EM CASES SUMMARY

Episode 66 – Backboard and Collar Nightmares from EMU Conference

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The Risks Associated with Backboard & Collar

The NUMBERS: In North America – over 1 million patients/year are evaluated for potential spinal injuries.

Approximately 2% actually have injuries and <1% have spinal cord injury.

The THEORY/ The MYTH: If we immobilize our patient, we prevent movement, and thus prevent worsening neurologic outcomes.

As practitioners we all fear worsening injury, causing harm, being sued. No one wants to be the outlier that isn't providing "gold standard care".

However, backboards and collars are not without risk:

1) Time intensive to apply, thus increasing time to definitive care
2) Create "Difficult airway" scenarios
3) Have been shown to increase mortality 2 fold in penetrating injuries
4) Quickly (~30minutes) cause pressure ulcers ~ and while we may consider pressure ulcers as a "minor" injury vs. the catastrophic (and theoretical) concept of a worsened neurologic outcome – in fact, decubiti are the leading cause of morbidity and mortality in spinal injured patients.
5) Very uncomfortable, and will alter patient's physical exam often resulting in unnecessary radiographs thus exposing patients to unnecessary radiation and increased length of stays in our departments.
6) Increase intracranial pressure (ICP) by restricting venous flow, thus potentially worsening neurological outcomes.

Patients who are at high risk for spinal injury are the same patients at risk of traumatic brain injuries. There are two sides to the coin:

A: The biomechanically and neurologically unstable injury may get worse with movement
B: The biomechanically stable but neurologically fragile (TBI) will get worse with delays to resuscitation, and suffer from increased ICP from C-collar

What should we use the backboard and collar for?

A Backboard is:

1. an extrication device
2. a hard surface for CPR

BUT…it has NEVER been proven to provide spinal protection!

A c-spine collar is useful when applied to those patients who meet the Canadian C-spine Rules. Vaillancourt et al suggest that ~40% of all very low-risk trauma patients could be transported safely WITHOUT C-spine immobilization.

ACEP Guidelines on EMS Management of Patients with Potential Spinal Injury, 2015

"Spinal motion restriction should be considered for patients who meet validated indications such as the NEXUS criteria or Canadian C-Spine rules. Spinal motion restriction should be considered for patients with plausible blunt mechanism of injury and any of the following:"

- Altered level of consciousness or clinical intoxication
- Mid-line spinal pain and/or tenderness
- Focal neurologic signs and/or symptoms (e.g., numbness and/or motor weakness)
- Anatomic deformity of the spine
- Distracting injury

Link to ACEP Guidelines
https://www.acep.org/Physician-Resources/Policies/Policy-Statements/EMS-Management-of-Patients-with-Potential-Spinal-Injury/

Note that the concept of 'Distracting Injuries' that is present in the NEXUS C-spine decision instrument is subjective and unreliable and some experts believe should be abandoned. In an awake and alert patient, clinical exam is sufficient and will allow reduction in radiographs.

