



ANAESTHETIC CONSIDERATIONS IN CEREBELLOPONTINE ANGLE TUMOUR EXCISION: A CASE REPORT

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ABSTRACT

Background: Cerebellopontine angle tumours are located in close proximity to critical neurovascular structures, including cranial nerves and the brainstem, making their surgical excision both technically and anaesthetically challenging. Optimal anaesthetic management requires maintenance of intracranial dynamics, facilitation of intraoperative neuromonitoring, and prevention of complications such as venous air embolism and haemodynamic instability. We report the perioperative management of a 33-year-old female undergoing cerebellopontine angle tumour excision under general anaesthesia using a total intravenous anaesthesia technique. Intraoperatively, the patient developed a trigeminocardiac reflex characterised by bradycardia, hypotension, and transient asystole following tumour traction. Prompt recognition and immediate intervention resulted in rapid haemodynamic recovery. The patient was electively ventilated postoperatively and extubated after 18 hours with an uneventful neurological outcome. This case highlights the importance of tailored anaesthetic techniques, vigilant monitoring, and rapid management of neurogenic reflexes in optimising perioperative outcomes..

KEYWORDS : Cerebellopontine Angle Tumour, Trigemino-cardiac Reflex, Total Intravenous Anaesthesia, Neuromonitoring, Neuroanaesthesia.

INTRODUCTION

Cerebellopontine angle tumours constitute a significant proportion of posterior fossa lesions and commonly include vestibular schwannomas and meningiomas. Their proximity to the brainstem and cranial nerves V to XI presents unique anaesthetic and surgical challenges. Patients may present with cranial nerve deficits, raised intracranial pressure, and brainstem compression. Anaesthetic goals include maintenance of cerebral perfusion, avoidance of intracranial pressure fluctuations, and facilitation of intraoperative neuromonitoring for preservation of neural integrity. Total intravenous anaesthesia is widely preferred in such cases due to minimal interference with evoked potentials. In addition, anaesthesiologists must anticipate complications such as venous air embolism, haemodynamic instability, and trigeminocardiac reflex, which can significantly impact intraoperative outcomes.

Case Presentation

A 33-year-old female, ASA physical status I, presented with tingling sensation over the right side of the face and recurrent vomiting. She had no significant comorbidities or prior surgical history. Clinical examination and routine investigations were within normal limits, and airway assessment was unremarkable. Neuroimaging findings were consistent with a cerebellopontine angle tumour. The patient was scheduled for elective tumour excision under general anaesthesia after appropriate counselling and informed consent.

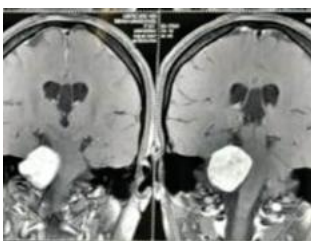


Figure 1: Coronal MRI Brain Images Demonstrating a Well-

defined Cerebellopontine Angle Lesion with Significant Mass Effect.

Anaesthetic Management

Standard ASA monitoring along with invasive arterial blood pressure monitoring was established. The patient was positioned supine with head tilt. Following pre-oxygenation, anaesthesia was induced using intravenous agents with a short-acting neuromuscular blocker to facilitate intubation. Maintenance of anaesthesia was achieved using total intravenous anaesthesia with propofol, dexmedetomidine, and fentanyl infusions. Volatile anaesthetics and nitrous oxide were avoided to preserve intraoperative neuromonitoring signals. Electromyographic monitoring of cranial nerves V, VII, and X was employed. Neuromuscular blockade was not continued after intubation, and train-of-four monitoring confirmed adequate neuromuscular recovery with 4/4 responses. Ventilation was adjusted to maintain normocapnia, and haemodynamics were maintained within optimal limits. During tumour manipulation, the patient developed sudden bradycardia, hypotension, and transient asystole lasting approximately 12 seconds, consistent with trigeminocardiac reflex. Immediate cessation of surgical stimulus, administration of intravenous atropine, increase in inspired oxygen concentration, and vasopressor support resulted in prompt recovery. The remainder of the procedure was uneventful.



Intraoperative neuromonitoring (IONM) display with multi-channel EMG traces from different muscles of CN 7,10

Postoperative Course

The patient was shifted to the surgical intensive care unit with elective postoperative ventilation due to anticipated airway compromise. Neurological status and respiratory parameters were closely monitored. Extubation was performed after 18 hours once airway reflexes and respiratory effort were adequate. The patient had an uneventful recovery with no postoperative neurological deficits.

DISCUSSION

Anaesthetic management of cerebellopontine angle tumour excision requires careful consideration of neurophysiological principles and intraoperative challenges. Total intravenous anaesthesia is preferred due to its favourable profile in preserving evoked potentials and providing haemodynamic stability, thereby facilitating reliable neuromonitoring of cranial nerves. Avoidance of neuromuscular blockade after intubation is essential for accurate electromyographic monitoring, which aids in preventing postoperative neurological deficits. The trigeminocardiac reflex is a significant intraoperative concern in such surgeries and is triggered by stimulation of the trigeminal nerve or its branches. It results in sudden parasympathetic activation leading to bradycardia, hypotension, arrhythmias, and even asystole. The underlying mechanism involves afferent signals from the trigeminal nerve to the brainstem, followed by efferent vagal stimulation causing cardiovascular depression. Recent literature highlights that the incidence of trigeminocardiac reflex is higher during skull base surgeries and can be potentiated by factors such as light anaesthesia, hypoxia, and hypercapnia (Meuwly et al., 2017; Schaller et al., 2020). Immediate cessation of the triggering stimulus, administration of anticholinergic agents, and haemodynamic support remain the cornerstone of management. Preventive strategies include maintaining adequate depth of anaesthesia and ensuring normoxia and normocapnia. Furthermore, studies have demonstrated that total intravenous anaesthesia provides superior stability in neurosurgical procedures involving neuromonitoring compared to volatile-based techniques (Bilotta et al., 2019). Postoperative care is equally crucial, as lower cranial nerve involvement may lead to airway compromise and aspiration risk. Elective postoperative ventilation and delayed extubation, as performed in this case, can enhance patient safety and improve outcomes.

CONCLUSIONS

Cerebellopontine angle tumour excision requires meticulous anaesthetic planning, use of total intravenous anaesthesia, and vigilant intraoperative monitoring to optimise neurological outcomes. Early recognition and prompt management of trigeminocardiac reflex are essential to prevent serious complications. A multidisciplinary approach and careful postoperative monitoring significantly contribute to improved perioperative safety and favourable patient outcomes.

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