Neuroimaging Highlight

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Superior Sagittal Sinus Thrombosis

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A 30-year-old female suffered minor head and neck trauma while tubing on a lake. Three days later she experienced an episode of transient expressive dysphasia later followed by a generalized seizure. Medications include oral contraceptives.

Computed tomography revealed no significant abnormalities. Magnetic resonance imaging (MRI) demonstrated subtle hyperintense cortical signal in the lateral anterior right frontal lobe on FLAIR images (Figure 1) which was much more obvious on diffusion-weighted imaging (DWI) with associated decreased apparent diffusion coefficient (ADC) (Figures 2a and 2b). Hyperintense T1 signal thrombus is seen in the location of the superior sagittal sinus (SSS) (Figure 3). MR venography (Figure 4) showed reduced flow in the anterior two thirds of the superior sagittal sinus which was confirmed with catheter angiography (Figure 5a and 5b). Follow-up MRI at about one month revealed resolution of the previous abnormalities (Figures 6a-d).

Dural sinus thrombosis is a rare condition that presents with nonspecific, highly variable clinical findings. At least four typical syndromes of presentation have been described: i) pseudotumor cerebri, ii) headache and focal neurologic deficit, iii) focal seizure and headache, and iv) headache, nausea, long-tract symptoms, and progressive decline in level of consciousness.[1] Imaging is mandatory with CT, MRI with MRV and/or cerebral angiography to provide the diagnosis. Distinct stages of parenchymal changes may be seen depending on the severity of venous congestion. Subtle early changes may be best detected with DWI but unlike arterial ischemia, DWI changes suggesting cytotoxic edema can be reversible and do not predict subsequent venous infarction.[2,3,4]

There is potential for full recovery with early treatment. An

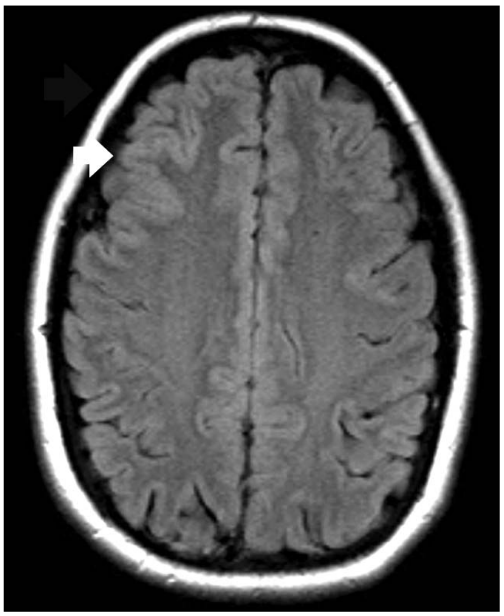

Figure 1: *MRI (Axial FLAIR) demonstrates very mild hyperintense signal with gyral swelling in right frontal cortex (arrow).*

A

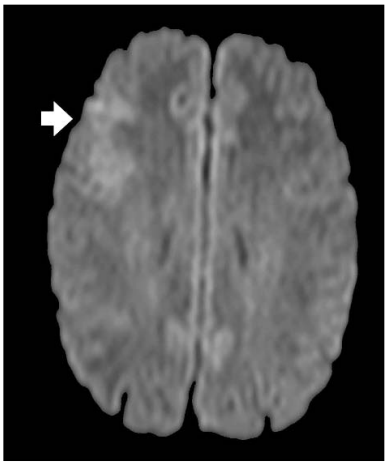

Figure 2a: *MRI (DWI) demonstrates restricted diffusion related to venous ischemia (arrow).*

B

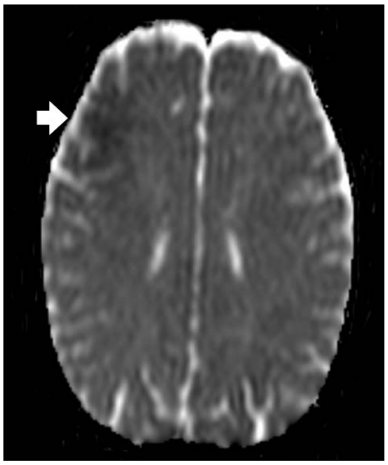

Figure 2b: *MRI (ADC)*

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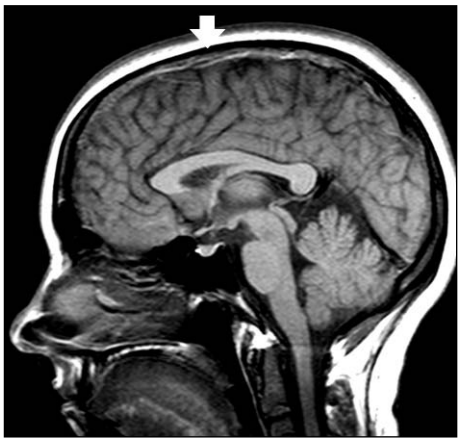

