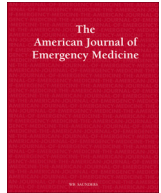




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## Case Report

## Transient splenial diffusion-weighted image restriction mimicking stroke ☆☆☆★

## Abstract

Acute transient diffusion-weighted image (DWI) restriction of the splenium of corpus callosum is reported in various medical conditions (encephalopathy, hypoglycemia, in patients on antiepileptic drugs) and in various infections. In some cases, the cause is unknown. We report a case of a 55-year-old woman who presented with acute-onset disorientation and ataxia, initially diagnosed as a case of stroke but later on found to be a case of transient splenial DWI restriction due to unknown cause. Because of a rich blood supply, stroke of the splenium of corpus callosum occurs only rarely. Thus, other reversible causes of splenial DWI restriction should always be excluded before diagnosing a patient with stroke. It is crucial to identify transient splenial DWI restriction and to rule out its reversible but critical causes, which, if not managed quickly, may lead to irreversible brain damage.

Reversible diffusion-weighted image (DWI) restriction of the brain is an uncommon finding usually seen in hemiplegia, migraine, seizure, venous sinus occlusion, or splenial injury [1,2]. Acute transient DWI restriction of the splenium of corpus callosum has been reported in various clinical conditions like encephalopathy and hypoglycemia in patients on antiepileptic drugs, various cerebral infections, and, in some cases, with no apparent cause [3]. We herein report a case of a 55-year-old woman who presented with acute-onset disorientation and ataxia along with DWI restriction of the splenium and was initially misdiagnosed as a case of stroke, but later turned out to be a case of transient splenial DWI restriction of unknown etiology.

A 55-year-old woman, not a known case of any chronic illness neither on any chronic medication (including antiepileptic drugs), presented with acute onset of inappropriate talking, slurring of speech, and increased tendency to fall on unassisted walking. She was first seen at a local hospital where she was diagnosed as having stroke and referred to a higher center for further management. When received in the emergency department of our medical college hospital, the patient was conscious, her vitals were stable, and other systemic examinations were unremarkable. On neurologic examination, the patient was found to be disoriented to time, place, and person; speech was dysarthric; and all cranial nerves were normal. Motor examination revealed normal bulk, tone, and power with brisk reflexes in all 4 limbs and bilateral plantar extensor. There was no neck rigidity, and Kerning sign was negative. The patient was ataxic with swaying on either side, but other cerebellar signs were negative.

On examination, we could not find any localizing feature, so we evaluated the patient for some possible metabolic abnormality. However, metabolic parameters including blood sugar, serum electrolytes, liver function tests, and renal function tests were within normal limits. Magnetic resonance imaging (MRI) of brain revealed DWI restriction of splenium of corpus callosum and posterior limb of internal capsule bilaterally (Fig. A). Acute infarct was kept as a provisional diagnosis, and conservative management was initiated. Considering the fact that splenial DWI abnormality can also be seen in various other clinical conditions, the patient was investigated to rule out any other possible etiology. Urine examination, blood culture, and cerebrospinal fluid examination were found to have normal results, which ruled out infectious etiology.

Over the next 2 to 3 days, the patient showed significant improvement in terms of orientation and ataxia, and by fifth day, the patient was absolutely normal. Repeat MRI of the brain was done, 5 days after the first MRI, which showed complete resolution of the brain lesion (Fig. B). Thus, the patient was diagnosed as having a case of transient splenial DWI abnormality of unknown etiology and was advised follow-up after 1 month. On follow-up after 1 month, the patient had no residual neurologic deficit.

