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Anesthetic Management for Tracheostomy in a Pregnant Patient with Neurotrauma

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Abstract

Background: Anesthesia in pregnant patients appearing for non-obstetric surgeries poses unique challenges. Neurotrauma including intracerebral haemorrhage, severe brain injury and ischemic infarct often warrants the procedure of tracheostomy. After taking written informed consent for publication, we are presenting a case of a mid-term pregnant female who was posted for tracheostomy after sustaining neurotrauma.

Case: A 28-year-old, female patient with 21 weeks of gestation was posted for elective early tracheostomy after sustaining a fall from height. Her Glasgow coma score was borderline (eight). The patient was first intubated under TIVA with a cuffed endotracheal tube of size 7.5 mm internal diameter to allow for better control of the patient's airway, followed by tracheostomy. Normotension and Normocarbia were cautiously maintained throughout the procedure.

Conclusion: This report presents a unique scenario for Anesthetic management owing to the combination of hemodynamic and respiratory targets to be maintained in a pregnant patient superadded with co-existing neurotrauma.

Introduction

Neurotrauma including intracerebral hemorrhage, severe brain injury and ischemic infarct often warrants the procedure of tracheostomy. Approximately, 2% of pregnant patients undergo non-obstetric surgery each year [1]. Pregnant women presenting for non-obstetric surgery present a unique set of challenges for the anaesthesiologists, with an objective to provide safe Anesthesia for both fetus and the mother. After obtaining written informed consent for publication, we present a case of a mid-term pregnant female who was posted for tracheostomy after sustaining neurotrauma.

Case

A 28-year-old, 48kg- female patient with 21 weeks of pregnancy was posted for elective early tracheostomy after sustaining a fall from height. The primary diagnosis was a traumatic brain injury. Her physical examination revealed a Glasgow Coma Score (GCS) of eight- E2V2M4. The laboratory investigations were significant for sodium 127mEq/L and Platelet count of 98,000/cumm. Rest all the investigations were within normal limits. The Pre-Anesthetic evaluation classified the patient as American Society of Anaesthesiologists (ASA) IV. The pre-procedure evaluation was carried out by the obstetrics team to check the wellbeing of the foetus.

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Inside the Operation theatre, non-invasive monitors were attached including Blood pressure, Oxygen saturation, heart rate and respiratory rate. Adequate preoxygenation was provided with the face mask at 6 L/min for three minutes. The uterus was given a left-tilt using Crawford's wedge. Anesthesia was induced with Total intravenous Anesthesia (TIVA) using propofol in a controlled target infusion of 2mcg/ml and fentanyl in the dose of 1.5mcg/ml. Rocuronium was administered at 1.2mg/kg. The patient was first intubated with a cuffed endotracheal tube of size 7.5 mm internal diameter to allow for better control of the patient's airway. Anesthesia was then maintained using sevoflurane at 1% in a 1:1 mixture of oxygen and air. The tracheostomy tube of size 7mm ID was placed. Maternal systolic pressure was maintained above 100mmHg at all times and no episode of desaturation was witnessed throughout the procedure.

Discussion

No Anesthetic drug has been shown to be clearly dangerous to the human fetus till date [2]. There are specific considerations in pregnant patients appearing for non-obstetric surgeries. A targeted multidisciplinary team-based approach is imperative to achieve the primary concerns of maternal and fetal safety. Anesthetic technique needs to be tailored as per the type and duration of surgery and the patient condition. Perioperative fetal monitoring should be done by trained personnel whenever feasible. The most important principles while providing Anesthesia to a pregnant patient include avoidance of hypotension, hypoperfusion, hypoxia, hypercarbia, acidosis and hypothermia. Attempts should be made at alleviating any aortocaval compression. There are several complex physiological changes occurring in pregnancy.

Surgeries dealing with the airway and respiratory system present a unique set of challenges in these patients. In pregnancy, an increase in minute ventilation and oxygen consumption with a concurrent decrease in residual volume and Functional Residual Capacity (FRC) predisposes pregnant patients to develop hypoxia and hypercapnia more rapidly with hypoventilation or apnea [3]. Hence, adequate pre-oxygenation helps in saturating this reduced FRC and awarding a longer safe apnea period to the anaesthesiologists. Another important consideration is reduced Minimum Alveolar Concentration values for volatile agents in pregnancy.

Anesthetic management of neurosurgery patients warrants control of hemodynamics, mild hypothermia, mild hypocarbia ($PaCO_2$ of 25–30 mmHg), and diuresis to reduce cerebral oedema. The presence of Hypocarbia and maternal alkalosis can lead to fetal distress and must be properly addressed. In this patient, as both hypocarbia and hypercarbia would be detrimental, a cautious balance of normocarbia would be the objective. A patient with neurotrauma with borderline GCS is at a higher risk of landing into hypoxia and hypercarbia which can easily go unrecognized in the early stage. In such a scenario, the clinician's decision to whether to go for a primary tracheostomy or perform endotracheal intubation followed by a percutaneous tracheostomy can reduce morbidity and mortality. A pregnant patient with neurotrauma with possibly raised Intracranial Pressure (ICP) presents another challenge where maternal hypotension can lead to fetal hypoperfusion and hypertension can further elevate the ICP. Hence, normotension needs to be cautiously maintained both intra- and peri-operatively. Perioperative fetal monitoring when done properly, permits early diagnosis and also improves fetal outcome. Regional and local Anesthesia is preferred approaches wherever possible owing to minimal exposure to drugs and physiological stress to both mother and fetus [4].

To the best of our knowledge, we could not find any other case reporting Anesthetic management for tracheostomy in a pregnant patient with neurotrauma. This report aims to highlight the fact that when tracheostomy is indicated in a pregnant patient with uncertain control of the airway, intubating the trachea first with a definitive airway can minimize both maternal and foetal complications associated with the procedure.

Conclusion

This report presents and highlights a unique scenario for Anesthetic management owing to the combination of hemodynamic and respiratory targets to be maintained in a pregnant patient superadded with co-existing neurotrauma.

References

1. Crowhurst JA. Anesthesia for non-obstetric surgery during pregnancy. Acta Anaesthesiol Belg. 2002; 53: 295-297.

2. Nejdlova M, Johnson T. Anesthesia for non-obstetric procedures during pregnancy. Crit Care Pain. 2012; 12: 203-206.

3. Kazma JM, van den Anker J, Allegaert K, Dallmann A, Ahmadzia HK. Anatomical and physiological alterations of pregnancy. J Pharmacokinet Pharmacodyn. 2020; 47: 271-285.

4. Reitman E, Flood P. Anesthetic considerations for non-obstetric surgery during pregnancy. Br J Anaesth. 2011; 107: 72-78.