MCC-7086

Bronchospasms during Anesthetic Emergence

Primary Author: Raymond Amponsah BA
Rutgers-Robert Wood Johnson Medical School

Co-Authors: Adil Mohiuddin, MD; Fathima Aquila, MBBS; Geza Kiss, MD; Scott Mellender, MD; Shaul Cohen, MD; Shruti Shah, MD; Stefanie Berman, MD;

INTRODUCTION: A 39-yr-old woman with IDDM, ESRD on Hemodialysis, HTN, and hypothyroidism was scheduled for a kidney and pancreas transplant. On extubation, she developed bronchospasm and cardiovascular collapse requiring CPR. The differential for bronchospasm requires constant vigilance to make a proper diagnosis and administer life-saving treatment.

CASE: The patient has a history of prior surgeries without anesthetic complications. However, a recent TEE resulted in cardiac arrest requiring CPR. Before the case, she reported an allergy to Nubain. Chest auscultation was normal before anesthesia, and an ECHO showed an EF of 55% with a negative stress test. The patient was premedicated with Versed (2 mg IV) before anesthesia, which was induced with Lidocaine (70mg IV), Propofol (100 mg IV) and Fentanyl (50 mg IV). Tracheal intubation (Grade I view) was facilitated with Rocuronium (50mg IV). During the case, she was maintained with Desflurane (6% IN). She received Methylprednisolone (500mg IV), and Heparin (2000mg IV) and RATG was started. After reversal and extubation, the patient’s O2 saturation declined at which time she developed difficulty being ventilated with a mask requiring reintubation. No cutaneous rashes or hives were noted. She showed signs of facial and lingual swelling. The patient subsequently developed bradycardia (HR in the 30s). Albuterol (2puffs IN) and Epinephrine (1mg IV) were administered. Patient’s bradycardia progressed to complete circulatory collapse requiring 3 minutes of CPR. Despite resistance during ventilation patient was resuscitated to 100% oxygen saturation and was transferred to the PACU once stable. Upon arrival, the patient became impossible to ventilate. The patient received repeat doses of Epinephrine (1mg IV) as well as Propofol, Cisatracurium (10mg IV) and Mg (2g IV), and albuterol nebulizer treatments. The patient was able to be ventilated with some resistance and was kept sedated with a Propofol drip. Post op work up revealed a new pneumomediastinum, Left lower lobe atelectasis and mild pulmonary vascular congestion on chest x-ray. EKG showed Nonspecific T wave abnormality in lateral leads and QTc prolongation (438–517). Cardiac echo Moderate circumferential pericardial effusion, EF 60-65%. No change in arterial blood gases was observed, and troponins remained negative. Testing for IgE, Eosinophil, tryptase and Rast Latex were all within normal limits.

DISCUSSION: Bronchospasm usually manifests during anesthesia as an expiratory wheeze, prolonged expiration and increased inflation pressures. Bronchospasm may occur alone or as a component of another problem such as anaphylaxis and is usually triggered by some maneuver, often in patients with a pre-existing airway disease such as asthma1. Bronchospasm encountered during the perioperative period especially after induction/intubation may involve an immediate hypersensitivity reaction such as the IgE-mediated anaphylaxis or a nonallergic mechanism.
triggered by mechanical (intubation/extubation-induced bronchospasm) or pharmacologic-induced (histamine releasing drugs such as atracurium or mivacurium) factors\textsuperscript{2}. Nonallergic bronchospasm immediately follows nonspecific stimuli, such an irritation by ET tube, and is usually not associated with cardiovascular symptoms. Blood pressure may be reduced secondary to decreased venous return and CO. Hypoxia, and respiratory failure may lead to cardiovascular collapse seen late after bronchospasm. Cutaneous signs may be observed. An Immediate Hypersensitivity Reaction occurs within an hour of the introduction of the offending agent\textsuperscript{4}. It can be diagnosed by clinical features including pruritus, flushing, urticaria, laryngeal edema, bronchospasm, shock and respiratory/cardiac arrest in its most severe form. Blood tests for Tryptase and IgE as well as postoperative skin tests aid in diagnosis. According to a study of 4,000 incidents, an allergic mechanism was less frequently involved (21\%) than a non-allergic mechanism (79\%). Among these non-allergic cases, 44\% occurred during the induction of anesthesia, 36\% during the maintenance phase, and 20\% during the emergence/recovery stage\textsuperscript{1}. Bronchospasm during emergence is typically seen in patients with asthma, history of smoking or chronic obstructive pulmonary disease\textsuperscript{5}. In conclusion, bronchospasm remains a serious life-threatening perioperative event requiring prompt diagnosis and aggressive treatment.

References.


