

Anesthetic management of a parturient with glioma brain for cesarean section immediately followed by craniotomy

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Abstract

The anesthetic management of a parturient with an intracranial tumor can be quite challenging for the anesthetist as it requires a fine balance of both maternal and fetal safety. The literature pertaining to anesthetic management of such cases is limited. We describe the anesthetic management and peri-operative concerns of this unusual case of a parturient aged 25 years with 8 months amenorrhea and a high grade glioma in the left temporo-parietal region who underwent cesarean section under general anesthesia immediately followed by craniotomy. Anesthetic management was tailored keeping in mind maternal safety and fetal considerations.

Key words: Anesthetic considerations, cesarean section, craniotomy, glioma, pregnancy

Introduction

The incidence of non-obstetric surgery during pregnancy is 0.75-2%.^[1] The incidence of intracranial neoplasm in 25-34 years aged parturients is reported as 6.9/100,000.^[2] Surgery for an intracranial tumor in parturients is even rarer.

Case Report

A parturient with 8 months amenorrhea aged 25 years, weighing 50 kg, presented with complaints of headache, vomiting, restlessness and loss of appetite of 2 month duration. Obstetric examination and ultrasound revealed a single live fetus of 33 weeks gestation. Neurological examination and brain magnetic resonance imaging revealed a mass lesion of 5.4 cm × 2.74 cm × 3.75 cm in size over the left temporo-parietal region suggestive of high grade glioma with dense perilesional edema [Figure 1]. Respiratory and cardiovascular

system examination was unremarkable and routine blood investigations were normal.

The patient was started on conservative therapy by the neurosurgeons with injection phenytoin, levictram, mannitol, lasix and dexamethasone to enable her to carry her pregnancy

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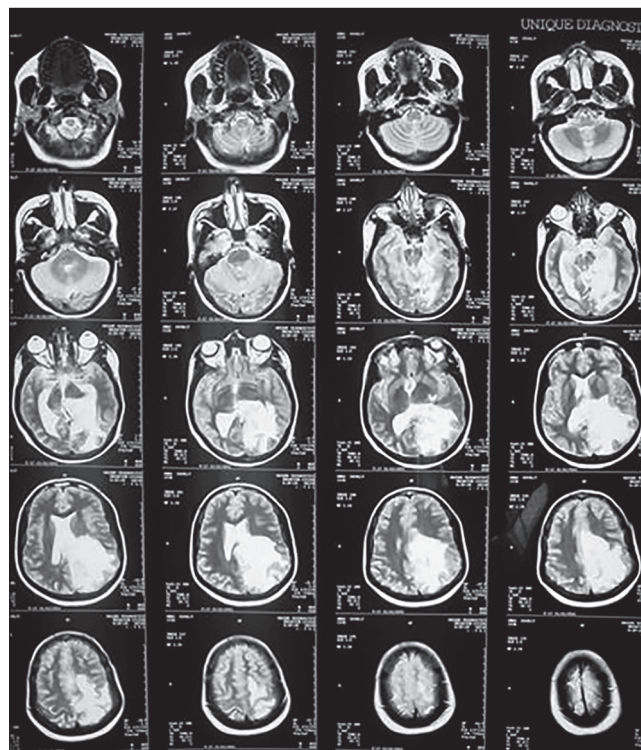


Figure 1: MRI brain showing left temporo parietal glioma

to term. However, at 36 weeks gestation, she started to develop blurring of vision and drowsiness with marked irritability and had a Glasgow Coma Scale (GCS) score of 11/15. Neurological examination revealed rising intracranial pressures (ICP) with possibility of optic nerve compression. Abdominal ultrasound confirmed that the fetus was alive and healthy. After due deliberations with the neurosurgeons and obstetricians, it was decided to take her up for an immediate cesarean section followed by craniotomy in the same sitting.

Routine pre-operative preparation was performed and acid aspiration prophylaxis accomplished with intravenous injection ranitidine 50 mg and injection metoclopramide 10 mg. In the operation theatre, standard monitors were applied, table tilt given and pre-oxygenation carried out. Narcotics were omitted. Rapid sequence induction was carried out with injection thiopentone sodium 300 mg and injection rocuronium 50 mg injection lignocaine 80 mg was administered for blunting the stress response. Pre-intubation vitals were 70/min and 126/74 mm Hg. Endotracheal intubation was achieved with 7.0 mm cuffed flexometallic tube with soft atraumatic silicone tip. There was minimal post-intubation response with post-intubation vitals of 74/min and 130/77 mm Hg. Anesthesia was maintained with 50:50 N₂O: O₂ with 0.6-1% isoflurane. End tidal carbon dioxide (Et CO₂) was maintained around 30-32 mm Hg. An intra-arterial catheter was placed in the left radial artery and central venous catheter in the right subclavian vein post-induction. Intraoperative vitals were normal. A healthy baby with an APGAR score of 9, 9, 8 at 1, 5 and 10 min was delivered. Thereafter, injection fentanyl 100 µg and midazolam 1 mg was administered. At this time, uterus was found to be relaxed resulting in excessive bleeding. High dose syntocinon infusion was started immediately. Intra-myometrial prostaglandin was administered by the obstetrician. Isoflurane was stopped and propofol infusion started@ 100 µg/kg/min to control the depth of anesthesia. The uterus contracted well after this measure and closure was carried out. After the cesarean section, anesthesia was continued with injection morphine, propofol infusion and top ups of rocuronium.

