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## Central dural venous thrombosis presenting with lateral rectus palsy in pregnancy

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### Abstract

**Background:** Cerebral venous sinus thrombosis (CVT) is a rare neurological emergency that occurs more often among women during pregnancy and puerperium than the general population. Isolated cranial nerve palsies are uncommon in pregnant women and abducens nerve palsy during pregnancy is extremely rare.

**Methods:** We report a case of a woman with hypothyroidism and gestational diabetes mellitus at 32+3 weeks of gestation who was diagnosed with gestational hypertension 2 weeks prior to the presentation of lateral rectus palsy.

**Conclusions:** Therapeutic guidelines for CVT in pregnant women are difficult to establish, as the incidence of CVT in pregnancy is rare. If a patient presents with a new persistent headache and abnormalities on neurologic examination during pregnancy, obstetricians and neurologists should consider CVT, and MRI should be performed immediately.

**Keywords:** Cerebral venous sinus thrombosis, isolated cranial nerve palsy, lateral rectus palsy, Anticoagulation therapy

### Introduction

Cerebral venous sinus thrombosis (CVT) is a rare neurological emergency that occurs more often among women during pregnancy and puerperium than in the general population [1]. The incidence of CVT during pregnancy and puerperium in women is 11.6/100,000 deliveries per year, accounting for 6-64% of pregnancy-related strokes [2]. In India, the rate of pregnancy-related CVT is 450/100,000 deliveries [3] and accounts for 9-15% of the overall death and dependency rate of pregnant women [3,4].

The hypercoagulable state of pregnancy and puerperium is considered to be one of the main pathophysiology associated with pregnancy-related CVT [5]. The specific pathophysiological observations include iron deficiency anaemia, alterations in platelet function and in pro- and anti-thrombotic protein function and levels, and changes due to acute trauma or haemorrhage during labour and delivery [6]. As a result of these pathophysiological changes, the clinical manifestation of pregnancy-related CVT includes sudden-onset headaches, blurry vision, focal neurologic deficits, altered level of consciousness, and seizures. As these symptoms are non-specific and can be confused with normal pregnancy state, it is difficult to diagnose and treat this disease in a timely manner, thereby making it a potentially life-threatening condition.

Acute neurological conditions requiring hospitalization in pregnancy are rare, the most common reason being seizures [7]. Isolated cranial nerve palsies are uncommon in pregnant women and abducens nerve palsy during pregnancy is extremely rare [8,9]. The abducens nerve has a long way from the brain stem to the lateral rectus muscle in the orbit, so paralysis may result from any lesion of the nerve between the pons and orbit [8,10,11]. We report a case of a woman with hypothyroidism and gestational diabetes mellitus at 32+3 weeks of gestation who was diagnosed with gestational hypertension 2 weeks prior to the presentation of lateral rectus palsy.

### Case report

A 27-year-old female was referred to our centre on account of imminent signs of severe pre-eclampsia. She presented with headache, blurring of vision and inability to close left eye at 32+3 wog (Figure 1). Her obstetric score was G2PIL1. The patient was diagnosed with hypertension, hypothyroidism, and gestational diabetes mellitus 2 weeks prior and was not on any treatment. She had no history of fever or head injury.

### On admission, Examination

The blood pressure was 160/100 mmhg with proteinuria. The patient was started on labetalol 200 mg BD. Fundoscopic examination showed grade 3 hypertensive retinopathy and extra ocular muscle examination showed right eye lateral rectus palsy and right eye esotropia and left eye nystagmus, mild ptosis.

### Radiology

Once the vitals were stable, the patient was subjected to MRI Brain and orbits with venogram. Results revealed central dural venous thrombosis involving anterior half of superior sagittal sinus (Figure 2).



