Severe Anemia Leading to Hypodensity of Cerebral Venous Sinuses on Computed Tomography Imaging

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A previously healthy 7-month-old boy presented with new onset seizures. His physical examination was nonfocal. Initial laboratory evaluation was significant for hemoglobin 1.1 g/dL and hematocrit 3.8%. A head computed tomography (CT; Figure 1) showed hypodensity of the transverse sinuses bilaterally. Further evaluation resulted in a suspected diagnosis of Diamond Blackfan anemia. Subsequent brain magnetic resonance imaging showed multifocal ischemic infarcts.

The attenuation of blood on CT is primarily a function of the protein fraction of hemoglobin.¹ A linear relationship has been established between hemoglobin levels and CT attenuation.² Thus, in patients with elevated hematocrit due to polycythemia, for example, CT imaging may demonstrate hyperdensity within the cerebral vasculature.^{2,3} Conversely, very low hemoglobin levels may cause decreased attenuation of blood, making it appear less dense than brain on CT

Figure 1. Computed tomography imaging demonstrating decreased attenuation in the transverse sinuses and torcula.

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imaging¹ and leading to the hypodensity seen in the transverse sinuses and torcula.

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