



Chapter 39 – Trauma in the Elderly

Episode Overview

- 1) 5 Risk Factors for falls in the elderly?
- 2) What anatomic and physiologic changes in the elderly patient are important for the management of trauma in the elderly patient. (changes in the CVS, CNS, reop, MSK, skin) Explain why these are important?
- 3) What are the most common c-spine injury in the geriatric patient?

Rosen's in Perspective

- GERIATRIC trauma is on the rise
- Have increased morbidity and mortality
- ATLS recommends that patients older than 55 yrs. be transferred to a trauma centre regardless of injury severity score
- Mechanism of injury
 - Falls - #1
 - MVCs
 - Ped. struck
 - Elder abuse
 - Suicide attempts
 - Burns
- We need to think about whether a medical problem **CAUSED** the crash!

1) What are 5 RFs for falls in the elderly?

So many to list! Think about it going from head to toe....

1. Cognitive impairment
2. Vision and hearing loss
3. Impaired thirst mechanism - dehydration, orthostatic hypotension
4. Reduced respiratory reserve
5. Cardiac disease - arrhythmias, poor CO, etc.
6. Osteophyte-arthritis anywhere - joint pain, immobility, decreased ROM
7. Loss of fine motor skills and sensation
8. Pharmacy - medications affecting cognition, balance, cardiac function,

2) What anatomic and physiologic changes in the elderly patient are important for the management of trauma in the elderly patient. (changes in the CVS, CNS, reop, MSK, skin)

Explain why these are important?



Distinguishing principles of disease

- **Effects of aging:**
 - Decreased Functional residual reserve [organs have less capacity?]
 - Multiple comorbidities
- Decreased physiologic reserve
 - less able to compensate for hypovolemia and stress
 - tissue hypoxia and organ failure
- Comorbidities
 - Arthritis / CAD / COPD / CVA / DM
- Effect of medications
 - 30% have >5 meds including ASA and BB and hypnotics

Now let's go through the basic trauma assessment approach - and what specific things differ with our geriatric patients

Modifications of the Trauma Assessment of older adults

- Same primary and secondary survey approach
- Usual vital sign abnormalities are absent:
 - Hypotension / tachycardia / pain
 - **Normal vital signs should NOT be reassuring**

Primary assessment and resuscitation

AIRWAY

- Have multiple predictors of difficult airway
 - Dentures, stiff neck
- Consider early intubation
- Consider VL rather than DL given reduced Cspine and jaw mobility
 - “denture less ness” will help you out here!!
- At higher risk for hypotension
- Reduced dosages of RSI meds (3/4 to 1/2 dose)
- Careful use (if any at all) of succinylcholine given risk for hyperkalemia
Rocuronium 1mg/kg is preferred

BREATHING

- High flow O2 recommended given reduced FRV
- More prone to tire easily

CIRCULATION

- Blunted stress response with less physiologic reserve and medications alter normal response to shock
- Normotension may indicate hypotension given baseline hypertension.
- control bleeding (e.g. scalp)
- catheter to monitor urine output
- small 500 ml boluses with reassessments, GIVE BLOOD asap if needed



REVERSAL of anticoagulation

- PCCs
- FFP
- Vit K.
- Octaplex.

DISABILITY

Assessment for TBI / Spinal cord injury / Vertebral fractures

Components

GCS (any score <15 = likely TBI)

Pupils

Mental alertness / headache (may have VERY subtle signs of TBI)

At high risk for Cspine fractures - to be discussed shortly

no rules exist to exclude the elderly from imaging, so imaging should be performed

Canadian cspine - excludes >65

Nexus included all ages, but most elderly people have Cspine tenderness

At increased risk for T, L, S spine fractures which are best imaged on CT

AT higher risk for SCIWORA due to spinal stenosis and kyphosis

high risk for central and anterior cord syndromes

EXPOSURE

At risk for hypothermia because:

- skin thinning
- decreased muscle, increased fat
- impaired thermoregulatory mechanisms
- prolonged exposure

Remove from backboards ASAP

Tetanus

Secondary assessment

- Complete hx
- Screen for alcohol and substance abuse or elder abuse
- LAB TESTING
- Trauma labs WITH troponin
- IMAGING
 - CT!

