



Ring Around The Collar: Update on EMS C-Spine Management

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- ~14,000 New Spinal Cord Injuries /yr.
- 4-5,000 Die During Initial Event
- \$417,000 first year expenses
- Lifetime Costs....? Million



■ Morbidity/Mortality Induced by Care Givers?

– “....25%”

- Toscano J. Prevention of neurological deterioration before admission to a spinal cord injury unit. Paraplegia. 1988 Jun;26(3):143-50. Department of Surgery, Austin Hospital, Melbourne, Australia.
- Podolsky S, et al. Efficacy of cervical spine immobilization methods. J Trauma. 1983 Jun;23(6):461-5.

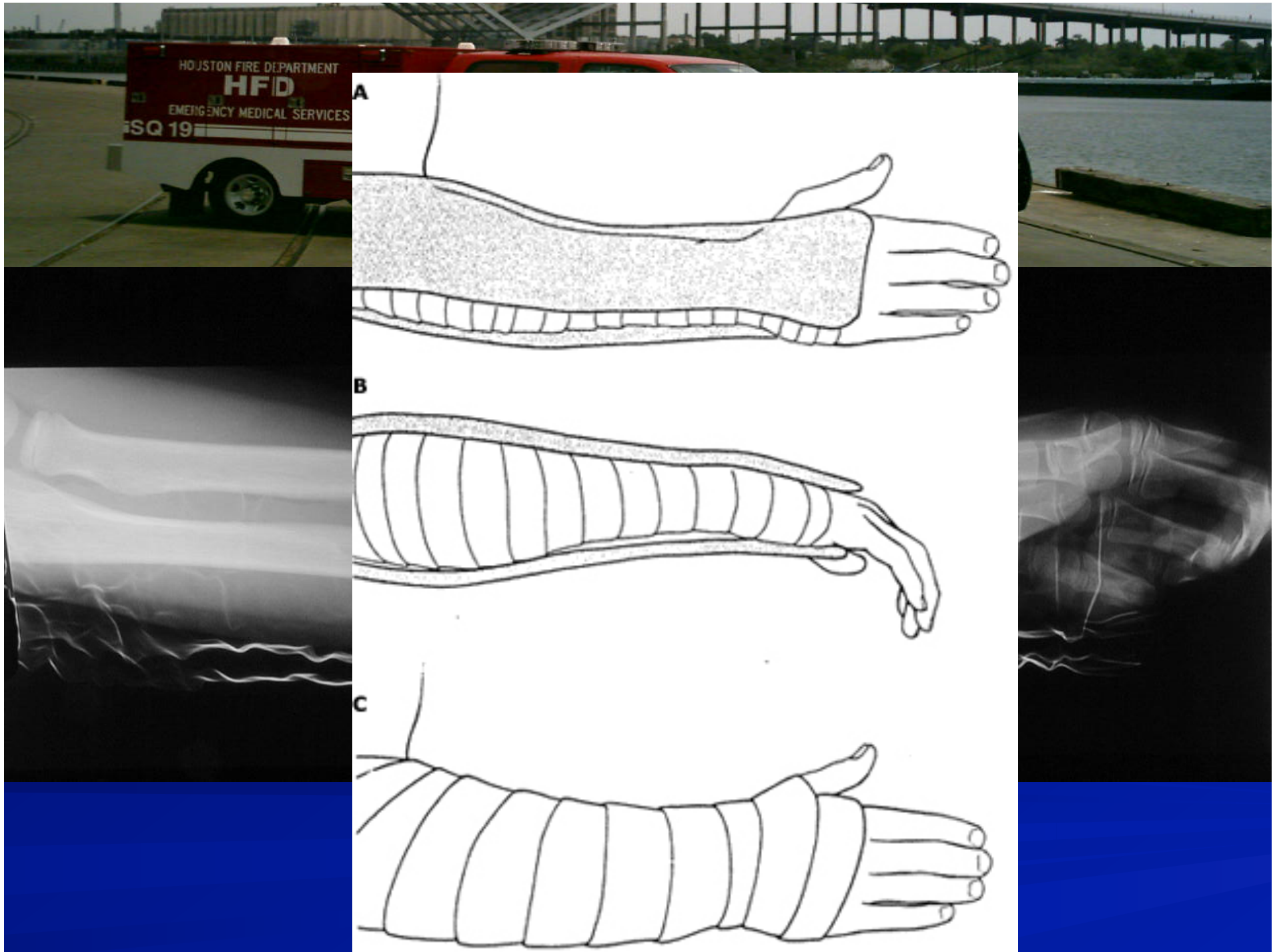


■ Indications for Cervical Spine Immobilization:

