



## ORIGINAL RESEARCH PAPER

## Anesthesiology

## Case Report- Anaesthetic management of a parturient with an intracranial tumor.

**KEY WORDS:** Anesthetic considerations, cesarean section, craniotomy, glioma, pregnancy Conflicts of interest- None to mention

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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 32 years with 34 weeks amenorrhea and a high grade glioma in the frontal region who underwent cesarean section under general anesthesia immediately followed by craniotomy. Anesthetic management was tailored keeping in mind maternal safety and fetal considerations.

**INTRODUCTION:**

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

Glioblastoma multiforme is a highly malignant infiltrating tumor that usually grows to a significant size before giving rise to clinical symptoms. It may extend to the meningeal surface or up to the ventricular wall. The malignant cells carried by the CSF may create distal foci in the spinal nerve roots or produce widespread meningeal gliomatosis. Extra-cranial metastases are very rare and usually affect the bones and lymph nodes after the craniotomy. It accounts for 10-15% of all brain tumors, and 55% of gliomas, 90% of adult brain gliomas.

The prevalence of this type of tumor during pregnancy is very low, hence the absence of tests to establish the relationship between tumor growth and pregnancy, unlike what has been reported with meningioma and malignant glial cell tumors. Because of this low prevalence, reports in the world literature are scarce. For this reason, we decided to highlight and publish this case, given the challenge of providing anesthesia to a patient with increased intracranial pressure (ICP) and with the need to maintain adequate uterine and placental perfusion while avoiding further increases in ICP.

**CASE REPORT:**

A parturient with 34 Weeks amenorrhea aged 32 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 34 weeks gestation. Neurological examination and brain magnetic resonance imaging revealed a mass lesion of 4.4 cm x 2.54 cm x 3.5 cm in size over the frontal region suggestive of high grade glioma with dense perilesional edema. 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, levocitram, mannitol, lasix and dexamethasone to enable her to carry her pregnancy 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 12/15. 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 propofol 100 mg and injection succinylcholine 100 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 tub. There was minimal post-intubation response with post-intubation vitals of 74/min and 130/77 mm Hg. Anesthesia was maintained with oxygen and injection propofol 1% infusion with rate of 30 ml per hours (100 mcg /kg/min). End tidal carbon dioxide (Et CO<sub>2</sub>) 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. The uterus contracted well after this measure and closure was carried out. After the cesarean section, anesthesia was continued with injection fentanyl, propofol infusion and top ups of vecuronium. Estimated time for tumor excision was 3-4 hrs. Et CO<sub>2</sub> was further reduced to 30 mm Hg. Neurosurgeons performed the craniotomy and excised the tumor mass. Intra-operatively injection mannitol, dexamethasone, lasix, phenytoin were given as cerebroprotective measures. Total surgery lasted 5 hrs with estimated blood loss of 1800 ml which was adequately replaced. As neurosurgeon demands to elicit immediate neurological deficit, patient was planned for extubation immediate after surgery. Propofol infusion stopped, reversal injection glycopyrrolate 0.4 mg + inj neostigmine 2.5 mg given after confirming minimal respiratory attempts. Patient extubated and shift to recovery ward & kept in observation for 6 hrs. Her GCS score at this time was 15/15 and she had no neurological deficit. She was discharged on 14 th post-operative day with a healthy baby.

**DISCUSSION:**

Intracranial neoplasms are rare during pregnancy and gliomas are even rarer. 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.

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 are known. Lignocaine hydrochloride pre-medication, liberal dose of propofol, endotracheal tube with soft atraumatic silicone tip were used to blunt the rise in ICP during laryngoscopy and intubation. Furthermore, our patient had been receiving cerebroprotective measures since admission therefore no cardiovascular stress response was seen. An Et CO<sub>2</sub> between 25 and 30 mm Hg is advocated by some authors. Keeping fetal safety in mind we initially maintained Et CO<sub>2</sub> 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. Manual methods such as uterine massage and intra-myometrial prostaglandin can also be used in such cases. 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 to avoid depressant action of all inhalational agents. We followed a balanced approach and were able to provide smooth hemodynamics and uneventful anesthesia with favorable maternal and fetal outcome.

**References:**

1. Reitman E, Flood P. Anaesthetic considerations for non-obstetric surgery during pregnancy. *Br J Anaesth* 2011;107 Suppl 1:172-8.
2. Imarengiaye C, Littleford J, Davies S, Thapar K, Kingdom J. Goal oriented general anesthesia for cesarean section in a parturient with a large intracranial epidermoid cyst. *Can J Anaesth* 2001;48:884-9.
3. Isla A, Alvarez F, Gonzalez A, Garcia-Grande A, Perez-Alvarez M, Garcia-Blazquez M. Brain tumor and pregnancy. *Obstet Gynecol* 1997;89:19-23.
4. Duggal K. Propofol should be the induction agent of choice for caesarean section under general anaesthesia. *Int J Obstet Anesth* 2003;12:275-6.
5. Sneyd JR. Recent advances in intravenous anaesthesia. *Br J Anaesth* 2004;93:725-36.
6. Wang LP, Paech MJ. Neuroanesthesia for the pregnant woman. *Anesth Analg* 2008;107:193-200.
7. Magorian T, Flannery KB, Miller RD. Comparison of rocuronium, succinylcholine, and vecuronium for rapid-sequence induction of anesthesia in adult patients. *Anesthesiology* 1993;79:913-8.
8. Abouleish E, Abboud T, Lechevalier T, Zhu J, Chalian A, Alford K. Rocuronium (Org 9426) for caesarean section. *Br J Anaesth* 1994;73:336-41.
9. Sahu S, Lata I, Gupta D. Management of pregnant female with meningioma for craniotomy. *J Neurosci Rural Pract* 2010;1:35-7.
10. Chang L, Looi-Lyons L, Bartosik L, Tindal S. Anesthesia for cesarean section in two patients with brain tumours. *Can J Anaesth* 1999;46:61-5.