

Cerebral venous sinus thrombosis in young children with inflammatory bowel disease: A report of two cases

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Abstract

We describe two young children aged 2 and 5-year-old with very early onset inflammatory bowel disease (IBD), who developed focal seizures during an acute flare of disease. Cerebral venous sinus thrombosis (CVST) was confirmed with magnetic resonance imaging and magnetic resonance venography of the brain. CVST is a rare complication of paediatric IBD that can cause significant morbidity and mortality. The important risk factor for CVST in our children was active disease, which exposed them to an increased prothrombotic state. Aggressive treatment of IBD resulted in full neurological recovery of our patients and resolution of the CVST. Our case report is the youngest reported age of CVST associated with IBD to date and highlights the need for clinicians to be vigilant for this rare complication, even in young children with IBD.

Keywords: Cerebral venous sinus thrombosis (CVST), inflammatory bowel disease (IBD), venous thromboembolism (VTE), children

INTRODUCTION

Venous thromboembolism (VTE) is a rare complication of inflammatory bowel disease (IBD) leading to significant morbidity and mortality.¹ The incidence of VTE in paediatric IBD (PIBD) is unknown.² Majority of the reported cases of VTE in children were deep vein thrombosis or pulmonary embolism. The occurrence of VTE in cerebral veins is uncommon.³ We report two young children with IBD who developed cerebral venous sinus thrombosis (CVST) during an acute flare of disease.

CASE REPORTS

Patient 1

A five-year-old girl presented with a 6-week history of bloody diarrhoea, poor appetite, and weight loss. On admission, she was confused, pale and lethargic. There was lower limb muscle weakness (3/5) with normal muscle tone and reflexes. There was no family history of thrombophilia. On the third day, she developed right-sided

focal motor seizure with impaired awareness and hypertonia of the right upper limb and sustained clonus of both lower limbs. Brain magnetic resonance imaging (MRI) and MR venography (MRV) showed CVST of left transverse and left sigmoid sinuses, with hemorrhagic venous infarcts at parasagittal posterior parietal lobes, right occipital lobe, and superior cerebellar vermis (Figure 1A-1D, 2A). Doppler ultrasound showed deep venous thrombosis of the right common femoral, superficial femoral and popliteal veins. Thrombophilia screening was normal. Anticoagulation was commenced with intravenous heparin and, subsequently subcutaneous enoxaparin.

Colonoscopy showed widespread colonic ulcers involving the rectosigmoid area to cecum with skip lesions. Histology examination confirmed the diagnosis of Crohn's disease. Methylprednisolone followed by infliximab were commenced. No further seizures were noted. A review eight weeks later showed a full neurological recovery and improvement in bowel symptoms. A repeat MRI and MRV at three months showed

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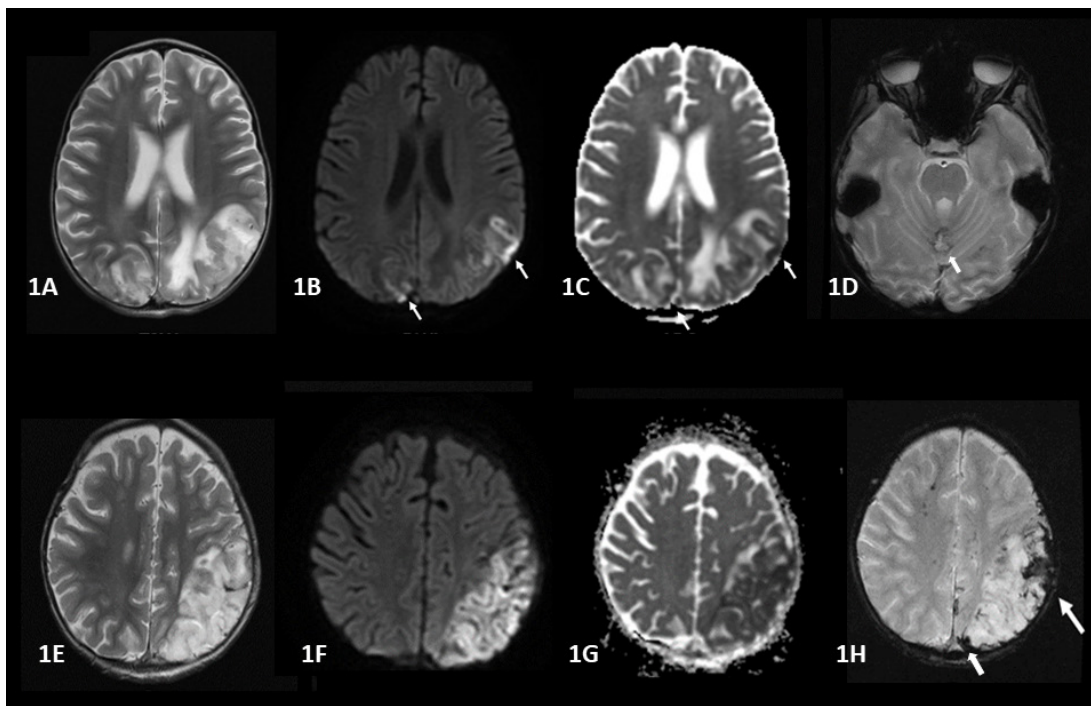


Figure 1. Patient 1 MRI showing axial T2-weighted (1A) hyperintensity with restricted diffusion on both DWI (1B) and ADC (1C) at left posterior parietal and right occipital lobe (arrowed). GRE sequence (1D) showed hemorrhage with blooming artefact at the cerebellar vermis. Patient 2 MRI showing axial T2-weighted (1E) hyperintensity and restricted diffusion on both DWI (1F) and ADC (1G) at the left parietal lobe with corresponding hemorrhage and blooming artefact on GRE sequence (1H, arrowed).

resolved left transverse and left sigmoid sinuses thrombosis (Figure 2B). Doppler ultrasound of lower limbs showed complete resolution of deep vein thrombosis.

