Anaphylaxis to Rocuronium: an Unexpected Cause of Extreme Intraoperative Hypotension

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A 73-year old male with hypertension, hyperlipidemia, chronic kidney disease and peripheral vascular disease was admitted for numbness and pain in the left lower extremity secondary to a left popliteal artery aneurysm. At the time, his only known allergy was to polyethylene glycol. The patient was subsequently planned for a left popliteal artery aneurysm repair. During medical evaluation, he was found to have contrast nephropathy in the setting of chronic kidney disease with a creatinine of 2.64. Eventually, the creatinine decreased to 1.64 with treatment and the patient was scheduled for revascularization of the left lower extremity.

OR Events:

Initial vital signs: BP: 177/92, HR: 64, oxygen saturation: 99%

Prior to induction, the patient received 1 mg of IV midazolam and 100 mcg of IV fentanyl. The patient was induced with 14 mg of etomidate, followed by 50 mg of rocuronium, and was successfully intubated. Immediately following intubation, the patient’s blood pressure dropped to 35/20, with the heart rate in the 80s-90s and was unresponsive to boluses of phenylephrine and ephedrine. Breath sounds were clear bilaterally. The patient eventually required vasopressin and epinephrine to restore adequate circulation. Due to the patient’s severe hypotension, which lasted upwards of 10 minutes, as well as his recent contrast nephropathy, the case was cancelled and the patient was transferred to the Surgical Intensive Care Unit, where he received further medical workup, including a stress test and cardiac catheterization which showed mild coronary artery disease and normal left ventricular function with an ejection fraction of 65%.

The patient was brought to the OR for a second time and the initial vital signs were the following: BP: 188/99, HR: 76, oxygen saturation: 99%.

A radial arterial line was placed prior to induction. The patient received IV fentanyl 50 mcg pre-induction and was induced with IV fentanyl 50 mcg and propofol 130 mg, followed by rocuronium 50 mg. Once again, patient immediately became hypotensive to a systolic pressure in the 30s, with the heart rate in the 70-80s and clear breath sounds bilaterally. The patient was resuscitated with pressors and transferred to the Surgical Intensive Care Unit, where he was found to have tryptase levels of 48.8 ng/ml (more than four times the normal range). A review of the anesthesia records pinpointed the hypotension occurring immediately following induction on both occasions, with the use of rocuronium as a common factor.

A third attempt at the case was made the following day and the patient was induced in a slow, controlled manner with IV midazolam, IV fentanyl and etomidate, followed by cis-atracurium in place
of rocuronium. The patient subsequently did not experience any hemodynamic abnormalities. The surgery was completed uneventfully and the patient was discharged home shortly afterwards.

Discussion:

Although anaphylaxis to rocuronium is uncommon, it can manifest with significant hemodynamic consequences intraoperatively. In addition to their rarity, rocuronium allergies are especially challenging to diagnose, given the multitude of other medications that are given during induction that could potentially be responsible for the drug reaction. Likewise, other physiologic causes for intraoperative hypotension must be included in the differential before confirming medication allergy as the cause. In this case, multiple attempts were made at the surgery with different induction and paralytic agents before it was confirmed that rocuronium was the offending medication.