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The silent clot: Post-abortion cerebral venous sinus thrombosis unmasked

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Abstract
Cerebral venous sinus thrombosis (CVST) is an uncommon but potentially life-threatening condition that may complicate pregnancy and the postpartum period due to the hypercoagulable state associated with these stages. CVST following medical termination of pregnancy (MTP) is extremely rare and poses significant diagnostic challenges due to its variable presentation. We report the case of a 32-year-old woman who developed severe, persistent headache and vomiting after emergency dilatation and curettage for retained products of conception following medical abortion. Neurological examination revealed no focal deficits, but neuroimaging confirmed thrombosis involving the right transverse and sigmoid sinuses extending into the jugular bulb and proximal internal jugular vein. Thrombophilia screening was unremarkable except for heterozygosity for the MTHFR C677T mutation. The patient was treated promptly with anticoagulation and supportive care, resulting in complete clinical recovery and radiological resolution on follow-up. This case highlights the importance of maintaining a high index of suspicion for CVST in postpartum patients presenting with persistent headache, even in the absence of focal signs, and emphasizes the role of early neuroimaging and timely anticoagulation in achieving a favourable outcome.

Keywords: Cerebral venous sinus thrombosis, medical abortion, postpartum headache, MTHFR mutation, anticoagulation

Introduction
Cerebral venous sinus thrombosis (CVST) is an uncommon but increasingly recognized cause of stroke, accounting for approximately 0.5-1% of all stroke cases worldwide [1]. Unlike arterial strokes, CVST predominantly affects young adults, with a notable female predominance due to sex-specific risk factors such as pregnancy, the puerperium, and hormonal contraceptive use [2, 3]. Pregnancy and the postpartum period pose a five- to six-fold increased risk of thromboembolic events due to the hypercoaguable state induced by physiological changes in coagulation factors, venous stasis, and vascular endothelial injury [2, 4].

Most pregnancy-related CVST cases occur during the third trimester or within the first six weeks postpartum [1]. However, CVST following medical termination of pregnancy (MTP) is extremely rare and not well documented in the literature. This clinical scenario may present an additional diagnostic challenge due to overlapping symptoms such as headache, vomiting, and fatigue, which may be attributed to common post-abortion sequelae rather than an underlying neurological emergency [5].

The clinical presentation of CVST is notoriously variable. Headache is the most common symptom, seen in up to 90% of cases, but patients may also develop seizures, focal neurological deficits, papilledema, or altered consciousness [1, 3]. Early recognition is critical, as untreated CVST can progress to venous infarction, intracranial hypertension, and, in severe cases, death [6]. Neuroimaging, particularly magnetic resonance imaging (MRI) with magnetic resonance venography (MRV), remains the gold standard for diagnosis, providing high sensitivity and specificity for detecting thrombus within the Dural venous sinuses [7].

Given its potential severity, CVST requires prompt diagnosis and timely anticoagulation therapy to prevent complications and improve outcomes [3, 6]. Here, we report a rare case of acute CVST occurring in a young woman following medical termination of pregnancy. This report highlights the importance of maintaining a high index of suspicion for CVST in postpartum and post-abortion patients presenting with unexplained severe headaches and underscores the role of early neuroimaging and appropriate management in achieving a favourable prognosis

Case Report

A 32-year-old woman, gravida 2 para 1 living 1, with a history of medical termination of pregnancy (MTP) one week prior, presented to our emergency department with complaints of persistent severe headache for five days. The headache was global, continuous, and progressively worsening, and was associated with multiple episodes of vomiting. She denied any visual disturbances, limb weakness, seizures, or loss of consciousness.

The patient had undergone emergency dilatation and curettage for retained products of conception following an incomplete medical abortion at six weeks of gestation. The procedure was uneventful. One week later, she developed a low-grade fever for which she received empirical antibiotics at a local clinic. Routine investigations for malaria, dengue, and leptospirosis and COVID -19 antigen were negative. Although the Widal test was positive, titres were within endemic baseline levels and did not support enteric fever.

Her past medical history was unremarkable, with no known coagulopathy, prior thromboembolic events, or relevant family history of haematological disorders. She denied use of oral contraceptives or hormonal therapy. On examination, she was afebrile and hemodynamically stable. Neurological examination revealed no focal deficits; her Glasgow Coma Scale score was 15/15. Fundoscopic examination did not show evidence of papilledema. Given the severity and persistence of her headache, neuroimaging was performed. Non-contrast computed tomography (CT) of the brain revealed a linear filling defect in the right transverse and sigmoid sinuses extending into the right jugular bulb and proximal internal jugular vein, suggestive of Dural venous sinus thrombosis. The patient was immediately started on intravenous mannitol and supportive measures, including maintenance of optimal hydration and blood pressure control.

Subsequent magnetic resonance imaging (MRI) with magnetic resonance venography (MRV) confirmed the diagnosis of sub-acute cerebral venous sinus thrombosis involving the right transverse and sigmoid sinuses. A detailed thrombophilia workup, including prothrombin gene mutation, Factor V Leiden, antiphospholipid antibodies, protein C and S levels, antithrombin III activity, and JAK2 mutation testing, was unremarkable. However, the patient tested heterozygous for the MTHFR C677T mutation. Her serum homocysteine levels were within normal limits.

Therapeutic anticoagulation was initiated with low-molecular-weight heparin (LMWH). The patient showed steady clinical improvement over the following days, with gradual resolution of headache and no new neurological signs. She was transitioned to warfarin for long-term anticoagulation three days prior to discharge, with appropriate INR monitoring and counselling regarding treatment duration.

A follow-up CT brain scan performed six weeks later demonstrated complete resolution of the venous sinus thrombus with normal flow restoration. She was advised to avoid estrogen-containing contraceptives and was counselled about thromboprophylaxis in future pregnancies.

