Management of Head Trauma

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June 3rd 2010
• CC: s/p fall

• HPI: This is an 87 y/o female who fell while walking to the bathroom and hit her head. When seen in ED the patient was found to be AAOx3 with a GCS of 15. She had a c/o headache along with vomiting and she denied any LOC.
• PMHx: HTN, Arthritis, CAD, hypercholesterolemia

• PSHx: CABG ‘00, stent ’03, ‘06

• Allergies: NKDA

• Meds: lopressor, losartan, aspirin, plavix, atorvastatin

• SHx: non-contributory
• **Vitals:** Temp 97.3° F   BP 118/48   HR 77   RR 14   O2 sat 100%

• **Physical Exam:**
  
  General: AAOx3
  
  HEENT: NCAT, EOMI, PERRL
  
  C-spine: collar in place, no cervical spine tenderness
  
  Chest: CTA bilaterally
  
  CVS: S1S2, rrr
  
  Abdomen: soft, +BS, NT, ND
  
  Back: no TLS tenderness or step-offs
  
  Extr: no edema or calf tenderness, FROM
  
  Rectal: good tone, no gross blood
• Labs:

CBC: 8.4 / 8.8 / 27 / 290
Chem: 133 / 3.6 / 95 / 28 / 19 / 0.8 / 120
Coags: 11.4 / 23.3 / 0.8
ABG: 7.483 / 29.2 / 188 / 100% / 23.8 / -1.3
Lactic acid: 1.0
Trop I <0.02
• Radiologic Studies:
  
  **CXR:** no rib fractures, no PTX
  **PXR:** no fractures
  **Head CT:** acute left hemispheric subdural hematoma, 15mm left to right midline shift
  **C-spine CT:** no acute fracture, subluxation or prevertebral swelling
  **CT Abd/Pelvis:** no intra-abdominal free air or fluid, no evidence of retroperitoneal bleed
Radiologic Studies: Head CT
• **Consult:** Neurosurgery

• **Plan:** Admitted to NeuroSurgical ICU
  
  NPO, IVF
  
  seizure prophylaxis
  
  transfusion of platelets
  
  Pre-op for OR
• **Intra-op:**

  Prior to OR the patient became drowsy and was intubated in ED. She was taken to the OR and underwent a left craniotomy with evacuation of subdural hematoma

• **Post-op course:**

  A repeat Head CT was obtained which revealed a re-accumulation of a left hemispheric subdural hematoma with left to right midline shift
• Post-op course: Head CT

1557837KI
Contrast:
Gantry: 14°
FoV: 250 mm
Time: 1000 ms
Slice: 5 mm
Pos: -74.705
FFS

F: STANDARD
MAS: 140
120 kV
Image no: 16
Image 16 of 30
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• The patient was taken back to the OR for re-exploration. A large subdural hematoma was found and removed. There was also bleeding from two ruptured anterior bridging veins. Hemostasis was achieved and 2 7mm flat JP drains were left in place.

• Repeat Head CT showed significant reduction of hematoma and midline shift
• Post-op course: Head CT

1557837KI
Contrast:
Gantry: 9°
FoV: 250 mm
Time: 1000 ms
Slice: 5 mm
Pos: 121.875
HFS

F: STANDARD
MAS: 140
120 kV
Image no: 15
Image 15 of 30

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• NSICU course:

• POD 5: JP drains were removed
• Head CT showed stabilization of residual hematoma and resolving pneumocephalus
• She underwent several weaning trials which were unsuccessful and subsequently had a tracheostomy as well as insertion of an IVC filter and PEG tube placement.
• She was then placed at xxNH.
**Glasgow Coma Scale (GCS):** neurologic exam that indicates the severity of injury and measures changes in consciousness.

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<tr>
<th>EYE-OPENING RESPONSE</th>
<th>VERBAL RESPONSE</th>
<th>MOTOR RESPONSE</th>
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<tbody>
<tr>
<td>Score</td>
<td>Response</td>
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Types of Head Bleed

• Epidural hematoma
  - arterial bleed: middle meningeal artery
  - patients may initially have LOC ➔ lucid period ➔ sudden deterioration in neurologic status
  - Head CT: lenticular deformity
  - operative intervention for significant neurologic deterioration or mass effect
Subdural Hematoma
- most common type, usually from tearing of bridging veins between dura and arachnoid
  - Head CT: crescent shaped deformity
  - operative intervention for significant mass effect
  - chronic SDH seen in elderly patients days to week after fall
    may have focal neurologic deficit, seizures
    if symptomatic may require burr hole drainage
• Subarachnoid Hemorrhage
  - usually due to cerebral aneurysms (50% from MCA) and/or AVM
  - severe headache, neurologic deficits, nuchal rigidity
  - OR for isolation of aneurysm from systemic circulation via clipping
Intracranial Pressure
• normal 10mmHg, if >20mmHg requires treatment
• monitoring is indicated if serial neurologic exam is not reliable of worsening intracranial pathology
• corresponds to a GCS of ≤ 8
• maximum brain swelling occurs 48-72 hours after injury
• symptoms: stupor, headache, nausea, vomiting
• Cushing’s triad: HTN, bradycardia, slow RR
- **CPP = MAP - ICP**, maintain between 60-70mmHg

- **Treatment:**
  - ABCs
  - raise head of bed 30°
  - relative hyperventilation (CO₂ 30-35mmHg)
  - mannitol load 1g/kg, 0.25mg/kg Q4H
  - sedation
• Surgical Intervention:
  - extra ventricular drain (EVD): placed within lateral ventricle to drain CSF and measure ICP
  - craniotomy: burr holes are drilled via skull to remove hematoma and decrease ICP
  - decompressive craniectomy: part of skull is removed to allow dura mater to expand and allow brain to swell in order to prevent continued crushing parenchymal injury and/or herniation
The Effects of Clopidogrel on Elderly Traumatic Brain Injured Patients

Wong, DK et al., Journal of Trauma. 2008; vol 65, pgs 1303-08

- Retrospective review of trauma data registry from 2001-2005
- Main outcome: mortality, ICU duration, disposition
- 131 patients: clopidogrel 21, ASA 90, coumadin 20
- Mechanism: fall, MVA, pedestrian struck
- GCS upon presentation: 14
The Effects of Clopidogrel on Elderly Traumatic Brain Injured Patients

Wong, DK et al., Journal of Trauma. 2008; vol 65, pgs 1303-08

- Head CT: SDH, majority occurring with pts on ASA, SAH
- elevated INR for pts on coumadin, transfused FFP
- 5 pts required craniotomy (1, 2, 2)
- pts on coumadin- increased ICU stay (10days)
- pts on clopidogrel- increased mortality rate: 14%, and placement to LT facility: 29%
The Effects of Clopidogrel on Elderly Traumatic Brain Injured Patients

Wong, DK et al., Journal of Trauma. 2008; vol 65, pgs 1303-08

- Conclusion: patients on clopidogrel have increased long-term disability and fatal consequences when compared to patients on other forms of anticoagulation.