

Thinking Beyond ATLS Protocol: Clearing the C-Spine

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Abstract

ATLS guidelines are considered standard for clearing the C-spine all over the world in any trauma patient. As per the guidelines, in patients with dangerous mechanism of injury, CT C-spine is considered as gold standard to clear C-spine in patients with absent initial permanent or transient neurological abnormalities. We are presenting a case of a 62 years old male who suffered from a RTA with dangerous mechanism of injury. Despite clearance of C-spine as per ATLS protocol, patient eventually landed up in quadriplegia; thus raising the question in mind that whether ATLS protocol is enough or we need to think beyond it for decreasing morbidity in such cases.

Keywords: Cervical Spine; Spinal Cord Injury; Acs in Trauma; Quadriplegia; Spine Immobilisation.

Introduction

As per ATLS protocol, cervical spine can be cleared after initial clinical evaluation (by using "NEXUS criteria" and "CANADIAN C-SPINE RULE") and radiological investigations (X-ray or CT C-spine). But as per our experience in this case, ATLS is not always the end point to clear the C-spine.

Case Report

A 62 years male patient was brought by ambulance to ED after alleged history of RTA. Patient was driving his four wheeler car when it suddenly lost the balance and rolled over before hitting a divider in the road due to accidental tyre burst.

Patient had h/o loss of consciousness at scene for few seconds but denied any h/o vomiting, seizure, ante grade/retrograde amnesia, ENT bleeding or intoxication.

Patient was a known hypertensive (20 years), on regular medication and no h/o known allergies.

Primary Survey

Airway: Patent, C-collar in situ with triple immobilization of cervical spine.

Breathing: B/L air entry present

No added sounds

Respiratory rate - 24/minute

Spo2- 90% on room air

Circulation: Initial BP - not recordable,

HR- 110/min

Peripheral pulses - not palpable.

Disability : GCS -E4V5M6

Pupils - B/L NSNR.

No lateralizing signs

Exposure: Lacerated wound around 12x5x3 cm over medial aspect of left ankle region.

Pelvic compression test - negative

Chest compression test - negative

Log roll - no step deformity of spine, no perineal injury

Per rectal examination – normal

Patient was put on high flow oxygen through face mask and 2 litre I.V saline infusion started. Blood bank informed for need of PRBCs and FFPs.

Reassessment of Vitals

HR- 100/min

BP- 90/60 mm Hg

Spo₂- 100 % with high flow O₂

Radial pulse - feeble, low volume.

Secondary Survey

HEENT - No external head injury, no ENT bleed

Small CLW over left chin

No C-spine tenderness or deformity

R/S - Trachea midline, No distended neck veins.

B/L air entry equal, no added sounds.

No palpable crepitus

CVS - S1,S2 heart sounds normally heard.

P/A - No visible bruise, abdomen soft,

Non tender, bowel sounds normally heard.

No external genitalia injury.

CNS- Conscious, oriented, no lateralizing signs.

Tone/power/reflexes/sensations/coordination - normal in all 4 limbs GCS- E4V5M6, Pupil-B/L NSNR.

FAST scan – Negative

Bedside CXR-WNL

ABG: PH-7.32 PO₂-86%, Hb-10.2, HCO₃⁻-20 Na⁺-132, K⁺-3.612 lead ECG - ST elevation in lead II and AVF

In view of ST changes in ECG and hypotension, cardiology team was involved to rule out cardiac emergency. Bed side echo done which showed RWMA in RCA territory. Patient was shifted immediately to cath lab with C-spine immobilization and radiology investigations were delayed until cardiac pathology had been ruled out. Coronary angiography showed 100% occlusion of RCA, Stenting was done.

After patient's vitals got stabilized NCCT head and CT C-spine were done which did not show any parenchymal or bony injury.

In view of no clinical signs and symptoms along with normal CT cervical spine finding, the cervical spine was cleared and collar was removed with continuing management for other injuries in intensive care unit under neurosurgery, cardiology and orthopedics team.

However, after 7 hours patient started complaining of gradually increasing weakness in all four limbs. On examination patient had power – 3/5 in B/L upper limbs and 1/5 in both lower limbs. Sensations showed variable response.

Urgent MRI C-spine with whole spine screening was done which showed IVD prolapse C3/4, C5/6, C6/7 with canal stenosis with cord compression with myelopathy.

Neurosurgery team reviewed the case and advised for cervical laminoplasty but attendants and patient refused for any surgical intervention considering the risk and poor prognosis.

Patient was kept on I.V steroid therapy but showed no improvement. Eventually, after a week of conservative management patient was discharged from hospital against medical advice as per relatives and patient request with neuro-deficit.

Conclusion

In case of patients with trauma with dangerous mechanism of injuries, we realized that ATLS guidelines are not sufficient and we need to think and anticipate beyond that. From our experience in this case, we would like to propose that in patients of trauma with significant mechanism of injury, we should immobilize c-spine for at least 24-48 hours and observe the clinical progression of the patient regardless of normal initial clinical evaluation and radiological investigations. Other than that MRI C-spine should be considered as first line of imaging in patients with dangerous mechanism of injury.

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