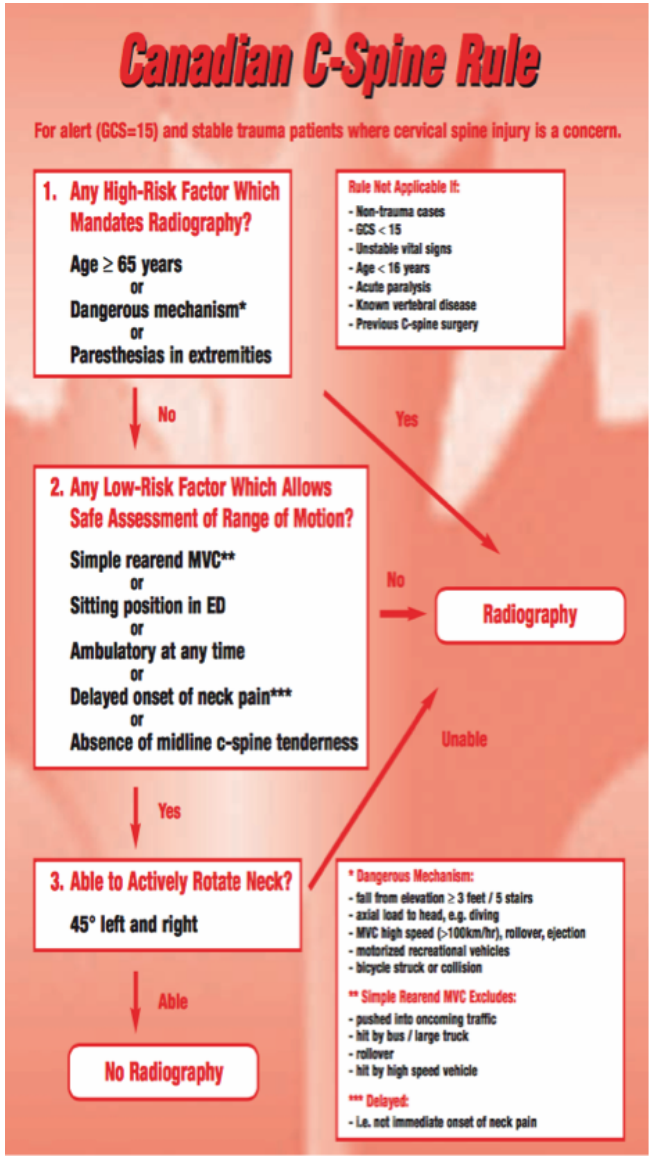
Evidence for selective use of backboard and collar

Will there ever be an RCT? Likely not; however, we do have some good evidence:

1) An international study of 454 patients with blunt spinal injuries compared those transported in the USA with full immobilization and in Malaysia with no immobilization – there was no difference in neurological outcomes. (Hauswald, 1998)
2) In 2005, a large prospective cohort study looked at selective immobilization by paramedics in 13,357 patients, 415 (3%) of which had cervical spine injuries. Thirty-three of the 415 patients with spine injuries were not immobilized, none of which sustained a spinal cord lesion (Domeier, 2005)
3) In a retrospective review of 861 records of patients transported to a trauma centre in California after application of a selective immobilization strategy, and

subsequently discharged with the diagnosis of cervical spine injury. Five injuries were missed by their C-spine clearance protocol, one of which resulted in an adverse outcome. They concluded: immobilization protocol is 99% (95% CI, 97.7% to 99.7%) sensitive in identifying patients with cervical injuries for immobilization. Those patients not identified were at extremes of age. These results suggest that selective immobilization may be safely applied in the out-of-hospital setting but should be used with caution at extremes of age. (Stroh, 2001)

4) In Canada, the Canadian C-Spine Rule (CCR) was validated *for paramedic use* in a study by Vaillancourt et al in 2009. The formal safety evaluation study publication is expected soon. EMS in the city of Calgary and the province of Nova Scotia are currently using the CCR. Most other Canadian EMS are awaiting further safety evaluation studies before implementing such a program.



A call to change the 'backboard and collar for all' paradigm

Prehospital and hospital based practices (including EMS, BLS, ACLS, ATLS) must change. Encourage the Ministry of Health, local EMS/base hospital and physician providers to change standard protocols that require all to be immobilized.

Educate colleagues re: evidence (or lack there of!) and use validated Canadian C-spine Rules to guide practice. The ED should be a NO-BB zone! The backboard is an extrication device only! Encourage EMS to transport on their cots, and if they do arrive with BB, ask EMS to safely transfer patient from the backboard to stretcher on a slider, minimizing movement and have EMS take the BB with them!

Draft ILCOR Cervical Collar Guidelines February 2015, Full PDF

http://www.scancrit.com/wp-content/uploads/2015/02/ILCOR-Cervical-Collar-Guidelines-DRAFT-2015.pdf

Quote of the Month

One of the first duties of the physician is to educate the masses not to take medicine

– William Osler

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