OhioHealth Emergency Medical Services Podcast Series
August 2020 Episode: Evaluation and Management of Traumatic Injuries

Objectives:

1. Discuss the recognition and initial management of traumatic brain injuries.
2. Discuss the recognition and initial management of traumatic spinal cord injuries.
3. Discuss blunt cardiac trauma recognition and initial management.
4. Describe blunt abdominal trauma recognition and initial management.

Podcasters

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Session 1

I. Neurologic Trauma: 75 YM fall from standing with a GCS of 14

- Traumatic Brain Injury
    - Patient Assessment
        - Risk Factors: elderly, anti-coagulation, mechanism of injury
            - **See attached article (Head Injury and Anti-Coagulation Use**)
        - Physical Examination
            - Determine baseline neurologic function of patient
            - Lateralizing deficits
            - Unequal pupils
            - Glasgow Coma Score
                - Abnormal GCS suggests traumatic brain injury
                - Motor component is most important
                - Some data suggests that the motor component performs as well as full GCS. **See attached article (GCS Motor**)
    - Management
        - The fundamentals matter the most
        - Assure airway, ventilation and oxygenation
        - Support circulation
        - Avoid hypoxia, hypotension and hyperventilation
        - Consider herniation with sudden changes in clinical status

- Traumatic Spinal Cord Injury
    - Patient Assessment
        - Spinal cord injuries may have obvious deficits or findings may be subtle
        - Deficits may take some time to develop
        - Consider spinal motion restriction for patients with any of the following characteristics:
            - Elderly
            - Midline spinal tenderness
            - Distracting injuries
            - Intoxication
            - Altered mental status
            - Focal neurological deficits
        - Full spinal motion restriction can be achieved with cervical collar and careful placement on cot. Backboards are rarely indicated and may actually cause harm.
    - Management
        - Similar to traumatic brain injuries.
        - Prevent any secondary injuries.

II. Blunt Cardiac Trauma: 22 YM status post MVC with chest pain and bruising

- Patient Assessment
    - Consider life-threatening causes of chest pain after trauma
        - Tension pneumothorax
        - Cardiac tamponade
        - Hemothorax
        - Penetrating chest trauma
    - Consider performing ECG with chest pain following trauma
        - Chest pain after trauma should NOT receive aspirin
        - Patients may have tachycardia, bradycardia, ST segment and T wave abnormalities, heart blocks, and several other ECG abnormalities
    - Patients may present with cardiogenic shock
- Management
    - Consider other life-threatening causes of chest pain
    - Maintain a low threshold for considering blunt cardiac injuries
    - Take chest pain following trauma seriously

III. Blunt Abdominal Trauma: 33 YF with abdominal pain after an MVC

- Patient Assessment
    - Patients may complain of pain in abdomen or lower back
    - There may be signs of bruising or a seat belt sign (https://coreem.net/core/initial-trauma-assessment/)

    - Tenderness is a concerning finding
    - The abdomen has solid (liver, kidney, spleen) and hollow (small bowel, large bowel) organs
        - Injuries to different organs may be obvious immediately or they may be delayed
    - The abdomen is innervated by different types of nerves. Patient with abdominal trauma may present with any of the following pain patterns:
        - Somatic pain: free fluid in the abdomen that causes sharp, well-localized pain
        - Visceral pain: trauma to abdominal organs that is vague and poorly localized
        - Referred pain: trauma to the abdomen that causes pain in another body region (diaphragm irritation from spleen injury causing shoulder pain)
        - No pain: retroperitoneal injuries may not have any symptoms at all
    - Management
        - Treat hemorrhagic and other forms of shock
        - Recognize need for extended monitoring periods to rule out abdominal injuries

Session 2

I. Pelvic Trauma: 17 YM with saddle injury

- Patient Assessment
    - Pelvic trauma may consist of lower spinal column and pelvic bone fractures, arterial and venous bleeding, and damage to the genitourinary and lower gastrointestinal systems
    - During the primary survey, assess for signs of shock
    - Bruising or anatomical abnormalities may be present with saddle injuries and other types of pelvic injuries. Blood at the urethral meatus and anus is concerning
- Management

For open book pelvic fractures, utilize a pelvic binder or bed sheet to close the pelvis and decreased potential space for hemorrhage (https://www.emsworld.com/article/10323983/emergency-stabilization-unstable-pelvic-fractures)

II. Crush Injury: 67 YF found down after 24 hours on the ground

- Patient Assessment
    - Crush injuries may be obvious, or they may be more subtle, especially in the elderly and patients found down for extended periods of time
    - Pain out of proportion is concerning
    - Prolonged pressure on one area of the body causes muscles to breakdown, lactic acid to accumulate and injured cells to spill potassium into the circulation
    - Hemodynamic compromise is possible secondary to acidosis and hyperkalemia
- Management
    - Treat with IV fluids +/- sodium bicarbonate
    - In some circumstances, it may be best to start treatment before the extrication/rescue process
    - If signs of hyperkalemia, utilize other medications in your protocol for treatment

III. Extremity Trauma: 36 YM with amputated wrist from chain saw

- Patient Assessment
    - Assess patient for signs of systemic trauma, shock and extremity hemorrhage
    - Locate and secure the amputated part
    - Penetrating injuries above the elbow and knee are concerning and are associated with neurovascular injuries
- Management
    - Amputation: control bleeding; place the amputated part in plastic and then place on ice. Do not allow amputated part to come into direct contact with ice
    - Penetrating trauma: leave the object in place; control hemorrhage.

IV. Penetrating Neck Trauma

- Penetrating neck trauma may cause extensive injuries to the upper airway, lungs, esophagus, blood vessels, spine and brain.
- Even minor appearing injuries may cause extensive damage
- Assess airway patency and neurovascular function
    - Maintain a low threshold for early airway interventions

V. ED Thoracotomies

- Typically utilized for penetrating traumatic arrest patients
- The left side of the chest is cut open to access the heart and the aorta
- In some instances, the right side of the chest is also cut open
- Patients requiring thoracotomies have a very poor prognosis