



Sudden Death from Infectious Encephalitis in a pediatric patient

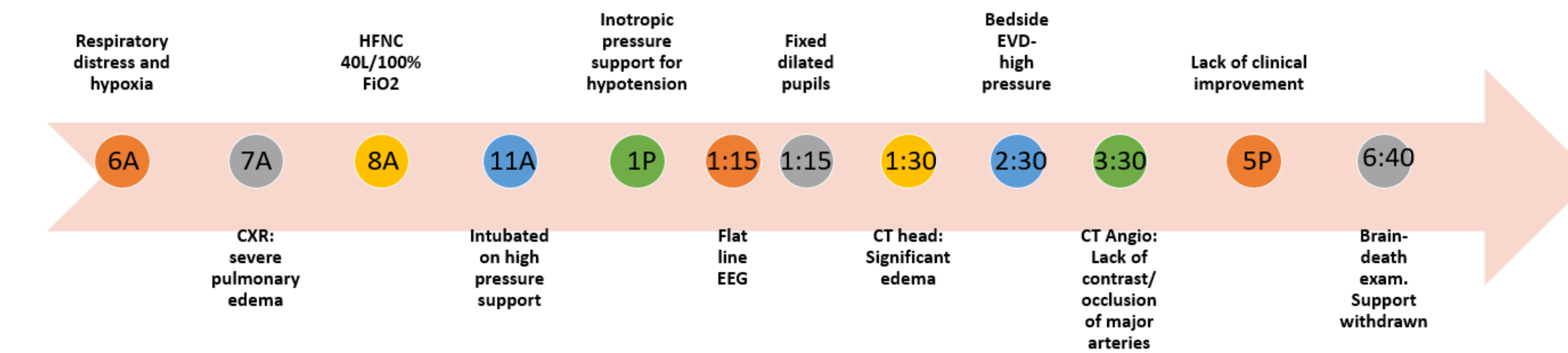
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BACKGROUND

- Most influenza A infections in childhood and young healthy adults are either asymptomatic or cause mild symptoms.
- In very rare occasions, it can lead to complications that increase morbidity and mortality.
- Rare but known complications include pneumonia, cardiac dysfunction, acute respiratory distress syndrome, and multi-system organ damage/failure.
- **Acute fulminant cerebral edema (AFCE)** is a subtype of acute encephalitis that is defined as a rapidly progressive neurological disease manifesting with acute altered mental status, leading to multi organ failure, coma and possibly death.
- The pathophysiology of influenza-associated cerebral edema and encephalitis is theorized to be related to a cytokine storm.
- There are very few reported cases of influenza A associated encephalitis leading to death in the pediatric population

- Work up revealed severe pulmonary edema on chest Xray. Initial Head CT was unremarkable. Lumbar puncture studies were negative for PCR and culture with only elevated protein. EEG reflected encephalopathy. Respiratory panel was positive for Influenza A. All other cultures were negative.
- She received Tamiflu, vancomycin, Piperacillin-tazobactam, and ceftriaxone in meningitis dosing.
- Further examination revealed new onset fixed dilated pupils and sudden EEG flattening.
- Head CT showed severe cerebral edema, loss of white-gray matter differentiation and hydrocephalus.
- Contrast Head CT revealed **lack of contrast** in the intracranial arteries.
- Emergency bedside EVD placement was performed revealing **high ICP** (around 60mmHg).
- Repeat Head CT revealed insignificant changes.
- CT angiography revealed complete **occlusion of ICA, V3-4** segments of vertebral arteries and effacement of basal cisterns and ventricles.
- Patient pronounced brain dead.
- Care withdrawn. Autopsy report pending



