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The EM Educator Series

Mini-Case: Trauma Chameleons and Missed Injuries

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A 78-year-old male presents to the ED via EMS on backboard with cervical collar after head-on MVC. The patient remembers driving and then woke up with his car rolled on its side. His ABCs are intact, and he has several abrasions. VS are stable, and FAST is negative.

Questions for Learners:

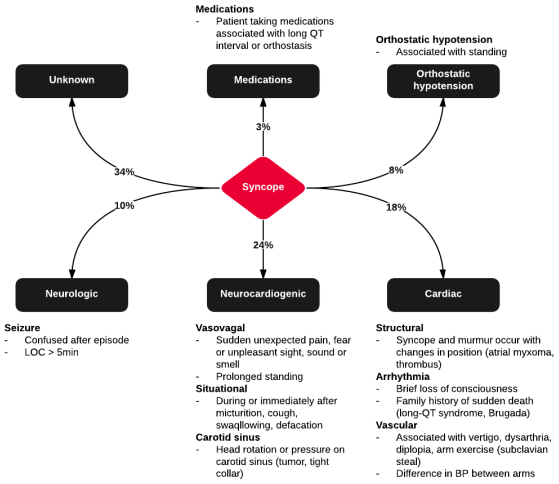
1. What is the etiology of the traumatic event, and what doesn't fit?
2. What medical co-morbidities should you consider, and how do they impact the trauma patient?
3. One size doesn't fit all… What should you consider in the pediatric, elderly, pregnant, obese, etc., patient?
4. What do we do with incidentalomas in the trauma work-up?
5. What are missed injuries in blunt and penetrating, and what is the importance of the tertiary survey?
6. Should we ambulate and PO challenge every trauma patient?

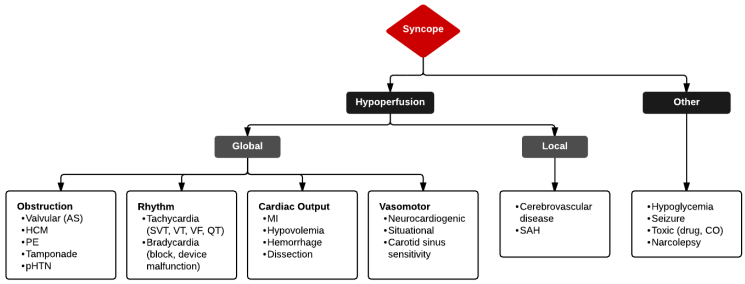
Suggested Resources:

- ✓ Articles:
  - https://emergencymedicinecases.com/pediatric-trauma-2/
  - http://www.emdocs.net/pediatric-trauma-pearls-pitfalls/
  - http://www.emdocs.net/geriatric-trauma-medical-illness-pearls-pitfalls/
  - https://lifeinthefastlane.com/what-the-elderly-should-say/
  - http://www.emdocs.net/resuscitation-of-the-pregnant-trauma-patient-pearls-pitfalls/
  - https://coreem.net/podcast/episode-34-0-trauma-in-pregnancy/
  - https://lifeinthefastlane.com/trauma-tribulation-006/
  - https://lifeinthefastlane.com/trauma-tribulation-007/
  - http://blog.ercast.org/pulmonary-nodule-incidentaloma/
  - http://www.emdocs.net/blunt-trauma-what-do-we-misshow-can-we-improve/
  - http://www.emdocs.net/the-cleared-trauma-patient-what-could-we-be-missing/
  - http://www.emdocs.net/penetrating-trauma-what-we-miss-and-how-we-can-improve/

Answers for Learners:

1. **What is the etiology of the traumatic event, and what doesn't fit?**
   Syncope – no prodromal symptoms. Many etiologies of syncope, so use your history / exam to figure it out before you send a "cleared" trauma patient home.





Above graphs obtained from ddxof.com.

