DOI: 10.7860/JCDR/2026/84121.22478

Case Report

Anaesthesia Section

Anaesthetic Management of a Cerebellopontine Angle Tumour in a Primigravida Undergoing Craniotomy: A Case Report

N MOHAMMED ARSHAD[1], M SHAHEEN KHAN[2], CK SWETHA RAMANI[3], HARI POOJA MUTUKUNDU[4]

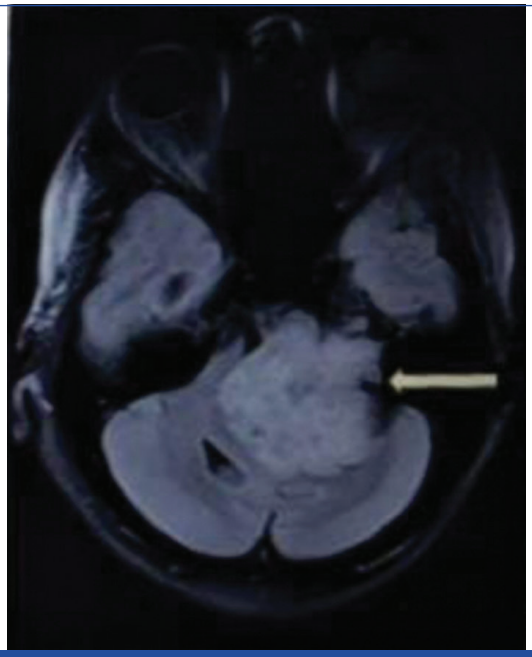
ABSTRACT

Cerebellopontine Angle (CPA) tumours are uncommon intracranial neoplasms that can present significant anaesthetic challenges, particularly in pregnant patients. The physiological, hormonal, and anatomical changes of pregnancy can mask neurological symptoms, delay diagnosis, and complicate both surgical and anaesthetic management. The authors report a rare case of a 22-year-old primigravida at 14 weeks of gestation who presented with progressive blurring of vision and left-sided tinnitus. Magnetic Resonance Imaging (MRI) revealed a large left CPA lesion compressing the fourth ventricle. She had a history of Ventriculoperitoneal (VP) shunt placement for hydrocephalus two weeks prior. The patient was subsequently planned for an elective left retromastoid suboccipital craniotomy. The procedure was performed under Total Intravenous Anaesthesia (TIVA) using propofol and dexmedetomidine, with continuous neurophysiological monitoring to preserve cranial nerve function. Muscle relaxants were avoided following intubation to facilitate Electromyographic (EMG) monitoring. Haemodynamic stability and foetal heart rate were maintained throughout the eight-hour procedure. The patient was electively ventilated overnight, extubated on the first Postoperative Day (POD) without neurological deficits, and postoperative imaging confirmed complete tumour excision. She later delivered a healthy male infant at 36 weeks via elective caesarean section. The present case highlights the successful perioperative management of a large CPA tumour during early pregnancy, where the timing of surgery, meticulous use of TIVA without muscle relaxants, and continuous foetal and cranial nerve monitoring ensured favourable maternal and foetal outcomes.

Keywords: Foetal monitoring, Neuroanaesthesia, Pregnancy, Total intravenous anaesthesia

CASE REPORT

A 22-year-old primigravida, weighing 60 kg at 14 weeks' gestation, presented with progressive bilateral blurring of vision for 20 days and intermittent left-sided tinnitus for one year. She had no co-morbidities. Two weeks prior, she had undergone right-sided ventriculoperitoneal shunt placement for hydrocephalus. MRI of the brain showed a 4.9×4.8×4.9 cm extra-axial lesion in the left CPA compressing the fourth ventricle [Table/Fig-1].



[Table/Fig-1]: Preoperative MRI showing left CPA mass compressing the fourth ventricle (arrow).

