

## CASE REPORT

# Anesthetic Considerations in an Eclamptic Patient Undergoing Cesarean and Craniotomy Simultaneously: A Case Report

Deepika Arora<sup>1</sup>, Ruchi Gupta<sup>2</sup>, Gaganjot Kaur<sup>3</sup>

## ABSTRACT

**Introduction:** Eclampsia is an unpredictable multisystem disorder of pregnancy and is responsible for the large mortality rates due to acute cerebral complications. The estimated mortality of eclampsia-associated intracranial hemorrhage is 9–38%. The incidence being even higher in developing countries. Pregnancy-induced intracranial hemorrhage is a rare yet potentially devastating event in pregnancy.

**Case description:** We report the case of a 34-year-old G4P3L1 female with period of gestation 34 weeks and acute-onset eclampsia. She had a GCS of E2V1M5 and presented with blood pressure of 200/100 mm Hg with right-sided weakness and seizures. Her pupils were bilaterally constricted and nonreactive. On further investigation, her magnetic resonance imaging showed frontoparietal hematoma with a midline shift of 11 mm, necessitating urgent neurosurgery. Due to her deteriorating condition, she was taken up for emergency lower segment cesarean section (LSCS) and simultaneous decompressive craniotomy. Further management and implications will be discussed.

**Discussion:** Intracranial hemorrhage is an important cause of morbidity and mortality in pregnancy. This case demonstrated the need of emergency procedures when the life of both mother and fetus are at risk and the advantage of multispecialty approach for a better patient outcome.

**Keywords:** Anesthetic considerations, Eclampsia, Intracranial hemorrhage, Preeclampsia, Pregnancy.

AMEI's Current Trends in Diagnosis & Treatment (2020): 10.5005/jp-journals-10055-0083

## INTRODUCTION

Cerebrovascular accident during hypertensive disorder of pregnancy is a rare entity but carries high risk of mortality and morbidity. Preeclampsia/eclampsia is the most common risk factor for stroke or cerebral hemorrhage in pregnancy, the incidence being 10 to 34 per 100,000 deliveries.<sup>1,2</sup> Clinical literature regarding anesthetic and critical care management for eclampsia with stroke is very sparse. Early diagnosis and management can improve the outcome in these patients.

We report the case of an eclamptic multigravida with 34 weeks gestation who developed right-sided hemiplegia that was associated with headache, blurred vision, and hypertension. Magnetic resonance imaging (MRI) of the brain confirmed a left frontoparietal spontaneous hemorrhage. Emergency cesarean delivery and craniotomy were done simultaneously under general anesthesia, and the recovery was uneventful. This case illustrates the timely diagnosis and multidisciplinary approach for management in such difficult patients where two lives are involved to decrease the associated mortality and morbidity.

## CASE DESCRIPTION

A 34-year-old female gravida 4 para 3 with one live issue of 34 weeks gestation with previous normal antenatal course presented to emergency department with sudden onset of headache, seizures, right-sided weakness, and blurring of vision. Supportive treatment in the form of oxygen with assisted ventilation, midazolam 1 mg, phenytoin 1 g, and magnesium sulfate (5 g im bolus + 4 g by iv infusion over 20 minutes) was started. Her vitals recorded were heart rate (HR): 109/minutes, noninvasive blood pressure (NIBP): 200/100 mm Hg, SpO<sub>2</sub>: 97% and Glasgow coma scale E<sub>2</sub>V<sub>1</sub>M<sub>5</sub>, and bilaterally constricted and nonreactive pupils. Injection labetalol 20 mg intravenous stat was given for the treatment of blood

<sup>1–3</sup>Department of Anesthesia, Sri Guru Ram Das Institute of Medical Sciences and Research, Amritsar, Punjab, India

**Corresponding Author:** Gaganjot Kaur, Department of Anesthesia, Sri Guru Ram Das Institute of Medical Sciences and Research, Amritsar, Punjab, India, Phone: +91 8198014504, e-mail: drgaganjot@yahoo.com

