

Do not forget to see the linear hyperdense sign on CT

Sir,

Cerebral venous thrombosis (CVT) is a relatively uncommon but serious neurologic disorder that is potentially reversible with prompt diagnosis and appropriate medical care. Because the possible causal factors and clinical manifestations of this disorder are many and varied, imaging plays a primary role in diagnosis. Accurate and prompt diagnosis of CVT (CVT) is crucial, because timely and appropriate therapy can reverse the disease

process and significantly reduce the risk of acute complications and long-term sequelae. What the clinicians and radiologists should see on CT? Here we are reporting a case with classical imaging findings. A 2-year-old boy presented with poor appetite, vomiting, single episode of seizure, and decreased level of consciousness. Nonenhanced head computed tomography (CT) on admission demonstrated small hemorrhages in right basal ganglia. Linear hyperdense appearance of internal cerebral veins, straight sinus,

and superior sagittal sinus was seen representing acute thrombus [Figure 1]. Repeat CT done 24 h later showed that the edema had progressed and involved bilateral thalami and basal ganglia [Figure 2]. The diagnosis of cerebral venous thrombosis (CVT) was made on the initial scan and anticoagulants were started. The child was saved and is now on antiepileptic therapy for focal seizures.

Predisposing factors of CVT in children are infection, coagulopathy, acute systemic illness, shock, and dehydration. Pathophysiologic mechanism behind CVT is same as risk factors for Virchow's triad, which includes local trauma to vessel wall, stasis, and a hypercoagulable state. Vasogenic edema develops due to disruption of the blood brain barrier followed by cytotoxic edema resulting from localized ischemia and damage to intracellular ion channels, eventually leading to neuronal swelling.

On imaging, direct signs of CVT are "cord sign" also known as "dense clot sign" which suggests acute thrombus.^[1,2] This sign is usually seen for the first 7-14 days.^[3] The cord sign represents direct visualization of a thrombosed cortical vein that is seen as linear hyperdensity. Indirect signs of CVT on CT are diffuse brain edema, decreased ventricular size, infarct not conforming to a major arterial vascular territory, involvement of a subcortical region with sparing of the cortex, extension over more than one arterial distribution, and hemorrhages. "Empty delta sign" seen for 5 days to 2 months on contrast-enhanced CT represents a filling defect (thrombus) in the dural veins.^[1] Poor prognostic factors of CVT include: Old age, involvement of deep veins, concomitant central nervous system (CNS) infection or cancer, or if the patient presents in coma or hemorrhage. Isolated instances of cortical venous thrombosis without sinus involvement are rare. The emphasis of this particular case lies in early recognition of the hyperdense sign. Treating clinicians should be aware of these imaging findings so that they can see on CT even if the radiologist has missed so that prompt treatment can be started.

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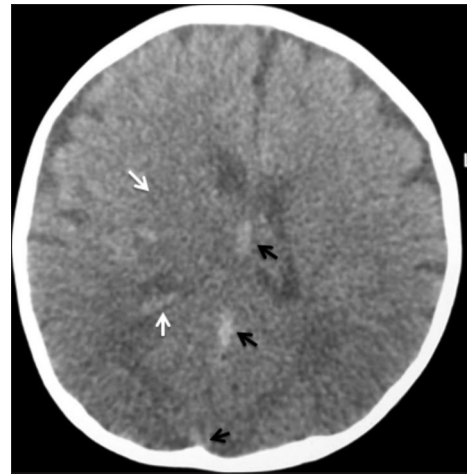


Figure 1: Non-enhanced head computed tomography (CT) showing linear hyperdense cord sign involving the deep venous system (black arrows), hemorrhages and hypodense (white arrows) right thalamus, and basal ganglia

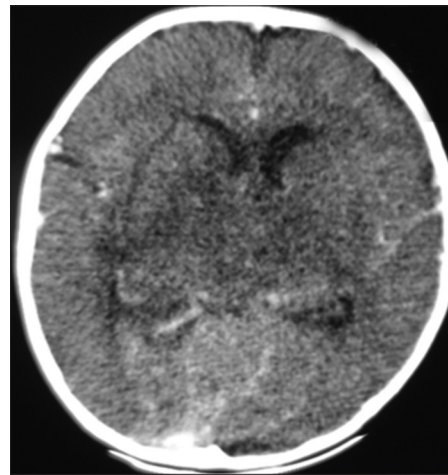


Figure 2: Contrast-enhanced head CT showing hypodensity involving bilateral thalami and basal ganglia

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