



Adapting to the limitations faced in the Anaesthetic Management of High Cervical Spine Surgeries in Resource-limited Settings: A Case Report

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BACKGROUND

- High cervical spine tumours present significant anaesthetic challenges due to the risk of spinal cord compression, respiratory compromise and haemodynamic instability. Airway management is particularly critical, as excessive cervical movement may worsen neurological injury.
- In resource-limited settings, the absence of advanced airway equipment necessitates pragmatic adaptations to ensure safe perioperative care.

CASE DESCRIPTION

A 17-year-old female presented with a 14-month history of posterior neck pain and progressive limb weakness. She had no prior medical or anaesthetic history.

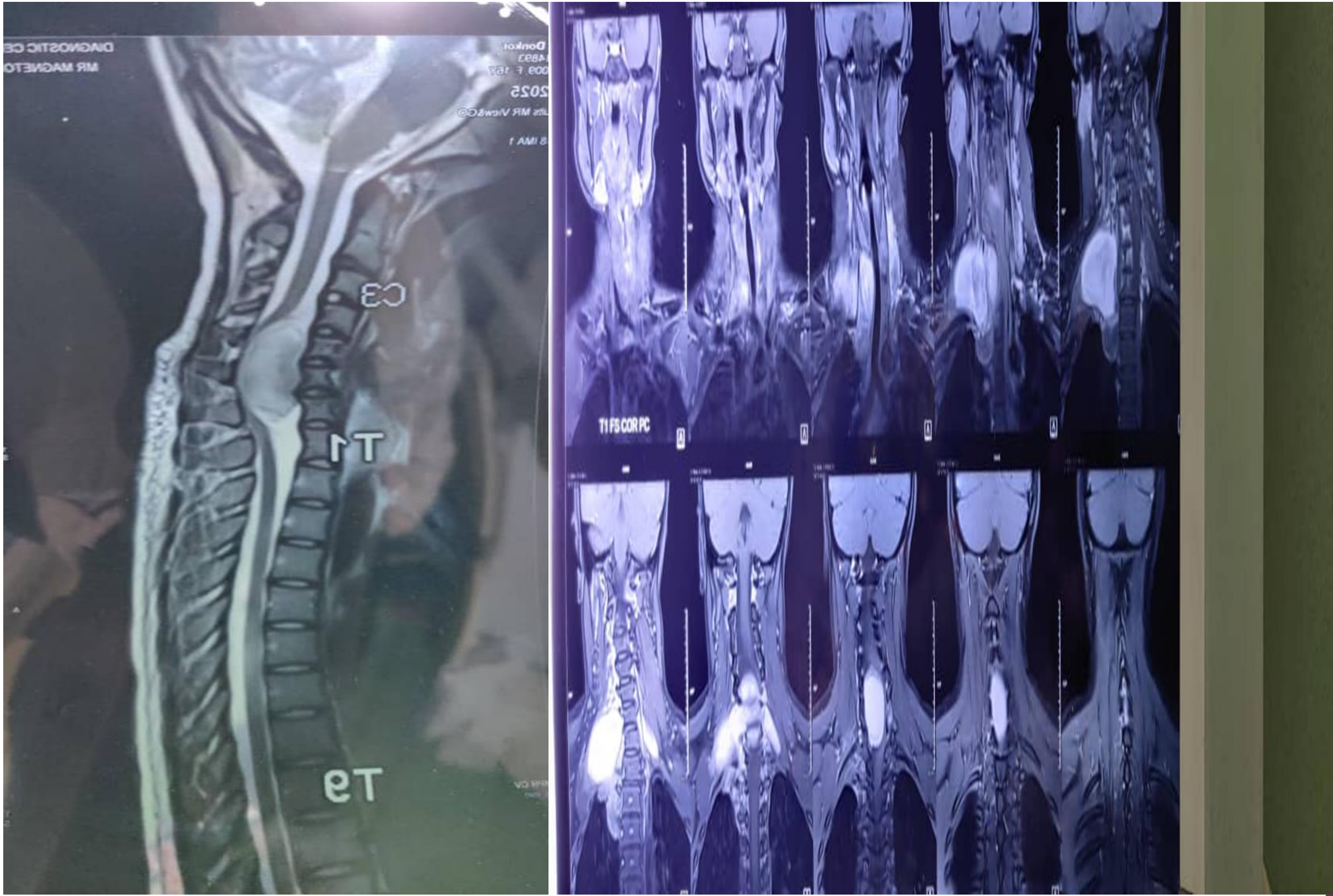
On examination, she was fully conscious and oriented. Neurological assessment revealed paraplegia (0/5 power in the lower limbs) and reduced strength in the upper limbs (4/5), with preserved sensation and no cranial nerve deficits. Multiple café-au-lait macules were noted. Respiratory assessment showed good effort with no signs of distress or paradoxical breathing. Airway assessment was unremarkable. Estimated body weight: 60 kg.

