History

• 11 month old male involved in MVC
• Transported to Dayton Children’s by Dayton Paramedics with a transport time of < 11 minutes.
  – Restrained back seat forward facing passenger
  – Vehicle “T-boned” by another vehicle, resulting in the car being split in half
  – The patient was found in the car seat which had been ejected and landed in the back yard of a house at that intersection
  – Responsive at scene, but GCS decreased from 9 to 4
History cont.

• Presented to CMC as an Alpha trauma alert
  – Initial injuries:
    • Forehead abrasion
    • Initial GCS of 9, decreased responsiveness
      – Intubated in trauma bay
    • Abrasion to left lower extremity
Labs:

- H/H: 11.2/34.8
- AST: 633
- ALT: 250
- Lipase: 55
- Amylase: 184
Imaging:

- CT head:
  - Cerebral edema, extra-axial fluid on the right
- Chest X-ray
- LLE plain films
  - Small buckle fracture of left tibia
- CT abdomen deferred secondary to benign abdominal exam
Course

• Admitted to PICU
• Neurosurgery consulted
  – Bolt placed
  – Opening pressure recorded as 23
  – Overnight ICP’s peaked to 30-40
Course Cont.

- PTD 2
  - Hgb drop to 7.8
  - Concern for missed abdominal injury
  - CT abd/pelvis performed
CT abd/pelv

- Right pleural effusion
- Atelectasis
- No solid organ injury
- Large amount of intraabdominal fluid
Course cont.

- IR performed paracentesis
- Blood in fluid
  - >35,000 RBC/hpf
- Patient to OR for ex lap
  - Small contusion to paracolic mesentery
    - No other injury noted
Course cont.

• Thoracentesis postoperatively
  – Bloody pleural fluid drained by IR

• Pt kept in ICU until PTD 14
  – Extubated, ICP monitor removed
  – Slow recovery of neurologic function

• Swallowing difficulty
  – NG feeds during therapy
  – Consideration of definitive feeding access
Course Cont.

• PTD 32
  – During speech therapy session, patient thought to have aspiration event
  – Some SOB that night with mild increase in O2 requirement
  – CXR obtained
Course Cont.

- Abx therapy begun for aspiration pneumonia
- PTD 33-43
  - Intermittent improvement in pulmonary status
  - Apparent consolidation in right lung without improvement
  - CT Chest performed to characterize nature of problem
Course Cont.

- PTD 44
  - Diaphragmatic hernia repair performed through right thoracotomy
    - Liver and gallbladder incarcerated in thoracic cavity.
    - 6cm defect opened an additional 3 cm for reduction
    - Repaired with single layer, interrupted, non-absorbable suture

- Uneventful recovery
  - Discharged to rehab on PTD 53
Discussion

• Incidence of diaphragmatic hernia secondary to blunt trauma
  – 0.8-5%
  – 90% occur in young men secondary to MVC
  – Right sided rupture rare
    • 5-20% of all diaphragmatic disruptions

• In children
  – Uncommon, and associated with severe trauma
  – Incidence of associated injuries is 75-90%
Discussion

• At time of injury (rupture)
  – Physical exam – non-specific
  – Plain films reported sensitivity as low as 17%
  – 30-40% of initial CXRs normal
  – CT – sensitivity between 14% and 61% and specificity between 76% and 99%

• Exploration?
  – 31% of patients with diaphragmatic rupture have no abdominal symptoms
Discussion

• Diagnosing right sided rupture in the acute setting
  – Boulanger BR, 1993 University of Maryland
  • Series of 80 blunt traumatic diaphragmatic ruptures diagnosed acutely
  • 59 left (79%), 16 right (20%), 5 bilateral (6%)
  • 27 left sided ruptures diagnosed preoperatively
    – CXR
  • 0 right sided ruptures diagnosed preoperatively
    – 11/11 DPLs performed on group were positive (>100K RBC)

• Often delayed unless high index of suspicion