OSCE
5

OSCE 5

Candidate Instructions

This is a **7-minute** Standardised Case-Based Discussion (SCBD) station.

You are working in a regional hospital and triage alerts you to a 25yo male with neck pain post blunt traumatic injury when he was swimming in a pool and his friend jumped onto his neck and upper back. This was associated with pins & needles in both upper limbs. An x-ray has been arranged and a cervical collar was applied. He then c/o brief bilateral lower limb weakness followed by pins and needles in his arms, associated with neck pain. The lower limb weakness resolved after few minutes but the weakness, pins and needles in his arms persist on arrival to ED. He denies taking any recreational drugs but has drunk few bottles of beer.

GCS 15
RR 16, Sats 99%RA
HR 78 BP 120/75

He has mild tenderness over his mid cervical region in midline and the neurological examination reveals posterior lower cervical spine tenderness, Motor power 3/5 in the both upper limbs with paraesthesia. The lower limbs examination is normal.

Your tasks

- Describe and interpret his x-ray
- Answer questions from examiner as case progresses

This OSCE will assess the following domains:

- · Medical Expertise – 60%

  o Assessment (30%) o Treatment (30%)

- · Prioritisation and Decision-making – 40%


R
R
A

Lead Examiner Script

The questions are standardised for this SCBD. They are to be delivered in the same manner to all candidates.

If a candidate's response lacks clarity– then the lead examiner may probe further or ask the candidate to justify their decision-making process.

Section 1- (2 minutes)

"Describe the abnormalities and interpret this x-ray."

1 - Anterior-inferior Tear drop # of C2
2 - Prevertebral soft tissue swelling
3 – Mild retrolisthesis C2 on C3

"Please also outline and justify clinical diagnosis that explains his neurological examination"

Clinical presentation consistent with 'Central Cord Syndrome'.

Motor impairment with **upper extremities affected more than lower extremities.**
A hyperextension cervical injury is a common mechanism for central cord syndrome, and in such cases, the cord is pinched between disc and ligamentum flavum hypertrophy posteriorly. Hyperextension teardrop fracture has associated acute traumatic central cord syndrome in ~80% of cases.

Examiner can prompt for further central cord syndrome features as below for better performing candidates.

- Bladder dysfunction, more often urinary retention than incontinence
- Variable sensory loss below the level of the lesion – often referred to as "suspended" or "floating" sensory levels
- Preservation of vibration and position sense (located in the spared posterior column).

Section 2 - (2 - 4 minutes)

"Your provisional diagnosis is a spinal cord injury specifically central cord syndrome. The patient's obs now are:

GCS 15

HR 50, BP 90/60

RR 26, Sats 90%RA

Your HMO states their opinion that this is spinal shock.

Q. Is the HMO correct?

Outline how you would assess for and differentiate spinal shock vs neurogenic shock".

If candidate starts talking about detailed neurological exam – redirect them to give a broad outline of findings as below.

Neurogenic Shock	Peripherally vasodilated
	Hypotensive
	Relative bradycardia
Spinal Shock	Flaccid below the level of lesion
	Loss of distal reflexes
	Loss of voluntary movement

Neurogenic shock is classically characterised by hypotension, bradycardia and peripheral vasodilatation. Neurogenic shock is due to loss of sympathetic vascular tone and happens only after a significant proportion of the sympathetic nervous system has been damaged – as may occur with lesions at the T6 level or higher.

This patient's vital signs are consistent with neurogenic shock.

Spinal shock is not a true form of shock. It refers to the flaccid areflexia that may occur after spinal cord injury, and may last hours to weeks. It may be thought of as 'concussion' of the spinal cord and resolves as soft tissue swelling improves. Priapism may be present.

Section 3 – Management (4 - 7 minutes)

"Describe in detail how you would manage this patient".

- **Primary survey and resuscitation (ABCDE approach)**
- Airway maintenance with cervical spine immobilization
  — lesions above C5 may require intubation for mechanical ventilation
  — maintain cervical spine precautions (hard collar, sandbags, tape forehead)
- Breathing and ventilation
  — Oxygen support – aim Sats > 95% (NP/Mask/Bipap if needed)
  — monitor for respiratory insufficiency from thoracic or higher spinal lesions, complications of spinal cord injury, or other thoracic injuries
- Circulation with haemorrhage control
  — seek and treat any sources of haemorrhagic shock (common in trauma)
- Look for neurogenic shock
  — treat neurogenic shock with repeated fluid boluses (e.g. 250 mL crystalloid) +/- noradrenaline infusion to maintain organ perfusion (normal mentation, warm peripheries, urine output >0.5 mL/kg/h) and/or a MAP 85-90 mmHg.
  — be aware that vagal stimuli (e.g. suction, NGT insertion, intubation) may exacerbate neurogenic shock; treat with atropine 0.6mg IV boluses.
- Disability (neurological evaluation)
  — detailed neurological exam including motor and sensory levels bilaterally; check for priapism; check anal sphincter tone and bulbocavernosus reflex.
- Exposure and Environmental Control
  — higher risk of hypothermia due to peripheral vasodilation resulting from sympatholysis and decreased muscular activity
  — use fluid warmer, warm blankets, and/or bair hugger to keep patient warm
- **Corticosteroids NOT indicated.**
- **Adjuncts to Primary Survey and Resuscitation**
  — ECG and full non-invasive monitoring including temperature
  — Bladder scan to assess for urinary retention
- **Transfer**
  — Organize early transfer to a spinal unit
- **Secondary survey**
  — Head-to-toe examination looking for other injuries
- **Adjuncts to Secondary Survey**
  — Organize imaging to define the nature of the spinal cord injury (CT is more readily available and defines bony injuries; MRI defines neurological injury)
  — Monitor for fluid overload using bedside ultrasound (look for IVC distention and pulmonary oedema) and/ or CVP monitoring.