The patient was scheduled for left retromastoid suboccipital craniotomy under general anaesthesia and was classified as American Society of Anesthesiologists (ASA) III. Verbal consent was obtained from the patient for surgery and the scientific publication of the present case report.

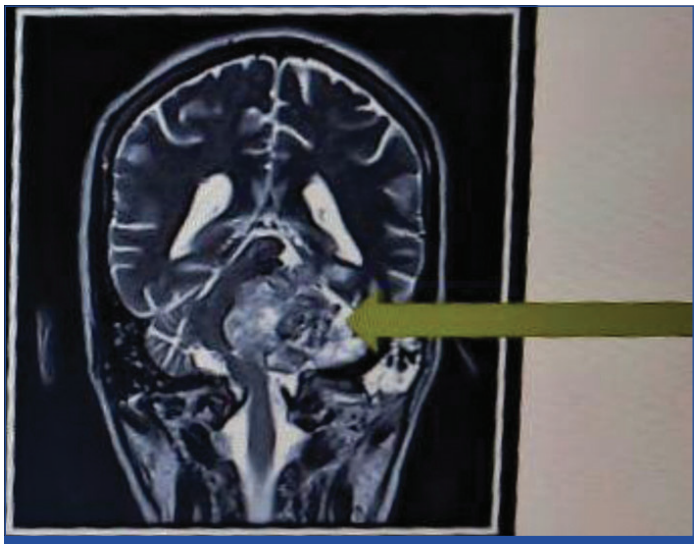
Pre-anaesthetic evaluation revealed mild anaemia {Haemoglobin (Hb) 10.8 g/dL}. Airway assessment showed Mallampati grade II with adequate mouth opening and neck mobility. Cardiovascular, renal, and coagulation profiles were within normal limits. Obstetric consultation recommended perioperative foetal heart rate monitoring. To assess the integrity of neural structures and minimise potential damage to vital neural structures, the procedure was performed under continuous neurophysiological monitoring with TIVA alone.

Anaesthetic management: In the operating room, standard monitoring was initiated {Electrocardiogram (ECG), pulse oximetry, non-invasive blood pressure, end-tidal Carbon di Oxide (CO_2), and temperature}. Baseline parameters were: Heart Rate (HR) 76/min, Blood Pressure (BP) 120/70 mmHg, peripheral Oxygen Saturation (SpO_2) 99% on room air. The right subclavian vein and left dorsalis pedis artery were cannulated for invasive BP monitoring.

Premedication included glycopyrrolate 0.2 mg Intravenously (IV) and ranitidine 50 mg IV. Anaesthesia was induced with fentanyl 2 µg/kg, dexmedetomidine 1 µg/kg, propofol 2 mg/kg, and atracurium 0.5 mg/kg. The patient was intubated using a 7.0 mm cuffed Flexometallic tube. Anaesthesia was maintained with TIVA using target-controlled propofol (3-4 µg/mL) and dexmedetomidine (0.2 µg/kg/h). Muscle relaxants were avoided after intubation to allow continuous intraoperative EMG monitoring of cranial nerves V, VII, IX, XI, and XII. Bispectral index was maintained between 40-60.

The patient was positioned in the park bench posture with left uterine displacement. Isotonic crystalloids were titrated to maintain normovolaemia and stable central venous pressure (6-8 cm H_2O). Intraoperative haemodynamics were stable, and continuous foetal heart rate monitoring was performed. The surgery lasted eight hours, with an estimated blood loss of approximately 450 mL.

At the end of the procedure, the patient was not extubated and was electively ventilated in the Post-Anesthesia Care Unit (PACU). In the PACU, postoperative analgesia included intravenous paracetamol (1 g every 6 hours) and low-dose dexmedetomidine. On POD 1, she was extubated. Post-extubation, she remained comfortable and did not develop any neurological deficits or further deterioration of cranial nerve function. Obstetric ultrasonography confirmed the wellbeing of the foetus. Postoperative MRI performed on POD 1 [Table/Fig-2] demonstrated complete tumour excision with no evidence of bleeding or infection. Histopathology of the tumour revealed Antoni A and Antoni B areas with hyalinised blood vessels, suggestive of vestibular schwannoma.



