Case Report

Access this article online
Website: www.njisa.org
eISSN - 2456-9712

Anaesthetic management of a parturient with clinoid meningioma for caesarean section

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ABSTRACT

Certain tumours such as meningiomas manifest during pregnancy due to rapid growth following increased blood volume which results in increasing size of vascular tumours. A 25 years old primi-gravida (weight 60 kg) presented at 34 weeks gestation with the complaints of headache, generalized grand mal seizure, diminished vision and loss of speech for 1 week and was diagnosed with intracranial meningioma. Caesarean section was performed followed by neurosurgery for removal of tumour. Anaesthetic management of these cases could be challenging due to lack of adequate guidelines.

Key words: Caesarean Section, Meningioma

INTRODUCTION

Incidence of intracranial neoplasms in a pregnant patient is not different from general population. Certain tumours such as meningiomas manifest during pregnancy due to rapid growth following increased blood volume which results in increasing size of vascular tumours[1]. Fluid retention and hormonal changes can also lead to rapid increase in size and therefore early diagnosis of few brain tumours[2]. The anaesthetic management of women with intracranial space occupying lesions during pregnancy has not been well evaluated. It requires careful planning to balance both maternal and foetal well being. It becomes even more difficult because neuroanaesthesia and obstetric anaesthesia often have contrasting anaesthetic considerations and requirements.

CASE REPORT

A 25 years old primi-gravida (weight 60 kg) presented at 34 weeks gestation with the complaints of headache, generalized grand mal seizure, diminished vision and loss of speech for 1 week. Cranial Magnetic Resonance Imaging (MRI) revealed large hyper-intense lesion on left side of clinoid process measuring 3.2x 3.4x 3.3 cm in diameter, encasing the optic nerve, suggestive of meningioma. Moderate surrounding edema was seen in left fronto-temporal region. On presentation patient was conscious with a Glasgow Coma Scale (GCS) of 11/15 ($E_4V_1M_6$) with right sided weakness. Cardiovascular and respiratory system examination was unremarkable. Obstetric examination and ultrasonography showed single viable foetus with cephalic presentation. Laboratory investigations showed low hemoglobin of 8.6 g/dl. Rests of the blood investigations were normal.

Conservative management to reduce Intracranial Pressure (ICP) was started with injections dexamethasone, phenytoin, mannitol, syrup glycerol and oral levetiracetam. However, at 35 weeks of gestation patient started to develop drowsiness and irritability and became disoriented. After consultation among the neurosurgeon and obstetrician, immediate cesarean section was planned followed by observation in Intensive Care Unit (ICU) and neurosurgery the next day.

In the operating room, the patient was drowsy, had a heart rate of 96 beats/minute, blood pressure of 132/86 mmHg

How to cite this article: Saxena KN, Mahajan A. Anaesthetic management of a parturient with clinoid meningioma for caesarean section. Northern Journal of ISA. 2018;3: 25-27.

and pulse oximetry showed 99% hemoglobin saturation on room air. Her GCS had now deteriorated to 9/15 ($E_3V_1M_5$) and bilateral pupils were normal size reacting to light. Ranitidine 50 mg and metoclopramide 10 mg were given intravenously for acid aspiration prophylaxis. Standard monitors were attached and left lateral tilt of 15 degrees was given to the operation table which was maintained till the delivery of baby. Patient was pre oxygenated and rapid sequence induction was done with sodium thiopentone 5 mg/kg and rocuronium 1 mg/kg. Narcotics were omitted. Lidocaine in a dose of 1.5 mg/kg was given to blunt the hemodynamic response to intubation. Trachea was intubated with an endotracheal tube of 7.0 mm inner diameter. Anaesthesia was maintained with N_2O and O_2 in a ratio of 50 : 50 with isoflurane 1%. Controlled ventilation was given with a tidal volume of 8 ml/kg body weight and end tidal CO_2 was maintained around 32 to 35 mmHg. After the delivery of baby, injection morphine 0.1 mg/kg and midazolam 1 mg was given to the patient, concentration of Isoflurane was decreased for better contraction of uterus and an infusion of 15 IU of oxytocin was started to the patient. Muscle relaxation was maintained with the top ups of rocuronium as there was no plan of reversing the patient after surgery as craniotomy was planned for the next day. Patient lost more than 1 liter of blood and had to be transfused blood intraoperatively. She remained hemodynamically stable during intraoperative period. However, after shifting to ICU patient was reassessed neurologically and an immediate craniotomy was planned. Tumour mass was successfully excised and patient was once again shifted to ICU and was electively ventilated for 48 hours. This surgery as well as the further ICU stay was managed by neuroanaesthesia team. After 48 hours she was extubated and had a GCS of 15 and no neurological deficit. She was discharged on 18th post operative day with a healthy baby.

