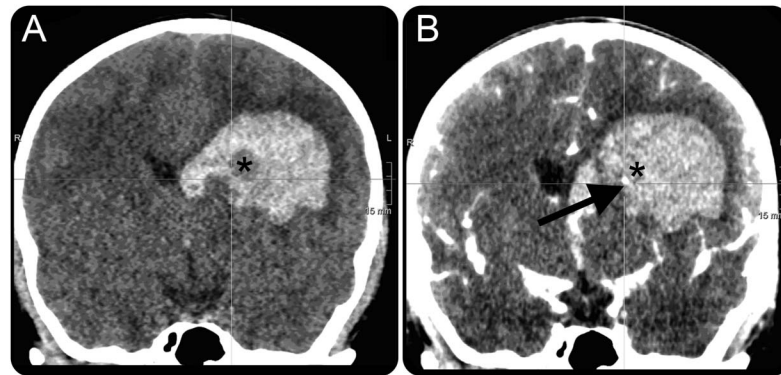


# Teaching NeuroImages: Swirl sign and spot sign in intraparenchymal hematoma

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**Figure 1** Imaging features of swirl sign and spot sign

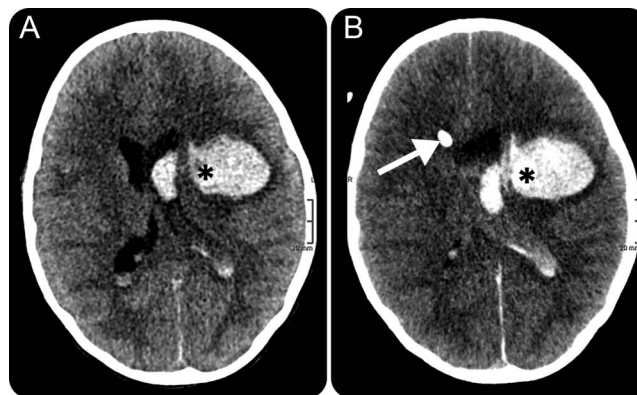


Coronal nonenhanced CT (A) demonstrates the hypodense area within the hematoma (swirl sign [asterisk]), whereas a hyperdense spot is shown on CT angiography (arrow) (B). There is already mass effect with midline shift and intraventricular hematoma extension.

A 10-year-old-girl was admitted with headache and vomiting. Nonenhanced CT showed hyperdense intraparenchymal hematoma with a hypodense area, consistent with swirl sign, a classic sign of active bleeding (figure 1).

CT angiography revealed a spot sign, consistent with active contrast leakage as in a bleeding focus. Subsequent CT scan 3 hours later showed progression of intraparenchymal hematoma (figure 2). The girl died later that day. Postmortem, factor XIII deficiency was diagnosed.

**Figure 2** Hematoma expansion



Transverse and coronal CT a few hours later (A) show placement of ventricular drain (arrow) and further medial extension of the hematoma (asterisk) (A, B).

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Swirl sign and spot sign are signs of active bleeding and predictors for hematoma growth and mortality in both young and old patients with intraparenchymal hematoma.<sup>1,2</sup> This case illustrates consistency between classic and new signs in the location of active bleeding.

#### **AUTHOR CONTRIBUTIONS**

B.A.J.M. Wagemans: data collection, writing, and image editing. S. Klinkenberg: critical revision of the manuscript for important changes and rewriting. A.A. Postma: study supervision, writing, and image editing.

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#### **DISCLOSURE**

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