Fig 1: Lateral rectus palsy

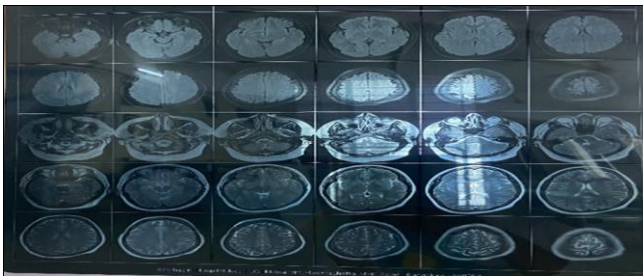


Fig 2: MRI brain and orbit with venogram

### Course in hospital

The patient was started on INJ Clexane 60 mg BD, *T. acitrom* 3 mg HS by the neurologist. INR was monitored daily to maintain above 2.5. During the course of admission, INR was maintained and neurological symptoms improved by 10 days of admission and the patient was discharged with the advice of medication *T. acitrom* 2 mg HS. The patient was regularly followed up and Elective LSCS was planned at 38<sup>th</sup> week. *T. acitrom* was stopped 5 days before surgery. She delivered a healthy male baby of weight 2.3 kg and had an uneventful post op period. Anticoagulants was given for 5 days and symptoms were fully resolved. The patient was discharged on POD5 with stable vitals. She was followed up regularly for 3 months and underwent a full recovery without any complaints or symptoms.

### Discussion

Pregnancy and postpartum period are high-risk phases for innumerable complications in a woman's lifetime, because of re-disposition of the maternal cardiovascular circulation, particularly third trimester of pregnancy and the first four weeks postpartum [12-14]. In addition, neurological symptoms like headache befall, often instigated by sleep deprivation, irregular food intake, or dehydration. All these factors along with the hormonal vacillations in oestrogen levels may result in postpartum headache and clouding of consciousness [15-17]. Diagnosis can be easily muffed with other common causes of headache or seizure presenting with similar clinical features in pregnancy.

Isolated cranial nerve palsies are uncommon among pregnant women. However, our case presented with visual symptoms suggestive of isolated cranial nerve palsy. The sixth nerve is a purely somatic nerve and runs the longest intracranial course of all the cranial nerves. After arising from the abducens nucleus located in the caudal pons at the level of the facial colliculus, it exits the brainstem ventrally at the border of the pons and medulla. It then climbs superiorly along the ventral surface of the pons. On reaching the apex of the petrous portion of the temporal bone, it makes a sharp turn anteriorly to enter the cavernous sinus. The sixth nerve then travels through the cavernous sinus close to internal carotid artery, to enter the orbit through the superior orbital fissure. The third, fourth and fifth cranial nerves lie on the lateral wall of the cavernous sinus. Possible causes of sixth nerve pathology in pregnancy include inflammation of the nerve, downward displacement of the nerve secondary to oedema/increased intracranial pressure and vasospasm of the vessels to the nerve [18]. In pregnant women with an isolated sixth nerve palsy, reported causes include head trauma, preeclampsia, thrombosis of cerebral sinuses including the cavernous sinus. Pregnancy-related cerebral venous thrombosis has also been reported in that the risk of peripartum central venous thrombosis increased with increasing maternal age, Cesarean delivery, as well as in the presence of hypertension, infections, and excessive vomiting in pregnancy [19]. Our case was diagnosed with gestational hypertension 2 weeks before clinical presentation.

Due to its superior diagnostic accuracy, MRI is the most suitable option for diagnosing CVT in pregnant women, especially as it does not expose them to radiation, and it clearly differentiates soft tissues. Recent studies have shown that MRI performed with a 1.5-T magnet is safe for diagnosis in pregnant women at all trimesters [20]. Our case was diagnosed with central dural venous thrombosis involving anterior half of superior sagittal sinus on MRI brain and orbit with venogram.

Anticoagulation constitutes the first-line therapeutic option for managing the acute stage of CVT [21, 22]. An important factor to consider with anticoagulation therapy is the potential consequence of intracranial hemorrhaging, especially in pregnant women [23]. If anticoagulation therapy fails, the patient should be started on fibrinolytic drug therapy [12, 21, 22]. Our case showed improvements in symptoms on anticoagulation therapy and underwent a successful LSCS at 38 week with regular monitoring and follow-up.

Therapeutic guidelines for CVT in pregnant women are difficult to establish, as the incidence of CVT in pregnancy is rare. If a patient presents with a new persistent headache and abnormalities on neurologic examination during pregnancy, obstetricians and neurologists should consider CVT, and MRI should be performed immediately.

### Conclusions

It is a rare condition and its presentation is extremely variable and life threatening.

Due to its diverse and varied neurological presentation. Cerebral venous sinus thrombosis should be considered in almost any brain syndrome.

### Declarations

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Conflict of interest: None

Ethical approval: Taken from IEC, Sapthagiri Institute of

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