

## CASE REPORT

# Anaesthetic Management of Cervical Spondylotic Myelopathy Patient with Poliomyelitis

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## ABSTRACT

**Introduction:** Cervical spondylotic myelopathy is a degenerative condition resulting in the compression of the spinal cord. It leads to symptoms such as gait disturbances, hand clumsiness, neck pain. The presence of poliomyelitis that causes motor neuron damage and muscle atrophy adds further complexity to the management of cervical spondylotic myelopathy.

**Case Report:** A 64 year-old male diagnosed with cervical spondylotic myelopathy was posted for limited cervical laminectomy. He came with complaints of neck pain radiating to left upper limb and left upper limb weakness for 4 months. He was a known case of poliomyelitis with right upper limb paralysis since childhood. He was short in stature. Airway examination showed Mallampati grade 2. Upon neurological examination his motor power in both lower limbs was 5/5, in right upper limb 0/5, left upper limb 3/5 with no sensory deficit. Blood & routine investigations were within normal limits.

Standard monitoring was ensured perioperatively, Patient was induced as per standard anaesthesia protocol. Patient was intubated with manual inline stabilization with Video laryngoscope. Then patient was log rolled to the prone position on the operating table with pressure point precautions. Intra operative vitals were stable. Anaesthesia was maintained with isoflurane, O<sub>2</sub> and N<sub>2</sub>O. Peri operatively multimodal approach of analgesia was employed. Patient was extubated and neurological assessment was done. Standard monitoring was continued IN the post aesthetic care unit for about 1 hour. There was no surgical or aesthetic complications.

**Conclusion:** This case illustrates the complexity of anesthetic management in patients with both cervical spondylotic myelopathy and poliomyelitis. Meticulous

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planning, including careful airway management and patient positioning, is critical to avoiding further neurological impairment. A tailored anesthetic approach, including preoperative evaluation and intraoperative vigilance, ensured a successful outcome in this patient.

**Key Messages:** Two challenges we faced in our case was upper limb paralysis due to poliomyelitis, we had to secure IV canula in the femoral vein and airway challenge due to spondylitis changes in cervical spine. Airway was accessed with inline stabilisation with the use of video laryngoscope. Electromyography or motor evoked potentials are desirable in this sort of patients where poliomyelitis and the changes due to spondylitis are to be monitored after surgical intervention.

## KEYWORDS

• Anaesthetic management • Cervical spondylotic myelopathy • Poliomyelitis

## INTRODUCTION

Cervical spondylosis myelopathy (CSM) is a pathological condition involving degenerative changes in the cervical spine, leading to spinal cord alterations. These changes can result in compression of the spinal cord or its vascular supply through stenotic processes, causing ischemia and demyelination. CSM is most prevalent in elderly individuals, with about 75% of cases occurring in males, and it is a common reason for spinal decompression surgery. Surgical intervention in CSM can relieve spinal cord compression, prevent further neurological deterioration, and improve existing symptoms, thereby enhancing quality of life.<sup>1</sup>

Perioperative challenges in CSM cases include airway manoeuvres during facemask ventilation and intubation, as well as risks from hypoxia, hypoperfusion, and hemodynamic instability. The anaesthesiologist's role is complicated by the typical age group affected patients over 40 who often have comorbidities that can impact perioperative management. Successful surgical intervention in symptomatic CSM patients requires a meticulous, knowledge based anaesthesia care plan and strong collaboration between aesthetic and neurosurgical teams.<sup>2</sup>

This case report emphasizes the importance of a detailed aesthetic care plan for the effective surgical management of a CSM patient with a potentially difficult airway.

## CASE REPORT

A 64 year-old male diagnosed with cervical spondylotic myelopathy (C3-C6) was posted for limited cervical laminectomy. He came

with complaints of neck pain radiating to left upper limb and left upper limb weakness for 4 months. He was a known case of poliomyelitis with right upper limb paralysis since childhood. He was short in stature with 150 cm height and 52 kgs weight. Airway examination showed Mallampati grade 2. Upon neurological examination his motor power in both lower limbs was 5/5, in right upper limb 0/5, left upper limb 3/5 with no sensory deficit. Blood & routine investigations were within normal limits.