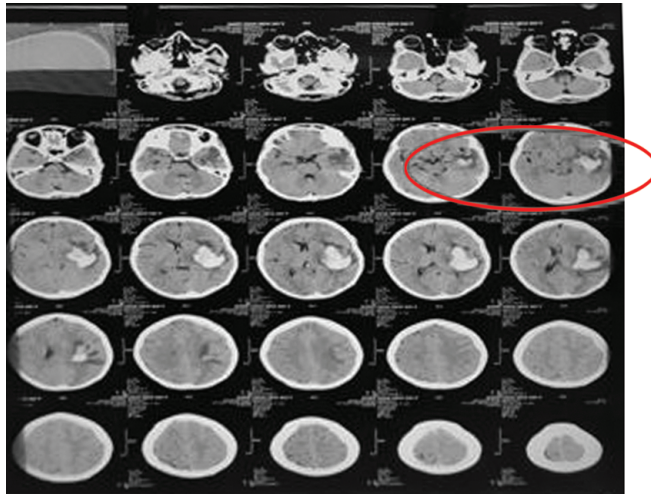
**How to cite this article:** Arora D, Gupta R, Kaur G. Anesthetic Considerations in an Eclamptic Patient Undergoing Cesarean and Craniotomy Simultaneously: A Case Report. AMEI's Curr Trends Diagn Treat 2020;4(1):26–28.

**Source of support:** Nil

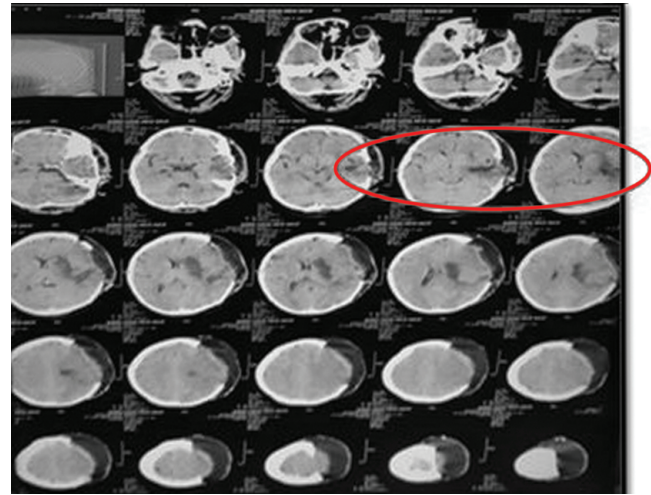
**Conflict of interest:** None

pressure. Obstetric examination showed live fetus with fetal HR of 140 bpm and decreased fetal movements. Brain MRI revealed frontoparietal hematoma with 11-mm midline shift (Fig. 1). Blood tests showed normal complete blood count (hemoglobin = 11.3 g/dL, total leukocyte count = 14,000, platelet count = 1.3 lakhs/mm<sup>3</sup>) and coagulation profile (prothrombin time index of 100%). Blood urea (22.3 mg/dL), serum creatinine (1.31 mg/dL), electrolytes (Na<sup>+</sup>-135, K<sup>+</sup>-4.15 mEq/L), blood sugar (84.0 mg/dL), and liver function tests were also found to be normal, and urine examination was negative for proteinuria.

Emergency lower segment cesarean section (LSCS) along with craniotomy was planned in view of decreased fetal movements and uncontrolled blood pressure under general anesthesia. Nitroglycerin infusion was started at 5 µg/minute prior to induction to maintain hemodynamics. Rapid sequence induction was done with 100 mg propofol, 100 mg succinylcholine, airways secured with cuffed ETT number 7.0 mm ID, and maintained with oxygen, nitrous oxide, and isoflurane. Muscle relaxation was achieved using 25 mg bolus of injection atracurium followed by maintenance doses.



