Progressive Venous Thrombosis in an 18-Year-Old Man with Down Syndrome

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To the Editor: Cerebral venous thrombosis (CVT) indicates occlusion of the main sinus/sinuses or cortical veins, resulting in vascular congestion and neurological lesions.[1] Juveniles with Down syndrome (DS) are more likely to develop thrombosis.[2] However, the association between thrombosis and DS has not been reported widely.

An 18-year-old man with a history of DS was admitted due to severe headache, nausea, and vomiting. He soon lost consciousness and had exhibited gastric bleeding within the past 10 days. He had no history of other diseases and no family history of thrombotic disorders or cerebrovascular diseases. On physical examination, the patient was in a light coma, with neck resistance, and other physical examinations were precluded by the patient's condition. Initial cerebrospinal fluid tests showed no obvious abnormalities, except that opening pressure was 200 mmH_2O (1 mmH_2O = 0.0098 kPa). Blood test results included erythrocyte sedimentation rate (ESR) 91 mm/h, C-reactive protein (CRP) 88 mg/L, D-dimer 20 mg/L, anti-thyroglobulin antibody 157.32 U/ml, and anti-thyroid peroxidase antibody 177.94 U/ml. Owing to family difficulties, no other immunological tests were performed. Magnetic resonance imaging (MRI) was conducted [Figure 1a-1c], which revealed heterogeneous hyperintense lesions in the bithalamus, bilateral periventricular white matter, and intraventricular structures, indicating the occurrence of venous hemorrhage. This thrombosis was subsequently confirmed by magnetic resonance venography (MRV) [Figure 1d and 1h]. Chest computed tomography demonstrated multiple areas of patchy clouding opacity on the inferior lobe of left lung, which suggested possible pneumonia. Results of the respiratory infection examinations were negative.

Initial therapeutic approaches included low-molecular-weight-heparin-calcium (fraxiparine) by subcutaneous injection, protection of gastric mucosa, reduction of intracranial pressure, and fluid infusion. After 4 days of therapy, the patient's lower left extremity was tumescent, and bedside color Doppler ultrasound demonstrated that he had widespread thrombosis in the lower extremity. No improvements in MRI or clinical condition were observed. In light of poor anticoagulant efficacy and the specificity of the patient, we considered that his CVT might be caused by a potential autoimmune condition. He was therefore administrated immunosuppressive therapy with antimicrobial protection. Following a 3-day treatment with methylprednisolone, 80 mg/d, his symptoms were slightly improved. Additional laboratory tests showed D-dimer 0.78 mg/L, ESR 42 mm/h, and CRP 18 mg/L. We then reduced the methylprednisolone dose to 40 mg/day and continued fraxiparine for 3 days. Later, the patient received prednisone 30 mg alone, along with 110 mg of an oral anticoagulant (dabigatran). The treatment was successful as subsequent MRI revealed abnormal signals and lesions of the bithalamus, but the left periventricular structure was significantly reduced compared to the previous MRI [Figure 1e-1g]. Ultrasound examination confirmed that the lower limb thrombosis was clearly alleviated. After 6-month follow-up, the patient continued oral anticoagulation and had no further episodes of thrombosis or new symptoms.

Genetic factors or autoimmune factors might contribute to high incidence of CVT in patients with DS. Wilcock *et al*.[3] demonstrated that DS could be triggered by abnormal proteins, including superoxide dismutase 1, collagen type VI, and cystathionine β-synthase, which are encoded on chromosome 21. These abnormal proteins might be involved in pro-inflammatory processes and complement activation, leading to potential thrombogenesis.[4] Medina *et al*.[5] reported a patient with DS who presented with right-hand ischemia followed by arterial and venous thrombosis of the right thoracic extremity and was finally diagnosed with catastrophic antiphospholipid syndrome. In our case, we applied glucocorticoids to inhibit inflammatory reactions and achieved good results.

