



CESAREAN DELIVERY IN A PATIENT WITH ACUTE CEREBRAL VENOUS SINUS THROMBOSIS, CEREBRAL INFARCTS AND A RECENT COVID 19 INFECTION

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Introduction:

Cerebral venous sinus thrombosis (CVST) occurs in the context of a hypercoagulable state with incidence of about 2–5 cases per million in general population and 1:10 000 - 1:25 000 in pregnancy. Risks factors include pregnancy, pre-eclampsia, anti-phospholipid syndrome, factor V Leiden, protein C and S deficiency, prothrombin mutation, COVID illness. We report a case of a pregnant patient with CSVT undergoing successful administration of neuraxial anesthesia for delivery.

Case report:

A 28 year old G5P4004 female with PMH of smoking, obesity, previous 4 x Cesarean sections and post-partum hemorrhage, admitted to the hospital at 36 weeks gestation with a 3-day history of progressively worsening frontal headache, right monocular blurriness and “red spots” in the right visual field. PMH relevant for COVID illness one month prior.

VS: Normal except for tachycardia at 107 BPM

BMI: 38kg/m²

Neurological exam: unremarkable

HELLP labs were negative

Bilateral venous dopplers failed to demonstrate any evidence of deep vein thrombosis

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MRI brain: ~15mm left posterior temporal occipital cortical hyperdense lesion with associated restricted diffusion likely a venous infarct in the setting of dural venous thrombosis; small infarct of the medial right adjacent parietal lobe. Complete thrombosis of the parasagittal sinus and transverse sinuses.