- Clinical Signs and Symptoms
- Mechanism of Injury

■ NEXUS Study

- Highly Reliable Criteria



Immobilization Concept Literature

Spinal immobilisation for trauma patients (Review)

Kwan I, Bunn F, Roberts I, on behalf of the WHO Pre-Hospital Trauma Care Steering Committee



2001

Authors' conclusions

We did not find any evidence that spinal immobilisation reduces mortality, neurological injury, spinal stability and adverse effects in trauma patients remains uncertain. Spinal immobilisation is a major cause of preventable death in trauma patients, and spinal immobilisation, particularly of the cervical spine, can contribute to airway compromise, the possibility that immobilisation may increase mortality and morbidity cannot be excluded. Large prospective studies



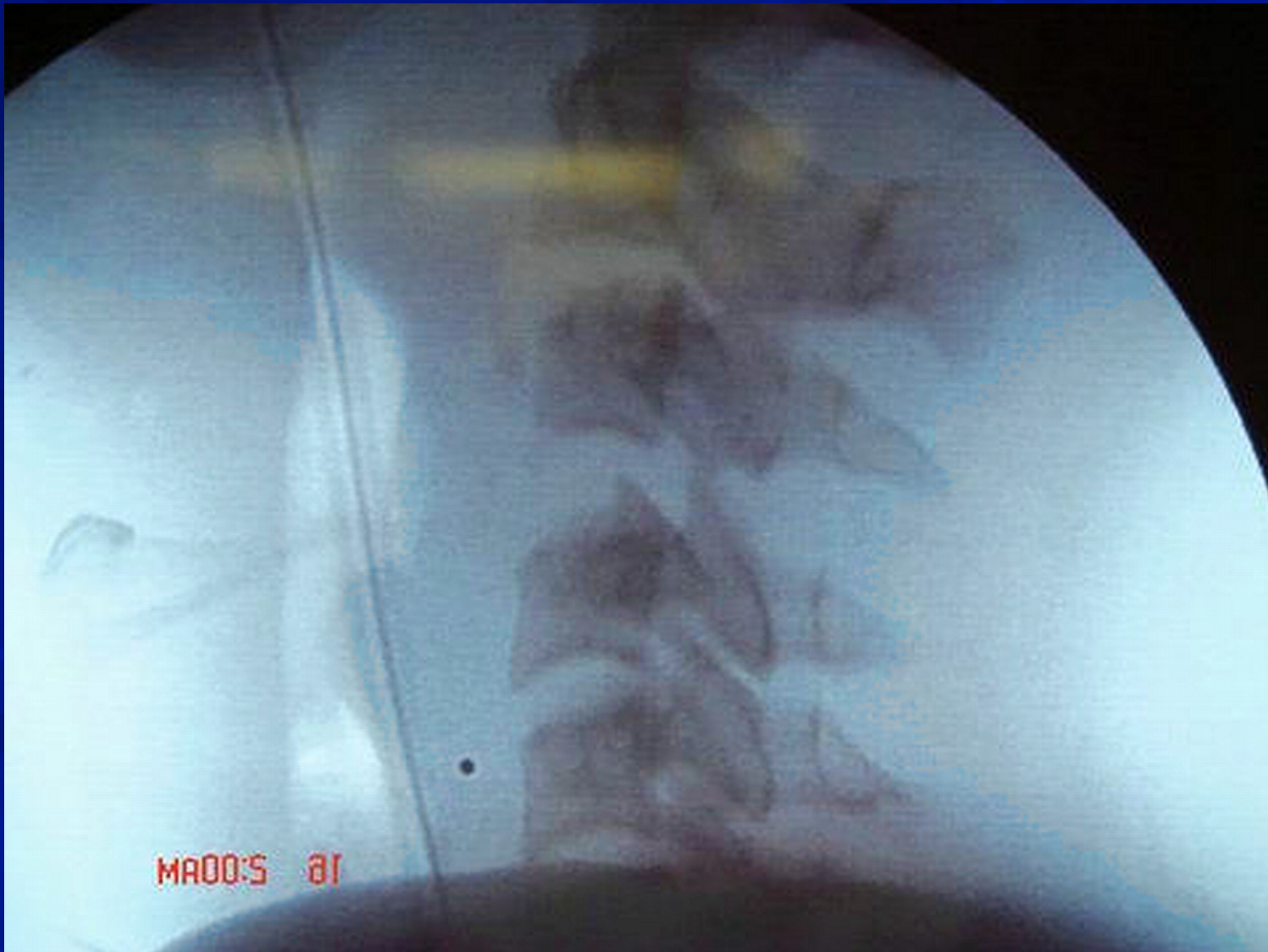
- Hauswald M, Ong B, Tandberg D, et al. Out-of-hospital spinal immobilization: Its effect on neurologic injury. Acad Emerg Med 1998;5:214-219.
- All Blunt Traumatic Spinal Cord Injuries to Univ of New Mexico or University of Malaysia.
- UNM – ALL patients were spinal immobilized in the field
- Univ Malaysia – NO patients were spinal immobilized in the field



