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Case Report

Postpartum Cerebral Venous Thrombosis Complicating Eclampsia: A Case Report from an Obstetric Critical Care Unit in Toamasina, Madagascar

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Abstract

Background: Cerebral venous thrombosis (CVT) is a rare but potentially fatal neurological emergency that can complicate pregnancy and the puerperium. Hypertensive disorders of pregnancy, particularly eclampsia and HELLP syndrome (Haemolysis, Elevated Liver enzymes, and Low Platelet count), increase the risk of thrombosis. Early recognition and intensive care management are essential to prevent permanent neurological sequelae, especially in low-resource settings. Case report: We report the case of a 29-year-old multiparous woman admitted to the intensive care unit of the Centre Hospitalier Universitaire Analankininina Toamasina (CHUAT), Madagascar, for an acute disturbance of consciousness occurring two days after an emergency caesarean section performed for eclampsia. The patient developed repeated generalised seizures in an afebrile context. On admission, she presented with a Glasgow Coma Scale score of 7/15, severe hypertension (190/150 mmHg), and left-sided hemiplegia. Laboratory investigations revealed features of HELLP syndrome with acute kidney injury. Brain computed tomography showed biparietal and frontal hypodense lesions consistent with venous infarction. Anticoagulation was initiated after correction of coagulopathy and exclusion of haemorrhage. The patient improved gradually and was discharged after 23 days with residual left-sided weakness. Discussion: This case highlights the diagnostic and therapeutic challenges of managing postpartum CVT in low-resource obstetric intensive care settings. The combination of eclampsia, HELLP syndrome, and CVT is rare but severe, reflecting overlapping mechanisms of endothelial dysfunction, hypercoagulability, and microangiopathy. Access to advanced imaging such as magnetic resonance venography is often limited in low-income countries, delaying diagnosis and anticoagulation. Anticoagulation remains the mainstay of treatment once haemorrhage is excluded, complemented by seizure control and supportive critical care. Conclusion: Postpartum CVT should be suspected in any woman with seizures or altered consciousness after delivery, especially in the context of hypertensive disorders. Early neuroimaging, judicious anticoagulation, and multidisciplinary critical care are essential to improving maternal prognosis in resource-limited environments.

Keywords

Cerebral Venous Thrombosis, Eclampsia, HELLP Syndrome, Madagascar, Postpartum Complications, Obstetric Intensive Care

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1. Introduction

Cerebral venous thrombosis (CVT) accounts for approximately 0.5–1% of all strokes, with a predilection for young adults and women during pregnancy or puerperium [1]. Physiological hypercoagulability, venous stasis, and vascular injury during pregnancy and the early postpartum period promote thrombosis [2]. Hypertensive disorders such as preeclampsia, eclampsia, and HELLP syndrome further increase thrombotic risk through endothelial dysfunction and microangiopathy [3, 4]. Recent systematic reviews highlight that CVT remains underdiagnosed in low- and middle-income countries, where access to neuroimaging and coagulation testing is limited [5, 6]. Mortality and long-term neurological disability are preventable with early diagnosis and treatment [7, 8]. In Madagascar, where obstetric critical care capacity remains constrained, postpartum CVT presents unique management challenges.

The present case, managed in the obstetric intensive care unit (ICU) of the Centre Hospitalier Universitaire Analankininina Toamasina (CHUAT), Madagascar, illustrates the critical care challenges and clinical reasoning required to diagnose and treat postpartum CVT complicating eclampsia and HELLP syndrome in a low-resource context.

2. Case Presentation

A 29-year-old Malagasy woman (gravida 2, para 2; BMI 27.3 kg/m²), with no history of thrombosis, smoking, or oral contraceptive use, was admitted two days after an emergency caesarean section performed for eclampsia at 38 weeks. She presented with recurrent seizures and altered consciousness. There was no family history of thrombophilia; screening was unavailable locally.

Magnesium sulphate was administered as anticonvulsant prophylaxis.

In the immediate postpartum period, the patient experienced recurrent generalised tonic–clonic seizures without fever or infection. On ICU admission, she was unconscious (Glasgow Coma Scale 7/15) with blood pressure of 190/150 mmHg, heart rate of 111 beats/min, and respiratory rate of 33 breaths/min. Oxygen saturation was 99% on room air. Neurological examination revealed left-sided hemiplegia, while pupils were equal and reactive. No meningeal signs were present. Other systemic examinations were unremarkable. Infection screening (complete blood count, C-reactive protein, urine and blood cultures) was negative.

Laboratory investigations showed severe anaemia (haemoglobin 6 g/dl), thrombocytopenia (platelets 54 × 10⁹/L), marked hepatic cytolysis (AST and ALT > 400 IU/L), and acute kidney injury (creatinine 1301 µmol/L). Coagulation studies showed a prothrombin time of 61% and INR of 1.29. Proteinuria was positive. These findings were consistent with HELLP syndrome complicated by renal failure.

Non-contrast brain computed tomography revealed parasagittal biparietal and right frontal subcortical hypodense lesions, consistent with venous infarction. No haemorrhage was detected. In the absence of magnetic resonance imaging, a presumptive diagnosis of postpartum cerebral venous thrombophlebitis complicating eclampsia with HELLP syndrome and acute kidney injury was made. MRI and MRV were unavailable.

