Initial Assessment and Management of Spine Injury

Purpose

To provide an evidence-based, practical guide to the evaluation and management of an adult patient with a spinal injury, including both spinal column fracture (SCF) and spinal cord injury (SCI).

Background/Definitions

Although fractures of the spine represent a small proportion of all fractures from traumatic injury overall (incidence ranging from 4-23 percent), their impact on the individual and the healthcare system is significant due to the potential for long-term disability, associated health care consequences and costs. Additionally, the incidence of traumatic spinal injuries is expected to increase globally as the population ages. Optimal outcomes are closely related to rapid identification of injuries, early surgical intervention when necessary and early mobilization.

Guideline Inclusion Criteria

Adult Trauma patients (15 yrs and older) with spinal column fracture (SCF) and/or spinal cord injury (SCI).

Guideline Exclusion Criteria

Pediatric trauma patients (Less than 15 yrs of age)

Diagnostic Evaluation

- All trauma patients should be initially evaluated per ATLS guidelines, independent of whether an SCF or SCI is suspected or confirmed.
- Cervical and thoracolumbar spinal motion restriction (SMR) should be maintained throughout this evaluation.
    - DO NOT use force to move the patient’s neck or thoracolumbar spine into a position that elicits pain.
    - Perform examinations of the spine by log rolling the patient when necessary.
- Examination of the cervical, thoracic, lumbar and sacral spine should include the following:
    - Gross inspection for abrasions, contusions, hematomas, open wounds, and obvious spinal deformities.

    - Systematically palpate the entire spine to evaluate for pain, tenderness, step offs, gaps or any other deformities.
    - When a SCI is suspected, perform a digital rectal exam (DRE) before rolling the patient back to the supine position.
  - NOTE: physical examination of the spine has low sensitivity for injury. Level of pain and/or tenderness often do not correlate with level of injury on imaging. A normal exam has low sensitivity in ruling out spinal injuries.
- Imaging of the spine **should be obtained** in any patient that has new/acute pain on examination or new neurologic deficit following a traumatic event.
- Imaging of the spine **should be considered** in trauma patients who present with severe injuries at high risk for associated spinal trauma including traumatic brain injury (TBI), complex maxillofacial trauma, pelvic fractures, thoracic trauma, calcaneal fractures resulting from fall from height, and presence of seat-belt sign. Imaging the spine should also be considered with certain mechanisms of injury including high speed motor vehicle collisions (especially when associated with ejection or roll over), motorcycle/bicycle/ATV or UTV collisions, crush injuries, falls from height, or injuries leading to an axial load on the head (e.g. diving and peds vs auto).
- Age by itself, is considered a high-risk factor for spinal trauma and spinal imaging should be taken into consideration even after low-energy mechanisms such as ground level falls.
- Computed tomography (CT) of the cervical, thoracic, and lumbar spine is the preferred initial imaging modality.

Practice Recommendations for Management

- Once spine fracture is identified on imaging or if acute neurologic deficit present/SCI suspected, consult the appropriate spine surgery service (Orthopedic Spine or Neurosurgery Spine) based on call schedule.
    - **EXCEPTION**: 3 or fewer isolated and unilateral transverse or spinous process fractures located in the thoracolumbar spine DO NOT require a spine consult
- Spine service will evaluate patient and address the following issues (if able) in consultation note:
    - Fractures present
        - Stable vs unstable
    - Spinal cord injury present
        - Level/ASIA grade
        - Blood pressure goals and length of goals
        - Other specific concerns (i.e. presence of epidural hematoma, etc)
    - Frequency of neurological exams
    - Additional imaging
    - Injury operative or non-operative
    - Need for brace/what type of brace
    - Activity restrictions (i.e. maintain full spine precautions, OK for HOB 30 deg, OK for activity in brace, etc)
    - Recommendations regarding initiation of DVT prophylaxis
    - Attending surgeon staffing consult

- Operative vs non-operative management of SCF will be at the discretion of the consulting spine service and based on patient exam and fracture pattern/stability.

- On admission:
    - Patient should be initiated on a multi-modality pain regimen to include the following (if not contraindicated):
        - Acetaminophen 1000 mg q 8 hrs
        - Calcitonin 200 IU per day intranasally
        - Lidocaine 5% patch to affected area for 12 hrs
        - Cyclobenzaprine 10 mg q 8 hrs (avoid in elderly)
        - Oxycodone (avoid in elderly)
        - Ibuprofen 800 mg q 8 hrs
        - Gabapentin 300 mg q 8 hrs
    - Activity orders
    - Appropriate bracing should be ordered.
    - Additional consults: physical therapy (PT), occupational therapy (OT)
        - Consider speech consult in patients with cervical fractures and complaints of dysphonia or dysphagia
        - PM&R consult for patients with SCI

- Non-operative spine fractures:
    - Within 24 hrs of admission:
        - Appropriate brace delivered to bedside
        - Ambulate with nursing staff and/or physical therapy (if not on full spine precautions or limited by concomitant injuries)
        - Upright X-rays or additional imaging ordered and obtained.
            - Once upright X-rays obtained, contact the appropriate spine service for interpretation and additional recommendations.
            - Spine service will provide interpretation and additional recommendations within 6hrs of being notified x-rays are complete.
            - If upright x-rays are unable to be obtained within 48 hrs of admission, notify spine service and discuss alternatives.
    - 24-48 hrs of admission:
        - PT/OT evaluations completed with disposition recommendations.
        - Social work and case management engaged in disposition and discharge planning.

- Operative spine fractures:
    - Surgical decompression or stabilization of SCF will ideally be performed within 72 hrs of admission in attempt to optimize outcomes and minimize morbidity related to delayed operative intervention.

        - If patient unable to undergo recommended operative intervention within 72 hours, document why (i.e. patient factors, OR availability, surgeon availability).
    - Within 24 hrs post-operatively:
        - Appropriate brace delivered to bedside (if required)
        - Ambulate with nursing staff and/or physical therapy
        - Upright X-rays or additional imaging ordered and obtained.
            - Once upright X-rays obtained, contact the appropriate spine service for interpretation and additional recommendations.
            - Spine service will provide interpretation and additional recommendations within 6hrs of being notified x-rays are complete.
    - 24-48 hrs post-operatively:
        - PT/OT evaluations completed with disposition recommendations.
        - Social work and case management engaged in disposition and discharge planning.

Follow-up Care

Patients with SCF and/or SCI will follow-up at the discretion of the consulting spine service in the post-hospital setting.

Outcome Measures and Guideline Adherence

- All trauma patients with SCF and/or SCI experiencing a complication will be reviewed by our Trauma PI team for compliance with spinal injury guidelines.
- 6 months following implementation of guidelines, timing to OR for operative spinal injuries and length of stay will be reviewed for compliance and opportunities for improvement.

Related Policies

Cervical spine clearance

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References

American College of Surgeons. Trauma Quality Improvement Program Spine Injury Best Practice Guidelines. spine_injury_guidelines.pdf (facs.org)

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