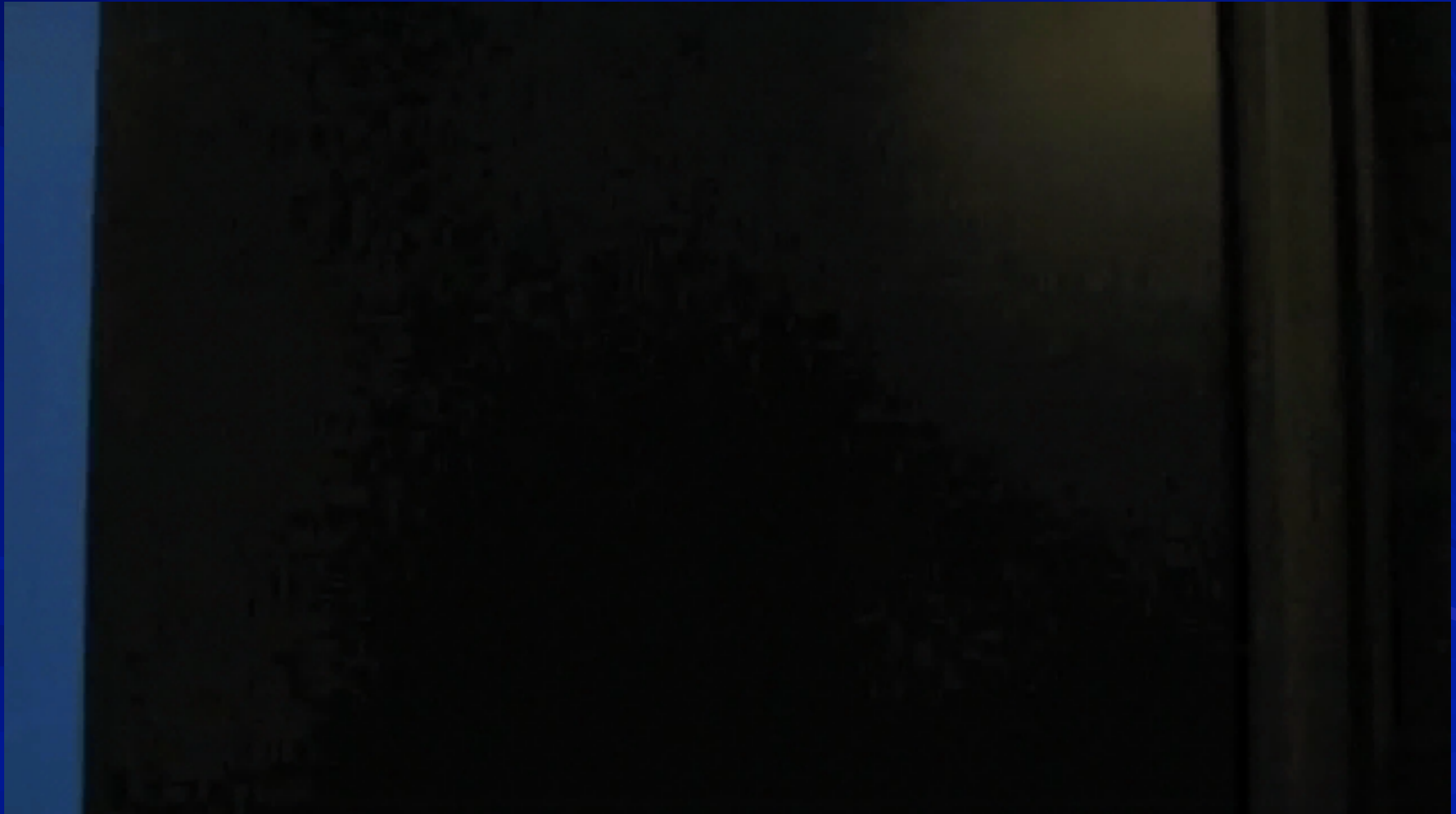
■ RESULTS:

