

## Case Report

**Cerebral venous sinus thrombosis complicated with haemorrhagic venous infarction and seizures, successfully treated with oral anticoagulation for one year: a case report**Hirantha Hettige<sup>1,2\*</sup>, Senaka Pilapitiya<sup>3</sup>, Niroshan Lokunarangoda<sup>3</sup>, Hemal Senanayake<sup>3</sup><sup>1</sup>Postgraduate Institute of Medicine, University of Colombo, Sri Lanka<sup>2</sup>Teaching Hospital, Anuradhapura, Sri Lanka<sup>3</sup>Department of Medicine, Faculty of Medicine and Allied Sciences, Rajarata University of Sri Lanka\*Corresponding author,  <https://orcid.org/0000-0002-3644-4522>**Abstract**

A 43-year-old mother of two children presented with an episode of cerebral venous sinus thrombosis (CVST) complicated with haemorrhagic venous infarction and seizure. She had two first trimester miscarriages and was on combined oral contraceptive pills (COCP) for two months.

Computed tomography (CT) venogram revealed venous sinus thrombosis with a right partial lobe haemorrhagic infarction. She was treated with subcutaneous enoxaparin for 14-days followed by oral warfarin for one year. The patient was started on oral levetiracetam but gradually tailed off over four months. Physiotherapy and occupational therapy were continued. She was advised on non-hormonal family planning methods. Thrombophilia and autoimmune screening were negative.

Haemorrhagic venous infarction complicated with seizures is a rare manifestation of venous sinus thrombosis. Timely and personalized anticoagulation is the mainstay of treatment.

**Keywords:** Cerebral venous sinus thrombosis, Haemorrhagic venous infarction, Combined oral contraceptive pill, Anticoagulation.

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**Introduction**

Cerebral Venous Sinus Thrombosis (CVST) is a rare cause of headache with an estimated annual incidence of 3-4 per million in the world [3]. The non-specific character of headache at the onset of CVST leads to undue delays and misdiagnosis [4–6].

**Case description**

A 43-year-old female presented with a headache for four days. She had a progressive right occipital headache. The initial pain scale of 4 progressed to 7 over four days. On admission to emergency treatment unit (ETU), she developed a generalized seizure. The patient denied vomiting, early morning worsening of headache, visual impairment, diplopia, or increase in the headache with cough. She had been started on losartan three months

back for hypertension, and blood pressure was under control.

There was no history of fever, skin rashes, joint pains, previous episodes of thrombotic events, or hair loss. She had no history of seizure disorder. She was a mother of two children and was on the combined oral contraceptive pill (COCP) for a period of two months.

There were two previous first trimester miscarriages. Past surgical history and allergic history were unremarkable.

She was not pale and not dehydrated. Blood pressure was normal. Her Glasgow coma scale was 15/15. On examination, left lower and upper limb tone was reduced, and power was 3/5 and 4/5, respectively. Lower limb reflexes were normal. Cranial nerve examination was normal. Fundus examination revealed grade 1 hypertensive changes. The cardiovascular and respiratory examination was normal. There was no evidence of organomegaly. Table 1 describes the chronology of the events.

**Table 1: Timeline of the events**

Date	Clinical sign/Action taken
2019 June 10	Headache
2019 June 14	Seizure and left-sided hemiparesis following hospital admission Confirmation of the diagnosis of cerebral venous sinus thrombosis with venous haemorrhages Commencement of sub-cutaneous enoxaparin and oral levetiracetam Continued physiotherapy Incidentally diagnosed as type-2 diabetes mellitus
2019 June 29	Enoxaparin was converted to oral warfarin
2019 July 03	The patient was discharged with oral warfarin, levetiracetam, metformin, and losartan
2019 September 4	Started to tail-off oral levetiracetam
2020 January 02	Omitted oral levetiracetam
2020 March 03	CT venogram: persistent filling defect in sagittal sinus Warfarin continued for another three months
2020 June 25	CT Venogram: Dural venous sinuses normal Warfarin omitted

Space occupying lesion, arteriovenous malformation, intracranial haemorrhage, and cerebral venous sinus thrombosis (CVST) were considered as possible differential diagnoses. With the history of progressive headache, history of 2 miscarriages, and COCP history, cerebral venous sinus thrombosis was high up in the list.

Urgent non-contrast computed tomography (CT) brain scan revealed delta sign with bleeding at right parietal region without a midline shift (figure 1A). CT venogram

revealed a filling defect in the superior sagittal sinus and straight sinus suggestive of CVST with acute parenchymal bleeding into the right partial lobe with perilesional oedema (Figure 1B).

#### Follow-up and Outcomes

The patient was started on subcutaneous enoxaparin for two weeks, followed by warfarin. Warfarin was continued for nine months with regular INR monitoring aiming at a target of 2-3 international normalized ratio.



Figure 1 A: Initial non-contrast CT-Brain: Delta Sign



Figure 1 B: Initial CT Venogram: Empty Delta Sign

Levetiracetam gradually tailed off over six months duration. The patient was advised to use a non-hormonal contraceptive method. Physiotherapy and occupational therapy hastened her recovery back to near-normal functional status.

In nine months, a repeat cerebral venogram revealed a partial filling defect in the posterior part of the superior sagittal sinus. Therefore, warfarin was continued for another three months. CT venogram performed after 12 months revealed normal dural venous sinuses. Warfarin therapy was omitted at this point.

### Discussion

Thorough history taking to elicit risk factors, with a low threshold to suspect CVST is the key to prevent undue

delays in diagnosis or misdiagnosis of CVST, as in this described patient. While magnetic resonance imaging with magnetic resonance venogram is the imaging modality of choice to diagnose CVST [7], even more available non-contrast CT can direct to the diagnosis.

The presence of thrombosis in an unusual site leads to an intense search for a predisposing procoagulant condition in this patient. Genetic test for thrombophilia; Methylenetetrahydrofolate reductase (MTHFR) Polymorphism, Factor V Leiden mutation, and prothrombin gene mutation were negative. Screening for Systemic Lupus Erythematosus and the antiphospholipid syndrome were also negative. COCP has been widely known as a risk factor for CVST [8–10]. In this background, the diagnosis of cerebral venous sinus thrombosis secondary to the oral contraceptive pill was made.

Patient-based risk stratification will lead to a clinical decision on anticoagulation strategy. The general consensus is to anticoagulate for three months if CVST was secondary to a transient risk factor or 6-12 months for idiopathic cerebral venous sinus thrombosis and indefinite anticoagulation to be considered in patients with two or more episodes of cerebral venous sinus thrombosis and those with one episode of hereditary thrombophilia [6,11]. Our patient was anti-coagulated along with serial assessment with CT venogram: until the venogram normalized and a patent cerebral venous sinus system was achieved. This required a total of 12 months of anticoagulation in our patient.

The risk of recurrence is low (< 10%), and most relapses occur within the first 12 months [12]. Apart from recurrence, she was monitored for potential complications, including headache, fits, dural arteriovenous fistulae, which didn't occur in our patient.

### Conclusion

A low threshold for clinical suspicion is vital not to miss CVST in the evaluation of headache, which could be life-threatening in the event if missed. The anticoagulation duration may be guided by the achievement of venous sinus patency as a parameter. Further studies are needed to validate the above observation.

**Patient perspective:** The patient is happy that doctors from all over the world are learning from her illness. She doesn't want anybody to experience this illness. She is fully independent at the moment.

**Informed Consent:** The patient has given verbal and written consent to publish her history and images as a case report.

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