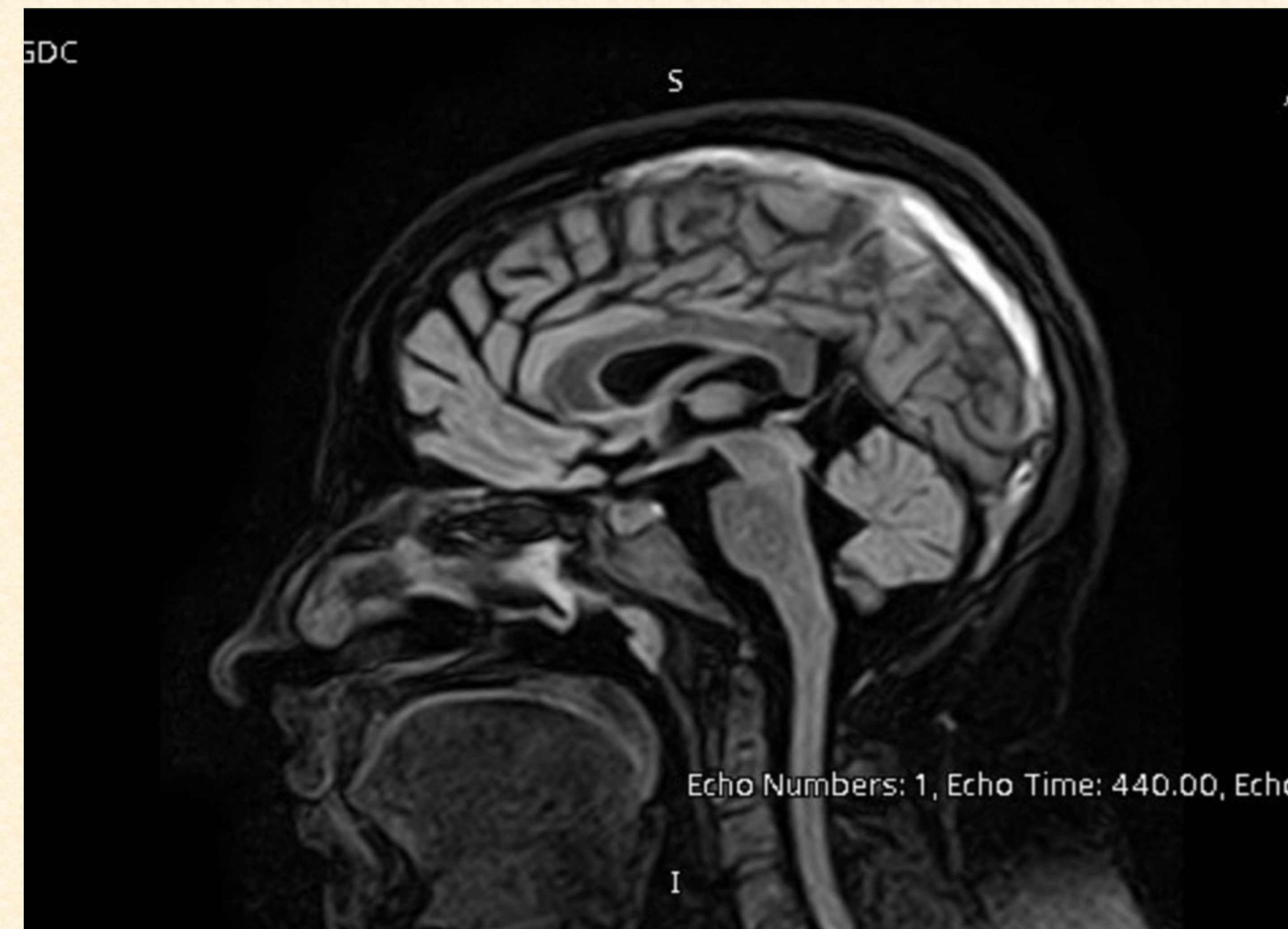


Figure 1. MRI brain - complete thrombosis of the parasagittal and transverse sinuses





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Hospital course:

She was admitted to the NSICU with CVST in the setting of pregnancy and recent COVID infection being the likely contributing factor to her hypercoagulable state.

Patient outside tPA window, as her last normal was 3 days prior.

Started on heparin infusion for anticoagulation.

Planned delivery at 37- 38 weeks, as patient was at high risk for uterine rupture and operative complications due to a history of previous 4 c-sections.

MRI was repeated on day 9 and showed persistence of the superior sagittal sinus thrombosis, attenuating flow in both transverse sinuses and evolving extensive venous sinus and cortical venous thromboses and small left parietal venous infarct. Decision was taken after a multidisciplinary meeting for a c-delivery at 37 weeks. Heparin infusion stopped according to ASRA/SOAP guidelines, INR and PTT checked and found to be normal. Pre – operative arterial line obtained.

OR course:

VS stable before neuraxial anesthesia

Spinal anesthesia at L4-L5 level using 25G Pencan needle, 1.6ml of hyperbaric bupivacaine(0.75%), 200mcg of epinephrine, 150mcg of Morphine PF and 15mcg of Fentanyl.