Estimated time for tumor excision was 4-6 h, neurosurgeons didn't want to assess the patient soon after surgery and elective ventilation for 24-36 h post-operatively was planned so morphine was used. Et CO₂ was further reduced to 30 mm Hg. The patient's head was elevated and tilted toward the right for better exposure. Neurosurgeons performed the craniotomy and excised the tumor mass. Intra-operatively injection mannitol, dexamethasone, lasix, phenytoin were given as cerebroprotective measures. Total surgery lasted 8 h with estimated blood loss of 2200 ml which was adequately replaced. After surgery, patient was electively ventilated in intensive care unit to reduce the ICP and was reversed and extubated after 36 h. Her GCS score at this time was 15/15 and she had no neurological deficit. She was discharged on 14th post-operative day with a healthy baby.

Discussion

Intracranial neoplasms are rare during pregnancy and gliomas are even rarer. Isla *et al.*^[3] noted that 7/126,413 parturients had an intracranial neoplasm. The management of such a case requires multidisciplinary approach and needs to be individualized according to various factors, of which, neurological status of the mother and gestational age of fetus are most important. For such a case, the clinical goals of neuro and obstetric anesthesia needed to be modified. Certain principles are similar while others are conflicting. Aspiration prophylaxis, pre-oxygenation, hemodynamic stability and vigilant monitoring are desirable in both. Table 1 outlines the contrasting anesthetic considerations for obstetric and neuroanesthesia.

Traditionally, spinal anesthesia is the preferred technique of choice for a cesarean section, but in our patient general anesthesia was indicated since she had raised ICP and needed to undergo both surgeries in the same sitting. Opioids were omitted as neonatal respiratory depression, apnea and chest wall rigidity^[6] are known. Short acting opioids such as remifentanyl and alfentanil were unavailable at our institution. Nitroglycerine causes cerebral vasodilatation and

Table 1: Contrasting anesthetic considerations for obstetric anesthesia and neuroanesthesia

Anesthetic considerations	Obstetric anesthesia	Neuroanesthesia
RSI	Mandatory	In GCS <8/15
Thiopentone sodium	Lower doses preferred	High dose indicated for reducing ICP
Propofol	Not approved for use in pregnant patients by manufacturer (Fresenius, Claris Life Sciences) recommendations. ^[4,5] and United States Food and Drug Administration. Used in our case after delivery of baby, in view of PPH	Preferred for induction since it facilitates smooth induction with decrease in ICP
Suxamethonium	Preferred for RSI	Leads to rise in ICP so avoided
Opioids	Given only after delivery of baby as can cause fetal depression	Indicated to blunt Intubation response
Hyperventilation	To be avoided as can cause adverse fetal effects	Helps in reducing ICP

RSI = Rapid sequence induction, GCS = Glasgow coma scale, ICP = Intracranial pressures, PPH = Postpartum hemorrhage

rise in ICP; esmolol causes fetal bradycardia so are better avoided.^[6] Lignocaine hydrochloride pre-medication, liberal dose of thiopentone sodium, endotracheal tube with soft atraumatic silicone tip were used to blunt the rise in ICP during laryngoscopy and intubation. Rocuronium was used instead of suxamethonium. It has no adverse maternal and fetal effects^[7,8] and is a preferred relaxant for craniotomy.^[9] Furthermore, our patient had been receiving cerebroprotective measures since admission therefore no cardiovascular stress response was seen.

An Et CO₂ between 25 and 30 mm Hg is advocated by some authors.^[6] Keeping fetal safety in mind we initially maintained Et CO₂ around 32 mm Hg which was later reduced to 30 mm Hg after delivery of baby.

Postpartum hemorrhage (PPH) from uterine atony is a known risk under general anesthesia as was seen in our case. Syntocinon is the drug of choice for PPH and has been safely used in patients with space occupying lesion.^[10] Manual methods such as uterine massage and intra-myometrial prostaglandin can also be used in such cases. Uterine stimulant methyl ergotamine, being a potent vasoconstrictor causes rise in blood pressure and ICP.^[6,10] Methyl ergotamine should be used only after consultation with neurosurgeons and was thus avoided in this case. PPH is an immediate life threatening complication so intra-myometrial prostaglandin (carboprost) was administered by the obstetrician along with syntocinon in our patient. Propofol infusion was started in place of isoflurane. Similar switch over to an intravenous technique for caesarean delivery has been reported by other workers.^[6] We followed a balanced approach and were able to provide smooth hemodynamics and uneventful anesthesia with favorable maternal and fetal outcome.

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