

Cavernous sinus thrombosis related to sphenoid sinusitis in a child

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A 13-year-old boy presented to our hospital with a 1-week history of fever and headache. On physical examination, he was alert and febrile (40.5°C). He had no neck stiffness or abnormalities in eye movement or appearance, visual acuity or facial sensation. He had an elevated white blood cell count (27.2 [normal range $3.3\text{--}8.6$] $\times 10^9/\text{L}$, with 85% segmented neutrophils), C-reactive protein (114.5 [normal range < 1.5] mg/L) and D-dimer ($28\,200$ [normal range < 1000] $\mu\text{g/L}$). Cerebrospinal fluid analysis was normal. Noncontrast magnetic resonance imaging (MRI) showed opacification in both sphenoid sinuses, and contrast-enhanced MRI showed filling defects in both cavernous sinuses (Figure 1A). We diagnosed cavernous sinus thrombosis (CST) secondary to sphenoid sinusitis. Magnetic resonance angiography showed narrowing of both internal carotid arteries (Figure 2A). We started intravenous administration of ceftriaxone, meropenem and heparin, and later identified *Hemophilus influenzae* in blood cultures. Although his symptoms improved in a week, his sphenoid sinusitis persisted on MRI, leading to endoscopic endonasal sinus surgery for abscess drainage 12 days after hospital admission. Subsequently, the CST shrank (Figure 1B) and the bilateral narrowing of the internal carotid arteries disappeared (Figure 2B).

Cavernous sinus thrombosis is a rare infectious thrombophlebitis caused by regional infections, such as sinusitis, otitis media, pharyngitis and facial cutaneous infection. Common presentations are fever, headache and orbital signs, such as ptosis and external ophthalmoplegia.^{1,2} Antibiotic therapy is the mainstay of treatment, along with surgical drainage of purulent collections. We administered anticoagulants to prevent extension of the CST, even though evidence supporting their use is limited.^{1,2} Narrowing of the internal carotid arteries is generally asymptomatic but has the potential to cause ischemic stroke in children and adults.^{1,2} Contrast-enhanced computed tomography (CT) or MRI is recommended for diagnosing CST, as noncontrast CT will not identify pathognomonic CST filling defects.¹ Both magnetic resonance angiography and contrast-enhanced CT are useful for detecting narrowing of the internal carotid arteries.^{1,2}

References

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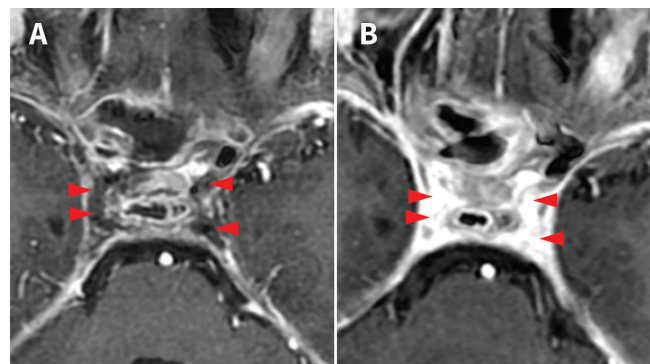


Figure 1: Contrast-enhanced magnetic resonance imaging scan from a 13-year-old boy on the first day of hospital admission (A) shows filling defects (arrowheads) in the cavernous sinus, indicating multiple venous thrombosis, which improved by day 24 of admission (B).

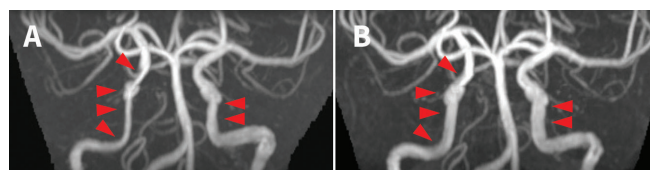


Figure 2: Magnetic resonance angiography images from a 13-year-old boy show a narrowing of both internal carotid arteries (arrowheads) on the first (A) day of hospital admission that disappeared by day 24 of admission (B).

Competing interests: None declared.

This article has been peer reviewed.

The authors have obtained parental consent.

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