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CASE REPORT

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Anticoagulation in haemorrhagic cerebral venous thrombosis with post-partum cardiomyopathy: Case Report

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ABSTRACT

Introduction: Cerebral venous thrombosis (CVT) is one type of uncommon stroke. The postpartum period is a risk factor for CVT. Cardiomyopathy increases the risk of CVT because of prothrombotic state. CVT may be accompanied with haemorrhage. We reported a haemorrhage CVT with favourably responded with anticoagulant.

Case Presentation: We reported a 29-year-old Female, with acute onset headache, tingling, and left-sided weakness. She had a history of preeclampsia, postpartum cardiomyopathy, and mitral regurgitation. On non-contrast head CT scan revealed right occipital subdural haemorrhage. During hospitalization, the neurological deficit worsened with new-onset seizures. Non-contrast head MRI MRA revealed occipital subacute hematoma and loss of right cerebral vein topography. The patient was treated with low-dose unfractionated heparin (UFH). After 5 days of anticoagulation, the neurological deficit improved with no bleeding complication.

Discussion: Anticoagulant therapy is still recommended despite haemorrhage features in CVT. The choice of CVT therapy recommendations in cases of pregnancy and puerperium is not different. We use UFH because of the readiness of protamine sulphate as antidote and short-acting feature so that we may control the bleeding complication.

Conclusion: CVT may accompanied with haemorrhage. Anticoagulation remains the first-line treatment in CVT. We suggest clinicians to treat CVT with anticoagulant despite the presence of haemorrhage while considering the benefits and risks of the anticoagulant.

INTRODUCTION

Cerebral Venous Thrombosis (CVT) is one type of stroke commonly affecting younger age and female. CVT is uncommon and the reported annual incidence is about 5 per million (Al-Sulaiman, 2019). CVT may be present with multiple signs and symptoms, mimicking other neurological disorders. Its uncommon case and various signs and symptoms, make CVT difficult to distinguish (Idiculla et al., 2020). Patients with CVT have a high mortality and morbidity, early recognition of symptoms and treatment will improve the outcome of these patients (Bose et al., 2019; Idiculla et al., 2020).

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On Imaging, CVT may be accompanied with haemorrhage (Pongmoragot & Saposnik, 2012). One-third of CVT patients develop intracerebral haemorrhage or haemorrhagic venous infarct (Ghandehari et al., 2013). Presentation of haemorrhage in CVT makes a diagnostic and therapeutic challenge (Pongmoragot & Saposnik, 2012a; Shrestha et al., 2016). There are several established risk factors for CVT. Pregnancy and puerperium were reported to be an independent risk factor in haemorrhagic CVT (Pongmoragot & Saposnik, 2012).

Anticoagulation remains the first-line treatment for CVT. Anticoagulation may prevent thrombus growth, facilitate recanalization, and prevent deep vein thrombus (Ghandehari et al., 2013). When managing CVT with haemorrhagic, physicians must consider the benefits and risks of anticoagulation. Many literatures report no adverse outcome when managing haemorrhagic CVT with anticoagulant. Although anticoagulant for CVT is beneficial despite the presence of haemorrhage, the evidence regarding anticoagulant type, dose, and optimum time to start anticoagulation is not yet established (Hegazi et al., 2009). We reported a haemorrhagic CVT with favorably responded with anticoagulation. This case report has passed the research ethics review from the Health Research Ethics Comission of Siloam Hospitals Yogyakarta.

CASE PRESENTATION

A 29-year-old Indonesian female, presented to the emergency department with 8 hours onset of weakness and tingling sensation in her left side of body accompanied with progressive headache one day before admission. She denied any head trauma, fever, nausea, and vomiting. She had a history of postpartum cardiomyopathy with mitral regurgitation and severe preeclampsia 1 month before.

On examination, she was fully alert, mild headache (VAS Score: 3), and had normal vital signs. Neurological examination results were normal cranial nerve, left-sided hypoesthesia, and left hemiparesis (muscle strength 4 on upper and lower extremities). The total NIHSS score was 3. Laboratory results were normal. A non-contrast Head CT scan revealed a subdural haemorrhage on the right occipital.