NOW: what specific disorders should we watch out for?

Specific disorders

Traumatic brain injury

Common, may be asymptomatic (more space for blood to go)

Pathophysiology

- frequent anticoagulant use
- brain size decreases by 10%



- less tortuous bridging veins and increased intracranial free space
 - > mobile brain
 - > ICH
- pre-existing cognitive impairment

Assessment and Dx:

- CT, INR

clinical variables alone are insufficient to rule out injuries

- all excluded from the new orleans or CT head rule (<65)

Treatment:

- Supportive care
- Reversal of anticoagulation
- Surgical decompression

Avoid

- Cerebral hypoxia
- Hypoperfusion
 - Get early invasive hemodynamic monitoring
 - Get early neurosurgical consultation to inquire re: ICP monitoring and decompression
 - Reverse coagulopathy

Prognosis and disposition:

- Morbidity increased with comorbidities, anticoagulation, low GCS, etc.
- If normal INR and CT may be discharged to a reliable home for observation

Thoracic Trauma

Higher risk for rib, sternal #, pulm contusions, pneumothorax (due to COPD)

Risk for pneumonia

- Due to pain, and splinting --> atelectasis
 - need admission for pain control and chest physio/incentive spirometry

Abdominal Trauma

- Goal is early dx and close monitoring
- Physical exam is UNRELIABLE
 - Grade III splenic injuries usually fail non-operative management
 - May have a role for angiography for blush or extravasation

Extremities

Order of fracture frequency:

- upper ext: distal radius > proximal humerus > elbow
- lower ext: ankle # > hip and pelvic > tibial plateau



Pelvis #: usually lateral compression -> at higher risk for hemorrhage

- 80% mortality rate if open
- Need resus, binding, blood, angio.

Hip fractures

- 15% 1 yr mortality
- Plain X-ray : 90% sensitive

End of life decisions

Grave prognosis if:

- GCS < 8 with anticoagulation
- GCS 3

Initial injury in the ED does not accurately predict long-term prognosis

Need to have discussions with family members re: goals of care, life support, life support measures, etc.

SUMMARY:

- OCCULT injuries with low force **are the norm!**
- Vital signs are unreliable
 - Look for other indicators:
 - mental status, urine output, skin perfusion
 - Use invasive monitoring
- Low threshold for imaging

3) What is the most common c-spine injury in the geriatric patient?

Vertebral fractures and spinal cord injuries

- Age changes put seniors at higher risk : OA; spinal stenosis:
 - Sx of **spinal stenosis**:
 - myelopathy, impaired coordination, gait, bowel/bladder dysfunction, abnormal motor/sensory function
 - “Shopping cart sign”
- Are more likely to have partial neurologic injuries
- **Three main types of injuries**
 - 1) central **cord syndrome**: "hyperextension injury"
 - J- Mechanism is buckling of ligamentum flavum
 - Weakness in Arms > legs
 - Often have NO fracture, but have pre-existing spinal stenosis
 - Painful hyperesthesias
 - Usually stable, need immobilization
 - May need surgery



- 2) cervical **extension-distraction injuries**: "hyperextension: face or forehead trauma"
 - caused by reduced ROM -- degenerative spondylolysis/disk space collapse/osteophyte formation
 - pt. may report that they are able to extend their neck more than they used to = "open book" fracture
 - Unstable

- 3) **odontoid fractures**:
 - Fall with impact to head
 - <10% cause neuro deficits
 - ****Type II (base of the dens) are the most common***
 - Type I – up through the neck to the head
 - Type III – down through the vertebral bodies