2. **What medical co-morbidities should you consider, and how do they impact the trauma patient?**
   - Understanding and undermanaging comorbidities (eg, COPD, CAD, smoking, ETOH consumption) may result in preventable morbidity/mortality.

3. **One size doesn't fit all… What should you consider in the pediatric, elderly, pregnant, obese, etc., patient?**
   - The principles of diagnosis and management in trauma are the same regardless of age, but the incidence of physiologic changes and disease states mandates a different overall approach.

   - **Elderly**
     - Less physiologic reserve
     - Occult shock/misleading picture of stability
     - Comorbid illnesses

   - **Pregnant**
     - It is important to recall that the best fetal resuscitation is good maternal resuscitation. Doing the simple things well, such as optimizing maternal hemodynamics and oxygenation, will ensure the best fetal outcomes.
     - The FAST is less sensitive for free fluid in the pregnant patient than in non-pregnant patients. Sensitivity decreases with increasing gestational age, likely due to altered fluid flow within the abdomen.
     - Expect a difficult airway, optimize pre-oxygenation and positioning, and expect significant edema and mucosal friability.
     - In late pregnancy, consider placing a chest tube higher than you would in a non-pregnant patient.
     - The patient should be positioned to reduce compression of the great vessels by the gravid uterus.
     - Attempt to obtain supra-diaphragmatic intravenous or intraosseous access for volume resuscitation and medication administration.

- CT imaging should be performed as clinically indicated; diagnostic studies, including CT of the abdomen and pelvis, will not expose the fetus to an unsafe amount of radiation. Contrast agents should be used if indicated.
- Perimortem cesarean section should be performed by emergency providers in cases of maternal cardiac arrest and a pregnancy sufficiently advanced to cause aortocaval compression. Ideally this would be initiated within 4 minutes of arrest; however even after substantial delay may be beneficial to both mother and fetus.

- **Pediatric Pitfalls – Failure in…**
  - Manage the airway – indicated for almost all severe TBI, any hypoxia
  - Appreciate and treat shock – do not wait for hypotension which is a sign of pre-arrest
  - Prioritize management of injuries – "CABC" recommended by some experts.
  - Check bedside sugar if altered LOC – "Don't Ever Forget the Glucose"
  - Keep the child warm

4. What do we do with incidentalomas in the trauma work-up?

- Pulmonary nodules are a common incidentaloma seen on CT scans – see ercast for amazing dive into this by Rob Orman.
- Tips for communicating with patients – see ercast for amazing dive into this by Rob Orman..

5. What are missed injuries in blunt and penetrating, and what is the importance of the tertiary survey?

- Following ATLS protocol may be helpful for an adequate assessment, but do you 'Tertiary Survey", which may result in decreased missed injuries.
  - Re-evaluation of laboratory tests obtained
  - Review of initial radiographs obtained
  - Assessment for the effective detection of occult injuries
- Blunt → Rib fractures, c-spine injuries in elderly, and spleen and liver (especially if an initial FAST examination is negative).
  - Lessons:
    - Some missed injuries may be due to inadequate clinical assessment; therefore an accurate assessment is very critical to identify injuries.
    - A false negative FAST examination is NOT sensitive enough to rule out all abdominal injuries.
    - The absence of abdominal pain or tenderness does not rule out significant injury.
- Penetrating → Tension PTX, diaphragmatic injury, hollow viscus injury, and ureteral injuries.

6. Should we ambulate and PO challenge every trauma patient?

- Yes to ambulation!
  - Most ED docs will x-ray painful extremities in trauma, but the majority of missed MSK injuries come from falsely negative x-rays. Don't miss injuries like a LisFranc because you choose not to ambulate the patient.
- PO challenge is an area of controversy → We do not want to miss blunt abdominal injuries, which is not so straight forward unlike penetrating ones.
  - In patients without a severe mechanism who do not have concerning findings or abnormal vitals, you are probably okay to send them home. If there's something that worries you, CT or observation may pick up additional injuries.