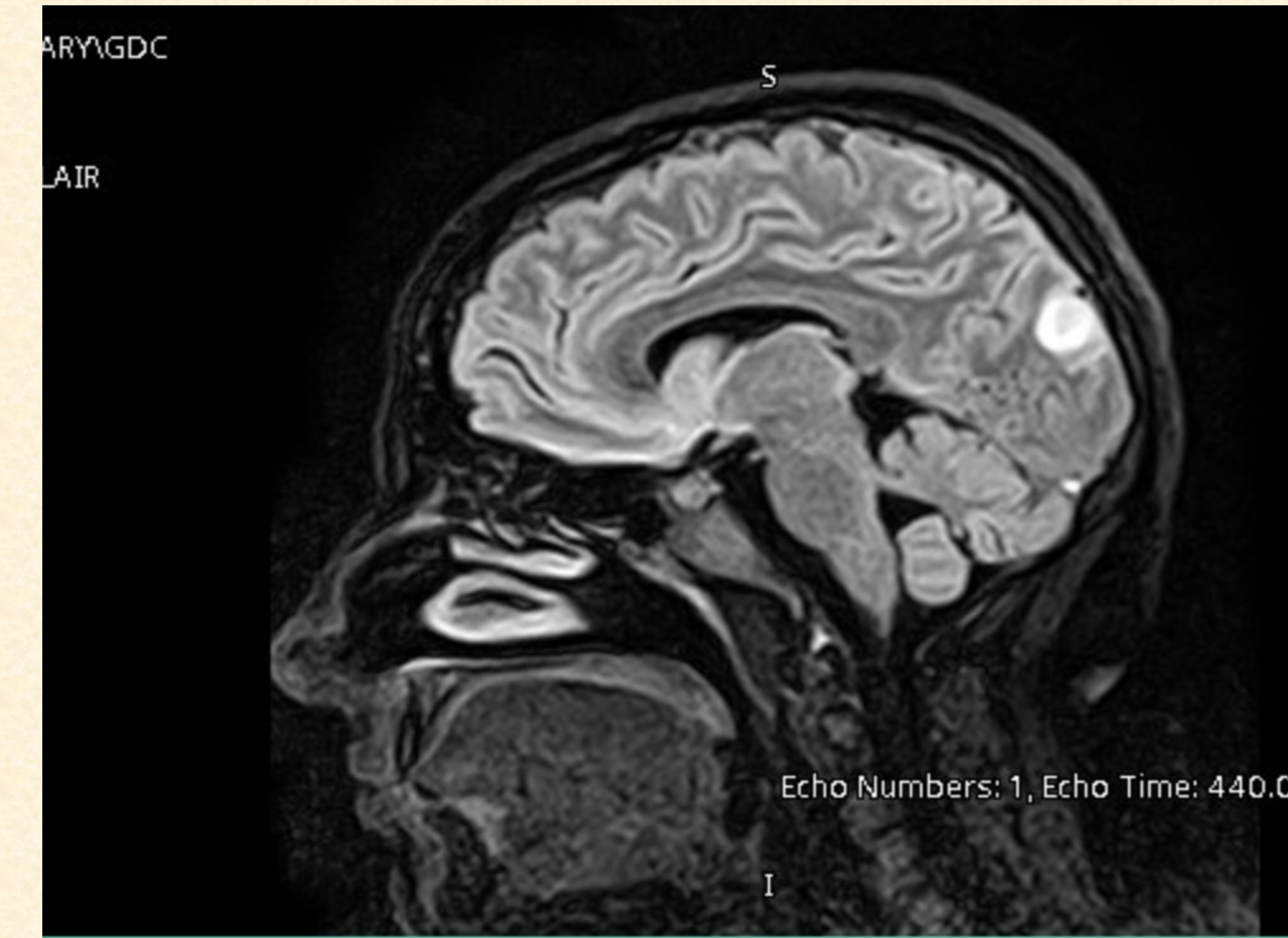


Figure 2. MRI brain - posterior temporal occipital hyperintense lesion (a small infarct of the medial right adjacent parietacortical lobe).

Phenylephrine drip started prophylactically
QBL was 460ml and surgery was otherwise unremarkable.