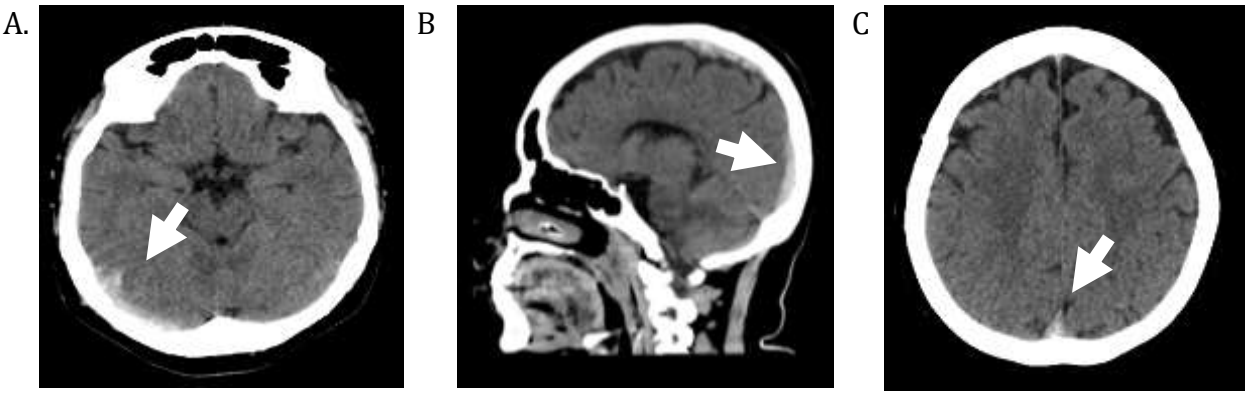

Figure 1. Non-contrast Head CT scan
A and C: Axial view of subdural haemorrhage especially on right occipital
B: Subdural Haemorrhage on sagittal view

We assessed the patient as acute subdural haemorrhage with postpartum cardiomyopathy and mitral regurgitation. We treated the patient with intravenous tranexamic acid and mecobalamin. Oral candesartan, furosemide, spironolactone, and bisoprolol were given after consultation with cardiologist for her cardiomyopathy and mitral regurgitation condition.

Six hours after admission, a focal-aware seizure occurred on the left side of body lasted for 2 minutes, and spontaneously resolved. After the seizure, the left body weakness worsened especially on the left hand. NIHSS Score after the seizure was 5. We treated the seizure with intravenous phenytoin 300 mg/day. We plan the patient for non-contrast head MRI MRA examination and blood D-dimer level. While waiting for the non-contrast head MRI MRA examination, the seizure occurred, with the same type of seizure, lasting for 3 minutes. The left side weakness worsened and the NIHSS score after the second seizure was 9.

Head MRI showed a subacute haemorrhagic lesion in the occipital and revealed no subdural haemorrhage. On Head MRA revealed loss of normal cerebral vein topography on the right side. The blood D-dimer level was 4300 ng/mL.

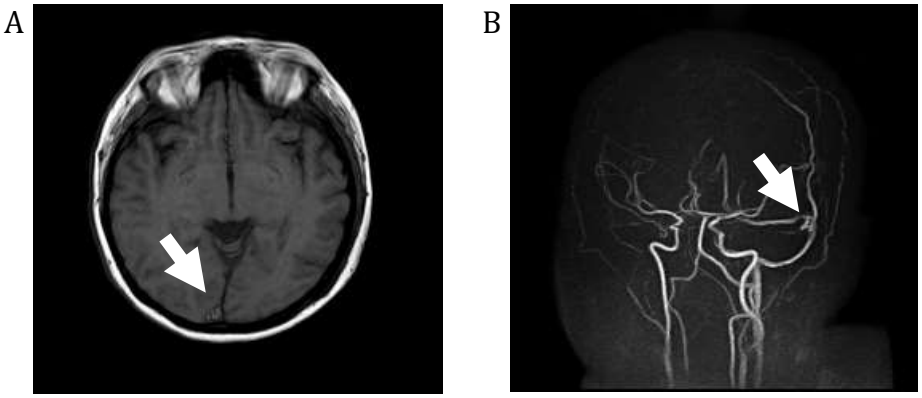

Figure 2. Non-Contrast Head MRI and MRA
A: Occipital Haemorrhage B: Spared Left Sigmoid Sinus

Based on this result, we assessed the patient with cerebral venous thrombosis with intracerebral haemorrhage. We stopped the tranexamic acid and planned anticoagulation with low dose unfractionated heparin, initial bolus dose of 60 U/kgBW continued with 12 U/kg/BW/hour. We targeted APTT 1,5-2 x control with fast bridging with warfarin 1 x 2 mg oral.

Table 1. Follow-up during anticoagulation

	Before anticoagulation	**Day 1 (during Anticoagulation)**	**Day 4 (during Anticoagulation)**	**Day 5 (during anticoagulation)**
Subjective	Seizure recurrence, left-side weakness	No Seizure, improvement of left-sided weakness	No Seizure, improvement of left-sided weakness	No seizure
Objective	Left Hemiparesis on Upper and Lower Extremities (Muscle Strength: 1)	Left Hemiparesis (Muscle Strength 4 on upper extremities, 3 on lower extremities)	Left Hemiparesis (Muscle Strength 4 on upper extremities, 4 on lower extremities)	Left Hemiparesis (Muscle Strength 4 on upper extremities, 4 on lower extremities)
Therapy	NIHSS score: 9 Phenytoin 100 mg/8 hours IV	NIHSS score: 5 intravenous UFH	NIHSS Score 3 intravenous UFH	NIHSS Score 3 Intravenous UFH Stopped
Plan	Anticoagulation with UFH		Oral warfarin 2 mg	Oral warfarin 2 mg/day, discharged

Six hours after anticoagulation, there was no seizure, and the neurological deficit improved with NIHSS score 5. After 4 days of anticoagulation, no seizure occurred, the neurological deficit improved with NIHSS score 3, and no bleeding complication. After 5 days of anticoagulation, we stopped the anticoagulant and then the patient was discharged with 2 mg oral warfarin for anticoagulation. The remaining neurological deficit when the patient discharged was left hemiparesis (muscle strength 4 in left upper and left-lower extremities) with NIHSS score 3.

