

Severe Neurological Complications in Pregnancy: A Case of ADEM

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Case

Patient: 33-year-old woman, 30 weeks' gestation

History:

- Poorly controlled ulcerative colitis (UC)
- Multiple unprovoked deep vein thromboses (DVTs)
- On long-term anticoagulation with apixaban

Initial Presentation:

- Severe UC flare, headache, vomiting
- CT and MRI: no acute findings
- Treated with IV steroids → transient improvement
- Discharged after 48 hours

Re-presentation (Day 3):

- Increasing lethargy, dysarthria, reduced consciousness
- Deteriorated on ICU sedation hold
- Repeat CT (figure):
 - diffuse white matter injury, basal ganglia infarcts, hydrocephalus, and signs of impending cerebral herniation

Decision to Deliver (Day 4):

- Emergency caesarean section at 30 weeks' gestation due to worsening neurological status and imminent risk of maternal death

CT Head (Day 3)

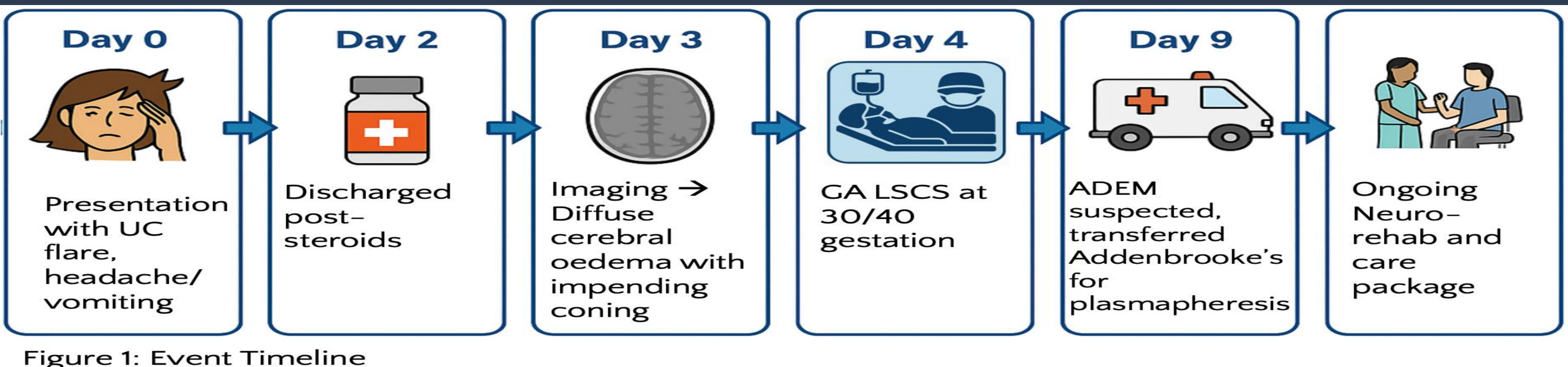


Figure 1: Event Timeline

Anaesthetic Management of Raised Intracranial Pressure

Anaesthetic Objectives:

- Prevent increases in intracranial pressure (ICP)
- Maintain adequate cerebral perfusion pressure (CPP)
- Deliver a viable preterm infant safely

Key Interventions:

- **Total Intravenous Anaesthesia (TIVA):** with deep neuromuscular blockade to minimise haemodynamic response to intubation and avoid ICP spikes [1]
- **Ventilation Strategy:** optimised oxygenation and CO₂ control to support cerebral autoregulation
- **Blood Pressure Management:** invasive monitoring to tightly maintain MAP and CPP
- **Pupillary monitoring:** intraoperative neurological trend detection
- **Osmotherapy:** antenatal mannitol avoided due to risk of fetal intracerebral shifts; hypertonic saline considered safer [2]
- **Mannitol reserved for postpartum use** in controlling maternal ICP [2]

Post Operative Course

Post Natal (Day 5)

- Transferred to Addenbrooke's Hospital
- Diagnosis of ADEM confirmed based on clinical and imaging features
 - Initiated on plasmapheresis
- Despite intervention, prognosis remained poor
- Patient transitioned to hospice care
 - Now able to interact minimally with family

Ethical & Legal Consideration

- Emergency delivery occurred without confirmed aetiology
- Balancing fetal prematurity against rapidly declining maternal neurology
- Complex decision-making around escalation, consent, and potential withdrawal of care
- Required input from obstetrics, anaesthesia, ICU, neurology, and ethics team

Discussion [3,4,5]

Acute Disseminated Encephalomyelitis (ADEM) is a rare, immune-mediated demyelinating disorder of the central nervous system, typically affecting children after infection or vaccination. It is uncommon in adults and extremely rare during pregnancy, where its presentation can mimic obstetric neurological emergencies such as eclampsia, cerebral venous thrombosis, or central pontine myelinolysis.

This case highlights the unique challenges of diagnosing and managing haemorrhagic ADEM in a pregnant patient. Pregnancy introduces significant physiological changes that affect intracranial dynamics and anaesthetic care. Altered cerebrospinal fluid buffering, modified vascular reactivity, and the need to balance cerebral and placental perfusion all complicate management.

Neuroanaesthetic principles must be adapted to the obstetric context, including:

- Preference for total intravenous anaesthesia (TIVA) over volatile agents
- Precise control of carbon dioxide levels and mean arterial pressure
- Cautious use of fluids and osmotic therapies
- Strategies for postoperative neuroprotection

This case underscores the importance of early critical care input, prompt multidisciplinary collaboration, and personalised anaesthetic strategies in managing rare central nervous system disorders during pregnancy.

Key Learning Points

- ADEM, though rare, should be considered in rapidly progressive encephalopathy during pregnancy
- Emergency caesarean may be required to facilitate maternal resuscitation, even in diagnostic uncertainty
- Neuroanaesthetic strategies can be adapted to the obstetric setting
- Full-dose osmotherapy should be avoided before delivery; hypertonic saline may be safer antenatally [2]
- Complex ethical decisions should be anticipated and supported by structured team communication

References

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