IV cannula was secured via the femoral vein as upper limb paralysis was there. Standard monitoring was ensured perioperatively which include pulse oximetry, end tidal carbon dioxide, electrocardiograph, non-invasive blood pressure, pulse rate. Patient was induced as per standard anaesthesia protocol. Patient was intubated with manual inline stabilization with Video laryngoscope to minimize mechanical movements of the neck during intubation. Then patient was log rolled to the prone position on the operating table with pressure point precautions. Intra operative vitals were stable. Anaesthesia was maintained with isoflurane, O<sub>2</sub> and N<sub>2</sub>O. Peri operatively multimodal approach of analgesia was employed. Patient was extubated and neurological assessment was done. Standard monitoring was continued in the post aesthetic care unit for about 1 hour. There was no surgical or aesthetic complications.

## DISCUSSION

The primary focus of the anaesthetist during cervical spine surgery is to prevent the exacerbation of pre-existing spinal damage and neurological deficit. The optimal anaesthetic

care involves a spectrum of thorough pre-operative assessment and a detailed, skill and knowledge based peri-operative anaesthesia care plan.<sup>2</sup> The index case was particularly a challenge to the anaesthetic team, as he was a prospective difficult airway because of his limited neck mobility, neck stiffness and airway manoeuvres, excessive flexion or extension during intubation or surgical positioning such as the prone positioning could have a devastating effect on the pre-existing cervical spine injury leading to further deterioration of the patient's presenting symptoms.<sup>3,4</sup>

To reduce the risk of peri-operative anaesthetic complications during laryngoscopy and intubation in our patient, specific caution was exercised while applying the face mask and during laryngoscopy. Intubation was achieved using manual in-line stabilization. Mask ventilation and airway management during intubation have also been implicated in neurological deterioration in patients with cervical spine pathology. However, there have only been a few case reports of possible damage to the spinal cord from intubation and no direct causal effect has been proven.<sup>3,4</sup>

The course of the pathology itself, intraoperative surgical complication, haemodynamic changes, hypoxia and hypoperfusion may all contribute to neurological deterioration,<sup>5</sup> Caution is necessary during the induction of anaesthesia in these peculiar patients as induction with agents like propofol, opioids and benzodiazepines may cause severe hypotension while at the other extreme the use of ketamine may precipitate increased neuraxial pressure. Both of which may lead to hypoxia and hypoperfusion. The combination of these agents to achieve a balance along with a cardio stable non depolarizing muscle relaxant like atracurium and vecuronium has been advocated.<sup>2</sup>

Hence our patient was induced with a combination of fentanyl, ketamine and propofol while vecuronium was the neuro muscular blocking agent of choice to facilitate intubation. This afforded us the advantage of induction without causing iatrogenic hypotension or hypertension with subsequent inadvertent hypo perfusion which can further exacerbate pre-existing cervical spine damage. The aim of intra-operative management is to prevent spinal cord ischemia, compression, oedema, hypoperfusion, hypoxia, hypercapnia,

hypoglycaemia and hypothermia.

Immediately after induction, prophylactic intravenous dexamethasone was given. The anti-inflammatory property of dexamethasone reduces the release of interleukins, prostaglandins and thromboxane's. Optimal positioning after proning is necessary so that the abdomen hangs free. This reduces the risk of increasing intra abdominal pressure which in turn reduces epidural venous bleeding. Similarly, the patients head was placed in a headrest in the neutral position to also avoid venous congestion.

Analgesia is usually given by multimodal approach using opioids such as fentanyl, morphine and local infiltration technique. Padded gauze protected the ear and eyes and body pressure points to avoid post-operative debilitating ulcers which can increase morbidity. Optimal temperature was maintained to prevent arrhythmias, poor coagulation and reduce the risk of infection.

Standard anaesthetic monitoring was continued from pre-operative period till post-surgery and recovery in the post anaesthetic care unit. Surgery lasted about 130 minutes and post surgery, the patient was haemodynamically stable hence extubated and taken to the post anaesthesia care unit, PACU. Post-operative neurological assessment is carried out and improvement is observed which was suggestive of a successful anaesthesia and surgical outcome.

## CONCLUSION

This case illustrates the complexity of anaesthetic management in patients with both cervical spondylotic myelopathy and poliomyelitis. Meticulous planning, including careful airway management and patient positioning, is critical to avoiding further neurological impairment. A tailored anaesthetic approach, including preoperative evaluation and intraoperative vigilance, ensured a successful outcome in this patient

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