

Perioperative Anaphylactic Shock Induced by Rocuronium: A Case Report Observed in the Operating Room

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ABSTRACT: Perioperative anaphylactic shock is a rare but potentially fatal complication of general anesthesia. Neuromuscular blocking agents, particularly rocuronium, are among the most frequently implicated pharmacological agents. We report the case of a 42-year-old man with no known allergic history who developed severe anaphylactic shock a few minutes after anesthetic induction for surgical fixation of an intra-articular elbow fracture. The diagnosis was confirmed by a significant elevation of plasma tryptase levels and later by specialized allergy testing. The clinical course was favorable following intensive management, including oxygen therapy with 100% FiO₂, intravenous epinephrine, and advanced resuscitative measures. This case highlights the importance of early recognition, aggressive management, and systematic allergological investigation to prevent re-exposure.

KEYWORDS: Perioperative anaphylaxis; Rocuronium; Anaphylactic shock; Neuromuscular blocking agents; Plasma tryptase; General anesthesia; Drug hypersensitivity; Perioperative care.

INTRODUCTION

Perioperative anaphylactic shock is a life-threatening emergency, with an estimated incidence ranging from 1 in 10,000 to 1 in 20,000 general anesthetics. Despite its rarity, it remains a major cause of anesthesia-related mortality. Neuromuscular blocking agents, particularly rocuronium, are implicated in 50–70% of reported perioperative anaphylaxis cases in several international series. Diagnostic difficulty arises from the variability of clinical presentations and the fact that early signs may be confused with common respiratory or hemodynamic complications occurring during general anesthesia.

We report here a typical but severe case of anaphylactic shock that occurred in the central operating room of the P17 intensive care unit in 2023, illustrating the key elements of diagnosis and management.

CASE PRESENTATION

A 42-year-old man, a chronic smoker and substance user, with no known allergies and no prior surgical history, was scheduled for osteosynthesis of an intra-articular elbow fracture. After installation in the central operating room of the P17 intensive care unit, general anesthesia was selected. Induction was performed in a standard manner with intravenous fentanyl, followed by propofol and rocuronium for neuromuscular blockade.

Orotracheal intubation was uneventful. Five minutes after initiation of mechanical ventilation, the patient suddenly developed acute respiratory distress characterized by a marked increase in airway pressures, diffuse wheezing on auscultation, and oxygen desaturation requiring rapid escalation of FiO₂ to 100%. Profuse sweating and severe hemodynamic instability were observed, with a sudden drop in end-tidal CO₂, profound hypotension, and vasoplegia associated with signs of peripheral hypoperfusion.

A generalized erythematous skin rash appeared secondarily, strongly reinforcing the suspicion of anaphylactic shock. Immediate management included increasing FiO₂ to 100%, deepening sedation, administration of bronchodilators and intravenous corticosteroids, and repeated intravenous epinephrine boluses of 50 µg. A continuous epinephrine infusion was subsequently initiated via a central venous line, leading to gradual hemodynamic stabilization.

The surgical procedure was aborted, and the patient was transferred to the intensive care unit. Immediate blood sampling, including plasma tryptase measurement, revealed a marked elevation consistent with a type I anaphylactic reaction. The clinical course in the ICU was rapidly favorable, allowing extubation the following day. The patient was discharged from the ICU after complete recovery. Several weeks later, specialized allergological investigations confirmed sensitization to rocuronium, thereby definitively establishing the diagnosis.

DISCUSSION

Perioperative anaphylaxis is most often mediated by specific IgE antibodies and typically occurs immediately after exposure to the triggering agent. In this case, rocuronium was identified as the culprit, in accordance with published data identifying it as one of the

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most allergenic neuromuscular blocking agents. The complete absence of allergic history does not exclude the possibility of such reactions, but contributes to their unexpected nature and diagnostic difficulty.

The initial clinical presentation combined severe bronchospasm, oxygen desaturation, increased airway pressures, and hemodynamic collapse with a sudden decrease in capnography values, all of which are characteristic features of perioperative anaphylactic shock. Although delayed, the appearance of a generalized skin rash is a highly suggestive sign when present.

Epinephrine remains the cornerstone of treatment and must be administered early, initially as boluses and subsequently as a continuous infusion in cases of persistent vasoplegia. The favorable response observed in this case illustrates the effectiveness of prompt intervention.

Plasma tryptase measurement is a valuable diagnostic tool when performed early, ideally within 1 to 2 hours after the event. The significant elevation observed in our patient provided strong objective evidence supporting the diagnosis of anaphylaxis.

Systematic allergological investigation is essential to prevent future re-exposure and to guide anesthetic management for subsequent procedures. In this case, positive testing for rocuronium allowed precise identification of the responsible agent. It is recommended that such patients be provided with an allergy alert card and that alternative agents such as cisatracurium be preferred, or that regional anesthesia be considered for future interventions.

CONCLUSION

Perioperative anaphylactic shock is a rare but formidable complication requiring immediate recognition and aggressive management. This case underscores the importance of constant vigilance in the operating room, even in patients with no known allergic history. The confirmed involvement of rocuronium highlights the necessity of systematic post-event evaluation to prevent recurrence. Rapid and appropriate management led to a favorable outcome, emphasizing the importance of well-established protocols and continuous training of anesthesia and critical care teams.

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