DISCUSSION

The most common clinical features of intracranial tumour and resulting raised intracranial pressure are headache and vomiting both of which are common in pregnancy too. Therefore there is a chance of misdiagnosis or delayed diagnosis of intracranial tumours in pregnancy. A multidisciplinary team including neurosurgeon, obstetrician, anaesthesiologist and neonatologist should be involved in the management. The decision to operate depends on various factors like type of tumour, site, size, neurological sign and symptoms, gestational age and viability of foetus[3]. Anaesthetic management of these cases could be challenging due to lack of adequate guidelines.

General anaesthesia remains safe and dependable for operative delivery in parturients with intracranial tumour. Neuraxial anaesthesia should be avoided as there is a risk of herniation in the patients of raised ICP[4]. It must be kept in mind that endotracheal intubation can be difficult due to oedema and structural changes at the oropharyngeal mucosa and breasts[5]. Propofol is preferred drug of induction in neuroanaesthesia since it facilitates smooth induction with decrease in ICP however it is not approved for use in pregnant patients by manufacturer so we used thiopentone[6]. Although Rapid Sequence Intubation (RSI) using succinylcholine is generally advocated in pregnant patients due to its short onset of action, it was avoided in our case as it is also known to increase intracranial pressure. Rocuronium was used in its place[7,8]. Opioids were withheld before intubation as they can cause neonatal respiratory depression[4]. Remifentanil is a safe option as it is short acting and has a unique metabolism[9]. However it was unavailable in our institute. Haemodynamic response to intubation can cause rise in ICP. This was blunted by intravenous lidocaine and liberal dose of sodium thiopentone.

It is important to preserve cerebral and uteroplacental perfusion by maintaining haemodynamic stability. In the absence of any means of monitoring ICP in our institute it was decided to maintain MAP above 75 mmHg to maintain cerebral perfusion pressure. End tidal CO_2 was maintained between 32–35 mmHg to decrease ICP, however further decrease was avoided as it may be harmful to the foetus by causing cerebral ischemia[10]. Uterine atony is a major risk under general anaesthesia so high concentrations of volatile anesthetics should be avoided. Synthetic oxytocin has been safely used in parturients with intracranial tumours. Methyl ergotamine should however be avoided as it causes hypertensive response which may lead to raised ICP[3].

The timing of surgery for the meningioma is a subject of debate as both have been reported: neurosurgery during pregnancy followed by delivery of baby as well as caesarean delivery followed by excision of tumour. This seems to depend on which stage of pregnancy the diagnosis of meningioma is made. The tumour is operated first when it is diagnosed early in pregnancy[1]. Successfull outcome has been reported[2]. When the diagnosis is made late in pregnancy then caesarean section is carried out first followed by neurosurgery. If signs of raised intracranial tension are present then neurosurgery should be performed immediately[11]. Both surgeries have been performed in the same sitting also, however in one such reported case

the parturient died postoperatively due to intractable hypotension[12]. In our patient caesarean section was carried out first followed by neurosurgery within a few hours as the patient was showing signs of neurological deterioration.

In conclusion, comprehensive knowledge of physiology and pharmacology of mother and foetus along with the understanding of neurophysiology and neuroanaesthesia should be used to carefully manage such cases.

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