In summary, this is a rare case report on the auxiliary examination, diagnosis, and successful therapeutic treatment of CVT in a patient with DS. Our case suggests that combined therapy of anticoagulants

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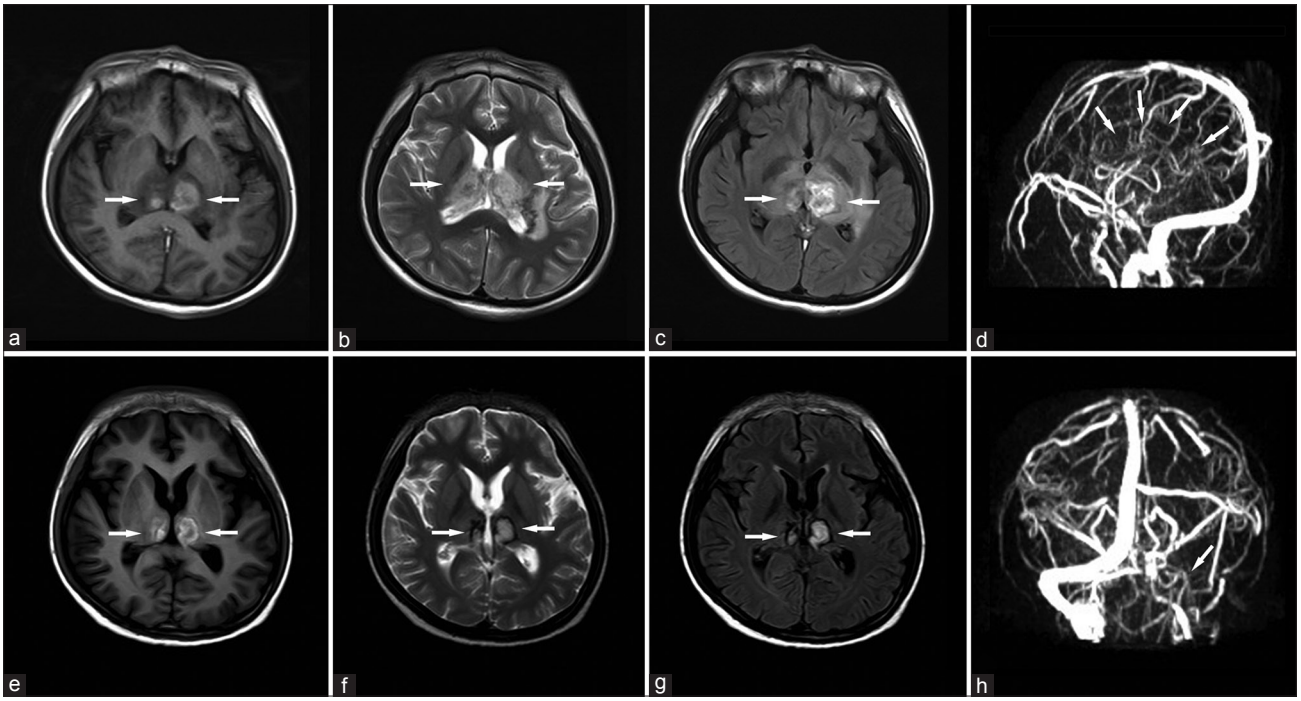

Figure 1: Progressive venous thrombosis in an 18-year-old man with Down syndrome. (a-c) MRI at admission demonstrated the lesions in the bithalamus, bilateral periventricular white matte and intraventricular parts (white arrows); (d and h) MRV revealed thrombosis in inferior sagittal sinus, great cerebral vein, left sigmoid sinus and straight sinus (the white arrow indicates thrombosis areas); (e-g) MRI at follow-up showed that the bithalamus and left periventricular parts had abnormal signals, and the lesions were significantly improved (white arrows). (a and e) Contrast-enhanced T1-weighted image. (b and f) Contrast-enhanced T2-weighted image. (c and g) T2/FLAIR image. (d) MRV at sagittal section. (h) MRV at coronal section. MRI: Magnetic resonance imaging; MRV: Magnetic resonance venography; FLAIR: Fluid attenuation inversion recover.

and glucocorticoids might be feasible for the treatment of progressive venous thrombosis in DS patients.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the journal. The patient understand that his names and initials will not be published and all due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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