**Fig. 1:** Preoperative magnetic resonance imaging (MRI) of the patient showing frontoparietal hematoma



**Fig. 2:** Postoperative computed tomography (CT) scan of the patient showing resolving hematoma

During intraoperative period, BP was controlled with injection labetalol 20 mg iv stat, and NTG was further increased to 15 µg/minute. After 12 minutes, a healthy female baby was delivered by cesarean section. The Apgar score was 8 and 10 at 1 and 5 minutes, respectively. After delivery, a left frontoparietal decompressive craniotomy with hematoma evacuation was performed, meanwhile the gynecologist started the closure of uterus and abdomen. Intraoperative vitals were in the range: HR = 73–110 bpm, BP = 134/78 to 157/104 mm Hg, O<sub>2</sub> saturation was normal (99–100%), and ETCO<sub>2</sub> (end tidal CO<sub>2</sub>) was maintained between 30 mm and 35 mm Hg. Intraoperative BP was controlled with NTG infusion at 25 µg/minute, 1.5-liter crystalloid, and 2 units of packed red blood cells. Urine output was at maintained at 50 mL/hour. Inj. butorphanol 1 mg (twice), 75 mg diclofenac for pain relief with inj. mannitol (1.5–2.0 g/kg), and ondansetron 8 mg were given intraoperatively. Postoperatively, the patient was shifted to intensive care unit (ICU) for elective ventilation in view of her persistently poor GCS of 5/15. On advice of neurosurgeon, conservative treatment with injection mannitol 500 mg 8 hourly, eptoin 100 mg 8 hourly, and amlodipine 10 mg was started. On fifth postoperative day, repeat computed tomography (CT) scan of head showed resolving hematoma with diffuse brain edema (Fig. 2). On seventh postoperative day, improvement in GCS to 9/15 was noted, and weaning from the ventilator was started. She got extubated on 16th postoperative day. The patient was discharged on 20th day in satisfactory condition with advice of regular follow-up.

## DISCUSSION

Intracerebral hemorrhage is an infrequent but life-threatening complication in pregnant women with hypertension. Severe preeclampsia complicates a small percentage of pregnancies and eclampsia under 0.1%, but they contribute to a large portion of cerebrovascular morbidity and mortality (around 28–50%) in pregnancy.<sup>3</sup> Occurrence of eclampsia may present suddenly without prior signs of preeclampsia, as in our patient who remained asymptomatic till 34 weeks of gestation and suddenly developed neurological symptoms with high BP that could be attributed to intracerebral hemorrhage. A noncontrast CT scan is the most sensitive test to diagnose acute intracerebral

hemorrhage, but MRI or angiography may be needed to exclude structural etiology. In our patient, uncontrolled hypertension is the most likely cause for intracerebral hemorrhage. One study concluded that brain edema in patients with preeclampsia-eclampsia syndrome is primarily associated with laboratory-based evidence of endothelial damage.<sup>4</sup> Therefore, the importance of early clinical and radiological assessment of the central nervous system in eclampsia patient with a sudden decrease in conscious level has also been emphasized.

Various risk factors have been reported for pregnancy-related stroke which include age >35 years, black ethnicity, hypertension, heart disease, smoking, multiple gestation, greater parity, and coagulopathy. Our patient was a 34-year-old multigravida but was asymptomatic till 34 weeks of gestation and suddenly developed signs and symptoms of eclampsia.

Anesthetic management in unconscious eclamptic patients may present several dilemmas, including blocking the stress responses to laryngoscopy, drug interaction between magnesium sulfate with muscle relaxant, and the risk of laryngeal edema presenting as difficult airway.<sup>5,6</sup> Emergency cesarean section followed by craniotomy was chosen in our patient, as this would ensure the quickest extraction of the fetus, thereby minimizing the exposure of the fetus to various drugs and maternal hemodynamic fluctuations. Because pregnant patients in third trimester are considered to have full stomach, rapid sequence induction and tracheal intubation was done to prevent pulmonary aspiration. This type of induction is associated with intense pressor response and catecholamine release further aggravating the etiology. The main aim of management is to maintain cerebral perfusion pressure; therefore, BP needs to be judiciously reduced in the acute phase with a target of <160/110 mm Hg. In our case, we used NTG infusion prior to induction along with preoperative of inj labetalol, thus leading to better hemodynamic stability.