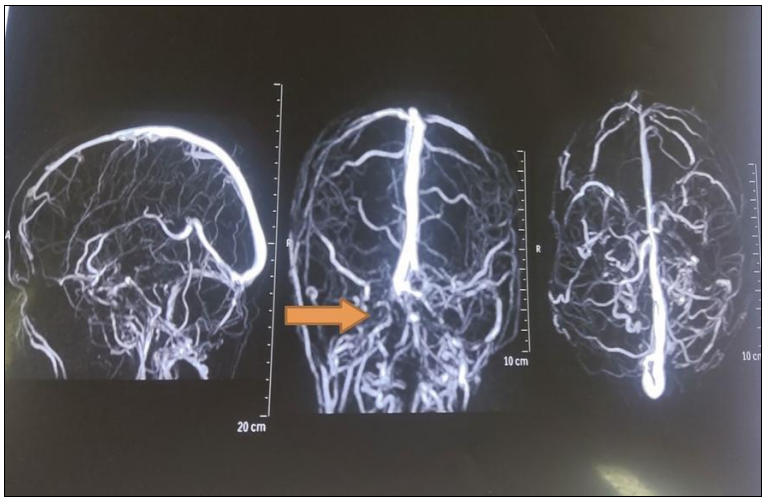

Fig 1: Magnetic resonance venography demonstrating thrombosis of the right transverse and sigmoid sinuses

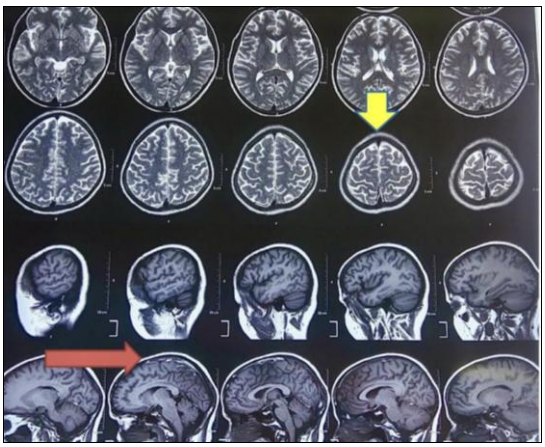

Fig 2: Serial CT brain images showing resolution of thrombosis after anticoagulation.

Discussion

Cerebral venous sinus thrombosis (CVST) is a rare but potentially life-threatening condition, accounting for approximately 0.5-1% of all strokes worldwide [1]. Pregnancy and the puerperium are established risk factors due to the physiological hypercoaguable state that occurs during this period [2]. Most cases of CVST occur in the third trimester or within the first six weeks postpartum, but its occurrence following a medical termination of pregnancy (MTP) is exceedingly rare, with very few cases reported in the literature [3].

The clinical presentation of CVST is highly variable and nonspecific, posing a significant diagnostic challenge for clinicians. Headache is the most common symptom, reported in up to 90% of cases [4]. Focal neurological deficits, seizures, and altered mental status may also occur but were absent in our patient, making the diagnosis more elusive. As highlighted by the International Study on Cerebral Vein and Dural Sinus

Thrombosis (ISCVT), a high index of suspicion is crucial, particularly in young women presenting with new-onset, severe, or persistent headache in the peripartum period [1].

Neuroimaging remains the cornerstone for the diagnosis of CVST. While non-contrast CT may demonstrate indirect signs such as the "empty delta sign" or hyper dense dural sinuses, magnetic resonance imaging (MRI) combined with magnetic resonance venography (MRV) is considered the gold standard for definitive diagnosis [5, 6]. In our case, the CT brain revealed a linear filling defect in the right transverse and sigmoid sinuses, which was subsequently confirmed on MRV.

Our patient's thrombophilia workup was largely unremarkable except for heterozygosity for the MTHFR C677T mutation. While hyperhomocysteinemia has been associated with venous thrombosis, the clinical significance of isolated MTHFR heterozygosity without elevated homocysteine levels remains unclear [2, 4].

Management of CVST relies on prompt anticoagulation, which reduces mortality and improves outcomes even in the presence of haemorrhagic infarction [3]. Low-molecular-weight heparin (LMWH) is typically used in the acute phase, with a transition to oral anticoagulants such as warfarin for long-term therapy, generally continued for 3-6 months as recommended by the European Stroke Organization and American Heart Association/American Stroke Association guidelines [3, 7]. Our patient responded well to LMWH followed by oral anticoagulation, with complete resolution of the thrombus on follow-up imaging.

Future pregnancies in women with a history of CVST should be managed carefully. Estrogen-containing contraceptives should be avoided due to increased thrombotic risk [4, 5]. If pregnancy is desired, prophylactic anticoagulation with LMWH during pregnancy and the postpartum period is advisable [2, 7].

In summary, this case highlights the need for heightened clinical vigilance for CVST in women presenting with severe or persistent headache following MTP. Early recognition and appropriate imaging are essential for timely diagnosis. A multidisciplinary approach involving obstetricians, neurologists, and radiologists is critical to achieving favourable outcomes in these patients

Conclusion

CVST is an uncommon but potentially life-threatening postpartum complication. Persistent headache, even in the absence of focal neurological signs, should prompt urgent neuroimaging to rule out CVST. Early diagnosis and prompt anticoagulation can significantly improve outcomes. Clinicians must maintain awareness of this rare but serious condition, especially following procedures such as medical abortion.

Patient Consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given consent for her clinical information and images to be reported in the journal. The patient understands that her name and initials will not be published and due efforts will be made to conceal her identity.

Conflict of Interest

None declared.

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