Clinically, splenial abnormality presents with confusion, seizures, dysarthria, or ataxia [4]. The exact mechanism of transient splenial abnormality on DWI is not known, but intramyelinic edema can explain the reversibility of the lesion [5]. Splenial abnormality evident on MRI is important to be identified because many of the causes of splenial abnormality are completely reversible on early institution of treatment. In addition, if it is timely identified, the patient may not be subjected to undue investigations [4]. It is very important to rule out metabolic abnormalities such as hypoglycemia or hyponatremia or any infectious cause. Metabolic abnormalities must be detected at the earliest and treated promptly, so that irreversible brain damage can be prevented. Patients should also be investigated for any infectious cause and, if found, should be treated accordingly [6]. Metabolic parameters were within the reference range in our patient. Normal findings from the cerebrospinal fluid examination, urine culture, and blood culture ruled out any infectious etiology.

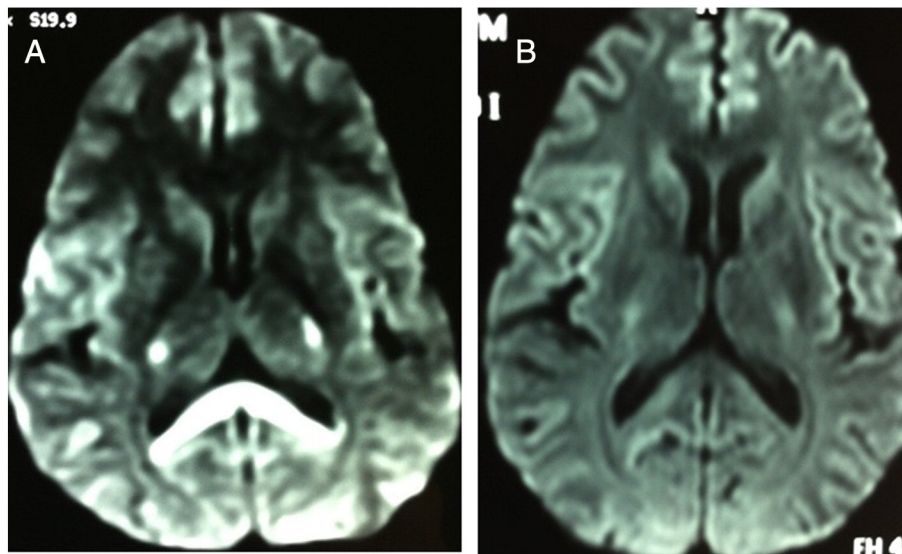
Diffusion-weighted image restriction of splenium of corpus callosum usually makes the clinicians think of a possible infarct. However, an infarct of corpus callosum is rare because corpus callosum receives rich blood supply from anterior communicating, pericallosal, and posterior pericallosal arteries. Thus, it is suggested that other causes of DWI restriction of splenium of corpus callosum should always be ruled out before diagnosing the patient as having infarct of splenium of corpus callosum [7].

Acute disseminated encephalomyelitis (ADEM) is an important differential diagnosis of transient splenial DWI restriction and should be excluded. Patients with ADEM usually improve clinically over a few

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**Fig. A,** MRI brain diffusion-weighted image showing diffusion restriction in splenium of corpus callosum and bilateral posterior limb of internal capsule. **B,** Repeat MRI brain diffusion-weighted image (done 5 days after the first) showing resolution of the lesion.

weeks with treatment. Magnetic resonance imaging of the brain in ADEM usually shows an asymmetric white matter abnormality, which disappears over a period of 1 to 2 months; thus, clinical improvement precedes the radiologic resolution of the lesion [6,8]. Acute disseminated encephalomyelitis in our patient was excluded, considering the absence of white matter abnormality on MRI, radiologic resolution of splenial abnormality for 5 days, and complete clinical improvement for 4 to 5 days without any specific treatment.

Stroke of the splenium of corpus callosum occurs very rarely owing to its rich blood supply. Thus, other reversible causes of splenial DWI restriction should always be excluded before making a final diagnosis of stroke of the corpus callosum. It is crucial to identify transient splenial DWI restriction and to rule out its reversible critical causes, which, if not managed, quickly may lead to irreversible brain damage.

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