Neuroprotective therapy including inj MgSO<sub>4</sub>, eptoin, and mannitol were started to prevent further episodes of seizures and subsequent cerebral edema. Modest short-term hyperventilation has been shown to reduce the effects of raised intracranial pressure (ICP).<sup>7</sup> In our case, we maintained ETCO<sub>2</sub> between 30 and 35 mm Hg. Therefore, timely diagnosis of eclampsia with intracerebral hemorrhage and surgical treatment helped us in successfully

managing the patient. Previous studies have also emphasized the importance of pharmacological therapy (diuretics, hyperventilation, steroids, and anticonvulsants) as well as the need for surgical clot evacuation in case of declining neurological state. Postoperative aggressive monitoring and measures to decrease ICP have a definitive role in early resolution of hematoma and improvement in GCS.<sup>8</sup> We used injection mannitol, dexamethasone, lasix, phenytoin in ICU as cerebroprotective measures. This case emphasizes that hypertension even for a short duration in pregnancy should be taken seriously and treated aggressively to prevent complications of eclampsia and intracerebral hemorrhage. The prompt intervention of a multidisciplinary team (obstetric, neurosurgery, and anesthesiology) is required to ameliorate the devastating effects of eclampsia and intracerebral hemorrhage.

## CONCLUSION

Simultaneous neurosurgical intervention in a pregnant patient undergoing emergency cesarean section although rare poses a challenge to the attending anesthesiologist, surgeons, and obstetricians. This case illustrates that timely diagnosis and multidisciplinary approach for management in eclamptic patient complicated by intracranial hemorrhage can decrease the mortality and morbidity associated with it.

## REFERENCES

1. Lanska DJ, Kryscio RJ. Risk factors for peripartum and postpartum stroke and intracranial venous thrombosis. *Stroke* 2000;31(6):1274–1282. DOI: 10.1161/01.str.31.6.1274.
2. Tang CH, Wu CS, Lee TH, et al. Preeclampsia-eclampsia and the risk of stroke among peripartum in Taiwan. *Stroke* 2009;40(4):1162–1168. DOI: 10.1161/STROKEAHA.108.540880.
3. Martin JN, Jr, Thigpen BD, Moore RC, et al. Stroke and severe preeclampsia and eclampsia: a paradigm shift focusing on systolic blood pressure. *Obstet Gynecol* 2005;105(2):246–254. DOI: 10.1097/01.AOG.0000151116.84113.56.
4. Boxer LM, Malinow AM. Preeclampsia and eclampsia. *Curr Opin Anesth* 1997;10(3):188–198. DOI: 10.1097/00001503-199706000-00007.
5. Parthasarathy S, Hemanth Kumar VR, Sripriya R, et al. Anesthetic management of a patient presenting with eclampsia. *Anesth Essays Res* 2013;7(3):307–312. DOI: 10.4103/0259-1162.123214.
6. Roopa S, Hegde HV, Torgal SV, et al. Anesthetic management of combined emergency cesarean section and craniotomy for intracerebral hemorrhage in a patient with severe preeclampsia. *Curr Anaesth Crit Care* 2010;21(5-6):292–295. DOI: 10.1016/j.cacc.2010.06.001.
7. Mokoka V. Early postpartum eclampsia complicated by subarachnoid haemorrhage, cerebral oedema and acute hydrocephalus. *S Afr J Anaesth Analg* 2003;9(5):19–22. DOI: 10.1080/22201173.2003.10873020.
8. Fairhall JM, Stoodley MA. Intracranial haemorrhage in pregnancy. *Obstet Med* 2009;2(4):142–148. DOI: 10.1258/om.2009.090030.