DISCUSSION

We presented a case of CVT in post-partum period with postpartum cardiomyopathy. The postpartum period is a risk factor for CVT because transient prothrombotic condition. Pregnancy induces prothrombotic changes in the coagulation system dan persists during early puerperium. Volume depletion and trauma after pregnancy worsen the hypercoagulable state (Ferro et al., 2017). In this patient, cardiomyopathy also worsens the prothrombotic state and hypercoagulable state and increases the risk of venous thromboembolism in CVT (Fanola et al., 2020).

Computed Tomography (CT) is used as initial imaging in patients suspected of CVT. Anatomic variability of venous sinuses makes CT diagnosis of CVT insensitive. Hyperdensity of a cortical sign is a primary sign of acute CVT on non-contrast CT. Acutely thrombosed cortical veins and dural sinuses appear as a homogeneous hyperdensity that may be mimicking subdural haemorrhage as resulted in the initial CT of this patient (Pongmoragot & Saposnik, 2012).

The main target of CVT therapy is initiating anticoagulant therapy, treating underlying causes such as sepsis, dehydration, prothrombotic drugs, and risk factors that trigger CVT, while ensuring patient stability by stopping seizures and managing elevated intracranial pressure if necessary (Al-Sulaiman, 2019; Ulivi et al., 2020). Haemorrhage is one of the clinical features that occur in CVT patients, either naturally or associated with anticoagulation drugs (Ferro et al., 2017). In this case, the bleeding was present at the time of admission, which created a dilemma in anticoagulation administration. Anticoagulant therapy is still recommended despite haemorrhage features in CVT (Gordon, 2004; Pongmoragot & Saposnik, 2012).

Evidence for choosing anticoagulation in treating cases of CVT remains weak because of the rarity of CVT. Therapy for CVT is guided by consensus and not from high-quality trials. Treatment with Unfractionated Heparin (UFH) or Low-Molecular-Weight Heparin (LMWH) is recommended in the acute phase of CVT (Field & Hill, 2019). In the previous report, it was found that cases of death were found to be higher following the administration of UFH compared to LMWH but in general, the clinician must balance the risks and benefits of anticoagulation depending on the clinical situation (Gordon, 2004; Misra et al., 2012).

The choice of therapy recommendations in cases of pregnancy and puerperium is not different from cases of acute CVT in adults in general, the choice of therapy in pregnant women remains with LMWH because it has lower side effects such as osteoporosis, although both are safe because they do not cross the placenta. In breastfeeding mothers and in the puerperium, LMWH and UFH and warfarin may be used. The guideline also suggests giving anticoagulant in pregnant and puerperal women with acute CVT. Some anticoagulants that often used may be transferred to breast milk but no adverse effects reported and well-tolerated (Ferro et al., 2017). In this case report, we use UFH because of the readiness of protamine sulfate as antidote and short-acting feature so that we may control the bleeding complication during anticoagulation.

The duration of oral anticoagulant therapy for CVT will depend on the patient's condition. The evidence of whether long-term (>6 months) anticoagulation improves outcome in CVT remains

weak. Long-term therapy is required for life in recurrent CVT, CVT followed by VTE, CVT with thrombophilia with INR target 2-3 (Idiculla et al., 2020b). It is suggested that using oral anticoagulant therapy with Vitamin K Antagonist (VKA) for 3-12 months to prevent recurrent CVT and other thromboembolic events (Ferro et al., 2017). Data regarded the recurrence of CVT are very limited. Although very rare, some studies found that history of venous thromboembolism and the presence of one or more anti-phospholipid antibodies (Shu et al., 2022). Pregnant women and women in the puerperium period can be given oral anticoagulant therapy for up to 6 weeks postpartum. It is also recommended to replace all hormonal contraceptives to become non-hormonal (Idiculla et al., 2020).

CONCLUSION

Cerebral venous thrombosis is one type of uncommon stroke type. The manifestation of cerebral venous thrombosis may mimic other neurological diseases. The most common manifestations of cerebral venous thrombosis are headache and seizure. Cerebral venous thrombosis may be a diagnostic challenge, the recognition of risk factors and the clinical manifestation are important for the suspicion of cerebral venous thrombosis. Brain imaging combined with blood D-dimer levels may lead clinicians to confirm cerebral venous thrombosis diagnosis.

Imaging of cerebral venous thrombosis may accompany with haemorrhage. Anticoagulation remains the first-line treatment for cerebral venous thrombosis. The evidence regarding the anticoagulant type, dose, and optimal timing for haemorrhagic CVT remains unclear. Despite this limited evidence, we suggest clinicians to treat haemorrhagic CVT with anticoagulant while considering the benefits and risks of anticoagulant.

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