Management included airway protection, oxygen supplementation, blood pressure control (nicardipin infusion) (target MAP <110 mmHg), anticonvulsants (magnesium sulphate followed by levetiracetam), osmotherapy (mannitol 20% (0.5 g/kg every 6 h for 5 days and dexamethasone 8 mg IV every 8 hours), and supportive measures. The patient underwent two sessions of haemodialysis for renal failure and received transfusions of packed red cells and platelets. Due to coagulopathy and recent surgery, anticoagulation with low-molecular-weight heparin (LMWH) was initially delayed. It was commenced after correction of coagulation abnormalities and exclusion of intracranial haemorrhage on repeat CT.

The patient's condition gradually improved. By day 10, neurological improvement was noted; by day 23 (2 September 2025), consciousness had fully recovered (GCS 15/15) with mild left hemiparesis (mRS = 2). She was discharged on warfarin (target INR 2–3) for six months. At six-month follow-up, she was seizure-free, independent (mRS = 1), and had discontinued anticoagulation a plan for neurological rehabilitation and follow-up.

3. Discussion

Cerebral venous thrombophlebitis (CVT) in the postpartum period is an uncommon but serious neurological emergency. The estimated incidence ranges from 11 to 20 per 100,000 deliveries [9]. The superior sagittal sinus is most frequently involved [10]. Pregnancy-associated physiological hypercoagulability, dehydration, and endothelial injury contribute to thrombogenesis [11]. In eclampsia and HELLP syndrome, these mechanisms are accentuated by systemic endothelial dysfunction, platelet aggregation, and microangiopathic haemolysis [12].

Recent systematic reviews confirm that pregnancy and the early postpartum period account for approximately 10–20% of all CVT cases worldwide [4, 5, 13]. Wang et al. (2024) and Zhang et al. (2025) demonstrated that anaemia, thrombocytopenia, and caesarean section are major risk factors in this population [5, 6].

Diagnosis is often delayed in resource-limited settings. MRI with MR venography remains the gold standard, but CT scanning can reveal indirect findings such as cortical hypodensity or the "empty delta" sign [9]. Early anticoagulation is crucial, even in the presence of haemorrhagic infarction, to

prevent thrombus propagation [14]. In HELLP syndrome, initiation must be delayed until haemostasis improves. In this case, LMWH was started once platelets exceeded 100×10^9/L, leading to progressive recovery.

Thrombophilia screening identifies inherited mutations (factor V Leiden, prothrombin G20210A, protein C/S deficiency) in up to 15% of CVT cases [15], but testing is often unavailable in low-income regions. In this case, the absence of prior thrombosis and the obstetric context indicated secondary rather than inherited causes. Direct oral anticoagulants (DOACs) are now being evaluated for CVT management [16, 17], though warfarin remains the standard in most settings.

Comparative studies and meta-analyses have shown excellent outcomes with timely anticoagulation, with over 85% achieving full or partial recovery [13, 18]. Recent African and Asian studies report similar outcomes when intensive care and anticoagulation protocols are adhered to [19, 20]. Our patient's outcome supports this evidence, with recovery despite diagnostic and logistical constraints.

Other supportive ICU interventions—such as seizure control, osmotherapy, and strict haemodynamic monitoring—are vital to limit secondary brain injury. Renal replacement therapy was necessary due to severe acute kidney injury, which may have been multifactorial, related to microangiopathy, haemodynamic instability, and nephrotoxic exposures.

From a critical care perspective, this case emphasises the importance of multidisciplinary coordination. Obstetricians, neurologists, nephrologists, and intensivists must collaborate to optimise care. Furthermore, awareness and clinical vigilance are crucial for early detection of neurological complications in postpartum patients with hypertensive disorders.

This report's limitations include absence of MRI confirmation, no thrombophilia testing, and limited neuroimaging follow-up. Nevertheless, the clinical picture, laboratory profile, and CT findings were diagnosis.

This case underscores the broader public health implications. In Madagascar, maternal mortality remains high, with hypertensive disorders ranking among leading causes. Improving access to neuroimaging, intensive care infrastructure, and clinician training in obstetric critical care could significantly reduce morbidity from conditions such as CVT.

4. Conclusion

Postpartum cerebral venous thrombosis is a rare but potentially devastating neurological complication of eclampsia and HELLP syndrome. Early suspicion, appropriate neuroimaging, and timely anticoagulation remain central to management. In low-resource obstetric critical care settings such as Analankininina University Hospital in Toamasina, multidisciplinary collaboration and pragmatic decision-making are key to achieving recovery despite diagnostic limitations. Strengthening critical care capacity and clinician awareness will be essential to improving outcomes in similar contexts.

5. Ethical Consideration

Written informed consent was obtained from the patient's family for the publication of this case report and any accompanying clinical details. The study was conducted in accordance with the ethical standards of the institutional and national research committees.

Abbreviations

CVT	Cerebral Venous Thrombosis
HELLP	Haemolysis, Elevated Liver Enzymes, and Low Platelet Count
CHUAT	Centre Hospitalier Universitaire Analankininina Toamasina
BMI	Body Mass Index
ICU	Intensive Care Unit
AST	Aspartate Aminotransferase
ALT	Alanine Aminotransferase
INR	International Normalized Ratio
MAP	Mean Arterial Pressure
LMWH	Low-molecular-weight Heparin
CT	Computed Tomography
MRI	Magnetic Resonance Imaging
MRV	Magnetic Resonance Venography
GCS	Glagow Coma Scale
DOAC	Direct Oral Anticoagulants

Author Contributions

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Conflicts of Interest

The authors declare no conflicts of interest.

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