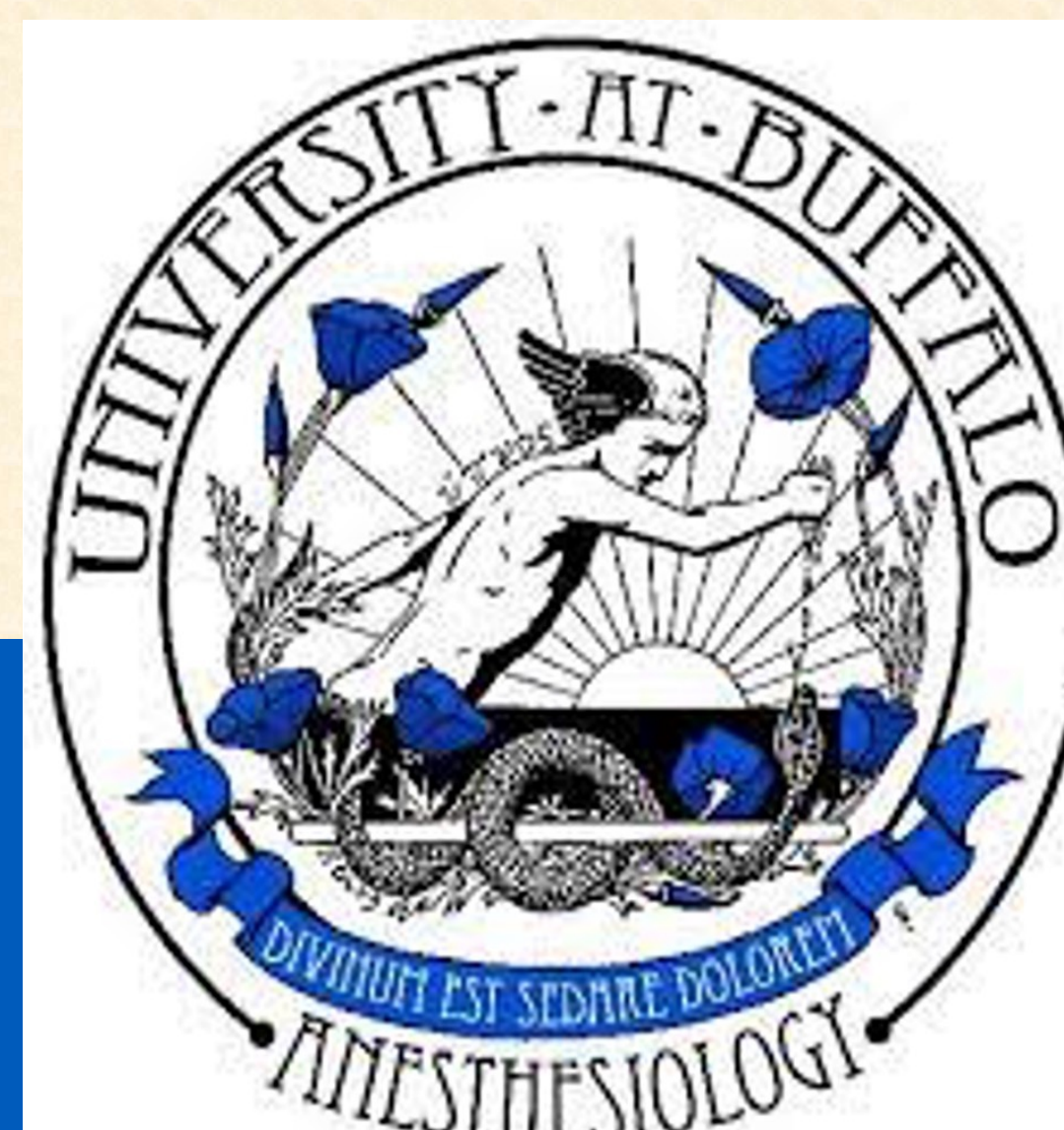
She was transferred to the NSICU for post operative monitoring.

Heparin re-started 8 hours postoperatively

Post - operative MRI of the brain was comparable with pre-operative study but with evidence of minor posterior parietal–occipital subarachnoid hemorrhage.

POD#2 – patient was started on Coumadin bridged with SC Lovenox

POD#8 – discharged home





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Discussion:

Our patient was at higher risk of CVST due to her pregnancy related pro – thrombotic state and a recent COVID illness. SARS-CoV-2 infection has been associated with increased pro-thrombotic and inflammatory markers, which accounts for the high incidence of DVTs and cryptogenic strokes in these patients⁽¹⁾. Thus, despite her COVID infection having been fairly mild, it is possible it contributed to formation of her CVST.

Benefits and potential adverse effects of GA vs. neuraxial anesthesia were carefully considered in this case. There was a concern that neuraxial anesthesia can potentially result in extension of the thrombosis and misdiagnosis of worsening CVST after delivery. This is based on the theory that dural puncture causing CSF leak and depletion would result in intracranial hypotension⁽²⁾. Compensatory vasodilation within the cerebral vasculature could decrease blood flow velocity and along with decreased CSF absorption in the venous sinuses would subsequently result in increased blood viscosity. These processes were hypothesised to magnify the risk of CVST formation in pregnant patients.

On the other hand, general anesthesia could be harmful due to the potential increase of ICP with airway instrumentation and a hypertensive response resulting in cerebral hemorrhage at site of cerebral infarct with impaired autoregulation.

It is worth noting, that a significant CSF leak is most likely to occur in a setting of accidental dural puncture with a large gauge epidural needle rather than an intentional dural puncture with a pencil point needle ⁽⁴⁾.

A single shot spinal injection with a 25 gauge Pencan needle carried a very small risk of a CSF leak and would not increase the risk of developing or worsening CVST.

Phenylephrine infusion was titrated intraoperatively and blood pressure maintained at about 140/80. Cerebral autoregulation is impaired at the site of infarct and hence careful maintenance of BP is extremely important as hypertension can result in cerebral hemorrhage and hypotension can increase the size of infarct

References:

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