

Hemicranial Headache in Cerebral Venous Sinus Thrombosis: Role of Trigeminovascular System

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Background

Cerebral venous sinus thrombosis (CVST) is an uncommon cause of stroke. Headache is the most common symptom in CVST and seen in 80 to 90% subjects. However, the mechanism of headache and its treatment are presently unclear.

We report a patient with CVST whose headache clinically resembled migraine. We propose pathophysiological similarity between common migraine and CVST-related headaches.

Case summary

A 25-year-old male developed severe right hemicranial, throbbing headache for 15 days. The headache was worse with routine activities, associated features included: nausea, vomiting, photophobia and phonophobia. Examination revealed bilateral papilledema and right lateral rectus palsy.

Magnetic resonance imaging of the brain with susceptibility-weighted imaging (SWI) demonstrated prominent right hemispheric veins (venous congestion, Figure 1 A) with thrombosis of right frontal cortical vein (Figure 1 A), superior sagittal, right transverse, and sigmoid sinus (Figure 2).

The patient's headache responded excellently to intravenous mannitol infusion and vascular decongestion was seen on repeat SWI during headache free phase (Figure 1 B). He was treated with unfractionated heparin, followed by oral anticoagulation. He remained symptom free at 3 months.

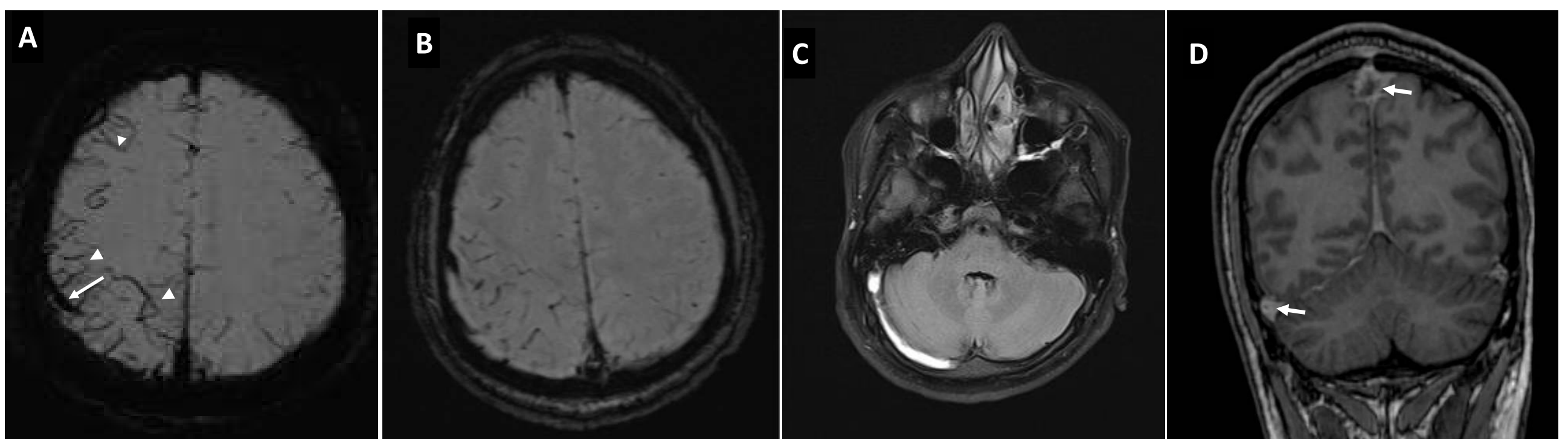


Figure 1: (A) Susceptibility-weighted imaging (SWI) showed right hemispheric vascular congestion (arrow heads) and thrombosed right frontal vein (white arrow)
(B) Post-mannitol image shows hemispheric decongestion

Figure 2. (C) Axial Fluid-attenuated inversion recovery (FLAIR) images demonstrated hyperintense thrombus in right transverse and sigmoid sinus. (D) Coronal T1 (postcontrast) image showed filling defect in superior sagittal, right transverse sinus (white arrows)

Discussion and Conclusion

Our patient's headache met many of the clinical criteria for migraine. Furthermore, vascular congestion seen on SWI has been reported in both migraine with aura and CVST.

The clinical-imaging resemblance suggests a possible shared mechanism of headache between migraine and CVST. Activation of the trigeminovascular system could be an important link. Activation of the trigeminovascular system in CVST could be caused either by blood products in cortical veins/dural sinus or vascular congestion.

We suggest that owing to shared pain pathway and presence of vascular congestion, some of the antimigraine or other medications with predominantly vaso/venoconstrictor effects could benefit CVST associated headache eg. Ergots, indomethacin and mannitol. Our patients certainly had dramatic headache reduction following mannitol infusion.

Bibliography

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