[Table/Fig-2]: Postoperative MRI demonstrating complete excision of tumour (arrow).

Upon review in the neurosurgical clinic two weeks later, she was alert, conscious, and ambulating independently, corresponding to a modified Rankin Scale score of 2. Obstetric abdominal scanning showed a live, thriving foetus, and she was advised to continue oral antiepileptic therapy. She was followed monthly until delivery and underwent elective caesarean section under general anaesthesia at 36 weeks of gestation. She did not exhibit any symptoms of raised Intracranial Pressure (ICP), and a healthy baby boy weighing 2.9 kg was delivered without congenital defects.

DISCUSSION

The CPA tumours account for 5-10% of intracranial neoplasms, with vestibular schwannoma being the most common type. Their occurrence during pregnancy is rare, estimated at 2-3 per 10,000 pregnancies [1]. Hormonal and haemodynamic changes during gestation, particularly increased oestrogen, progesterone, and plasma volume, can accelerate tumour growth and exacerbate neurological symptoms [2].

Multidisciplinary collaboration among neurosurgery, anaesthesia, and obstetrics is essential. When surgery is unavoidable, it is best performed during the second trimester to reduce teratogenic risk [3]. Patient positioning can be complicated by a gravid uterus, especially in late pregnancy [3]. TIVA with propofol and dexmedetomidine was chosen to provide stable haemodynamics, minimal interference with neurophysiological monitoring, and rapid emergence [4]. These agents do not significantly affect Brainstem Auditory Evoked Potentials (BAEP), Motor Evoked Potentials (MEP), or Somatosensory Evoked Potentials (SSEP), unlike inhalational agents. They provide adequate cerebral relaxation, maintain Cerebral Perfusion Pressure (CPP), and prevent fluctuations in ICP. Muscle relaxants were withheld after intubation to facilitate EMG-based cranial nerve monitoring [5].

Continuous foetal heart rate monitoring, invasive BP, and maintenance of normocapnia are essential to prevent uteroplacental hypoperfusion [6]. Left uterine displacement was employed to prevent aortocaval compression [1]. Careful fluid balance and avoidance of mannitol or hypertonic saline were practiced to reduce the risk of foetal dehydration [4]. ICU observation allowed prompt management of haemodynamics and cerebral resuscitation.

Yeap TB et al., reported a similarly managed CPA lesion during pregnancy, emphasising multidisciplinary planning, intraoperative neuromonitoring, and foetal surveillance. The present case aligns with these principles, differing in tumour size, prior VP shunt status, and the prolonged eight-hour operative duration managed without maternal or foetal compromise [1]. Khurana T et al., demonstrated safe combined obstetric and neurosurgical management, although their timing differed (caesarean immediately followed by craniotomy) [5]. Close collaboration among neurosurgery, anaesthesia, and obstetric teams is a key factor in achieving favourable maternal and foetal outcomes.

Bhardwaj M et al., highlighted the importance of TIVA and EMG monitoring for neurosurgery in pregnant patients [2]. In our patient, the use of TIVA and EMG ensured stable maternal and foetal haemodynamics and prevented nerve injury. Pennell PB emphasised that physiological changes in pregnancy alter antiepileptic drug kinetics, supporting careful dose adjustment and monitoring [7]. Accordingly, the authors' perioperative antiepileptic strategy prioritised agents with favourable pregnancy safety profiles and close postoperative monitoring to reduce maternal and foetal risks.

Anaesthesia for CPA tumour resection presents unique challenges due to complex anatomy, potential for significant blood loss, and the need to maintain haemodynamic stability and minimise neurological complications. The goal is to maintain adequate cerebral and uteroplacental perfusion pressure to ensure viability of both the brain and foetus. CPP should be maintained at 50-70 mmHg throughout surgery and ideally guided by ICP [8].