- “There was less neurologic disability in the unimmobilized Malaysian patients (OR 2.03; 95%CI 1.03-3.99; $p=0.04$). This corresponds to a <2% chance that immobilization has any beneficial effect.”

Mandible Injury



Rapid Deceleration Injury





High Cervical Dissociation

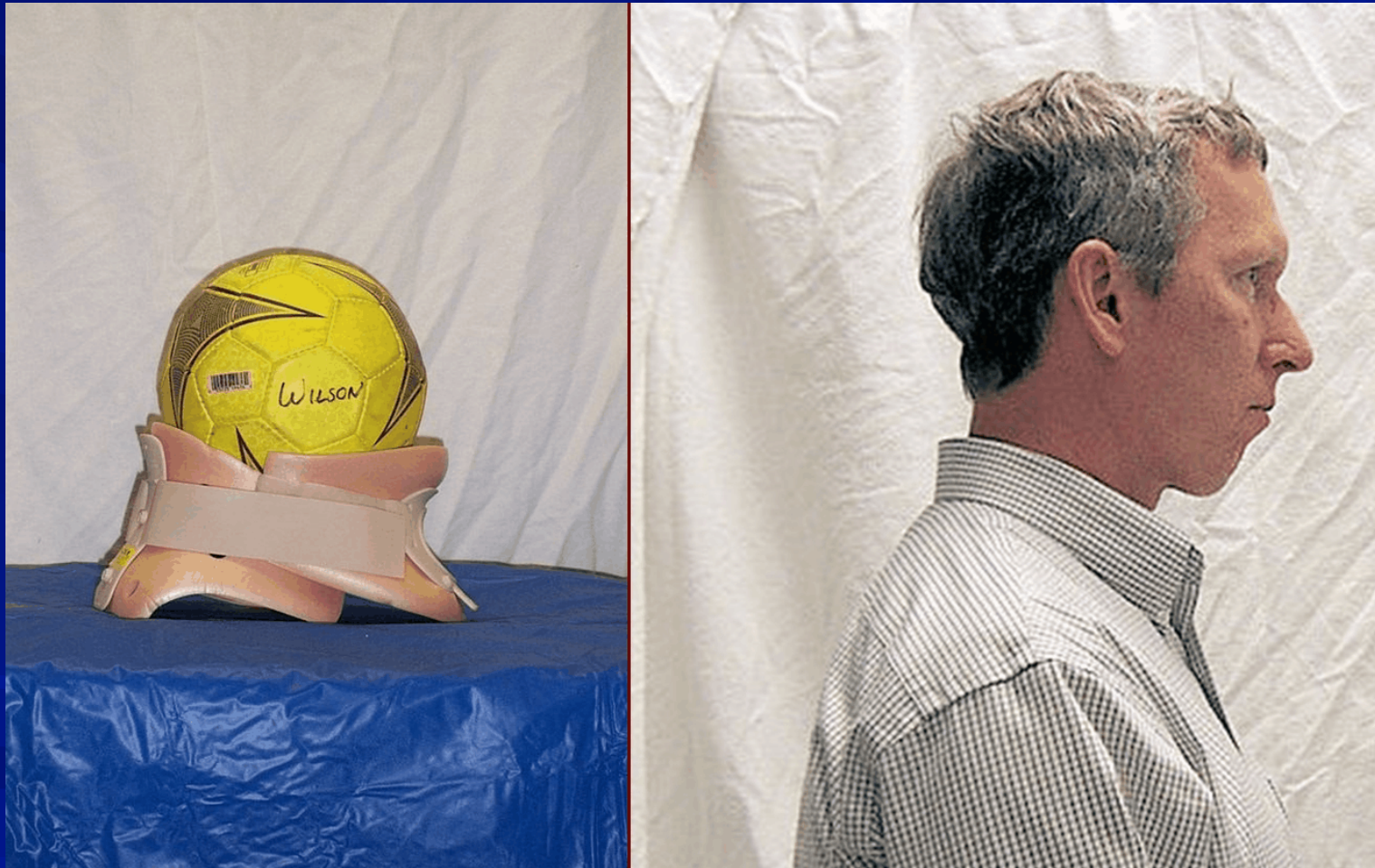
- Alker GJ, et al. **Postmortem radiology of head neck injuries in fatal traffic accidents.** Radiology. 1975 Mar;114(3):611-7.
 - 21% of Victims of MVC had neck injuries, most at craino-cervical junction.
- Bucholz RW, et al. **Occult cervical spine injuries in fatal traffic accidents.** J Trauma. 1979 Oct;19(10):768-71.
 - 24% of victims of MVC had fatal neck injuries, most dislocations at the atlanto-occipital junction.

