

## Short Report

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# Intraoperative anaphylaxis to sugammadex: A case report

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## Abstract

Sugammadex is widely used for the reversal of aminosteroid neuromuscular blockade, particularly rocuronium and vecuronium. Although it is considered generally safe, anaphylaxis has been increasingly reported. We describe the case of a healthy young woman who developed sudden cardiovascular collapse, bronchospasm, and hypoxemia immediately after administration of sugammadex during laparoscopic surgery. Rapid recognition and prompt administration of intravenous epinephrine and supportive therapy resulted in complete recovery. This case highlights the potential for life-threatening hypersensitivity reactions to sugammadex and reinforces the importance of vigilance, preparedness, and confirmatory allergy testing after recovery.

**Keywords:** Sugammadex; Anaphylaxis; Perioperative complication; Hypersensitivity; Neuromuscular blockade reversal; Case report.

**Abbreviations:** ASA: American Society of Anesthesiologists; IV: Intravenous; ICU: Intensive Care Unit; SpO<sub>2</sub>: Peripheral Oxygen Saturation.

## Introduction

Sugammadex is a modified  $\gamma$ -cyclodextrin compound developed to encapsulate aminosteroid neuromuscular blocking agents such as rocuronium and vecuronium, thereby producing rapid and reliable reversal of neuromuscular blockade [1]. Since its introduction, it has become widely adopted in anaesthetic practice because of its efficacy and predictable recovery profile. Despite its favourable safety record, hypersensitivity and anaphylaxis have emerged as significant concerns [2,3].

The reported incidence of sugammadex-induced anaphylaxis varies between 1 in 2,500 and 1 in 20,000 administrations, with higher rates reported in Japanese clinical surveillance [4,5]. These reactions typically occur within minutes of administration and can result in cardiovascular collapse, bronchospasm,

and cutaneous manifestations [6]. We report a case of intraoperative anaphylaxis associated with sugammadex and discuss its clinical relevance in the context of the current literature.

## Case presentation

A 32-year-old woman, American Society of Anesthesiologists (ASA) II, with a body mass index of 24, was scheduled for elective laparoscopic cholecystectomy. She had no history of drug allergies and only a background of mild, well-controlled asthma.

Anaesthesia was induced with Intravenous (IV) propofol (2 mg/kg) and fentanyl (2  $\mu$ g/kg). Rocuronium (0.6 mg/kg) was used to facilitate intubation, and anaesthesia was maintained with sevoflurane in oxygen/air. The intraoperative course remained stable, and no additional muscle relaxant was required.

At the conclusion of the procedure, spontaneous breathing was observed. Sugammadex 200 mg IV was administered for reversal of neuromuscular blockade. Within one minute, the patient developed sudden hypotension (118/70 mmHg to 60/30 mmHg), tachycardia (128 bpm), bronchospasm with increased airway pressures, oxygen desaturation to 82%, and generalized erythema. End-tidal CO<sub>2</sub> rose, and ventilation became difficult.

The anaesthesia team diagnosed intraoperative anaphylaxis. Immediate measures included discontinuation of sevoflurane, ventilation with 100% oxygen, and administration of IV epinephrine 100 µg, repeated twice for persistent instability. Rapid fluid resuscitation was initiated, followed by IV hydrocortisone 200 mg and chlorpheniramine 10 mg. Over 10 minutes, haemodynamics stabilized (110/65 mmHg), SpO<sub>2</sub> improved to 96%, and bronchospasm resolved.

The patient was transferred to the Intensive Care Unit (ICU) and intubated for observation. She was extubated safely after 6 hours, with no neurological sequelae. Serum tryptase obtained one hour after the event measured 28 µg/L (normal <11 µg/L). Six weeks later, allergy testing confirmed hypersensitivity to sugammadex, with negative results for rocuronium and other agents. The patient was discharged on postoperative day two with advice to avoid sugammadex in the future.

## Discussion

This case shows the typical features of sugammadex-induced anaphylaxis: Rapid onset of cardiovascular instability, bronchospasm, hypoxemia, and skin changes shortly after administration. The diagnosis was supported by elevated serum tryptase and confirmed by allergy testing.

Although sugammadex is generally considered safe, anaphylaxis is a recognized complication. Surveillance data from Japan report an incidence as high as 1 in 2,500, significantly higher than initial post-marketing estimates [4]. The reaction may be IgE-mediated to sugammadex itself or to the sugammadex-rocuronium complex [7]. Previous reports have documented cases across a spectrum of ages and doses, underscoring that reactions may occur even without prior exposure [3,6].

Management follows standard anaphylaxis protocols, with epinephrine as the first-line agent [8]. In this case, immediate administration of epinephrine and supportive care resulted in rapid recovery, in line with established guidelines [9]. Post-event investigation is essential, as serum tryptase supports diagnosis and allergy testing guides future anaesthetic management.

## Conclusion

In conclusion, anaesthetists should maintain vigilance during and after sugammadex administration. Early recognition and prompt treatment of anaphylaxis are lifesaving. Patients must undergo confirmatory testing and carry documentation to avoid future re-exposure.

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