Figure 3: *MRI (Sagittal T1) demonstrates possible hyperintense thrombus in anterior SSS (arrow).*

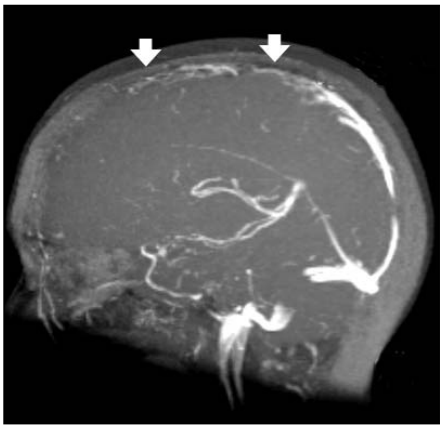

Figure 4: *MR venography (Sagittal 3D time of flight) demonstrates slow flow in anterior two thirds of the SSS.*

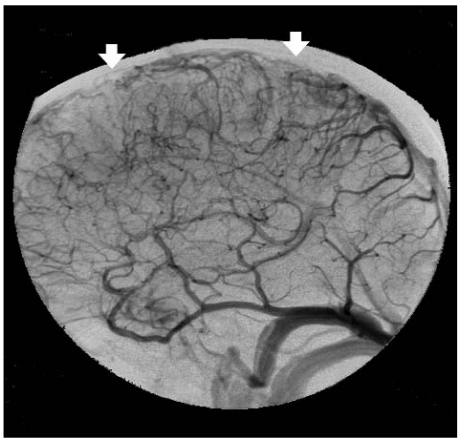

Figure 5a: *Catheter angiogram (venous phase) demonstrates poor filling in anterior SSS consistent with thrombus.*

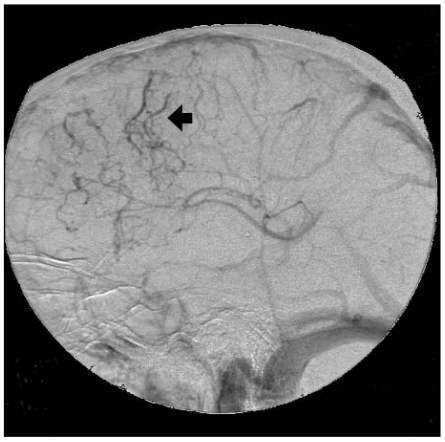

Figure 5b: *Delayed venous phase demonstrates delayed cortical venous drainage.*

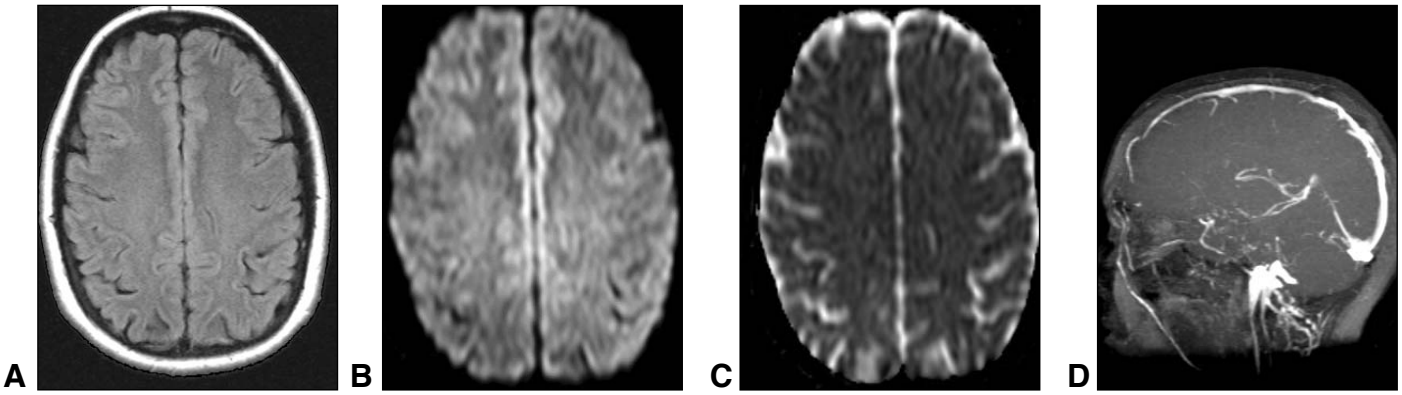

Figure 6a-d: *MRI day 20 (FLAIR (a), DWI (b), ADC (c), and MR venography (d)) demonstrate no residual abnormality.*

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extensive etiologic search is needed as there are numerous causes or predisposing factors (infectious, hematological, connective tissue disorders, metabolic, trauma, pregnancy, neoplastic and medication related). The mainstay of therapy is to treat the cause and symptoms as well as anticoagulation with intravenous heparin. Local thrombolysis can be performed if there is clot extension or clinical worsening despite treatment.[5]

References

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