Patient 2

A two-year-old boy was admitted after a six-month history of bloody diarrhoea. There was no family history of thrombophilia. Colonoscopy showed severe pancolitis. Histology examination confirmed ulcerative colitis. Methylprednisolone followed by infliximab were started. The disease was complicated by septic shock, requiring ventilatory support and central venous catheter for parenteral nutrition. On week four of admission, he developed right-sided focal motor seizure followed by right hemiparesis. MRI and MRV brain showed CVST involving the superior sagittal and straight sinuses and bilateral parietal lobes hemorrhagic infarcts worse on the left side (Figure 1E-1H, 2C). No anticoagulant was commenced due to persistent rectal bleeding. The disease was resistant to infliximab, ciclosporin, azathioprine and methotrexate. He had total colectomy three months after the first presentation. MRI and MRV four months from onset on CVST showed near

complete resolution of venous sinus thrombosis superior sagittal sinus and straight sinus (Figure 2D) with full neurological recovery.

DISCUSSION

CVST is a rare form of VTE associated with IBD.⁴ To our knowledge, our two cases are the first reported CVST associated with Very Early Onset PIBD in Asia. Both of our cases presented at a younger age of presentation of PIBD-induced-CVST compared with previously published literature that reported a higher incidence of this complication among adolescents aged 10-19.^{1,2} Diagnosis of CVST in children with IBD is often delayed since presenting symptoms can be non-specific or due to the lack of awareness among clinicians of this rare complication. Both patients presented with a focal seizure during an episode of severe colitis, resulting in immediate brain MRI leading to prompt diagnosis and management.

The pathophysiology of VTE associated with IBD was postulated to be caused by platelet hyperactivation, hypercoagulation, and hypofibrinolysis.⁵ Active colitis, parenteral nutrition, prolonged immobility, thrombocytosis, hereditary thrombophilia, and indwelling central

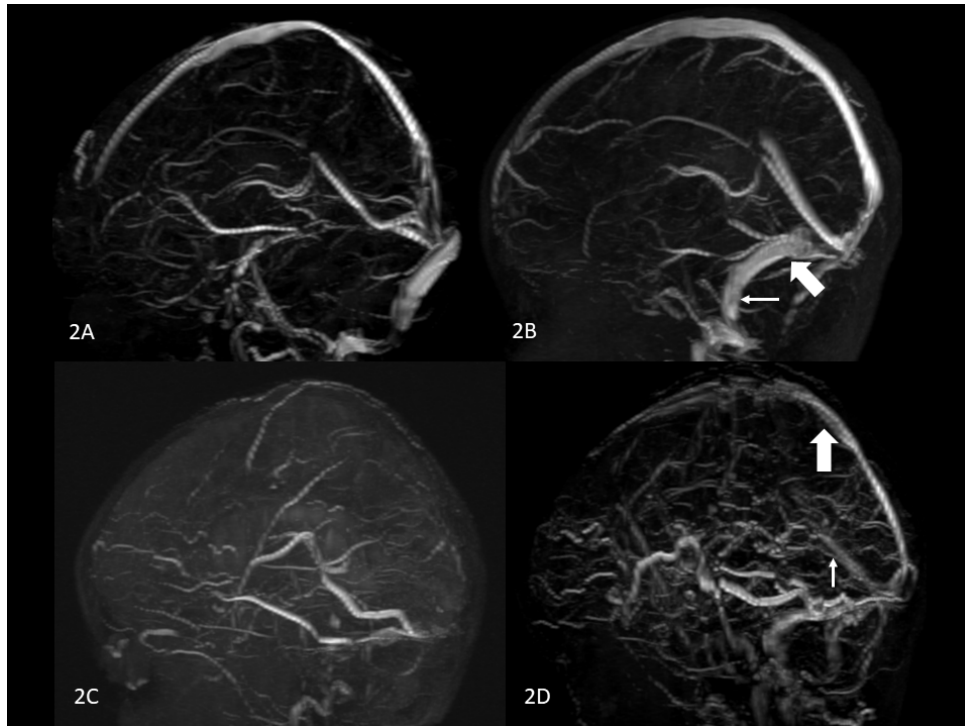


Figure 2. Patient 1 sagittal MRV showing absent filling of the left transverse and left sigmoid venous sinus (2A); and repeat follow-up MRV showing patent left transverse (2B, large arrow) and patent left sigmoid venous sinus (2B, small arrow). Patient 2 sagittal MRV showing absent filling of superior sagittal and straight venous sinus (2C); and repeat follow-up MRV showing patent superior sagittal (2D, large arrow) and patent straight venous sinus (2D, small arrow).

venous catheter were risk factors of VTE in PIBD.¹ However, the most important factor is active IBD disease. Active colitis with high inflammatory burden combined with other risk factors increases prothrombotic risk, as seen in the second child.⁶ The mainstay of treatment of CVST is prompt control of active colitis, anticoagulant therapy to prevent clot extension thrombus formation and to prevent recurrence of VTE.^{3,7}

Our cases expand the phenotype of PIBD-induced-CVST, highlighting the need for clinicians to be vigilant for this possible complication, even in young children. It reiterates the importance of prompt diagnosis, aggressive treatment of IBD, with or without anticoagulant therapy can result in excellent neurological outcome even in the presence of extensive CVST if remission of IBD is achieved in a timely manner.

DISCLOSURE

Conflict of interests: None

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