<u>If candidate finishes ahead of time, ask following</u>

"Given the distance to the tertiary hospital and bad weather conditions, patient will need to be transferred out by road. How would you prepare to transport this patient?"

Airway

Ensure patient airway safety

Assess airway stability for all patients.

Secure the endotracheal tube *(*ETT). Ensure the tapes are firm and intact. If there is a suspected head injury the tapes should not occlude venous drainage, preventing increases in intracranial pressure (tapes may need to be tied above the ears and secured with tape).

Record the length and diameter. Ensure a chest x-ray has been performed at the current ETT length.

Insert the orogastric tube. Ensure it is not secured to the ETT (so is independently secure) and aspirate prior to transport.

It is preferable to replace hard (extrication) cervical collars with a Philadelphia collar to minimise the risk of a pressure injury. A cervical collar must remain in situ during transfer to a MTS, regardless of spinal clearance.

Breathing

Ensure optimised oxygenation

Observe the patient's respiratory rate and its character.

Measure the oxygen saturation (SpO_2) and end-tidal carbon dioxide ($ETCO_2$).

Administer oxygen using the correct delivery device.

Check arterial blood gases. If a head injury is suspected, ensure the partial pressure of carbon dioxide ($PaCO_2$) is between 35 and 40 mmHg. This will optimise cerebral perfusion.

Secure an intercostal catheter (ICC) if present. Ensure the dressing is dry and intact and drainage system is functioning and not clamped/kinked.

Ventilation considerations:

- If a head injury is suspected and the patient is receiving positive pressure ventilation, maintain PEEP levels below 10 cm of water to minimise the impact of increased intrathoracic pressures on intracranial pressure.
- If there are known or suspected chest injuries ensure the tidal volume is 4–6 mL/kg to

prevent an acute lung injury.
· Avoid high peak inspiratory pressures.
· If a flail segment is involved, consider early ventilation and utilise PEEP levels higher than usual.

Circulation and C-spine

Ensure IV access and management

Insert a minimum of two large-bore peripheral IV lines.

Secure all lines, ensuring the injection ports are accessible.

Attach a rapid infuser pump line and fluid for transfer.

Record all IV fluids. Ensure accurate documentation of all blood products administered.

Monitor vital signs for evidence of developing haemorrhagic shock.

Utilise serial blood gases to monitor Hb and lactate and consider serial coagulation screens to identify coagulopathy and guide blood product administration.

Transduce/monitor all arterial and central venous lines. Ensure lines are anchored appropriately and transducers are aligned with the phlebostatic axis.

Documentation

Ensure complete patient documentation

Provide copies of all medical and nursing clinical notes and charts.

Include all investigation results – pathology and ECG. Check the coagulation status and platelet count for all trauma patients.

Provide digital copies of all imaging – films, scans, MRI.

Advise of any 'limitations of treatment' orders.

Include the contact details of next of kin.

Include contact numbers for staff at the referral centre.

Ensure patient belonging/valuables are documented and included with the transfer.

Alert

It is important that you notify the ARV coordinator of significant deterioration in:
- Conscious state.
- Blood pressure.
- Heart rate.
- Respiratory status.
- Oxygenation.
- Major clinical developments such as significantly abnormal diagnostic tests or new clinical signs.

The need for major interventions prior to the retrieval team arriving [11] (for example, intubation and surgery)

Other

Maintain body temperature

Hypothermia contributes to poor outcomes for trauma patients. Warm the patient to achieve normothermia and package to prevent heat loss.

Insert an in-dwelling catheter

Be mindful of potential bladder injuries – maintain a strict fluid balance chart.

Empty drainage bags prior to transport

Ensure clear documentation of fluid loss.

Administer antiemetic

Maintain spinal precautions

In a major head injury, ensure the bed is tilted to 20–30 degrees to reduce intracranial pressure.

Stabilise or splint fractures

Pelvic injuries should be stabilised with a pelvic binder or bed sheet. If an unstable pelvic fracture is suspected, treat it with strict spinal precautions and do not log roll; use a Jordan frame or spinal board for transfers.

If limb immobilisation devices are applied, ensure there are no areas of potential pressure injury

Check lab results and modify treatment if needed

Check all limbs for potential compartment syndrome

Maintain neurovascular observations, elevate the affected limb and consider fasciotomy if circulation is compromised.

Ensure all open wounds are cleaned and covered

Be mindful that trauma patients are highly susceptible to infection and severe sepsis.

Ensure adequate analgesia is in progress prior to transport

Notify the patient's family or next of kin of the trauma transfer and ensure all patient property is identified and secured