CONCLUSION(S)

Neuroanaesthesia for CPA tumour resection during pregnancy remains a significant challenge. The use of TIVA in conjunction with intraoperative neuromonitoring provided optimal surgical conditions while ensuring foetal safety. Maintenance of adequate cerebral and uteroplacental perfusion, avoidance of teratogenic agents, and seamless multidisciplinary coordination throughout the perioperative period are vital to achieving favourable maternal and foetal outcomes in pregnant patients undergoing non-obstetric surgery.

REFERENCES

[1] Yeap TB, Hamzah N, Ismail MI, Ab Mukmin L. Neuroanaesthetic challenges in a pregnant patient with a huge cerebellopontine angle meningioma. BMJ Case Rep. 2023;16(5):e253694.
[2] Bhardwaj M, Saini S, Kaur K, Choudhary S, Hooda S. Anaesthetic management of a case of schwannoma with intraoral extension. Egypt J Anaesth. 2014;31(2):215-17.
[3] Ng JH, Maheshwari D. Anaesthesia for posterior cranial fossa surgery. World Federation Soc Anaesthesiol Tutorial. 2021.
[4] Prajapati AL, Patel A, Shah DR, Sarvaiya VU. Anesthetic management of the pregnant patient with intracranial haemorrhage for cesarean section and craniotomy. Int J Sci Res. 2013;2(8):310-12.
[5] Khurana T, Taneja B, Saxena KN. Anesthetic management of a parturient with glioma brain for cesarean section immediately followed by craniotomy. J Anaesthesiol Clin Pharmacol. 2014;30(3):397-99.

[6] Prachi W, Nisal R, Reddy S, Verma N, Jadhav J, Bhalerao N. Anaesthetic management of left cerebellopontine angle acoustic nerve schwannoma in sitting position with intraoperative electromyographic facial-nerve monitoring. J Pharm Res Int. 2021;33(60B):2325-31.
[7] Pennell PB. Antiepileptic drug pharmacokinetics during pregnancy and lactation. Neurology. 2003;61(6 Suppl 2): S35-S42.
[8] Brain Trauma Foundation; American Association of Neurological Surgeons; Congress of Neurological Surgeons. Guidelines for the management of severe traumatic brain injury. J Neurotrauma. 2007;24(Suppl 1):S1-S106.

PARTICULARS OF CONTRIBUTORS:
1. Postgraduate Student, Department of Anaesthesiology, SRM Medical College Hospital and Research Centre, Chengalpattu, Tamil Nadu, India.
2. Postgraduate Student, Department of Anaesthesiology, SRM Medical College Hospital and Research Centre, Chengalpattu, Tamil Nadu, India.
3. Professor, Department of Anaesthesiology, SRM Medical College Hospital and Research Centre, Chengalpattu, Tamil Nadu, India.
4 . Postgraduate Student, Department of Anaesthesiology, SRM Medical College Hospital and Research Centre, Chengalpattu, Tamil Nadu, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
CK Swetha Ramani,
Professor, Department of Anaesthesiology, SRM Medical College Hospital and Research Centre, Chengalpattu, Tamil Nadu, India.
E-mail: swethark@srmist.edu.in

PLAGIARISM CHECKING METHODS: [Jain H et al.]
- Plagiarism X-checker: Sep 26, 2025
- Manual Googling: Nov 11, 2025
- iThenticate Software: Nov 13, 2025 (2%)

ETYMOLOGY: Author Origin

EMENDATIONS: 6

AUTHOR DECLARATION:
- Financial or Other Competing Interests: None
- Was informed consent obtained from the subjects involved in the study? Yes
- For any images presented appropriate consent has been obtained from the subjects. Yes

Date of Submission: **Sep 05, 2025**
Date of Peer Review: **Oct 15, 2025**
Date of Acceptance: **Nov 15, 2025**
Date of Publishing: **Mar 01, 2026**