She was scheduled for C4–C7 laminectomy and excision of an intradural extramedullary tumour under general anaesthesia.

INVESTIGATIONS

- MRI: C4–C6 cervical canal tumour extending into the neck and right lung apex; brachial plexus involvement, no vascular attachment
- Chest X-ray: Normal
- Hb: 12.2 g/dL
- Platelets: 258 × 10⁹/L
- INR: 1.2 | APTT: 28 s
- Renal function: Normal
- Spirometry: Not performed

Figures 1 and 2: Preoperative MRI showing cervical tumour



ANAESTHETIC MANAGEMENT

Preoperative Considerations

- Anticipated a difficult airway due to the need to minimise cervical movement.
- Risk of neurological deterioration with manipulation.
- Possible significant blood loss.
- Limited ICU availability for postoperative ventilation.

Induction and Airway Management

Standard monitoring and preoxygenation were performed. Anaesthesia was induced with midazolam, fentanyl, and propofol. Tracheal intubation was successfully achieved using direct laryngoscopy with manual in-line cervical stabilisation, facilitated by vecuronium, yielding a Cormack–Lehane Grade I view. No fiberoptic or video laryngoscope was available.

Maintenance

Anaesthesia was maintained with isoflurane in an oxygen–air mixture with intermittent vecuronium. Careful prone positioning was ensured with appropriate padding. Multimodal analgesia, prophylactic antibiotics, and haemodynamic support (ephedrine) were administered.

- Surgical duration: 4 hours 35 minutes.
- Estimated blood loss: 250 mL.
- Intraoperative course was stable.

Emergence and Postoperative period

Neuromuscular blockade was reversed with neostigmine and atropine. The patient was extubated awake based on:

- Adequate respiratory effort
- Satisfactory tidal volumes
- No intraoperative neurological compromise

She was monitored overnight in the HDU for airway and haemodynamic stability, had an uneventful recovery, and was transferred to the ward the following day. A second-stage surgery was successfully performed two weeks later.

DISCUSSION AND LEARNING POINTS

Discussion

- In this case, direct laryngoscopy with manual in-line stabilisation was safely employed in the absence of advanced airway equipment.
- Extubation was guided by preserved respiratory function, intraoperative stability, and absence of neurological compromise, thereby avoiding postoperative ventilation and conserving limited ICU resources.

Learning points

- ☐ Patients with high cervical tumours require meticulous airway planning to minimise cervical movement, with preference for awake fiberoptic or video-assisted techniques.
- ☐ In resource-limited settings, direct laryngoscopy with manual in-line stabilisation may be a safe alternative when advanced airway devices are unavailable.
- ☐ Postoperative ventilation and ICU observation should be considered due to the risk of airway/breathing compromise.
- ☐ Normal preoperative respiratory effort, in the absence of intraoperative inadvertent neural injury, may preclude the need for postoperative ventilation.