

Sugammadex Rescue in Avoiding Intensive Care Unit Admission in an Octogenarian Undergoing Emergency Laparotomy

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Postlaparotomy management for elderly patients with underlying comorbidities is always a challenge because of poor cardiorespiratory reserves and prolonged effect of anesthetic drugs. For these reasons, such patients usually require intensive care unit (ICU) admission in the postoperative period. We report a case of an 85-year-old chronic smoker with controlled diabetes mellitus who needed an emergency laparotomy for a perforated gastric ulcer. Unfortunately, there was a shortage of ICU backup. With the successful conduct of an early surgery using combined general and regional anesthesia, the use of sugammadex (Bridion, Merck Sharp & Dohme Corp, Oss, the Netherlands) as a reversal agent, a skilled surgeon, and good post-anesthesia care, the patient did not require ICU admission. He recovered fast and was discharged home 4 days after surgery. This case study aims to contribute to the literature on experience of a successful conduct of anesthesia in a high-risk geriatric patient when ICU facilities are limited.

Keywords: geriatrics, sugammadex, muscle relaxant reversal, perforated gastric ulcer, intensive care.

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MORBIDITY ASSOCIATED WITH general anesthesia is always an issue when dealing with elderly patients.¹ This is largely attributed to underlying comorbidities, poor cardiorespiratory reserves, and the prolonged effect of anesthetic drugs.¹ The condition becomes more challenging when it comes to emergency laparotomy for a perforated viscus.² Therefore, intensive care unit (ICU) admis-

sion after emergency laparotomy for an elderly patient with comorbidity is a routine practice in many institutions.³ A delay of bed availability in the ICU, however, often causes significant morbidity and mortality.^{4,5}

Sugammadex (Bridion, Merck Sharp & Dohme Corp, Oss, the Netherlands) is a novel selective

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relaxant binding agent that can produce rapid and complete reversal of aminosteroid muscle relaxant without causing cholinergic side effects.⁴ It is a reliable alternative to neostigmine as a reversal agent with better cost-effectiveness.⁶ It acts by encapsulating the neuromuscular blocking drug very tightly and forming a stable complex in the plasma until removed from circulation.⁵ With this mechanism, the increased duration of action in rocuronium seen in elderly patients⁷ is no longer a problem.

This article intends to provide an overview of perianesthesia care that might improve outcomes in an actual geriatric patient. To our knowledge, there has been no literature describing the practical use of sugammadex contributing to the successful perioperative management of an unplanned emergency laparotomy in a high-risk geriatric patient when ICU facilities are unavailable.

Perianesthesia Case Study

An 85-year-old, 55 kg gentleman presented with a 1-day history of epigastric pain associated with severe tenderness and guarding. His chest radiograph showed air under the diaphragm, and he was diagnosed to have perforated gastric ulcer (PGU).

The patient had underlying, controlled Type II diabetes. He was also a chronic smoker who had been smoking since the age of 30. However, he did not have many functional limitations. Preoperatively, he was able to climb two flights of stairs and ride a motorbike. On review, he was mildly dehydrated, with a blood pressure (BP) of 106/76 mm Hg and a heart rate of 96 bpm. Central venous pressure was 8 cm H₂O, urine output was 40 mL/hour, but the urine was concentrated. Although having severe tenderness and a mildly distended abdomen, he was afebrile. Total white count was $13.5 \times 10^3/\text{mm}^3$. Venous blood gas showed pH of 7.36, bicarbonate was 21.3 mmol/L, base excess was -3.5 mmol/L, lactate was 1.8 mmol/L, and random blood sugar was 7.4 mmol/L. Chest radiography showed mildly hyperinflated lungs in addition to the finding of air under the diaphragm. There was no cardiomegaly. Bedside ultrasonography revealed the presence of free fluid in the abdomen. In view of his morbidity, he was placed in acute bed in the ward with one-

to-two nursing care. Intravenous fluid therapy was started, and he was kept nil-by-mouth with hourly monitoring of blood sugar level and vital signs. Urine output was also monitored strictly to ensure adequate kidney perfusion.

Surgery was planned for laparotomy and PGU repair. Unfortunately, there was no backup bed in the ICU. The ICU facility in the only nearby tertiary hospital was also full. It became a dilemma whether to first proceed with surgery or to wait for availability of ICU backup. After a multidisciplinary discussion, consensus was reached. A technique of combined general and regional anesthesia would be used perioperatively, with sugammadex as reversal, and the surgery would be performed by a senior surgeon to shorten the duration of surgery.

The patient was called to the operating room immediately for the PGU repair with continuous fluid resuscitation. After preoxygenation, anesthesia was induced with midazolam 3 mg and fentanyl 50 mcg. Once unconscious, cricoid pressure was applied, and intravenous rocuronium 60 mg (1.1 mg/kg) was given. He was intubated with video laryngoscope (Karl Storz, Tuttlingen, Germany) under modified rapid sequence induction with endotracheal tube size of 7.5 mm. Anesthesia was maintained with a sevoflurane concentration of 1.7% to 2%, aiming at minimal alveolar concentration of 0.7.

Postintubation, bilateral ultrasound-guided transverse abdominis plane block with bupivacaine 0.25% (a total of 30 cc) was given as perioperative analgesia. Infusion of remifentanyl 0.05 mcg/kg/minute was administered as adjunct analgesia for visceral coverage. PGU repair was performed. There was a 1×1 cm prepyloric perforation with 200 cc of pus. Peritoneal cavity was washed thoroughly. Primary repair and omental patch repair were done. The surgery was completed in 98 minutes. Vital signs and temperature were stable throughout the procedure. Arterial blood gas showed no acidosis with lactate level of 1.0 mmol/L (Table 1). BP at the end of surgery was 100/70 mm Hg, and heart rate was 95 bpm.

The patient was subsequently transferred to the Phase I postanesthetic care unit (PACU) with one-to-one nursing care for fast weaning. Continuous oxygen saturation (SPO₂) and vital signs

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