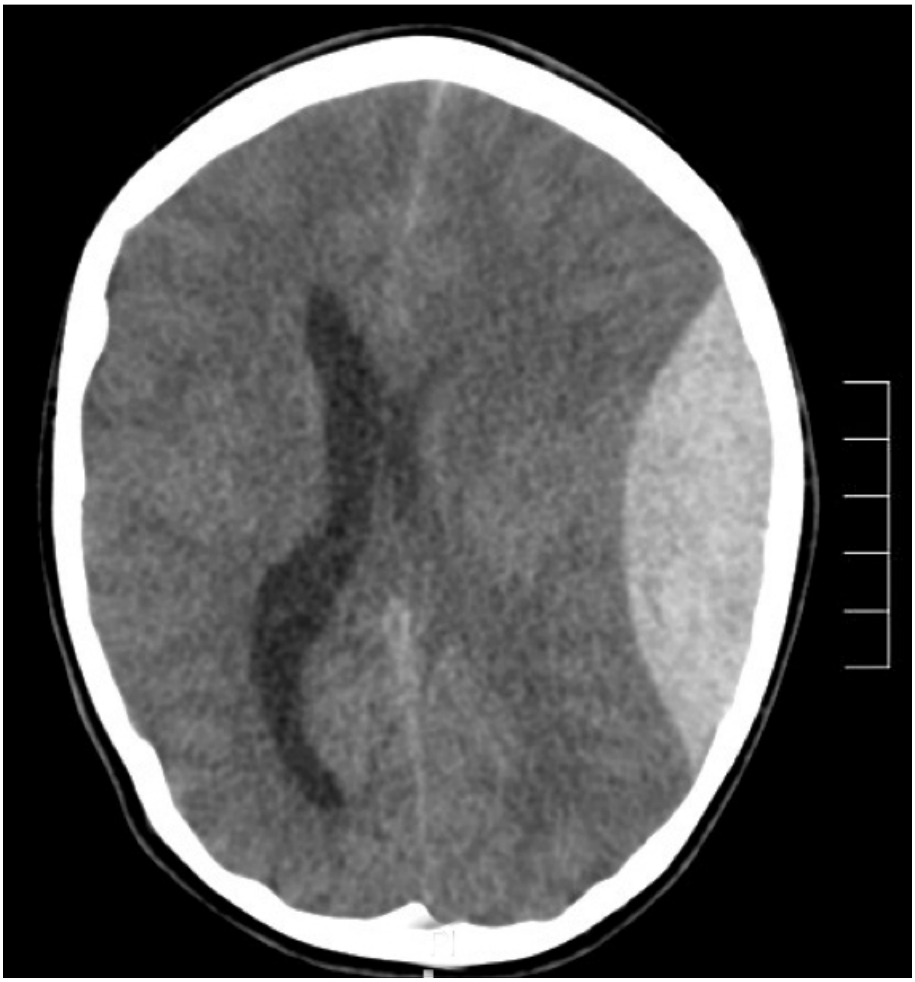
VAQ 2010.1.8 (CT)

An 11 year old boy has an isolated head injury after falling from a skateboard 10 hours ago. He has a GCS of 4 with decerebrate posturing.
An image from his non contrast head CT scan is shown.



a. Describe and interpret his CT scan (30%)
b. Outline your pre-operative treatment in the emergency department (70%)

This is a severe head injury with a large left extradural haemorrhage with signs of raised ICP including midline shift.
He needs immediate management with a focus on avoiding hypoxia and hypotension, secondary neuroprotection, and expeditious neurosurgical decompression.

CT head

axial slice
level of lateral ventricles
Approx 9×4 cm biconvex hyperdensity in left parietal region
does not cross suture lines
compressive effects on adjacent brain
consistent with extradural haematoma and pressure effect

Loss of sulcal markings
Effacement of left lateral ventricle
Prominent right lateral ventricle may be early hydrocephalus
Midline shift approx 1.5 cm away from lesion
No skull fracture identified (but not bony windows)
Degree of grey-white differentation preserved
No intracerebral haematoma seen

Pre-operative treatment
Weight for 11yo – (11+4)x2 = 30 kg (individualise if 'big' 11yo)

Secondary neuroprotection
- key issues
  - avoid hypotension, avoid hypoxia

Other issues
- maintain euglycaemia, head up 30 degrees, ensure cervical spine adequately cleared or image
- consider osmotic agents (at least one and dose)
  - mannitol 1 g / kg (30g)
  - (alternative 3% hypertonic saline 3ml/kg (90ml) – therapeutic hypernatraemia as target of 150-160 serum Na)

Definitive airway (ETT) with non-hypotensive RSI
- (e.g. ketamine 1.5 mg/kg (45mg), suxamethonium 1.5 mg/kg (45mg))

Controlled ventilation – pCO2 35-40

Fluid boluses 10mg / kg 0.9% saline as required to maintain blood pressure (300ml)
Consider phenytoin 15mg/kg infusion (450mg)
Prompt involvement of neurosurgical team and expeditious transfer to OT

Time permitting, consider post-intubation cares
- Chest radiograph to confirm hardware placement
- IAL, CVL (partic if using hypertonic saline)
- IDC, OGT
- infusion – fentanyl / midazolam 50mg/500mg in 50ml starting at 5ml/hr
- paralysis – vecuronium 3mg boluses as required