■ Chaput CD, et al. **Survival of Atlanto-Occipital Dissociation Correlates With Atlanto-Occipital Distraction, Injury Severity Score, and Neurologic Status.** J Trauma. 2010 Dec 31. [Epub ahead of print]

- 1174 Trauma Admissions, 2005-2009.
- 14 High Cervical Injury, 6 Died

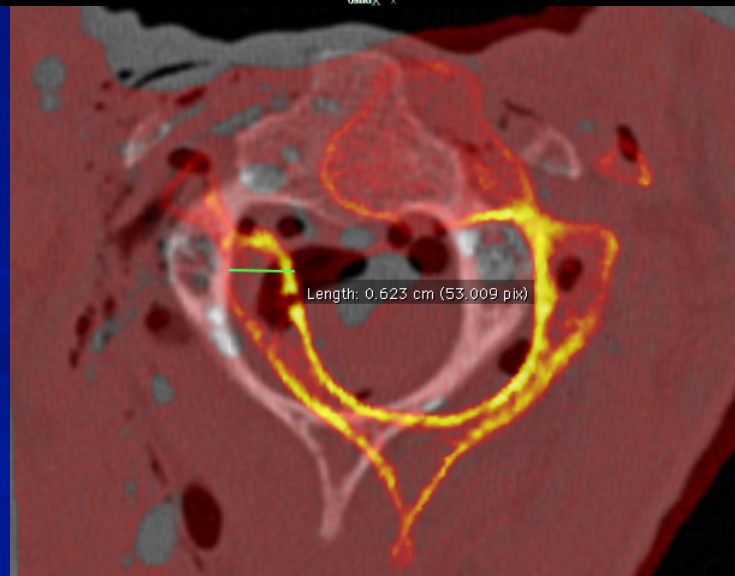
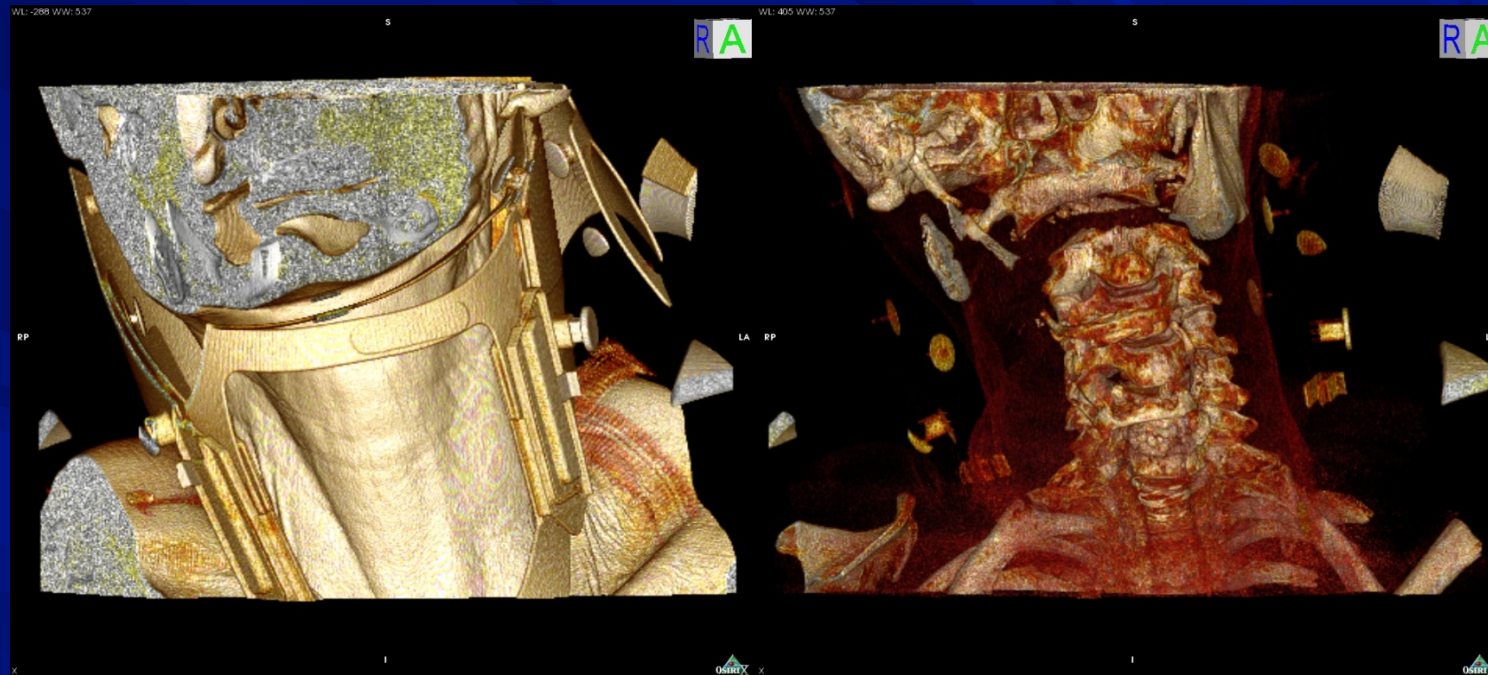
- Dreiangel et al. Occipitocervical dissociative injuries: common in blunt trauma fatalities and better detected with objective computed tomography-based measurements
The Spine Journal Volume 10, Issue 8, August 2010, Pages 704-707
- 74 patients who expired w/in 21 days of admission and had CT exams
- On review of CT's:
 - 37 (50%) had one or more major c-spine injury
 - ONLY ONE WAS DIAGNOSED BEFORE DEATH!

Hypothesis: collar creates distraction ?

