

Giant Stellate “Cord Sign” in Cerebral Venous Sinus Thromboses

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INTRODUCTION AND CASE HISTORY

A 35-year-old previously healthy male with no known medical co-morbidities presented with new-onset persistent headache of 48 h duration, followed by an episode of generalized tonic-clonic seizure. Subsequently, his sensorium further declined requiring intubation and mechanical ventilation. Baseline non-contrast enhanced CT scan (NCCT) of the head revealed a large left frontal cortical intraparenchymal hemorrhage. Hyperdensity was noted within the anterior portion of the superior sagittal sinus, inferior sagittal sinus, as well as multiple cortical veins, draining to the latter, suggestive of a classical “Cord Sign” indicative of an underlying cerebral venous sinus thrombosis (CVST) [Figure 1a]. Contrast-enhanced magnetic resonance (MR) venography of the brain confirmed the presence of dense thromboses of the inferior sagittal sinus as well as the anterior third of the superior sagittal sinus [Figure 1b]. Despite prompt initiation of therapeutic anticoagulation with intravenous heparin infusion, he deteriorated clinically with imaging evidence of hematoma expansion and worsening cerebral edema, eventually requiring decompressive craniotomy and hematoma evacuation. After a prolonged inpatient hospitalization of 70 days, the patient was eventually discharged home with the National Institutes

of Health Stroke Scale (NIHSS) of 0 and Modified Rankin Score (mRS) of 1, on therapeutic anticoagulation with oral warfarin. Etiology for CVST was attributed to probable dehydration secondary to long-distance running in the summer season, which he started just a week before the index event, with extensive workup for underlying hypercoagulable state being negative.

DISCUSSION

“Cord sign” is considered as a direct imaging marker of CVST on NCCT of the head, with the hyperattenuation of the thrombus within the involved venous sinuses contributing to the cord-like appearance.^[1-3] However, as the thrombus ages, the attenuation characteristics of the latter varies, as evidenced by the transition to iso and later hypoattenuation beyond 7–14 days of thrombus formation.^[2,4] The sensitivity and specificity of the “Cord sign” for diagnosis of CVST was 64.6% and 97.2%, respectively, in a study carried out by Linn *et al.*^[2] False-positive “Cord sign” may occur due to partial volume effects on NCCT due to close proximity of the venous sinuses to the skull and secondary to medical conditions contributing to sluggish venous flow such as polycythemia or hemoconcentration.^[5] Hence even though the absence of “Cord sign” on the NCCT head does not rule out the presence of CVST, the presence of a giant “Cord sign” such as depicted in our case, points strongly in favor of the diagnosis of CVST thereby warranting urgent imaging of the venous sinuses for confirmation and timely initiation of treatment to limit morbidity and mortality as well as to achieve favorable outcomes.

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.

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Nil.

Conflicts of interest

There are no conflicts of interest.

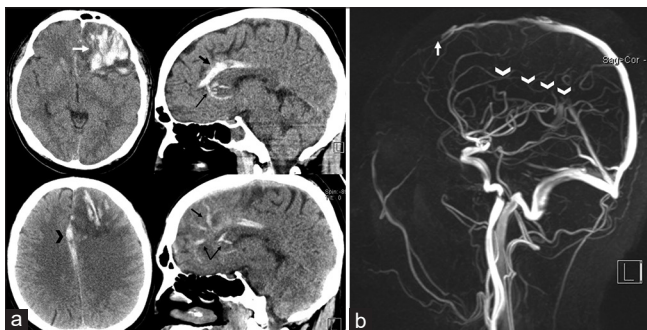


Figure 1: (a) NCCT scan of the head demonstrates a large left frontal intracerebral hemorrhage (thick white arrow). Homogenous hyperdensity is noted along the inferior sagittal sinus (thick black arrow), superior sagittal sinus (black arrow head) as well as multiple frontal cortical veins located above and below the inferior sagittal sinus, draining into it in a stellate pattern (thin black arrow). (b) Sagittal view of contrast-enhanced MR venogram showing non-opacification of the inferior sagittal sinus (arrow heads) as well as the anterior third of the superior sagittal sinus (arrow)

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