Acute Management of Cervical Spine Injuries in Sport

Mark R. Hutchinson
Professor of Orthopaedics and Sports Medicine
University of Illinois at Chicago

I. What’s the risk?
A. Incidence in sport
B. Sports at risk
   1. Sports at height
      a. Cheerleading
      b. Gymnastics
      c. Diving
      d. Equestrian
   2. Collision sports
      a. American football
      b. Ice hockey
      c. Rugby
      d. Motor car racing

II. Be Prepared
A. Pre event: Emergency Plan
   1. 911 versus EMT on site
   2. Educate: Players do NOT move downed athlete!!!!
   3. Equipment
      a. Spine board (adult and pediatric?)
      b. Tape
      c. Facemask removal tools
      d. Oral airways
      e. Ambu bag
   3. Emergency team practice
      a. Log rolling
      b. Maintaining stable spine
      d. Transfer to spinal board
      e. Stabilization on spinal board
   4. Special issues/needs
      a. Helmeted sports
      b. On the ice
      c. In the water
      d. In the gymnastics pit
      e. Pediatrics

B. Game day: Time Out
   1. Safety check
      a. Equipment present
      b. Team knows its roles (who has the head)
      c. Response plan in place, (batteries charged in phone)
III. Ready-Set-Go

A. Be calm. Take a deep breath. Begin the Mantra.....ABC, ABC, ABC

B. To transport or not to transport: That is the question

1. Sideline assessment of mobile athlete
   a. Pain to palpation
      1. Non-tender midline, pain lateral muscles MAYBE
      2. Pain midline bone: high risk YES
   c. Active range of motion
      1. Full symmetric range of motion MAYBE
      2. Guarded extremes of motion MAYBE
      3. Very guarded (+/- spasm) YES
      4. Holds his head in his hands YES
   d. Neurological
      1. Any positive YES
      2. Normal exam MAYBE
   e. Psych
      1. Calm athlete, all is OK MAYBE
      2. Anxious athlete, something is wrong YES

2. On-field assessment of downed athlete
   a. ABC, ABC, ABC
   b. If breathing and talking
      1. Keep him down where he lies
      2. Establish control of C-spine
      3. Calm the athlete
      4. Make assessment (palpate spine, neuro)
      5. If negative, ask athlete if he is capable of moving to his back, sitting up, rising to his feet (stepwise and slowly)
      6. If positive, take control of situation. Gather
         i. Gather team and equipment.
         ii. Talk out load of who has c-spine control, each person’s role, and sequence of events.
         iii. Get patient supine on board and stabilize as practiced
         iv. Remove facemask if present before transfer since all EMT and ER may not have proper tools.
         v. If multiple doctors present, one may go with athlete to maintain spine. If only one sideline doc, then transfer care to EMT (Team still needs you)
   c. If unconscious or not breathing
      1. Expedited response
      2. C-spine injury until proven otherwise
3. ABC, ABC, ABC
   a. Stabilize c-spine
   b. Establish airway
   c. Initiate CPR as indicated

IV. **Beware:** Not yet out of harm’s way.

A. Issues in the Emergency Room
   1. Staff may not be aware of guidelines for athletes
   2. Spot lateral with helmet in place
   3. Remove both helmet and pads simultaneously
   4. How to maintain head/spine during helmet removal
   5. No tools to remove facemask

B. Issues in the Radiology Suite
   1. Disappear from physician control for extended period of time
   2. NEVER actively assist flexion/extension views

C. Issues in the Training Room
   1. Tend to respond less aggressively to similar complaints if they walk into your training room. Maintain protocol.
   2. Reviewing images in the training room:
      a. Complete visualization of all cervical spine vertebrae, if not CT.
      b. Assess alignment, soft tissue swelling (3 at 3, 7 at 7)
      c. Things to look for: (stable vs **unstable**)
         i. SCIWORA
         ii. Unilateral/ **bilateral facet dislocation**
         iii. **Hangman’s fx, Odontiod fx, C1/C2 instability**
         iii. Posterior process fx **(Jefferson, Clay shoveler’s spine**
         iv. Vertebral body fx **(teardrop, compression, burst)**