

Intraoperative Anaphylaxis Reaction Due to Suspected Anesthesia Agent

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ABSTRACT

Background: Intraoperative anaphylaxis is a life-threatening condition that may present atypically without cutaneous or respiratory manifestations, making early diagnosis challenging. Case Presentation: A 24-year-old male (ASA II) with sinus bradycardia and three previous uneventful general anesthetics underwent left auricular mass extirpation under general anesthesia. Approximately 90 minutes after induction, the patient developed sudden tachycardia despite minimal surgical stimulation. No additional epinephrine infiltration had been administered. Body temperature was normal and sevoflurane MAC was 0.7. Initial management included a 200 mL crystalloid fluid challenge, fentanyl 2 µg/kg IV bolus, and reduction of sevoflurane MAC to 0.5; however, tachycardia persisted and severe hypotension ensued (from 100/60 mmHg to 50/30 mmHg). No rash, bronchospasm, or fever was observed. Suspected intraoperative anaphylaxis was treated with epinephrine 0.1 mg IV (two doses), 500 mL crystalloid bolus, and supine positioning. Tachycardia resolved after the first epinephrine dose, and blood pressure improved after the second dose. Conclusion: This case highlights that intraoperative anaphylaxis can occur without skin or airway manifestations, consistent with World Allergy Organization (WAO) criteria. Prompt recognition and early epinephrine administration are crucial to improving patient outcomes.

Keywords: Epinephrine, intraoperative anaphylaxis, general anesthesia, hypotension, tachycardia

INTRODUCTION

World Allergic Organization defines anaphylaxis as a serious systemic hypersensitivity reaction that is usually rapid in onset and characterized by potentially life-threatening compromise in airway, breathing and/or circulation, and may occur without typical skin features or circulatory shock being present¹. The incidence of anaphylaxis is ranging from 1 in 3500 to 1 in 20,000 and its mortality rate is in the range of 3-9%.^{2,3} Identification of anaphylaxis reaction intraoperatively has several barriers, especially in general anesthesia, in which the patient is completely knocked down. Surgical draping that covers the skin, face, and extremities may hamper early identification of any skin reactions.

Anesthesia agents that cause vasodilation and hypotension mimic the anaphylactic shock. Neuromuscular blocking agents (25%) and antibiotics (48%) are most frequently linked Allergens perioperatively in UK, while in France 61% are linked with NMBAs.² We describe a peculiar case of anaphylaxis reaction intraoperatively of a healthy 24-year-old male that already undergone 3 general anaesthesia before the case. This paper will discuss the thought process to identify and treat Anaphylaxis reactions which show common intraoperative events of tachycardia and hypotension.

CASE

a healthy ASA II, 24-year-old male with sinus bradycardia, underwent mass extirpation of the left auricular. The patient has 3 history of general anesthesia without problem. During the induction after adding 150 mcg of fentanyl, 100 mg of propofol and 40 mg of rocuronium patient developed tachycardia without hypotension. We give additional fentanyl 50 mcg to eliminate the possibility of light Analgesia during the triple maneuver and intubation. Tachycardia attenuated after fentanyl bolus. One and a half hours after induction, the patient began to have tachycardia. We did confirm the surgeon had not injected any additional epinephrine and the surgery was already on closure suturing so there was minimal manipulation for noxious stimulations. Body temperature within normal

limit and MAC of sevoflurane is 0.7. A total of 500 ml crystalloid is given after tachycardia with 200 ml initial bolus.

Sevoflurane was reduced to 0.5 MAC to eliminate the possibility of reflex tachycardia caused by vasodilatation. Fentanyl bolus of 50 mcg is given but there is no response. Blood pressure began to decrease from 100/60 mmHg to 50/30 mmHg. We began to suspect an anaphylaxis reaction even though there was no skin or respiratory manifestation. First bolus of Epinephrine 0.1 mg reduces tachycardia and hypotension. A second bolus of Epinephrine 0.1 mg is given as the blood pressure not yet responding. After the second bolus hemodynamic was more stable. Methylprednisolone 125 mg and Diphenhydramine 10 mg are given. The patient was extubated at the end of surgery and monitored in Post Anesthesia Care Unit. After 6 hours of monitoring, the patient did not developed any reaction and was transferred to the ward.

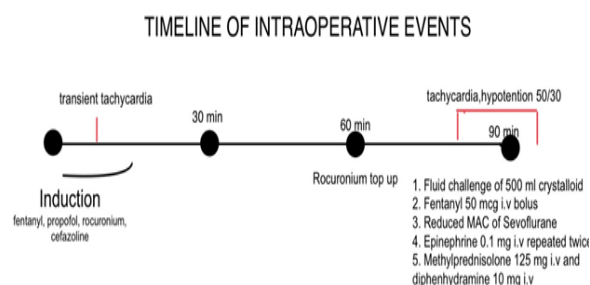


Figure 1: Timeline of Intraoperative Events

DISCUSSION

World Allergic Organization defines 'anaphylaxis as a serious systemic hypersensitivity reaction that is usually rapid in onset and may cause death. Severe anaphylaxis is characterized by potentially life-threatening compromise in the airway, breathing and/or circulation, and may occur without typical skin features or circulatory shock being present. In this case patient has only rapid circulatory compromise.¹

Sudden tachycardia and hypotension without skin or respiratory manifestation as a clinical anaphylaxis reaction have many

mimicking diagnoses such as vasodilation related to anesthetic agents, intravascular volume depletion, superficial anesthesia, amniotic fluid embolism, bone cement implantation syndrome, pulmonary embolism until the possibility of excessive oxytocin administration.⁴ In a short period, anesthesiologists need to exclude the differential diagnosis.

Management of this condition is a combination of 1) tackling the anaphylaxis reaction by fluid replacement, corticosteroid, antihistamine, and epinephrine injection, 2) establishing allergic reaction by taking serum tryptase 1-3 hours after reaction and referring the patient for allergic investigation 4-6 weeks after the event to prevent false positive result. An anesthesiologist is needed to give all relevant intraoperative information to the Allergist. In this patient, we did not take serum tryptase due to its unavailability. Anesthesia flow chart is uploaded online to RSCM data-based for further Allergist investigation.^{2,4,5}

Anaphylaxis reaction of Rocuronium is classified as non-mediated IgE. It involves the interaction of rocuronium with the MRGPRX2 receptor which induces Mast Cells granulations. The onset of non-IgE-mediated anaphylaxis is unpredictable.⁶ Some reports on the anaphylaxis reaction of Rocuronium occurs after some exposure to Rocuronium from previous surgery.⁷ This patient had 3 history of surgery without problems in our hospital. Intraoperatively patient was given fentanyl, propofol, rocuronium, dexamethasone, cefazoline, and metoclopramide. All of these drugs were already given at the previous surgery. Establishing Rocuronium as the culprit needs more investigation.

CONCLUSION

Managing anaphylaxis reaction intraoperative is challenging as there are many differential diagnoses. There are obstacles to establishing the anaphylaxis reaction by taking the blood work intraoperatively as the regiment of serum tryptase is not always available in all medical centers and giving complete information for Allergic investigation.

Consistent with World Allergic Organisation (WAO), anaphylaxis reaction can be diagnosed without bronchospasm or skin manifestation, and immediate administration of epinephrine could help the outcome.

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