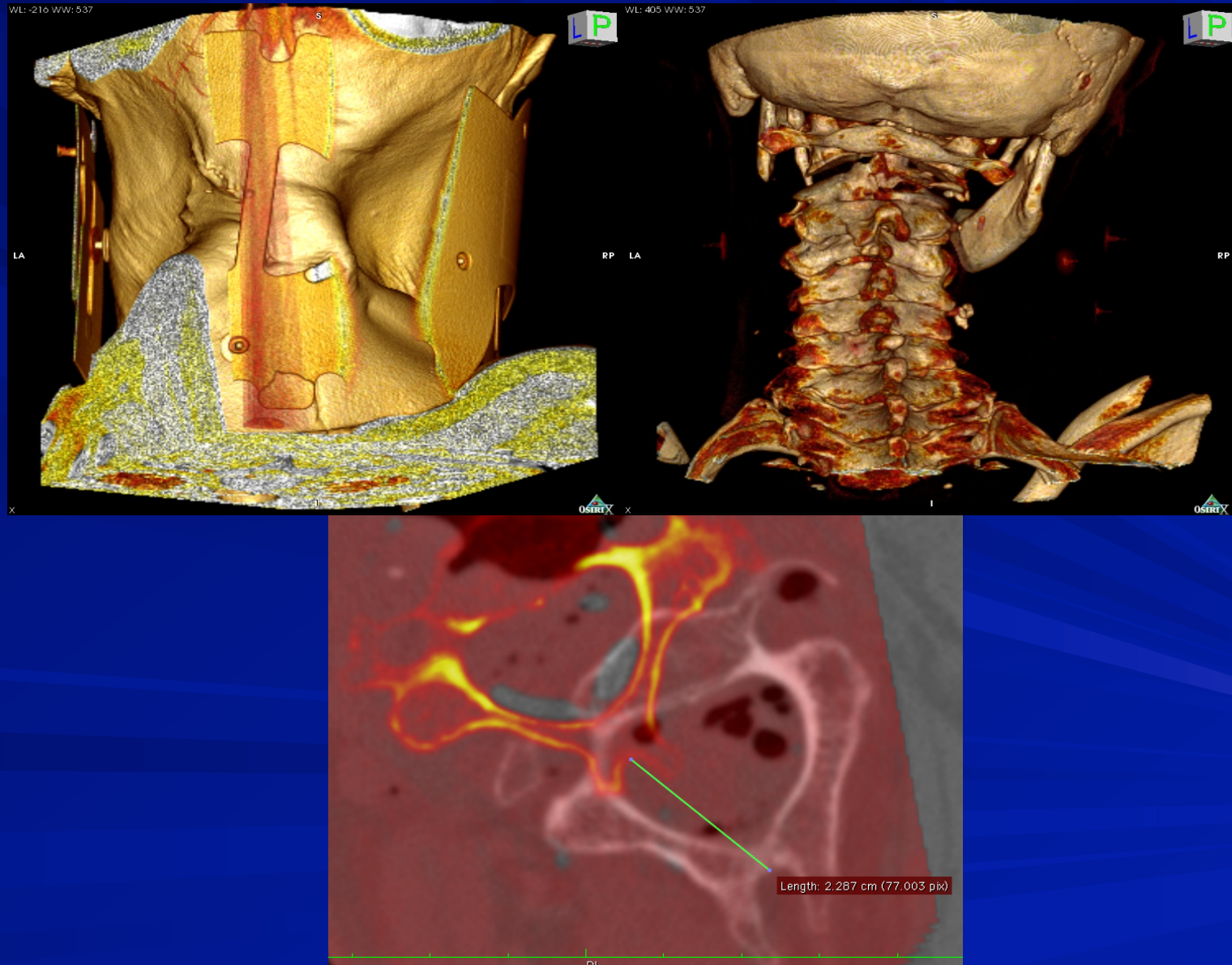




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Head Hinges upon Collar edge





- **BOTTOM LINE:**
- C-Spine Injuries are low-frequency/high-criticality events.
- NO evidence to support how we care for potential c-spine patients today
- NEW evidence strongly suggests what we are doing may be harmful



■ Take Away:

- Be Selective (Using Recognized Criteria),
- Use Properly Sized Collar
- The Spine is NOT Protected Until the Entire Head/Neck/Thorax Complex is Immobilized.
- The Goal Is Immobilization, Not Just Getting a Collar On.
- Towel Rolls are Light Weight, Versatile, and Inexpensive and Effective.