey.

Typical MRI findings are T2-weighted and FLAIR hyperintense, diffusion-restricted and decreased ADC, and isointense on T1-weighted sequence without contrast enhancement.[11] The lesions in our cases were also T2-FLAIR hyperintense, T1-weighted isointense, and diffusion-restricted with low apparent diffusion coefficient (ADC) values and no contrast enhancement.

It is divided into 2 types: type 1, which is characterized by diffusion restriction only in the splenium of the corpus callosum, and type 2, which has lesions in the periventricular–supraventricular white matter in addition to the splenium.[12] Type 1 MERS is the most common

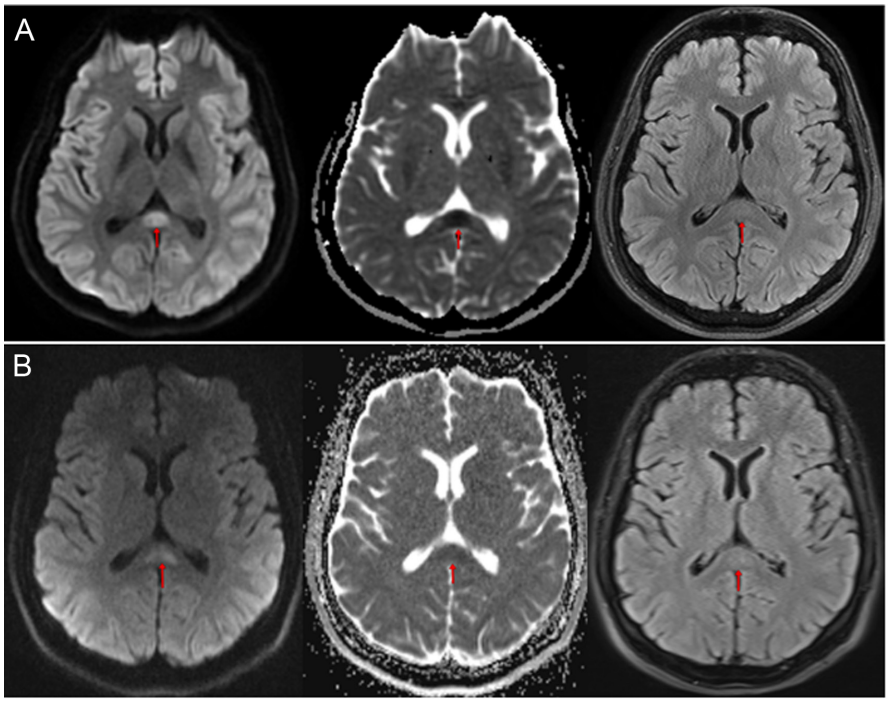

Figure 2. (A) Diffusion-weighted image hyperintense, apparent diffusion coefficient hypointense, and FLAIR mild hyperintense area in the splenium of the corpus callosum. (B) Decrease in findings in the same localization after 4 days.

type, and our patients had only splenium lesions and both were considered type 1. Differential diagnosis should be made with many diseases such as ischemia, posterior reversible encephalopathy syndrome, human immunodeficiency virus-associated encephalopathy, diffuse axonal injury, multiple sclerosis, lymphoma, epilepsy, and extrapontine myelinolysis.[10] Grosset et al[13] suggested lower ADC values in differentiation by ischemia.

Although it is still debated whether treatment is needed and what to use in treatment, the prognosis of both types of MERS is quite good. Most of the cases in the literature were discharged with full recovery.[1,3] Our 2 patients were discharged with complete recovery after 15 and 14 days, respectively.

Informed Consent: Written informed consent was obtained from patient and their relatives who participated in this study.

Peer-review: Externally peer-reviewed.

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