PICU Case Presentation

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- 10yo female
- Crossed street to get mail
- Didn’t look both ways
- Hit by SUV going
- Major damage to vehicle
On Scene

- GCS 3
- Pupils fixes and dilated

0"
- BP 190/130
- HR 148
- RR 0 (bagged)
- Sats 100

5"
- BP 160/120
- HR 140
- RR 0 (bagged)
- Sats 100

- Intubated
- IO Placed
ED - Head to Toe

• Warm and well perfused
• Pupils fixed at 3mm
• BS decreased on left
• Heart – RRR
• Grossly distended abd
• Rectal sphincter tone present
Diagnostics

• **CT:**
  - Head
  - Maxilofacial
  - Total spine
  - Abd

• **CXR**

• **FAST US**

• **Rainbow labs**
In PICU

- Pupils asymmetric with R 3mm, reactive, L ~ 2mm minimally reactive
- Some spontaneous respirations, cough, and withdrawal of RUE with PIV placement
- Art line placed
- Bolt in
- PICC line
Surgeries

• 5/3 bolt placed
  – Opening ICP over 100 (27)
  – HOB elevated, sedated down to 20
• 5/7 repair of craniocervical dislocation (atlantooccipital dislocation)
  – Bone grafting over C1-C2
  – Rod C3-C4
  – Bone chip fusion
  – Songer cable wiring
• 5/20 GT place
Neuro status

• Prior to GT placement
  – Giving thumbs up/down on command
  – holding up two fingers or squeezing hand

• Less responsive since GT
  – Squeezed hand x 1
  – No other following command

• Thought r/t meds in her system, not neurological decline, as she has remained relatively stable
Re-admit 6/3

• c/o progressive vomiting and intolerance of G-tube feeds
• Family noticed her having more headaches (squinting her eyes)
• Less voluntary movement
• Head CT 6/3/10:
  – enlarged ventricles with transependymal flow
VPS placed same day

Post-Traumatic Hydrocephalus
Neuro

• POD 1
  – started following simple commands, “high-five”

• POD 2
  – said “hi” to Dr Selden (he was semi-convinced)
Neuro

• POD 3
  – lifts bottom, opens mouth, squeezes hand

• POD 4
  – wiggling toes, waving, holds hands with OT, crossing fingers, and has improving motor control of her left arm and hand to scratch her head/face
• Return to Emmanuel Rehab until end of July
Brain Injury

• Primary Damage
  – Result of direct impact
  – Mechanical damage brain

• Secondary Damage
  – Increased ICP
  – Decreased cerebral blood flow
  – Hypotension/hypoxia
  – Brain swelling
  – Post-traumatic hydrocephalus
  – Infection
Post Traumatic Hydrocephalus

• Associated with
  – Delayed recovery
  – Post-traumatic seizures
  – Responds to VPS placement
Post Traumatic Hydrocephalus

- Onset varies from 2 wks to yrs after TBI
- Wide range of incidence from 0.7-50%
- More commonly 0.7-29%
- Variation results from underdiagnosis and atypical presentation
- 50% of pts with post acute phase severe TBI had PTH
  - Only 11% required surgery
• More commonly noted s/p trauma w/GSC <8
• Pt presented with
  – new neuro deficits
  – Ceased clinical improvement after initial improvement
  – Increased hypertonia
Post Traumatic Hydrocephalus

- Ventricles progressively larger
- Clinical deterioration
- Symptomatic
- Increased ICP
Cerebral Atrophy

- Cerebral atrophy/necrosis
- Atrophy asymmetrical
- Occurs over 6mo-a year
- Ventricular enlargement passive
- ICP often remains stable