Timeline of events leading to death

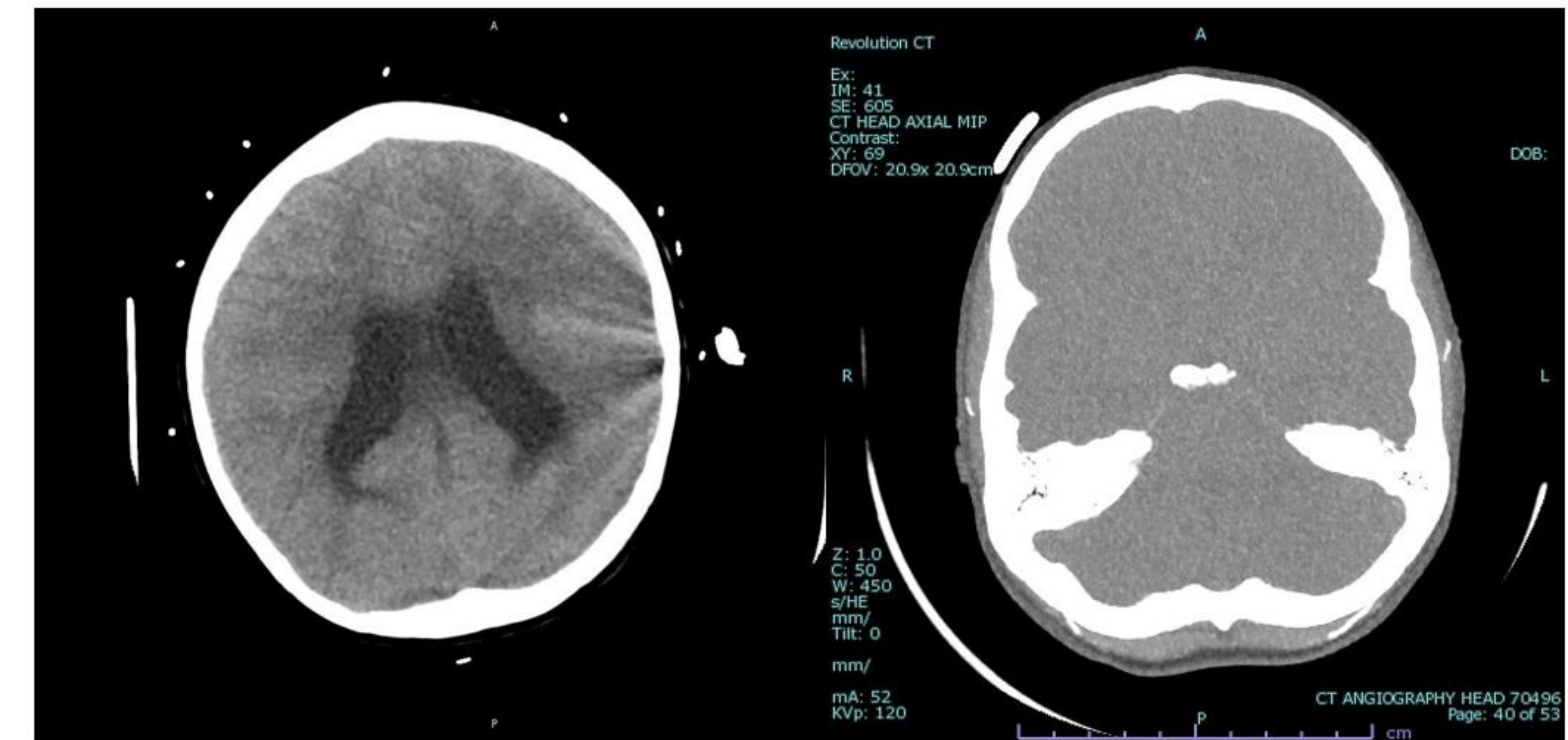


Figure 1a: ventriculomegaly and cerebral edema. Figure 1b: absence of contrast in intracranial arteries.

Case Presentation

- 9-year-old female presented with altered mental status.
- Within 12 hours of admission, she had worsening respiratory distress and support was quickly escalated to endotracheal intubation. Multi-organ dysfunction ensued, and she was started on Epinephrine and Norepinephrine drips.



Right and left carotid bifurcation revealing complete occlusion of the ICA.

CONCLUSION

- The pathophysiology of AFCE remains complex. It is a combination of hypoxic-ischemic injury, systemic inflammatory response, and potential genetic predisposition.
- This case highlights the need to identify potential risk factors in the progression of ACFE and the need for continued research.

References:

Santiago LE, Alvi AT, Nadeem Z, Chaudhry A. Acute Fulminant Cerebral Edema Caused by Influenza Type B in an 18-Year-Old Female: A Rare Case. Cureus. 2023 Sep 18;15(9):e45501..